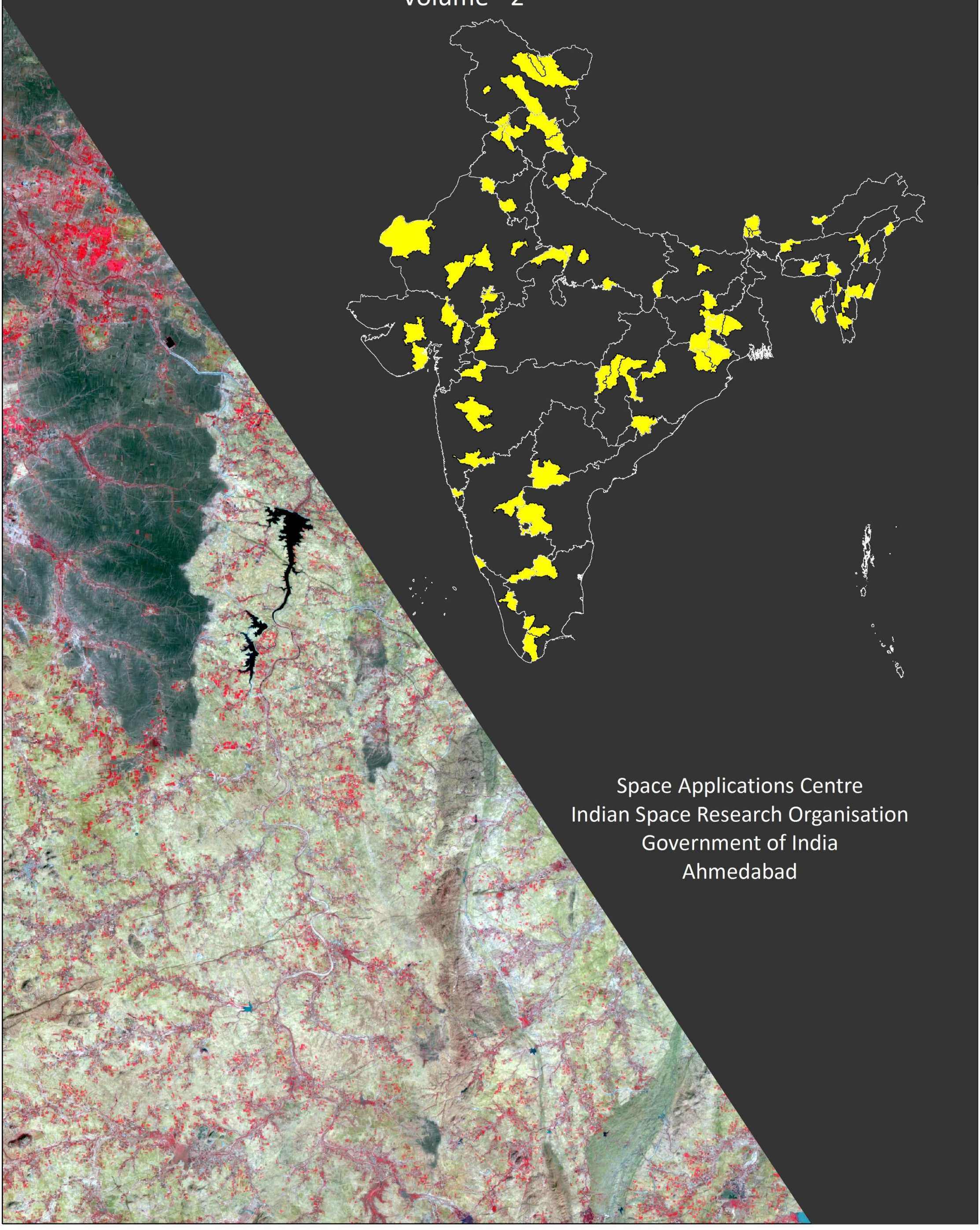
Desertification and Land Degradation Atlas of Selected Districts of India

(Based on IRS LISS III data of 2011-13 and 2003-05)

Volume - 2



Space Applications Centre
Indian Space Research Organisation
Government of India
Ahmedabad

Desertification and Land Degradation

Atlas of Selected Districts of India

(Based on IRS LISS III data of 2011-13 and 2003-05)

Volume - 2

Sponsored by
Ministry of Environment, Forest and Climate Change
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Dr. Harsh Vardhan

सत्यमेव जयते

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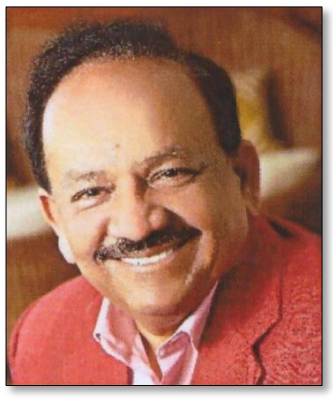
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्री
GOVERNMENT OF INDIA
MINISTER OF ENVIRONMENT, FOREST & CLIMATE CHANGE



Message

There is an urgent need to halt and reverse land degradation for ensuring food, water, environment and livelihood security in the country. Global efforts are being made to combat desertification and land degradation by more than 195 countries working together, including India through United Nations Convention to Combat Desertification (UNCCD). Overall goal is to improve the living conditions of people in drylands, maintain and restore land and soil productivity and mitigate the effects of drought.

Ministry of Environment, Forest & Climate Change (MoEF&CC) is the nodal agency interacting with UNCCD and I am happy to note that Desertification Cell of the Ministry is actively coordinating with all concerned Central and State Government Departments engaged in various scientific and technical issues related to desertification and land degradation. These efforts help in preparing national action plans for combating desertification and land degradation.

I am glad to note that in this endeavor, inventory and monitoring of the land under various processes of desertification and land degradation in our country is being carried out using data from Indian Remote Sensing Satellites. The current report-cum-atlas "Desertification and Land Degradation Atlas of Selected Districts of India (Based on IRS LISS-III data of 2011-13 and 2003-05)", provides spatial information on various land degradation processes and their severity.

I appreciate the project team of Space Applications Centre, ISRO, Ahmedabad and all other partner Central/State Government Departments and Academic Institutes for their valuable contributions in bringing out the Atlas and am sure that it shall be extremely useful to planners in combating land degradation.

Date: 01.06.2018

(Dr. Harsh Vardhan)

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Dr. Mahesh Sharma

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GOVERNMENT OF INDIA

Message

There are global concerns on reduction of limited fertile land due to desertification and land degradation processes. Increasing population is putting pressure on our finite land resources. Inappropriate land use and agricultural practices viz., over-cultivation, overgrazing, deforestation, poor irrigation practices, indiscriminate mining, increasing urbanization are some of the major causes leading to loss of fertile agricultural and forest covered land.

There is an urgent need for sustainable land management along with preparation and implementation of suitable action plans for combating desertification and land degradation.

I am happy to note that Desertification Cell of the Ministry of Environment, Forest & Climate Change (MoEF&CC) is representing India in United Nations Convention on Combating Desertification (UNCCD) and is actively coordinating with all concerned Central and State Government Departments engaged in various scientific and technical issues related to combating desertification and land degradation. I am sure that these efforts shall help us in achieving land degradation neutral status by 2030.

I am glad that at the behest of MoEF&CC, Space Applications Centre (SAC), Indian Space Research organization (ISRO), Ahmedabad along with twenty partner institutes has taken up the task of inventory and monitoring desertification and land degradation status using data from Indian Remote Sensing Satellites. It would facilitate in prioritizing areas to be taken up for combating desertification and land degradation and help in halting and reversing land degradation.

I congratulate the project team of Space Applications Centre, ISRO, Ahmedabad and all other partner Central/State Government Departments and Academic Institutes for their valuable contributions.

(Dr. Mahesh Sharma)

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Preamble

Harnessing space technology for national development is the motto of Indian Space Program. Various Ministries, Central and State Government Departments are utilizing space technology. Currently, Indian Space Research Organisation is working with different ministries for enhanced utilization of space technology in governance and development through various projects.

Increase in desertification/land degradation affected areas, reduction in fertile lands and resultant migration of people and cattle, as well as poverty, are issues of global concern. Space technology can be effectively utilised not only for rapid inventory and monitoring but also for action plan preparation to combat land degradation. In this direction, Space Applications Centre (SAC), ISRO, Ahmedabad, has brought out an Atlas titled "Desertification and Land Degradation Atlas of Selected Districts of India (Based on IRS LISS III data of 2011-13 and 2003-05)". This joint activity, involving twenty concerned partner institutes of the country, has resulted in 1:50,000 scale maps of desertification/ land degradation for 76 districts and 2 sub-basins in Leh district of Jammu & Kashmir. It is extremely useful for prioritising areas needing immediate action to combat land degradation.

I am sure that this atlas would be extremely useful to the Ministry of Environment, Forest & Climate Change (MoEF&CC) for India's reporting to United Nations Convention to Combat Desertification (UNCCD), taking effective actions to combat land degradation and would help to achieve land degradation neutrality status by 2030. I hope that with current rapid improvements in earth observation satellites, analytical tools and techniques, space technology would play a major role in above endeavors.

I congratulate the Project team for bringing out this Atlas for easy reference and use by policy makers, planners, managers and researchers.

12/6/2018

(कै. शिवन / K. Sivan)

Dated: June 12, 2018

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SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

सत्यमेव जयते

सी.के.मिश्रा
C.K.Mishra

Foreword

There are increasing global concerns regarding loss of valuable fertile land due to natural processes of land degradation, overexploitation and unplanned developmental activities. Moreover, increasing human and cattle population is putting pressure on finite land resources. Land is a precious and limited natural resource and needs to be used cautiously. There is need for sustainable land management.

India is signatory to the United Nations Convention on Combating Desertification (UNCCD) and is committed to combat desertification/land degradation and achieving land degradation neutral status by 2030. The Ministry of Environment, Forest and Climate Change (MoEF&CC) is the nodal Ministry for India's periodic reporting on status of desertification/land degradation to UNCCD. In order to combat land degradation, Government of India has launched large number of National Level Programmes and Schemes.

These programmes/schemes require baseline data on inventory and monitoring of desertification/land degradation status of entire country using Earth observation satellites. I am happy to note that Space Applications Centre, Ahmedabad at the behest of Ministry has taken a lead in this direction and has developed process based desertification/land degradation classification and methodology for analyzing satellite data along with concerned academic/Central/State government Departments at National level. Desertification and Land Degradation Atlas of India (Based on IRS AWiFS data of 2011-13 and 2003-05) has been already published. These maps were prepared on 1:500, 000 scale.

In continuation, similar work has been completed for selected 76 districts and two sub-basins in Leh district of Jammu & Kashmir State on 1:50, 000 scale for 2011-13 and 2003-05 time frame using IRS LISS-III data. The present Atlas provides the maps, area estimates and change analysis.

The outcome in the form of desertification/land degradation maps prepared using multi-temporal Indian remote sensing satellite data in GIS environment and change detection area estimates are extremely useful for prioritizing areas requiring efforts for combating land degradation and also India's reporting status of desertification/land degradation to UNCCD.

I congratulate the national team for their efforts and am sure that this Atlas would be useful as a ready reference for concerned policy makers, researchers and all others concerned with combating desertification and land degradation in the country.

Dated: 31st May 2018
Place: New Delhi

(C.K. Mishra)

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Preface

Recognizing the significant role of Earth Observation Satellites and geospatial techniques in desertification and land degradation studies, Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India, New Delhi has entrusted a National level project on "Desertification Status Mapping of India" to Space Applications Centre (SAC), ISRO, Ahmedabad. As part of this project, Desertification and Land Degradation Status Mapping on 1:500 K for entire country using digital IRS AWiFS data for two time frames 2011-13 and 2003-05 was completed and the outcome was published in the form of an atlas. The atlas has been found to be extremely useful by MoEF&CC as well United Nations Convention to Combat Desertification (UNCCD). Further, it has been widely utilised by concerned policy makers, planners, managers and researchers through its availability on SAC web portal VEDAS and MoEF&CC website.

In continuation, work has been completed for selected districts using digital IRS LISS III data of 2011-13 and 2003-05 time frames on larger scale (1:50K) and the outcome has been brought out in the form of "Desertification and Land Degradation Atlas of Selected Districts of India (Based on IRS LISS III data of 2011-13 and 2003-05)".

This atlas contains district wise Desertification/ Land Degradation status maps for two time frames, along with area statistics and changes. It is extremely useful for understanding various land degradation processes in different parts of the country and prioritizing areas to combat land degradation. The geospatial database created for two timeframes along with satellite images has been put on SAC Web Portal VEDAS. The geospatial database can be easily updated in future.

I am happy to note that this work is further continuing and efforts are there to develop automated techniques for monitoring land degradation using current and planned earth observation satellites. In addition, it is also envisaged to develop techniques for early warning and prepare action plans for combating land degradation on 1:10K scale.

I appreciate the efforts made by the national project team and congratulate them for their valuable contributions.

(तपन मिश्रा)

(Tapan Misra)

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Acknowledgements

The project entitled "Desertification Status Mapping of India", has been taken up by the Space Applications Centre (SAC), Ahmedabad, based on the recommendation of National Natural Resources Management System (NNRMS) Standing Committee on Bio-resources and Environment (NNRMS SC-B). We are thankful to the Ministry of Environment, Forest & Climate Change (MoEF&CC) for entrusting the task to SAC through NNRMS and funding the project.

We would like to place on record our deep sense of gratitude to Shri K. Sivan, Chairman, Indian Space Research Organisation (ISRO) and Secretary, Department of Space (DOS), Shri A.S. Kiran Kumar, former Chairman, ISRO and Secretary, DOS and Shri Tapan Misra, Director, SAC for their encouragement and guidance.

We are thankful to Shri Ravi Shankar Prasad and Shri Jigmet Takpa, Joint Secretaries, Dr. Satish C. Garkoti, Dr. T. Chandni, Dr. G.V. Subrahmanyam, Shri Lalit Kapur, Ms. Madhumita Biswas, Scientists G and Advisers and Ms. Bharati, Director(IFS-II), MoEF&CC for their keen interest and guidance.

We are also thankful to Dr. Harendra Kharkwal, Shri Pankaj Verma, Scientists-D, and Dr. Rajesh Prasad Rastogi, Scientist B, MoEF&CC for their support.

We express our thanks to Dr. Raj Kumar, Deputy Director, EPSA, Dr. B.S. Gohil, Dr. P.K. Pal, Dr. J.S. Parihar former Deputy Directors, EPSA and Dr. M. Chakraborty, former Group Director, GSAG, SAC for providing technical guidance, suggestions and necessary support. Shri Shashikant A. Sharma, Group Head, VRG, SAC is acknowledged for facilitating hosting of entire geospatial database and Atlas in SAC Web Portal VEDAS for wider dissemination and usage. We are thankful to Dr. S. Bandyopadhyay, Scientist, ISRO HQ, and Shri J.G. Patel, Scientist, SAC for their support.

Contributions made by Shri Manish Parmar, Scientist, SAC in the analysis and presentation of the outcome including design conceptualization of the Atlas are significant and noteworthy. Contributions and efforts of Ms. Koyel Sur, former SRF, SAC are appreciable. We are thankful to the SAC Committee on, 'Space Applications: Projects Monitoring and review, Outsourcing and Inter Agency Document Review Committee', for their comments and suggestions.

We extend our gratitude to Directors/Heads of the Institutes/Vice-Chancellors of twenty collaborating research organizations/academic institutions of the country for their support in executing this project.

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Executive Summary

There are global efforts to combat desertification. India is signatory to the United Nations Convention on Combating Desertification (UNCCD) and is committed to achieve the land degradation neutral status by 2030. The Convention addresses specifically the issue of Desertification, Land Degradation and Drought (DLDD). Desertification Cell at Ministry of Environment, Forest & Climate Change (MoEF&CC), Government of India, New Delhi represents India in UNCCD and has established a multi-institutional mechanism for India's reporting to UNCCD related to implementation of Indian programmes for combating desertification and land degradation.

One of the key requirement is inventory and monitoring desertification and land degradation of the country using satellite data in Geographical Information System (GIS) environment for providing baseline data to be used for prioritizing areas, carrying out desertification vulnerability and risk assessment and preparing action plans for combating desertification and land degradation.

Accordingly, Desertification and Land Degradation has been identified as one of the thrust area by the National Natural Resources Management System - Standing Committee on Bio-resources and Environment (NNRMS SC-B), Chaired by Secretary, MoEF&CC. NNRMS SC-B provides broad guidelines about the requirements of MoEF&CC and approves relevant projects using satellite data catering to its needs.

A project entitled, "Desertification Status Mapping of India", under NNRMS Scheme, funded by MoEF&CC has been completed by Space Applications Centre (SAC), Indian Space Research Organisation (ISRO), Ahmedabad as a nodal Centre along with 20 concerned Central/State government departments and academic institutes of the country. Indian Remote Sensing satellite (IRS) data has been utilised to prepare Desertification /Land Degradation Status Maps in Geographical Information System (GIS) environment depicting Land Use, Process of Desertification/Land Degradation and Severity Level for entire country based on interpretation of Advanced Wide Field Sensor (AWiFS) data with 56 m spatial resolution on 1:500K and for selected districts of the country by interpreting Linear Imaging Self Scanner (LISS) – III data with 23 m spatial resolution on 1:50K for 2011-13 and 2003-05 time frame and reports the changes. These maps are helpful in identifying early signals of land degradation in good agriculture/forest land as well improvement in existing degraded land due to various reclamation measures.

The project has generated baseline geospatial database along with corresponding satellite data on status of desertification/land degradation which is helpful in prioritizing areas for regional planning and to the ongoing National Action Plans (NAP) and Sustainable Land and Ecosystem Management (SLEM) program for combating desertification/land degradation. It can be further used for monitoring changes in future. The status of India's desertification and land degradation along with the changes can be used for India's reporting to UNCCD.

Based on the above mentioned work, an Atlas entitled, "Desertification and Land Degradation Atlas of India (Based on IRS AWiFS data of 2011-13 and 2003-05)", was prepared and released on June 17, 2016 on the occasion of "World Day to Combat Desertification", in a programme jointly organized by MoEF&CC and AFRI at Jodhpur. It is put on web portal of MoEF&CC as well web portal of SAC for wider dissemination and usage. The copies were also made available to UNCCD through Desertification Cell of the Ministry and the work was appreciated. This Atlas presents Desertification /Land Degradation Status Maps depicting Land Use, Process of Degradation and Severity Level along with area statistics consolidated for entire country as well state-wise for 2011-13 and 2003-05 time frame and reports the changes. Representative sample images of IRS AWiFS data are also included for reference purpose.

The analysis revealed that 96.40 mha area of the country is undergoing process of land degradation i.e., 29.32% of the Total Geographic Area (TGA) of the country during 2011-13, while during 2003-05 the area undergoing process of land degradation is 94.53 mha (28.76% of the TGA). Analysis shows that around 23.95% (2011-13) and 23.64% (2003-05) of desertification/land degradation with respect to TGA is contributed by Rajasthan, Maharashtra, Gujarat, Jammu & Kashmir, Karnataka, Jharkhand, Odisha, Madhya Pradesh and Telangana in descending order. All other remaining states are contributing less than 1% (individually) of desertification/land degradation.

However, the analysis with respect to TGA of the individual states show that Jharkhand, Rajasthan, Delhi, Gujarat and Goa are showing more than 50% area under desertification/land degradation, whereas states with less than 10% area under desertification/land degradation are Kerala, Assam, Mizoram, Haryana, Bihar, Uttar Pradesh, Punjab and Arunachal Pradesh.

There is a cumulative increase of 1.87 mha area undergoing process of desertification/land degradation in the country (constituting 0.57% of the TGA of the country) during the time frame 2003-05 and 2011-13. The change analysis indicates that around 1.95 mha land has been reclaimed and 0.44 mha land has been converted from high severity to low severity degradation class, indicating improvement. On the other hand, around 3.63 mha productive land has degraded and 0.74 mha land has converted from low severity to high severity degradation class. Further, during this time frame, high desertification/land degradation changes are observed in the states of Delhi, Tripura, Nagaland, Himachal Pradesh and Mizoram (11.03-4.34 %), whereas Odisha, Rajasthan, Telangana and Uttar Pradesh have shown improvement (-0.11 to -1.27 %).

The most significant process of desertification/ land degradation in the country is Water Erosion (10.98% in 2011-13 and 10.83% in 2003-05). The second most significant process is Vegetation Degradation (8.91% in 2011-13 and 8.60% in 2003-05), which is followed by Wind erosion (5.55 % in 2011-13 and 5.58 % in 2003-05).

Area under desertification (arid, semi-arid and dry sub-humid regions of the country) during 2011-13 is 82.64 mha; whereas, during 2003-05 it is 81.48 mha. Thus there is a cumulative increase of 1.16 mha area under desertification. The most significant processes of desertification in arid region is observed to be wind erosion and in semi-arid and dry sub-humid regions vegetation degradation and water erosion dominates

The present atlas entitled, "Desertification and Land Degradation Atlas of Selected Districts of India (Based on IRS LISS – III data of 2011-13 and 2003-05)", depicts above mentioned work carried out on 1:50, 000 scale for 76 districts and 2 sub-basins in Leh district of the country (List given in table below).

These districts/sub-basins have been selected from each state based on list of districts identified as drought prone under Drought Prone Areas Programme (DPAP) of Department of Land Resources, Ministry of Rural Development, Government of India and/or chosen by the concerned

state department/academic institute based on their priority. This Atlas presents Desertification /Land Degradation Status Maps depicting Land Use, Process of Degradation and Severity Level along with area statistics and reports the changes.

Table: List of districts mapped on 1:50, 000 scale using IRS, LISS-III data of 2011-13 and 2003-05

S. No.	State	District (s)
1	Andhra Pradesh	Anantapur
2	Arunachal Pradesh	Tawang, Tirap
3	Assam	Golaghat, Hailakandi, Kokrajhar
4	Bihar	Bhabua, Samastipur, Sitamarhi
5	Chhattisgarh	Durg, Raipur, Rajnandgaon
6	Goa	North Goa
7	Gujarat	Bhavnagar, Panch Mahals, Sabar Kantha, Surendranagar
8	Haryana	Bhiwani, Sirsa
9	Himachal Pradesh	Kangra, Kinnaur, Lahul & Spiti
10	Jammu & Kashmir	Badgam, Kargil, Kathua, Nubra Sub-Basin & Shyok Sub-Basin, Leh
11	Jharkhand	Bokaro, Giridih, Pashchimi Singhbhum
12	Karnataka	Bellary, Chamarajanagar
13	Kerala	Kasaragod, Palakkad
14	Madhya Pradesh	Dhar, Morena, Neemuch, Ratlam
15	Maharashtra	Ahmadnagar, Dhule, Sangli
16	Manipur	Chandel, Churachandpur
17	Meghalaya	Jaintia Hills, West Khasi Hills
18	Mizoram	Aizawl, Lunglei
19	Nagaland	Kohima, Wokha
20	Odisha	Bargarh, Kendujhar, Koraput, Mayurbhanj
21	Punjab	Hoshiarpur, Pathankot
22	Rajasthan	Ajmer, Dausa, Jaisalmer, Pali
23	Sikkim	North Sikkim, South Sikkim, East Sikkim, West Sikkim
24	Telangana	Mahabubnagar
25	Tamil Nadu	Dharmapuri, Krishnagiri, Theni, Tirunelveli, Virudhunagar
26	Tripura	South Tripura ,West Tripura
27	Uttar Pradesh	Chitrakoot, Etawah, Kanpur Dehat
28	Uttarakhand	Chamoli, Pauri Garhwal
29	West Bengal	Bankura, Purulia

On-screen visual interpretation of IRS LISS – III data (three season i.e., rabi, summer and kharif) in GIS environment on 1:50, 000 scale has been carried out. Geo-database was created using ArcGIS software package based on National Spatial Frame work on 1:50K with LCC projection and WGS 84 datum. Base layers of administrative boundaries, settlements, water bodies, road and rail networks were used as reference from ancillary datasets. Forest boundaries were taken from Forest Survey of India (FSI) and used as reference layer to delineate polygons particularly within forest areas. Ground truth data and field checks were carried out to finalize the maps. Quality Checking (QC) was carried out considering accuracy of georeferencing (Image co-registration < 2 pixels error), uniformity in projection and datum, correctness of interpreted land use, process & severity, correctness of GIS database design and standards (MMU > 2.25 ha, topology checking, seamless mosaic, codification, cartographic elements) etc.

Mapping has been carried out for 49.66 million ha, which is ~ 15.10 % of country's total geographical area. The analysis reveals that out of 49.66 million ha area, 22.80 million ha area (45.92%) in undergoing land degradation during time frame 2011-13. The area under degradation during time frame 2003-05 is 22.94 million ha (46.20%). A cumulative decrease of 0.14 million ha area (0.28%) in the area undergoing land degradation is observed.

Top three districts with highest area undergoing desertification/land degradation are Jaisalmer, Rajasthan (92.96% during 2011-13 and 98.13% during 2003-05), Lahul & Spiti, Himachal Pradesh (80.54% during 2011-13 and 80.57% during 2003-05) and Kargil, Jammu & Kashmir (78.23% during 2011-13 and 78.22% during 2003-05).

Districts with more than 50% area under desertification/land degradation in descending order are Shyok sub-basin (Jammu & Kashmir), Giridih (Jharkhand), Kinnaur (Himachal Pradesh), Bokaro (Jharkhand), Anantapur (Andhra Pradesh), Dhule (Maharashtra), Kohima (Nagaland), Bargarh (Odisha), Purulia (West Bengal), Ahmadnagar (Maharashtra), Koraput (Odisha), West Khasi Hills (Meghalaya) , Kendujhar (Odisha), Aizawl (Mizoram), Panch Mahals (Gujarat), Surendranagar (Gujarat), Theni (Tamil Nadu) and North Goa (Goa).

Bottom three districts with least area under desertification/land degradation are Sitamarhi, Bihar (2.01% during 2011-13 and 3.25% during 2003-05), Hoshiarpur, Punjab (3.32% during 2011-13 and 2.61% during 2003-05) and Samastipur, Bihar (3.16% during 2011-13 and 3.97% during 2003-05).

Highest increase in land degradation is observed in Lunglei district of Mizoram (5.81% increase from 2003-05 to 2011-13). Other districts with more than 2% increase in land degradation in descending order are Aizawl (Mizoram), South Tripura (Tripura), Kathua (Jammu Kashmir), Bhiwani (Haryana), Kokrajhar (Assam), Hailakandi (Assam) and Tirap (Arunachal Pradesh).

Jaisalmer district of Rajasthan is observed with highest decrease (5.17% decrease from 2003-05 to 2011-13) in area undergoing land degradation indicating improvement in land reclamation. Other districts indicating decrease in land degradation area with more than 2% in descending order are Kohima (Nagaland), Etawah (Uttar Pradesh), Badgam (Jammu Kashmir), Bhavnagar (Gujarat), Wokha (Nagaland) and Ahmadnagar (Maharashtra). All of these districts show improvement due to land reclamation measures.

The maps and salient findings compiled in the form of Atlas are meant for a ready reference to be used by concerned policy makers, regional planners and researchers. The maps prepared on 1:500K for entire country and 1:50K for selected districts have been uploaded on SAC Web portal VEDAS (www.vedas.sac.gov.in) for wider usage.

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Introduction

It is a known fact that Desertification/land degradation is a major economic, social and environmental problem of global concern. In general, land degradation is reduction in productivity of soil. Loss of soil productivity means loss of ecology and economy. Land degradation in drylands (arid, semi-arid and dry sub-humid zones) is defined as Desertification (UNCCD, 1994). Land is a precious limited natural resource and needs to be properly utilised for the sustenance of current and future generations of mankind. Increasing loss of fertile soil or reduction in productivity of soil leading to loss of crop land or forest cover are alarming scenarios.

The main causes of land degradation are natural processes such as water erosion/wind erosion, man-made such as mining/ quarrying/urbanization or a mix of natural and human induced such as vegetation degradation, water logging, salinity/alkalinity etc. Increasing population (both human and cattle), over exploitation of natural resources, un-sustainable land use practices, frequent natural hazards, extreme weather conditions and climate changes are accelerating the processes of land degradation. The physical status of the land is also a critical factor towards its vulnerability to land degradation, e.g., a land without vegetation cover and loose soil is more susceptible to erosion by water or wind. Actions are required for preventing productive land getting transformed to degraded land.

There are global efforts to combat desertification/land degradation. India is signatory to the United Nations Convention on Combating Desertification (UNCCD) and is committed to achieve the land degradation neutral status by 2030. The Convention addresses specifically the issue of Desertification, Land Degradation and Drought (DLDD). Desertification Cell at Ministry of Environment, Forest & Climate Change (MoEF&CC), Government of India, New Delhi represents India in UNCCD and has established a multi-institutional mechanism for India's reporting to UNCCD related to implementation of Indian programmes for combating desertification and land degradation.

One of the key requirement is inventory and monitoring desertification and land degradation of the country using satellite data in Geographical Information System (GIS) environment for providing baseline data to be used for prioritizing areas, carrying out desertification vulnerability and risk assessment and preparing action plans for combating desertification and land degradation.

Desertification and Land Degradation has been identified as one of the thrust area by the National Natural Resources Management System - Standing Committee on Bio-resources and Environment (NNRMS SC-B), Chaired by Secretary, MoEF&CC. NNRMS SC-B provides broad guidelines about the requirements of MoEF&CC and approves relevant projects using satellite data catering to its needs.

Accordingly, Space Applications Centre (SAC), Indian Space Research Organisation (ISRO), Ahmedabad has been entrusted with a project entitled, "Desertification Status Mapping of India", under NNRMS, funded by MoEF&CC. SAC has completed the project along with 20 concerned Central/State government departments and academic institutes of the country. Indian Remote Sensing satellite (IRS) data has been utilised to prepare Desertification /Land Degradation Status Maps in Geographical Information System (GIS) environment depicting Land Use, Process of Desertification/Land Degradation and Severity Level for entire country based on interpretation of Advanced Wide Field Sensor (AWiFS) data with 56 m spatial resolution on 1:500K and for selected districts of the country by interpreting Linear Imaging Self Scanner (LISS) – III data with 23 m spatial resolution on 1:50K for 2011-13 and 2003-05 time frame and reports the changes. These maps are helpful in identifying early signals of land degradation in good agriculture/forest land as well improvement in existing degraded land due to various reclamation measures.

The project has generated baseline geospatial database along with corresponding satellite data on status of desertification/land degradation which is helpful in prioritizing areas for regional planning and to the ongoing National Action Plans (NAP) and Sustainable Land and Ecosystem Management (SLEM) program for combating desertification/land degradation. It can be further used for monitoring changes in future. The status of India's desertification and land degradation along with the changes can be used for India's reporting to UNCCD.

Based on the above mentioned work, an Atlas entitled, "Desertification and Land Degradation Atlas of India (Based on IRS AWiFS data of 2011-13 and 2003-05)", was prepared (SAC, 2016). This Atlas presents Desertification /Land Degradation Status Maps prepared on 1:500K depicting Land Use, Process of Degradation and Severity Level along with area statistics consolidated for entire country as well state-wise for 2011-13 and 2003-05 time frame and reports the changes. Representative sample images of IRS AWiFS data are also included for reference purpose.

The Atlas has been put on web portal of MoEF&CC as well web portal of SAC for wider dissemination and usage. The copies were also made available to UNCCD through Desertification Cell of the Ministry and the work was appreciated. Figure-1 is a consolidated Desertification/Land Degradation Status Map of India based on 2011-13 AWiFS data.

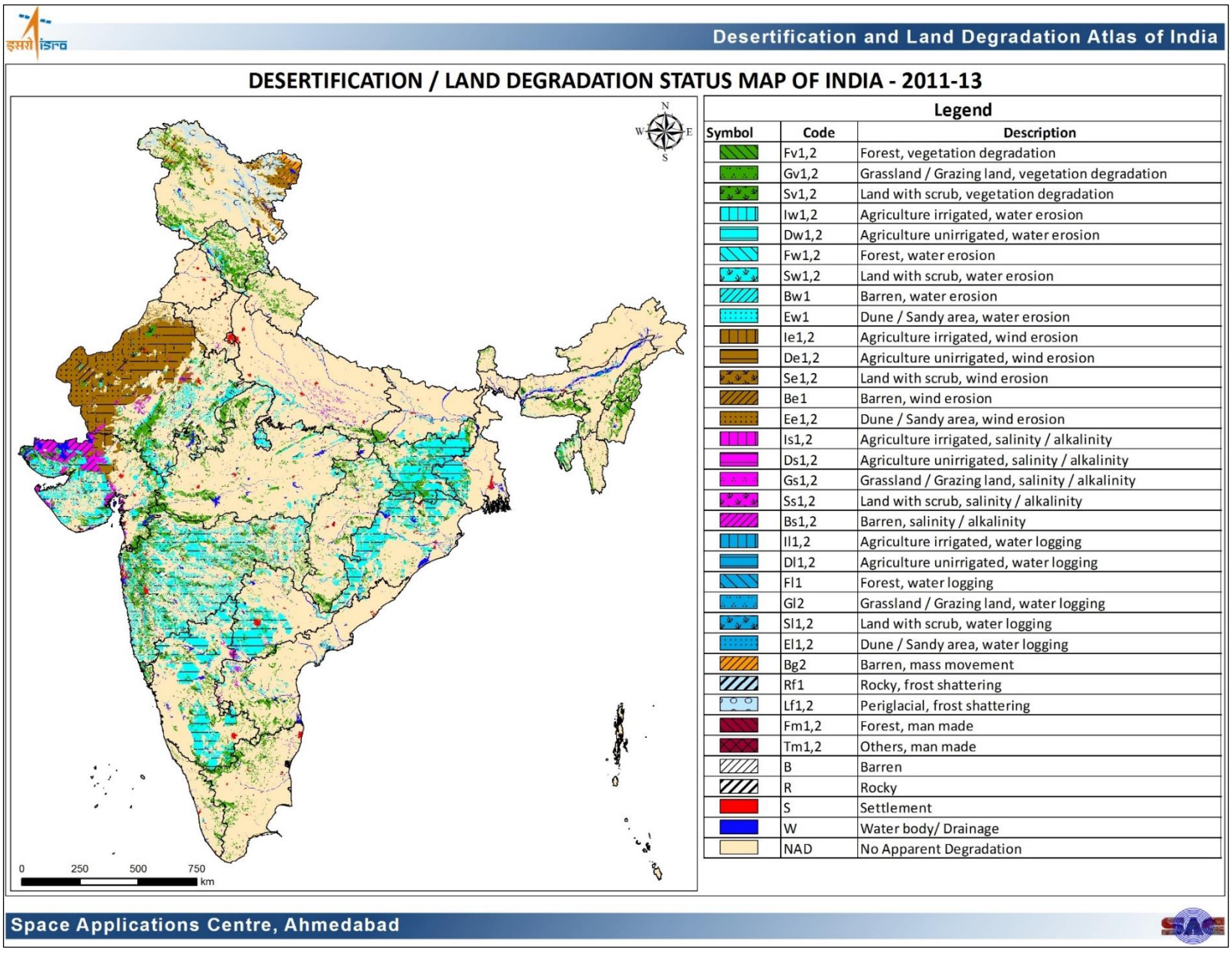


Figure-1: Desertification/ Land Degradation Status Map of India for time frame 2011-13 (SAC, 2016)

The analysis revealed that 96.40 mha area of the country is undergoing process of land degradation i.e., 29.32% of the Total Geographic Area (TGA) of the country during 2011-13, while during 2003-05 the area undergoing process of land degradation is 94.53 mha (28.76% of the TGA). Analysis shows that around 23.95% (2011-13) and 23.64% (2003-05) of desertification/land degradation with respect to TGA is contributed by Rajasthan, Maharashtra, Gujarat, Jammu & Kashmir, Karnataka, Jharkhand, Odisha, Madhya Pradesh and Telangana in descending order. All other remaining states are contributing less than 1% (individually) of desertification/land degradation.

However, the analysis with respect to TGA of the individual states show that Jharkhand, Rajasthan, Delhi, Gujarat and Goa are showing more than 50% area under desertification/land degradation, whereas states with less than 10% area under desertification/land degradation are Kerala, Assam, Mizoram, Haryana, Bihar, Uttar Pradesh, Punjab and Arunachal Pradesh.

There is a cumulative increase of 1.87 mha area undergoing process of desertification/land degradation in the country (constituting 0.57% of the TGA of the country) during the time frame 2003-05 and 2011-13. The change analysis indicates that around 1.95 mha land has been reclaimed and 0.44 mha land has been converted from high severity to low severity degradation class, indicating improvement. On the other hand, around 3.63 mha productive land has degraded and 0.74 mha land has converted from low severity to high severity degradation class. Further, during this time frame, high desertification/land degradation changes are observed in the states of Delhi, Tripura, Nagaland, Himachal Pradesh and Mizoram (11.03-4.34 %), whereas Odisha, Rajasthan, Telangana and Uttar Pradesh have shown improvement (-0.11 to -1.27 %).

The most significant process of desertification/ land degradation in the country is Water Erosion (10.98% in 2011-13 and 10.83% in 2003-05). The second most significant process is Vegetation Degradation (8.91% in 2011-13 and 8.60% in 2003-05), which is followed by Wind erosion (5.55 % in 2011-13 and 5.58 % in 2003-05).

Area under desertification (arid, semi-arid and dry sub-humid regions of the country) during 2011-13 is 82.64 mha; whereas, during 2003-05 it is 81.48 mha. Thus there is a cumulative increase of 1.16 mha area under desertification. The most significant processes of desertification in arid region is observed to be wind erosion and in semi-arid and dry sub-humid regions vegetation degradation and water erosion dominates

In continuance, the present atlas entitled, “Desertification and Land Degradation Atlas of Selected Districts of India (Based on IRS LISS – III data of 2011-13 and 2003-05)”, depicts maps prepared on 1:50, 000 scale for 76 districts and 2 sub-basins in Leh district of the country.

These districts/sub-basins have been selected from each state based on list of districts identified as drought prone under Drought Prone Areas Programme (DPAP) of Department of Land Resources, Ministry of Rural Development, Government of India and/or chosen by the concerned state department/academic institute based on their priority. This Atlas presents Desertification /Land Degradation Status Maps depicting Land Use, Process of Degradation and Severity Level along with area statistics and reports the changes.

The maps and salient findings compiled in the form of Atlas are meant for a ready reference to be used by concerned policy makers, regional planners and researchers. The maps prepared on 1:500K for entire country and 1:50K for selected districts have been uploaded on SAC Web portal VEDAS (www.vedas.sac.gov.in) for wider usage.

Objective

1. Desertification and land degradation status mapping using IRS LISS III data at 1:50,000 scale for 2011-13 and 2003-05 time frames for selected districts.
2. To carry out change analysis of desertification and land degradation status between 2011-13 and 2003-05 time frame.

Study area

Desertification and Land Degradation Status Mapping at 1:50,000 scale is carried out for 76 district and 2 sub-basins in Leh district, as per the list given below. These districts/sub-basins have been selected from each state based on list of districts identified as drought prone under Drought Prone Areas Programme (DPAP) of Department of Land Resources, Ministry of Rural Development, Government of India and/or chosen by the concerned state department/academic institute based on their priority. The atlas is printed in two volumes, as per the list given below.

Table-1: List of districts under Volume-1

Volume - 1					
S.No.	State	District	S.No.	State	District
1	Andhra Pradesh	Anantapur	20	Himachal Pradesh	Kangra
2	Arunachal Pradesh	Tawang	21		Kinnaur
3		Tirap	22		Lahul & Spiti
4	Assam	Golaghat	23	Jammu Kashmir	Badgam
5		Hailakandi	24		Kargil
6		Kokrajhar	25		Kathua
7	Bihar	Bhabua	26		Nubra Sub-Basin, Leh
8		Samastipur	27		Shyok Sub-Basin, Leh
9		Sitamarhi	28	Jharkhand	Bokaro
10	Chhattisgarh	Durg	29		Giridih
11		Raipur	30		Pashchimi Singhbhum
12		Rajnandgaon	31	Karnataka	Bellary
13	Goa	North Goa	32		Chamarajanagar
14	Gujarat	Bhavnagar	33	Kerala	Kasaragod
15		Panch Mahals	34		Palakkad
16		Sabar Kantha	35	Madhya Pradesh	Dhar
17		Surendranagar	36		Morena
18	Haryana	Bhiwani	37		Neemuch
19		Sirsa	38		Ratlam

Table-2: List of districts under Volume-2

Volume - 2					
S.No.	State	District	S.No.	State	District
39	Maharashtra	Ahmadnagar	60	Sikkim	North Sikkim
40		Dhule	61		South Sikkim
41		Sangli	62		East Sikkim
42	Manipur	Chandel	63		West Sikkim
43		Churachandpur	64	Tamil Nadu	Dharmapuri
44	Meghalaya	Jaintia Hills	65		Krishnagiri
45		West Khasi Hills	66		Theni
46	Mizoram	Aizawl	67		Tirunelveli
47		Lunglei	68		Virudhunagar
48	Nagaland	Kohima	69	Telangana	Maha`bubnagar
49		Wokha	70	Tripura	South Tripura
50	Odisha	Bargarh	71		West Tripura
51		Kendujhar	72	Uttar Pradesh	Chitrakoot
52		Koraput	73		Etawah
53		Mayurbhanj	74		Kanpur Dehat
54	Punjab	Hoshiarpur	75	Uttarakhand	Chamoli
55		Pathankot	76		Pauri Garhwal
56	Rajasthan	Ajmer	77	West Bengal	Bankura
57		Dausa	78		Purulia
58		Jaisalmer			
59		Pali			

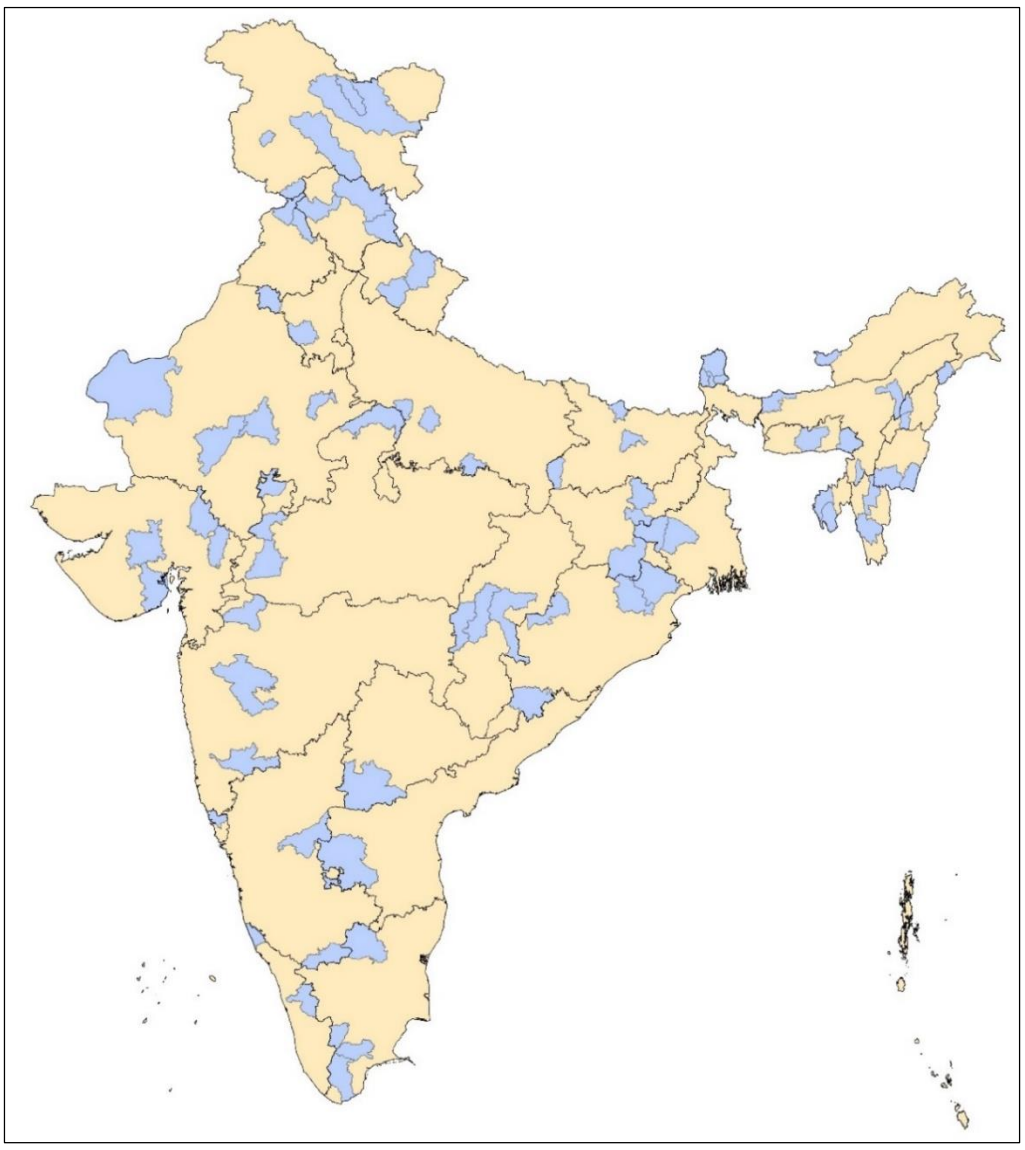


Figure-2: Districts selected for Desertification and Land Degradation Status Mapping at 1:50,000 scale

Data Used

Multi-temporal digital IRS LISS III data, ancillary information, collateral data and forest cover layer of Forest Survey of India (FSI) were used. IRS LISS III is 10 bits data with 23.5 meters spatial resolution, 24 day repeativity, swath of 141 km in four spectral channels, i.e. 520-590 nm (Green), 620-680 nm (Red), 770-860 nm (NIR) and 1550-1700 nm (SWIR). False Color Composite (FCC) prepared using first three bands. Base layers of water bodies, rivers and administrative boundaries were taken from Natural Resources Data Base (NRDB) and road and railway networks were taken from SAC National Wetland Inventory & Assessment (NWIA) project. Limited field data was also utilised to support image interpretation.

Table-3: List of data used

Satellite Data (2011-2013 and 2003-2005)	
Season	**Timeframe**
Kharif	October - December
Rabi	January - March
Summer	April - June

Ancillary Data	
Layer	**Source**
Forest Boundary	Forest Survey of India
Water body, Rivers	Natural Resources Data Base
Administrative boundary	
Road and railway network	SAC National Wetland Inventory & Assessment

Classification System

The classification system and the broad methodology for the desertification/land degradation mapping standardized during the previous studies/projects at SAC, ISRO (SAC 2007a, SAC, 2007b, Ajai et al., 2009 and SAC, 2016) has been followed in the present work. It comprises of three elements, viz., Land Use, Process of Degradation and Severity Level. A three level Alpha-numeric code is used for codification of the DSM maps in the current project. The details of classification system are depicted below:

Table-4: Desertification/land degradation classification system

Level-1: Land Use		**Level-2: Process of Desertification**		**Level-3: Severity**	
Agriculture irrigated	I	**vegetation degradation**	**v**	Slight	1
Agriculture unirrigated	D	water erosion	w	Moderate	2
Forest / Plantation	**F**	wind erosion	e	**Severe**	**3**
Grassland / Grazing land	G	salinity / alkalinity	s/a		
Land with scrub	S	water logging	l		
Barren	B	mass movement	g		
Rocky area	R	frost heaving	h		
Dune / Sandy area	E	frost shattering	f		
Glacial	C	man made	m		
Periglacial	L				
Others	T				

Forest, vegetation degradation, Severe → Fv3

Processes of Desertification/ Land Degradation

Vegetation degradation:

Vegetation degradation is referred as reduction in the biomass and/or decline in the vegetative ground cover, as a result of deforestation and/ or overgrazing. Such degradation is a major contributory factor to soil degradation particularly with regard to soil erosion and loss of soil organic matter. Vegetation is an important factor in the protection of soil and soil fertility. Destruction of vegetation accelerates soil degradation leading to its degradation. When a soil loses vegetation cover, it becomes more susceptible to wind and water erosion. Removal of top soil by water or wind erosion results in loss of organic material leading to decrease in soil aggregation and stability, and hence soil fertility. The water-holding capacity and the nutrient content of the soil are reduced when organic material is lost, which is an additional strain on vegetation survival. Agriculture observed within forest lands has also been classified under vegetation degradation. Figure-3 shows vegetation degradation as seen in LISS III image and corresponding field photograph.

Figure-3: Vegetation degradation within forest as visible in LISS III image covering parts of Tirap district, Arunachal Pradesh with corresponding field photograph

Water erosion:

Water Erosion is referred as loss of soil cover mainly due to rainfall and/ or surface runoff water. Water erosion can be categorised in three types, based on severity level, viz. sheet / rill erosion, gully erosion and ravine erosion. The sheet erosion (mostly within agricultural lands) and rills are categorised in slight category, the narrow and shallow gullies are categorized as moderate erosion, while the deep / wide gullies and ravines are classified as severe erosion. Particularly in the context of desertification or land degradation as a whole, water erosion does not refer to the river erosion. Figure-4 shows water erosion in LISS III image and corresponding field photograph.

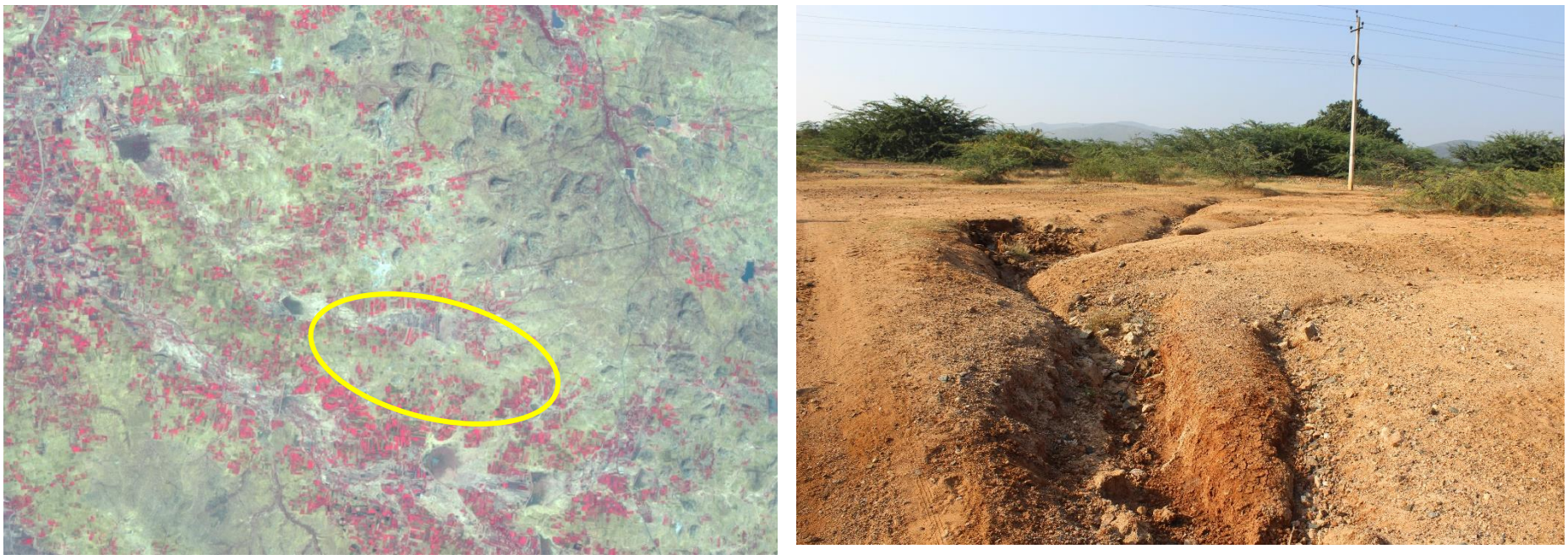


Figure-4: Gully erosion as visible in LISS III image covering parts of Bellary district, Karnataka with corresponding field photograph

Wind erosion:

Wind erosion pertains to the Aeolian activities. It denotes the spread of sand by various processes, even up to lofty altitudes of Himalayas. Soil is more vulnerable to wind erosion in conditions such as very sparse or no vegetative cover, increasing wind speed, loose, dry, fine or very light soil, smooth soil surface, large exposed area etc. Wind erosion removes the topsoil, which is rich in all plant nutrients and bacterial activities. Removal of topsoil reduces the capacity of the soil to function and restricts its ability to sustain future uses. Moreover, windblown dust or sand is deposited in cultivated land and buries the lands, thus reducing the production. Various kind of sand cover and their severity are classified based on the depth and spread of sand sheet/dunes and barchans. Figure-5 shows the satellite image and field photograph of wind erosion.

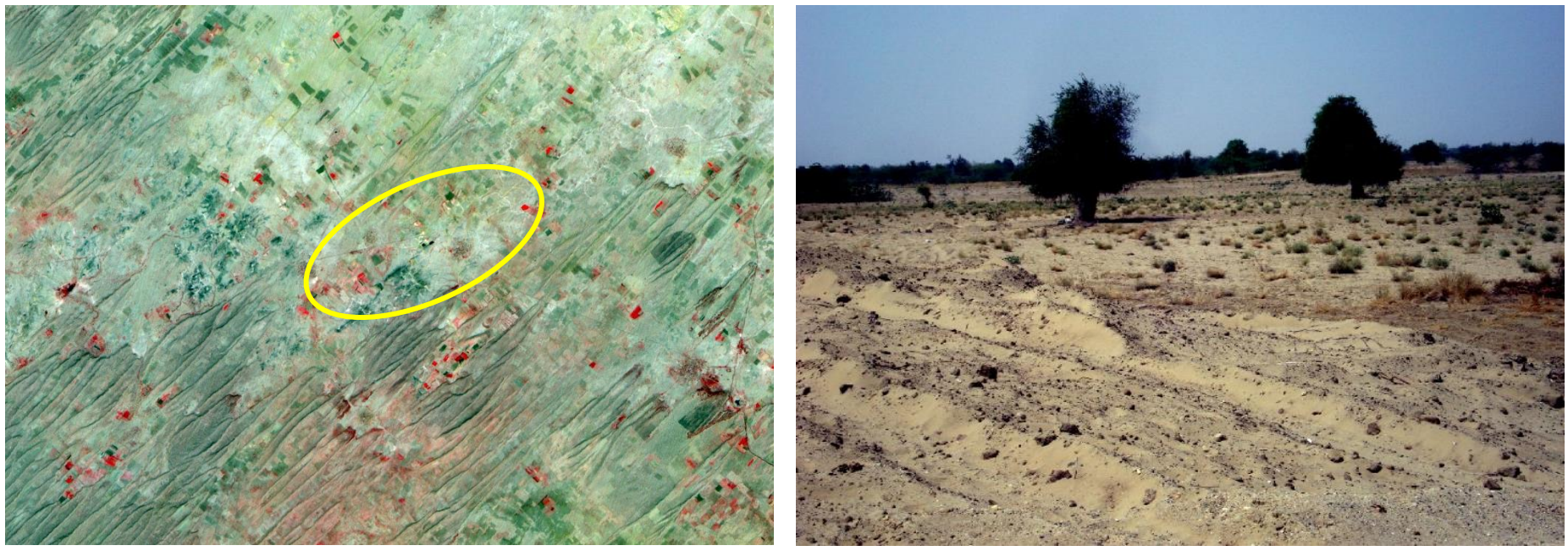


Figure-5: Sand dunes as visible in LISS III image covering parts of Jaisalmer district, Rajasthan with corresponding field photograph

Water logging:

Water logging refers to the saturation of soil with water. The undrained land parcels tend to accumulate standing water for longer durations of time on the surface, this condition is called water logging. Soil may be regarded as waterlogged when it is nearly saturated with water much of the time such that its air phase is restricted. This results in reduction of productivity as in agriculture, various crops need air to a greater or lesser depth in the soil. The severity of water logging is determined based on the period of time the water remains stagnant. Several situations can be responsible for the rise in water table like flood, salt-rich hard pans, excess irrigation, wrong drainage planning etc. Water logging may also lead to salinization. Figure-6 shows water logging in LISS III image and in corresponding field photograph.

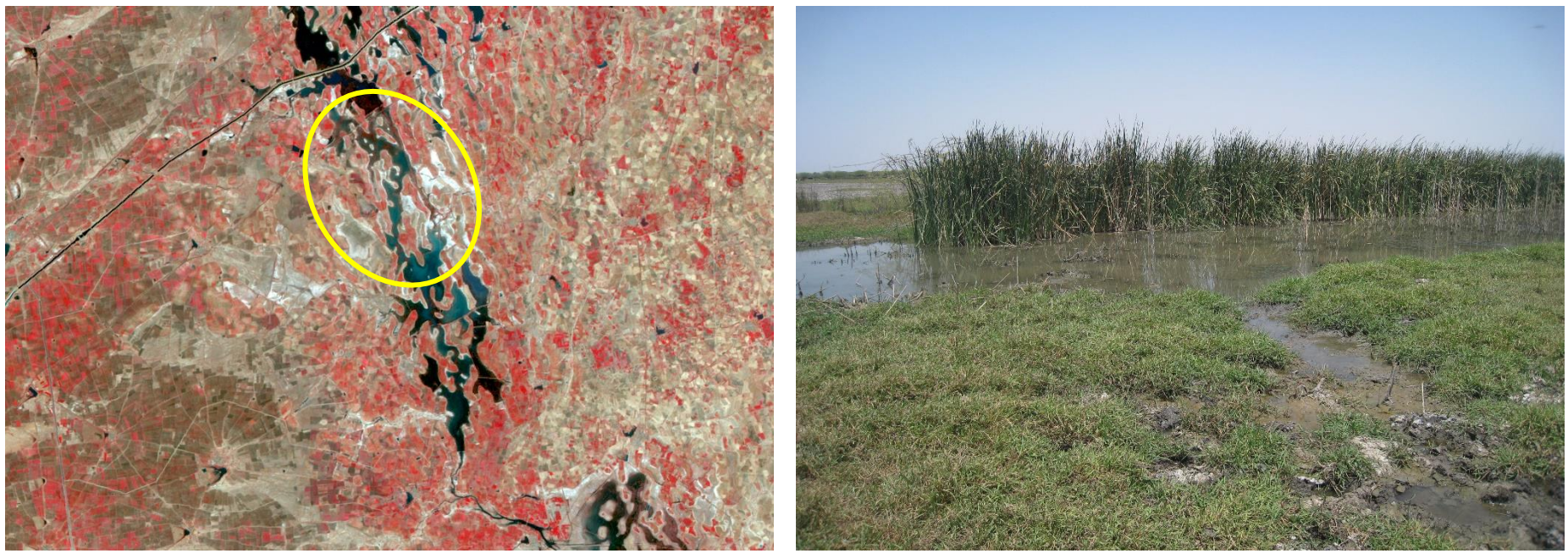


Figure-6: Water logging as visible in LISS III image covering parts of Surendranagar district, Gujarat with corresponding field photograph

Salinity / Alkalinity:

Salinity or Alkalinity is fundamentally the chemical property of the soils. It occurs mostly in cultivated lands, especially in the irrigated areas. At places salinity is clearly observed on satellite images, while the alkalinization is not seen and is mostly inferred based on ground truth and soil sample analysis as well as information/ published maps. Soil salinity refers to the water dissolvable salt present in soil. Salinity can develop naturally, or by human-induced factors. The main causes of salinity are excess evapotranspiration, drought, excess irrigation, increase in toxicity, and rise in ground water table. The salts from the groundwater are raised by capillary action to the surface of the soil and over time, water evaporates, and the salt remains on the surface. Salinity in irrigated land can occur due to over irrigation and excess use of fertilizers and other chemicals. Figure-7 shows LISS III image and field photograph of salinity.

Figure-7: Salinity in agricultural field as visible in LISS III image covering parts of Kanpur Dehat district, Uttar Pradesh with corresponding field photograph

Mass Movement:

The spontaneous downward movement of soil and rock under the influence of gravity (but without the dynamic action of moving fluids) is included under the general term Mass Movement (mass wasting). The mass movement processes include all forms of down slope movement of soils, overburden, or bedrock under the direct influence of gravity. Mass movement represents the spontaneous yielding of earth materials when gravitational force exceeds the internal strength of the material. It involves sliding, rolling and flowage of masses of soil, overburden and bedrock. Figure-8 shows the LISS III image of mass movement as visible in satellite image and corresponding field photograph.

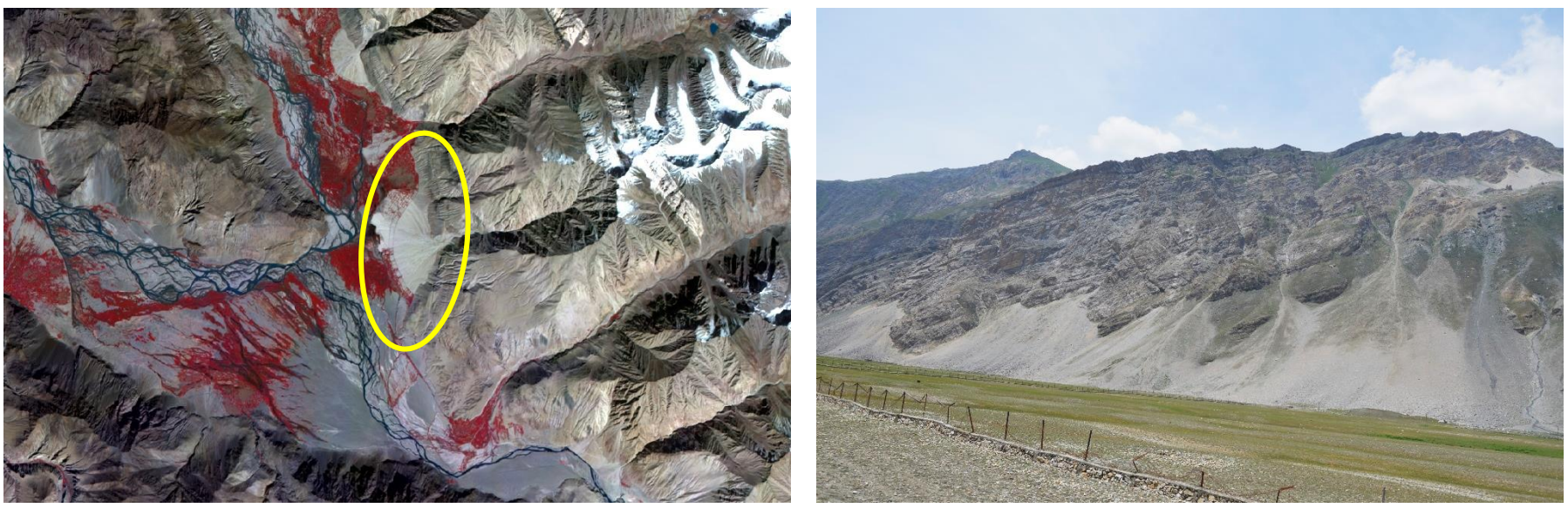


Figure-8: Mass movement as visible in LISS III image covering parts of Jammu & Kashmir with representative field photograph

Frost Heaving:

Frost heaving is the process of ice lens formation beneath the soil surface during freezing conditions in the atmosphere. The ice grows in the direction of heat loss (vertically toward the surface), starting at the freezing front or boundary in the soil. It requires a water supply to keep feeding the ice crystal growth. The growing ice is restrained by overlying soil, which applies a load that limits its vertical growth and promotes the formation of a lens-shaped area of ice within the soil. The force of one or more growing ice lenses is sufficient to lift a layer of soil, as much as 30 cm or more. The LISS III image and corresponding field photograph of frost heaving is shown in figure-9.

Figure-9: Frost heaving as visible in LISS III image covering parts of Jammu & Kashmir with corresponding field photograph

Frost shattering:

Frost shattering is the essentially a process of mechanical weathering or breakdown of rocks due to regular fluctuation in temperature, around $0^{o}C$, in joints or cracks in rocks. At times water enters into the cracks of rock and it freezes to ice and results in increases in its volume. This creates tremendous pressure on the surrounding rock and generates cracks. This process continues over time, widens the joints/cracks, and causes pieces of rock to shatter from the main rock. The broken pieces of rocks fall down and spread over creating a stony surface called Talus or Scree. This is a regular process in a periglacial environment. The alternating process of frost shattering slowly widens the joints/cracks, and in time, causes pieces of rock to shatter from the main rock. Figure-10 shows LISS III image and field photograph of frost shattering process.

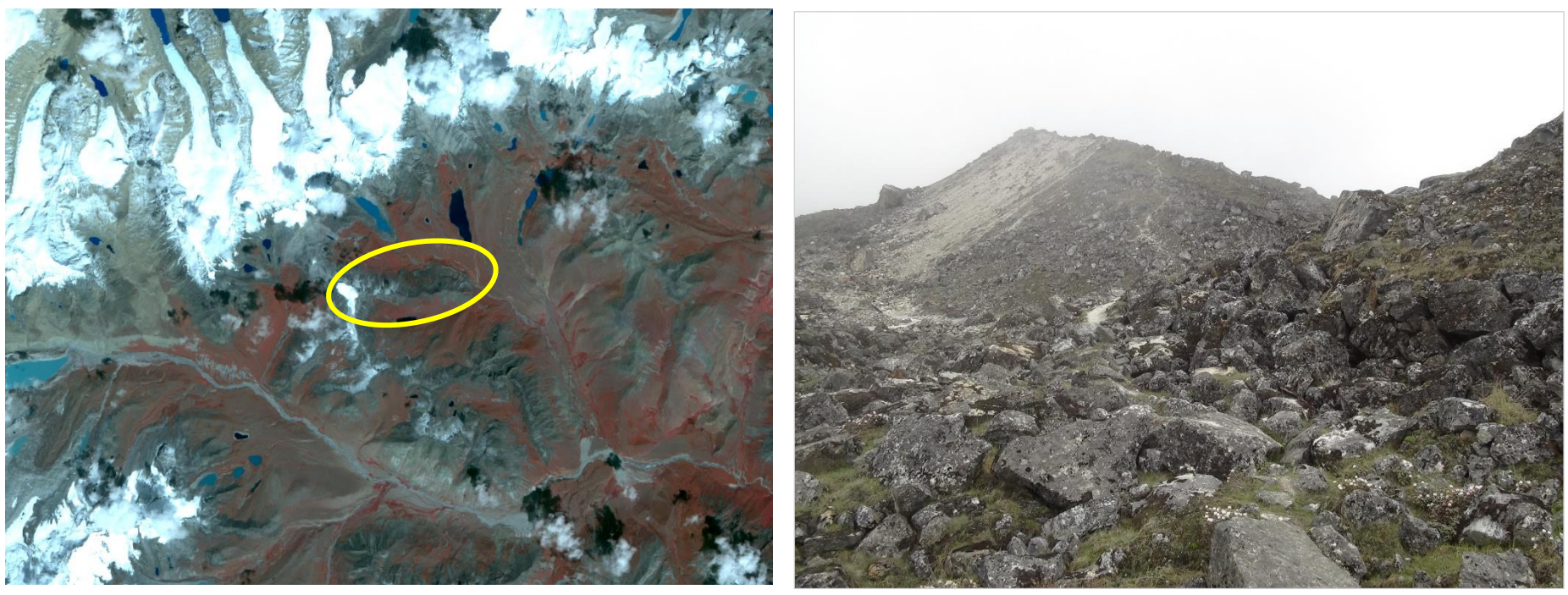


Figure-10: Frost shattering as visible in LISS III image covering parts of North Sikkim district, SIkkim with corresponding field photograph

Man Made:

All those land degradation processes which are induced directly or indirectly by human intervention and are not natural, are categorised as Man Made desertification processes. It includes, Mining/Quarrying, Brick Kiln, Industrial Effluents, City Waste, Urban Agglomeration etc. This occurs across various land use/ land cover classes. Figure-11 shows mining area in LISS III image and corresponding field photograph.

Figure-11: Open cast mining as visible in LISS III image covering parts of Bokaro district, Jharkhand with corresponding field photograph

Barren / Rocky area:

Barren / rocky areas are kind of wastelands which do not have productive capacity. These areas are mostly without or negligible soil cover either due to weathering and erosion of exogenetic processes or due to specific regolith made of hard rock. Figure 12 shows LISS III image and field photograph of rocky area.

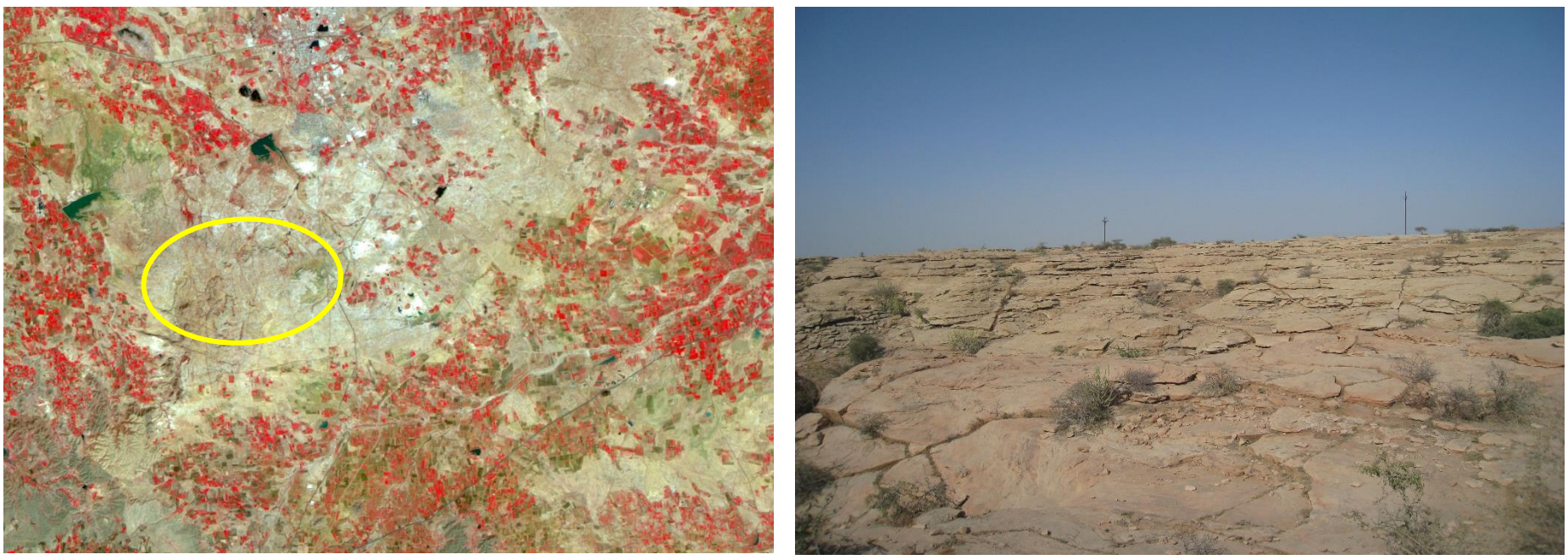


Figure-12: Rock outcrop as visible in LISS III image covering parts of Surendranagar district, Gujarat with corresponding field photograph

Participating Organisations

S. No.	Name of Participating Organisations	Mapping Area/ Work Responsibility
1	CRDF, Centre for Environment and planning Technology (CEPT), Ahmedabad	Bhavnagar, Panch Mahals, Sabar Kantha and Surendranagar districts, Gujarat
2	Haryana Remote Sensing Applications Centre (HARSAC), Hisar	Bhiwani and Sirsa districts, Haryana
3	ICAR - Central Arid Zone Research Institution (CAZRI), Jodhpur	Jaisalmer and Pali districts, Rajasthan
4	Institute of Remote sensing (IRS), Chennai	Dharmapuri, Krishnagiri, Theni, Tirunelveli and Virudhunagar districts, Tamil Nadu Kasaragod and Palakkad districts, Kerala
5	Jawaharlal Nehru University, (JNU), Delhi	Kangra, Kinnaur and Lahul & Spiti districts, Himachal Pradesh Shyok and Nubra sub-basins, Leh district, Jammu & Kashmir
6	Maharashtra Remote Sensing Applications Centre, (MRSAC), Nagpur	Ahmadnagar, Dhule, and Sangli districts, Maharashtra, North Goa district, Goa
7	Mizoram Remote Sensing Application Centre (MIRSAC), Aizawl	Aizawl and Lunglei districts, Mizoram South Tripura and North Tripura districts, Tripura
8	MP Council of Science and Technology (MPCST), Bhopal	Dhar, Morena, Neemuch and Ratlam districts, Madhya Pradesh Durg, Raipur and Rajnandgaon districts, Chhattisgarh
9	Nagaland GIS & RS Centre, Kohima	Kohima and Wokha districts, Nagaland Chandel and Churachandpur districts, Manipur
10	National Bureau of Soil Survey and Land Use Planning, (NBSSLUP), Bangalore	Anantapur district, Andhra Pradesh, Mahabubnagar district, Telangana Bellary and Chamrajanagar districts, Karnataka
11	North eastern Hill University, (NEHU), Shillong	Golaghat, Hailakandi and Kokrajhar districts, Assam Jaintia Hills and West Khasi Hills districts, Meghalaya
12	Orissa Remote Sensing Applications Centre, (ORSAC), Bhubaneshwar	Bargarh, Kendujhar, Koraput and Mayurbhanj districts, Odisha
13	Remote Sensing Applications Centre, Uttar Pradesh, (RSACUP), Lucknow	Chitrakoot, Etawah and Kanpur Dehat districts, Uttar Pradesh
14	Sikkim State Centre of Space Technology (SSCST), Sikkim	North Sikkim, South Sikkim, East Sikkim and West Sikkim districts, Sikkim
15	Soil and Land Use Survey of India, (SLUSI), Delhi	Chamoli and Pauri Garhwal districts, Uttarakhand Hoshiarpur and Pathankot districts, Punjab
16	State Remote Sensing Applications Centre (SRSAC AP), Itanagar	Tawang and Tirap districts, Arunachal Pradesh
17	University of Calcutta, Kolkata	Bankura and Purulia districts, West Bengal
18	University of Jammu, Jammu	Kargil district, Jammu & Kashmir
19	University of Kashmir, Srinagar	Badgam and Kathua districts, Jammu & Kashmir
20	University of Rajasthan, Jaipur	Ajmer and Dausa districts, Rajasthan
21	Space Applications Centre (SAC), ISRO, Ahmedabad	Project conceptualisation, formulation, overall coordination, methodology development, geospatial database design and organization, training, quality checking, analysis of outcome and Atlas Preparation. Mapping: Bhabua, Samastipur and Sitamarhi districts, Bihar Bokaro, Giridih and Pashchimi Singhbhum districts, Jharkhand; Krishnagiri district, Tamil Nadu

Methodology

Geo-coded LISS III digital data were analysed using onscreen visual interpretation techniques along with ancillary information to interpret Desertification and land degradation classes. District wise preliminary Desertification Status Maps (DSM) at 1:50,000 scale were prepared in Geographical Information System (GIS) environment. Geo-database was created in GIS using ArcGIS software package based on National Spatial Frame work on 1:50K with LCC projection and WGS 84 datum. Base layers of administrative boundaries, settlements, water bodies were used as reference from NRDB datasets and road and rail networks were used as reference from SAC NWIA project. Forest boundaries were taken from Forest Survey of India (FSI) and used as reference layer to delineate polygons particularly within forest areas. Ground truth data and field checks were carried out to finalize the maps.

Quality Checking (QC) was carried out considering accuracy of georeferencing (Image co-registration < 2 pixels error), Uniformity in Projection and Datum (WGS 1984 Lambert Conformal Conical), process & severity identification and GIS database design and standards (MMU > 2.25 ha, topology checking, seamless mosaic, codification, cartographic elements, etc). Necessary corrections were incorporated.

District wise statistics were generated for different processes for both the time frames. Changes in desertification and land degradation classes were brought out for the timeframes 2011-13 and 2003-05.

Mapping of area under Frost Shattering process was carried out from the images showing maximum ablation zone for both the time frames.

Schematic representation of the methodology is shown in Figure 13.

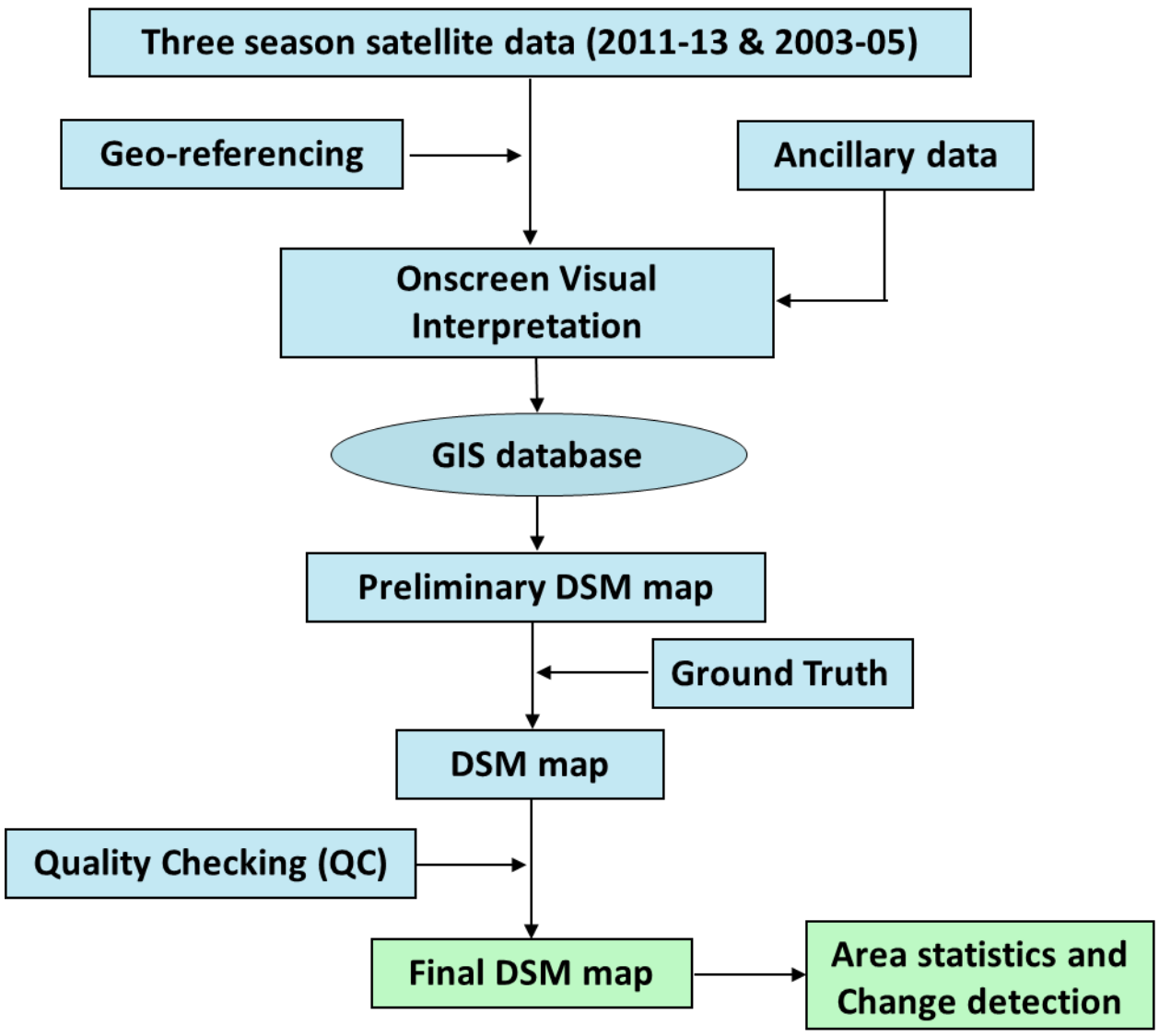


Figure-13: Schematic representation of Methodology

Summary of Analysis

Desertification/ Land degradation status mapping is carried out for selected districts for two time frames (2011-13 and 2003-05). In this project, a total of 76 districts and 2 sub-basins were mapped. The selected area covers 49.66 million ha, which is ~ 15.10 % of country's total geographical area (Census 2011).

The analysis reveals that out of selected/ mapped 49.66 million ha area, 22.80 million ha area (45.92%) is undergoing degradation during timeframe 2011-13. The area under degradation during time frame 2003-05 is 22.94 million ha (46.20%). A cumulative decrease of 0.14 million ha area (0.28%) in the area undergoing land degradation is observed (Figure 14).

Top three districts with highest area undergoing desertification/land degradation are Jaisalmer, Rajasthan (92.96% during 2011-13 and 98.13% during 2003-05), Lahul & Spiti, Himachal Pradesh (80.54% during 2011-13 and 80.57% during 2003-05) and Kargil, Jammu & Kashmir (78.23% during 2011-13 and 78.22% during 2003-05) as shown in Table-5.

Districts with more than 50% area under desertification/land degradation in descending order are Shyok sub-basin (Jammu & Kashmir), Giridih (Jharkhand), Kinnaur (Himachal Pradesh), Bokaro (Jharkhand), Anantapur (Andhra Pradesh), Dhule (Maharashtra), Kohima (Nagaland), Bargarh (Odisha), Purulia (West Bengal), Ahmadnagar (Maharashtra), Koraput (Odisha), West Khasi Hills (Meghalaya) , Kendujhar (Odisha), Aizawl (Mizoram), Panch Mahals (Gujarat), Surendranagar (Gujarat), Theni (Tamil Nadu) and North Goa (Goa) as shown in Table-5.

Bottom three districts with least area under desertification/land degradation are Sitamarhi, Bihar (2.01% during 2011-13 and 3.25% during 2003-05), Hoshiarpur, Punjab (3.32% during 2011-13 and 2.61% during 2003-05) and Samastipur, Bihar (3.16% during 2011-13 and 3.97% during 2003-05) as shown in Table-6.

Highest increase in land degradation is observed in Lunglei district of Mizoram (5.81% increase from 2003-05 to 2011-13) as shown in Table-7. Other districts with more than 2% increase in land degradation in descending order are Aizawl (Mizoram), South Tripura (Tripura), Kathua (Jammu Kashmir), Bhiwani (Haryana), Kokrajhar (Assam), Hailakandi (Assam) and Tirap (Arunachal Pradesh).

Jaisalmer district of Rajasthan is observed with highest decrease (5.17% decrease from 2003-05 to 2011-13) in area undergoing land degradation indicating improvement in land reclamation (Table-7). Other districts indicating decrease in land degradation area with more than 2% in descending order are Kohima (Nagaland), Etawah (Uttar Pradesh), Badgam (Jammu Kashmir), Bhavnagar (Gujarat), Wokha (Nagaland) and Ahmadnagar (Maharashtra). All of these districts show improvement due to land reclamation measures.

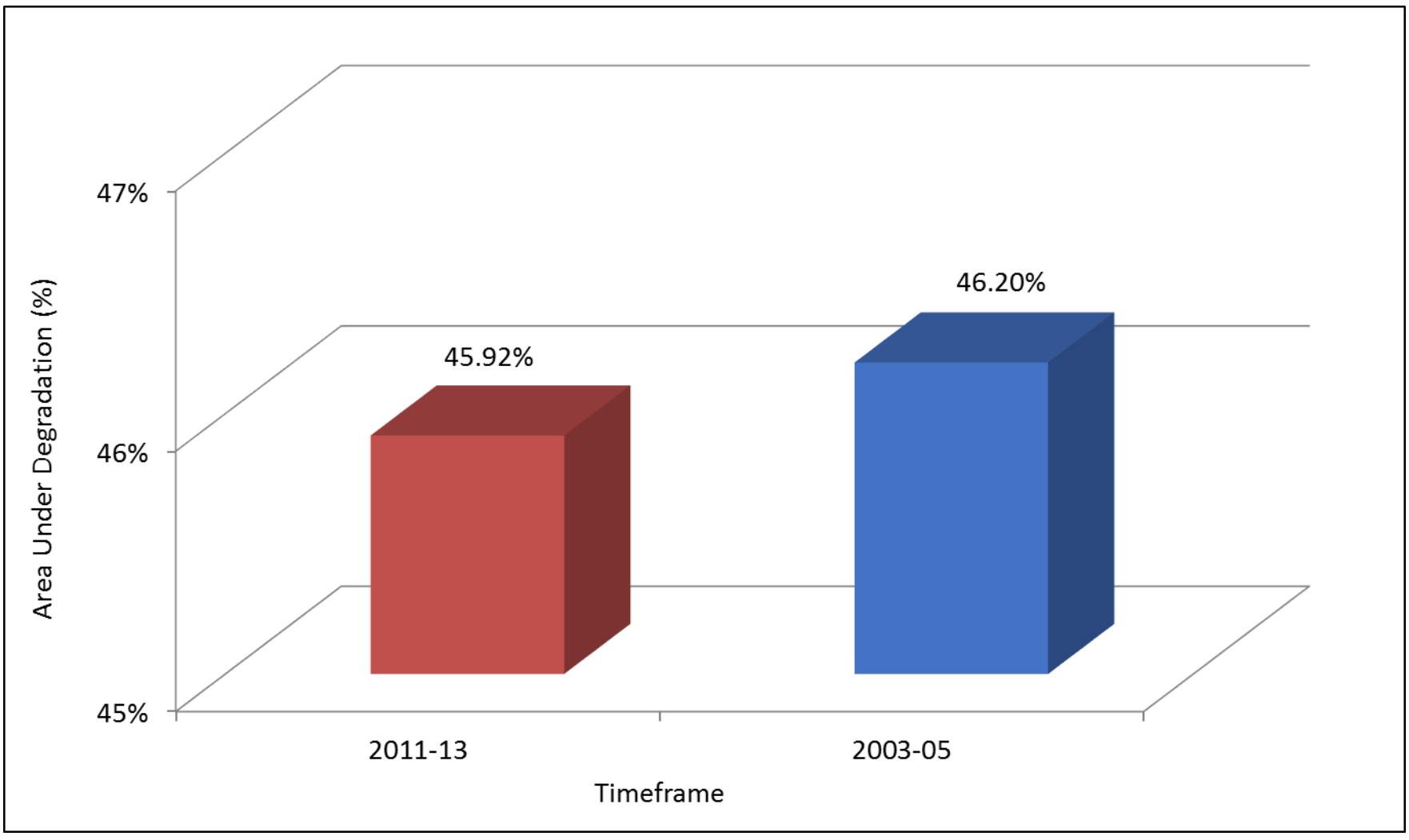


Figure 14: Area undergoing land degradation (as percentage of total area selected for mapping)

The tables below show the list of (a) districts observed with more than 50% area undergoing land degradation, (b) districts observed with less than 10 % area undergoing degradation, and (c) districts observed with more than 2% of changes between 2011-13 and 2003-05 timeframes.

Table-5: List of districts observed with more than 50% area undergoing land degradation

S.No.	District	State	2011-13		2003-05	
			Area (ha)	Area (%)	Area (ha)	Area (%)
1	Jaisalmer	Rajasthan	3569583	92.96	3768402	98.13
2	Lahul & Spiti	Himachal Pradesh	1114727	80.54	1115115	80.57
3	Kargil	Jammu Kashmir	1098082	78.23	1097904	78.22
4	Shyok	Jammu Kashmir	1967814	73.89	1968791	73.93
5	Giridih	Jharkhand	358183	73.79	358295	73.81
6	Kinnaur	Himachal Pradesh	462977	72.33	462880	72.31
7	Bokaro	Jharkhand	193892	67.25	193717	67.19
8	Anantapur	Andhra Pradesh	1232136	64.41	1231397	64.37
9	Dhule	Maharashtra	461902	64.20	456688	63.47
10	Kohima	Nagaland	91338	62.43	98466	67.30
11	Bargarh	Odisha	358162	61.36	365375	62.60
12	Purulia	West Bengal	357330	57.09	353639	56.50
13	Ahmadnagar	Maharashtra	963233	56.50	1007057	59.07
14	Koraput	Odisha	487504	55.35	486896	55.29
15	West Khasi Hills	Meghalaya	278159	53.01	275035	52.42
16	Kendujhar	Odisha	439848	52.97	437684	52.71
17	Aizawl	Mizoram	188976	52.83	171767	48.02
18	Panch Mahals	Gujarat	272387	52.07	273518	52.29
19	Surendranagar	Gujarat	536493	51.47	534534	51.28
20	Theni	Tamil Nadu	146450	51.06	146689	51.15
21	North Goa	Goa	87239	50.25	86434	49.79

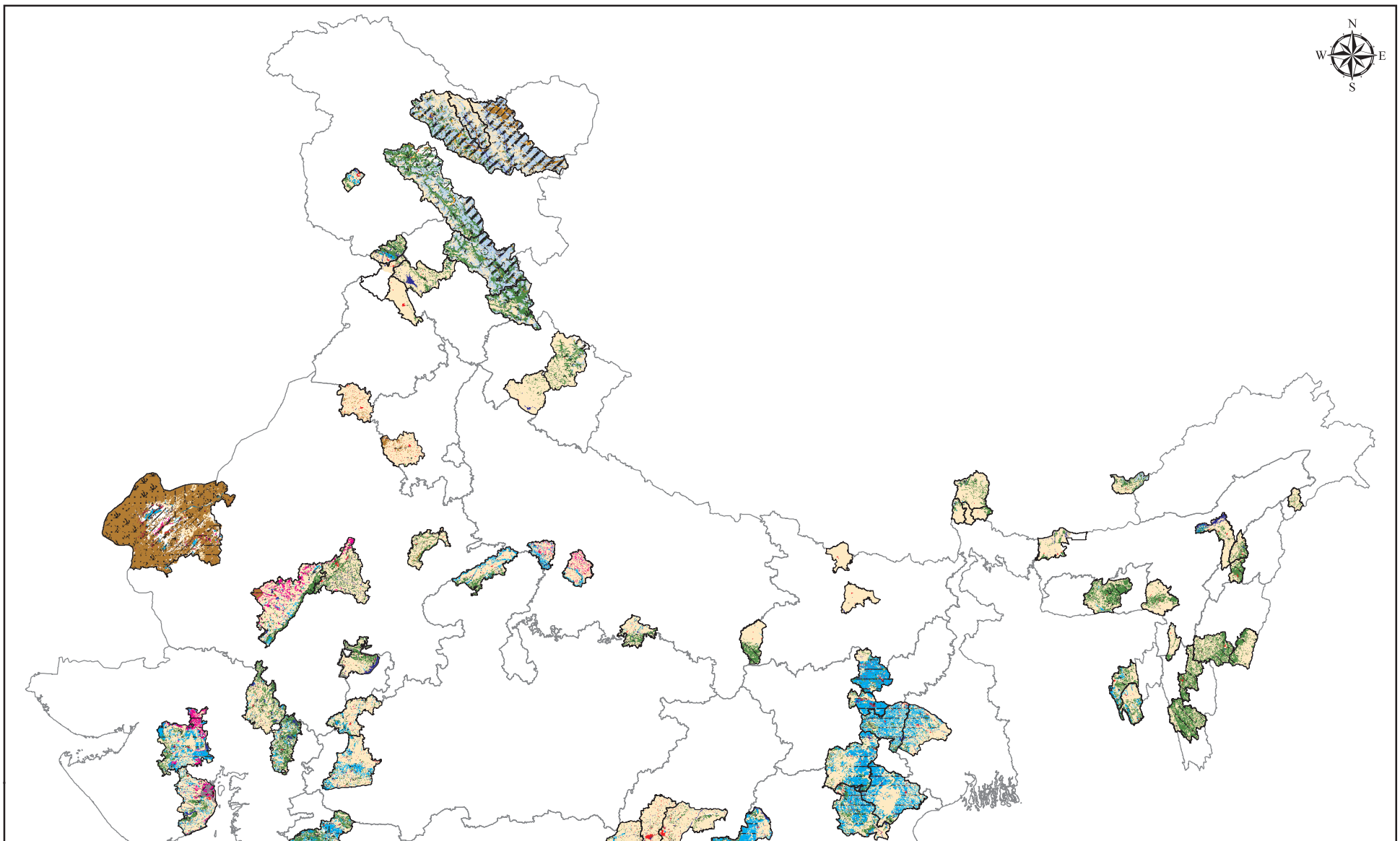
Table-6: List of districts observed with less than 10 % area undergoing degradation

S.No.	District	State	2011-13		2003-05	
			Area (ha)	Area (%)	Area (ha)	Area (%)
1	Sitamarhi	Bihar	4419	2.01	7153	3.25
2	Hoshiarpur	Punjab	11233	3.32	8827	2.61
3	Samastipur	Bihar	9165	3.16	11518	3.97
4	Pauri Garhwal	Uttarakhand	27067	5.08	25873	4.86
5	Palakkad	Kerala	33581	7.50	32384	7.23
6	Durg	Chhattisgarh	68363	8.01	66214	7.76
7	Kokrajhar	Assam	34946	10.60	26048	7.90
8	Pathankot	Punjab	9534	10.26	8728	9.39

Table-7: List of districts observed with more than 2% of changes between 2011-13 and 2003-05 timeframes

S.No.	District	State	2011-13		2003-05		Change (%) (2011-13) - (2003-05)
			Area (ha)	Area (%)	Area (ha)	Area (%)	
1	Lunglei	Mizoram	146673	32.32	120324	26.51	5.81
2	Jaisalmer	Rajasthan	3569583	92.96	3768402	98.13	-5.17
3	Kohima	Nagaland	91338	62.43	98466	67.30	-4.87
4	Aizawl	Mizoram	188976	52.83	171767	48.02	4.81
5	South Tripura	Tripura	97443	31.88	85506	27.97	3.90
6	Etawah	Uttar Pradesh	97202	42.06	105988	45.86	-3.80
7	Kathua	Jammu Kashmir	121819	48.69	113167	45.23	3.46
8	Badgam	Jammu Kashmir	50946	37.16	55447	40.44	-3.28
9	Wokha	Nagaland	59574	36.59	64597	39.68	-3.09
10	Bhavnagar	Gujarat	297044	35.64	322623	38.71	-3.07
11	Bhiwani	Haryana	75750	15.85	61696	12.91	2.94
12	Kokrajhar	Assam	34946	10.60	26048	7.90	2.70
13	Ahmadnagar	Maharashtra	963233	56.50	1007057	59.07	-2.57
14	Hailakandi	Assam	23543	17.74	20718	15.61	2.13
15	Mahabubnagar	Telangana	475430	25.79	436653	23.69	2.10
16	Tirap	Arunachal Pradesh	17401	14.97	15016	12.92	2.05

DESERTIFICATION / LAND DEGRADATION STATUS MAP OF SELECTED DISTRICTS - 2011-13

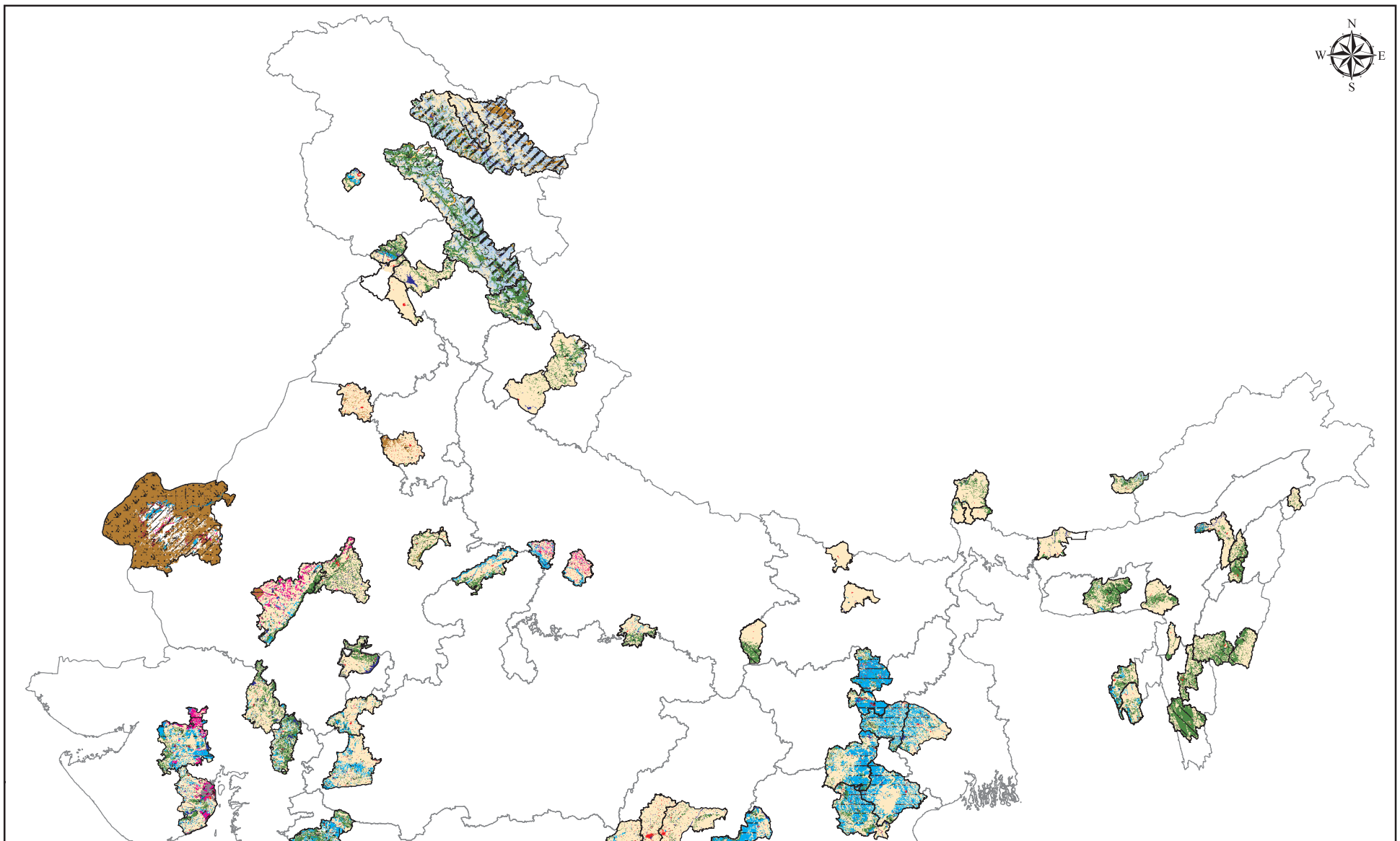


Legend

Symbol	Code	Description	Symbol	Code	Description	Symbol	Code	Description
	Fv1,2,3	Forest, vegetation degradation		Ee1,2,3	Dune / Sandy area, wind erosion		Lh1	Periglacial, frost heaving
	Gv1,2,3	Grassland / Grazing land, vegetation degradation		Is1,2,3	Agriculture irrigated, salinity / alkalinity		Lf1,2,3	Periglacial, frost shattering
	Sv1,2,3	Land with scrub, vegetation degradation		Ds1,2,3	Agriculture unirrigated, salinity / alkalinity		Rf1,2,3	Rocky, frost shattering
	Iw1,2,3	Agriculture irrigated, water erosion		Fs1,2,3	Forest, salinity / alkalinity		Fm1,2,3	Forest, man made
	Dw1,2,3	Agriculture unirrigated, water erosion		Ss1,2,3	Land with scrub, salinity / alkalinity		Tm1,2,3	Others, man made
	Fw1,2,3	Forest, water erosion		Bs1,2,3	Barren, salinity / alkalinity		B	Barren
	Sw1,2,3	Land with scrub, water erosion		Il1,2,3	Agriculture irrigated, water logging		R	Rocky
	Bw1,2	Barren, water erosion		Dl1,2	Agriculture unirrigated, water logging		S	Settlement
	Ew1,2	Dune / Sandy area, water erosion		Fl1,2,3	Forest, water logging		W	Water body/ Drainage
	Ie1,2	Agriculture irrigated, wind erosion		Gl1,2,3	Grassland / Grazing land, water logging		NAD	No Apparent Degradation
	De1,2	Agriculture unirrigated, wind erosion		Sl1	Land with scrub, water logging			
	Fe1	Forest, wind erosion		El1,2	Dune / Sandy area, water logging			
	Se1,2,3	Land with scrub, wind erosion		Sg3	Land with scrub, mass movement			
	Be1,2,3	Barren, wind erosion		Bg1,2,3	Barren, mass movement			

Prepared by:
Space Applications Centre, ISRO, Ahmedabad

DESERTIFICATION / LAND DEGRADATION STATUS MAP OF SELECTED DISTRICTS - 2003-05



Legend

Symbol	Code	Description	Symbol	Code	Description	Symbol	Code	Description
	Fv1,2,3	Forest, vegetation degradation		Ee1,2,3	Dune / Sandy area, wind erosion		Lh1	Periglacial, frost heaving
	Gv1,2,3	Grassland / Grazing land, vegetation degradation		Is1,2,3	Agriculture irrigated, salinity / alkalinity		Lf1,2,3	Periglacial, frost shattering
	Sv1,2,3	Land with scrub, vegetation degradation		Ds1,2,3	Agriculture unirrigated, salinity / alkalinity		Rf1,2,3	Rocky, frost shattering
	Iw1,2,3	Agriculture irrigated, water erosion		Fs1,2,3	Forest, salinity / alkalinity		Fm1,2,3	Forest, man made
	Dw1,2,3	Agriculture unirrigated, water erosion		Ss1,2,3	Land with scrub, salinity / alkalinity		Tm1,2,3	Others, man made
	Fw1,2,3	Forest, water erosion		Bs1,2,3	Barren, salinity / alkalinity		B	Barren
	Sw1,2,3	Land with scrub, water erosion		Il1,2,3	Agriculture irrigated, water logging		R	Rocky
	Bw1,2	Barren, water erosion		Dl1,2	Agriculture unirrigated, water logging		S	Settlement
	Ew1,2	Dune / Sandy area, water erosion		Fl1,2,3	Forest, water logging		W	Water body/ Drainage
	Ie1,2	Agriculture irrigated, wind erosion		Gl1,2,3	Grassland / Grazing land, water logging		NAD	No Apparent Degradation
	De1,2	Agriculture unirrigated, wind erosion		Sl1	Land with scrub, water logging			
	Fe1	Forest, wind erosion		El1,2	Dune / Sandy area, water logging			
	Se1,2,3	Land with scrub, wind erosion		Sg3	Land with scrub, mass movement			
	Be1,2,3	Barren, wind erosion		Bg1,2,3	Barren, mass movement			

Prepared by:
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District wise status of Desertification/ Land Degradation for 2011-13 (area in ha)

S.N.	State	District	Vegetation Degradation	Water Erosion	Wind Erosion	Salinity / Alkalinity	Water Logging	Mass Movement	Frost Heaving	Frost Shattering	Man Made	Barren/ Rocky	Settlement	Total Area under Desertification		No Apparent Degradation	Total Geographical Area
														ha	%		
1	Andhra Pradesh	Anantapur	418203	656794	-	140077	-	-	-	-	2502	1369	13190	1232136	64.41	650251	1913000
2	Arunachal Pradesh	Tawang	63222	-	-	-	-	-	-	34638	-	-	942	98802	45.49	117768	217200
3		Tirap	16904	-	-	-	-	-	-	-	-	-	496	17401	14.97	97775	116200
4	Assam	Golaghat	37728	-	-	-	14789	-	-	-	-	-	2808	55325	15.80	257127	350200
5		Hailakandi	21966	-	-	-	1305	-	-	-	-	-	273	23543	17.74	107680	132700
6		Kokrajhar	33212	-	-	-	-	-	-	-	-	-	1734	34946	10.60	278820	329600
7	Bihar	Bhabua	102494	2128	-	0	-	-	-	-	-	-	1009	105630	31.70	227290	333200
8		Samastipur	-	-	-	-	8007	-	-	-	-	-	1157	9165	3.16	275465	290400
9		Sitamarhi	-	-	-	-	3252	-	-	-	-	-	1167	4419	2.01	214891	220000
10	Chhattisgarh	Durg	34954	3439	-	-	1396	-	-	-	4568	160	23847	68363	8.01	761286	853525
11		Raipur	98299	72722	-	-	749	-	-	-	6504	7046	21427	206747	16.70	1002109	1238300
12		Rajnandgaon	44363	31995	-	-	1470	-	-	-	1443	1475	5864	86611	10.73	702118	807025
13	Goa	North Goa	75181	-	-	-	1632	-	-	-	81	760	9586	87239	50.25	78603	173600
14	Gujarat	Bhavnagar	95507	90512	-	74599	-	-	-	-	14147	7598	14680	297044	35.64	505720	833400
15		Panch Mahals	211440	57702	-	-	-	-	-	-	305	-	2940	272387	52.07	223461	523100
16		Sabar Kantha	197931	28266	-	-	-	-	-	-	1375	-	6285	233857	31.63	476704	739400
17		Surendranagar	130569	253663	-	143696	1570	-	-	-	850	-	6145	536493	51.47	482604	1042300
18	Haryana	Bhiwani	3865	-	52536	-	748	-	-	-	759	926	16915	75750	15.85	402034	477800
19		Sirsa	306	-	26481	-	404	-	-	-	532	-	16519	44242	10.34	382732	427700
20	Himachal Pradesh	Kangra	101570	-	-	-	-	191	-	9755	-	-	1075	112592	19.62	425329	573900
21		Kinnaur	280687	-	3742	-	-	416	-	178132	-	-	-	462977	72.33	174419	640100
22		Lahul & Spiti	346332	-	14332	-	-	13240	-	740823	-	-	-	1114727	80.54	255636	1384100
23	Jammu & Kashmir	Badgam	21467	17399	-	-	3694	-	-	-	0	-	8386	50946	37.16	81518	137100
24		Kargil	435157	-	7180	-	-	20524	9	526860	-	107574	779	1098082	78.23	305518	1403600
25		Kathua	103983	14476	-	-	118	38	-	-	-	-	3203	121819	48.69	108887	250200
26		Nubra sub-basin	13037	-	23807	-	-	7446	-	155051	-	-	-	199340	46.55	218981	428200
27		Shyok sub-basin	192831	-	196369	-	-	114251	-	1464024	-	-	341	1967814	73.89	650068	2663200

S.N.	State	District	Vegetation Degradation	Water Erosion	Wind Erosion	Salinity / Alkalinity	Water Logging	Mass Movement	Frost Heaving	Frost Shattering	Man Made	Barren/ Rocky	Settlement	Total Area under Desertification		No Apparent Degradation	Total Geographical Area
														ha	%		
28	Jharkhand	Bokaro	25417	153672	-	-	-	-	-	-	11108	-	3695	193892	67.25	84267	288300
29		Giridih	40639	297024	-	-	-	-	-	-	2874	238	17409	358183	73.79	123082	485400
30		Pashchimi Singhbhum	90487	339902	-	-	-	-	-	-	2326	4267	11523	448505	46.49	503548	964800
31	Karnataka	Bellary	154864	151805	837	21384	-	-	-	-	14553	240	10690	354372	41.88	458519	846100
32		Chamarajanagar	161587	95401	-	5142	-	-	-	-	966	-	2913	266009	47.10	291092	564800
33	Kerala	Kasaragod	2053	19376	866	-	-	-	-	-	-	-	716	23011	11.57	169373	198900
34		Palakkad	28237	306	-	-	-	-	-	-	60	-	4978	33581	7.50	408733	448000
35	Madhya Pradesh	Dhar	45329	145765	-	2414	64	-	-	-	4124	4559	6160	208415	25.56	585472	815300
36		Morena	78402	90432	-	756	-	-	-	-	698	2341	5644	178273	35.73	308153	498900
37		Neemuch	130930	1837	-	4966	-	-	-	-	816	4435	4411	147395	34.63	251125	425600
38		Ratlam	43667	50110	-	352	285	-	-	-	665	1746	5703	102527	21.09	374384	486100
39	Maharashtra	Ahmadnagar	421757	458476	-	-	-	-	-	-	495	59606	22898	963233	56.50	703587	1704800
40		Dhule	251501	170913	-	-	-	-	-	-	88	28245	11155	461902	64.20	238168	719500
41		Sangli	256590	78516	-	2954	-	-	-	-	-	35045	19600	392705	45.81	452586	857200
42	Manipur	Chandel	109585	-	-	-	-	-	-	-	-	-	2975	112560	33.98	218335	331300
43		Churachandpur	220495	-	-	-	-	-	-	-	-	-	3907	224402	49.10	229581	457000
44	Meghalaya	Jaintia Hills	84127	-	-	-	-	-	-	-	3637	-	695	88458	23.16	291874	381900
45		West Khasi Hills	268221	-	-	-	-	-	-	-	9617	-	320	278159	53.01	244947	524700
46	Mizoram	Aizawl	184638	-	-	-	-	-	-	-	-	-	4338	188976	52.83	166939	357700
47		Lunglei	143821	-	-	-	-	-	-	-	-	-	2852	146673	32.32	305058	453800
48	Nagaland	Kohima	87617	-	-	-	-	-	-	-	-	-	3721	91338	62.43	54531	146300
49		Wokha	57451	-	-	-	-	-	-	-	-	-	2123	59574	36.59	101116	162800
50	Odisha	Bargarh	46437	304160	-	-	-	-	-	-	668	4247	2649	358162	61.36	200544	583700
51		Kendujhar	139159	280150	-	-	-	-	-	-	9512	-	11027	439848	52.97	373305	830300
52		Koraput	139479	340265	-	-	-	-	-	-	1128	621	6011	487504	55.35	368557	880700
53		Mayurbhanj	35454	401997	-	-	-	-	-	-	729	-	12045	450224	43.22	575619	1041800
54	Punjab	Hoshiarpur	7455	-	-	-	-	-	-	-	-	-	3778	11233	3.32	325976	338600
55		Pathankot	6960	-	-	-	-	-	-	-	251	-	2322	9534	10.26	77791	92900

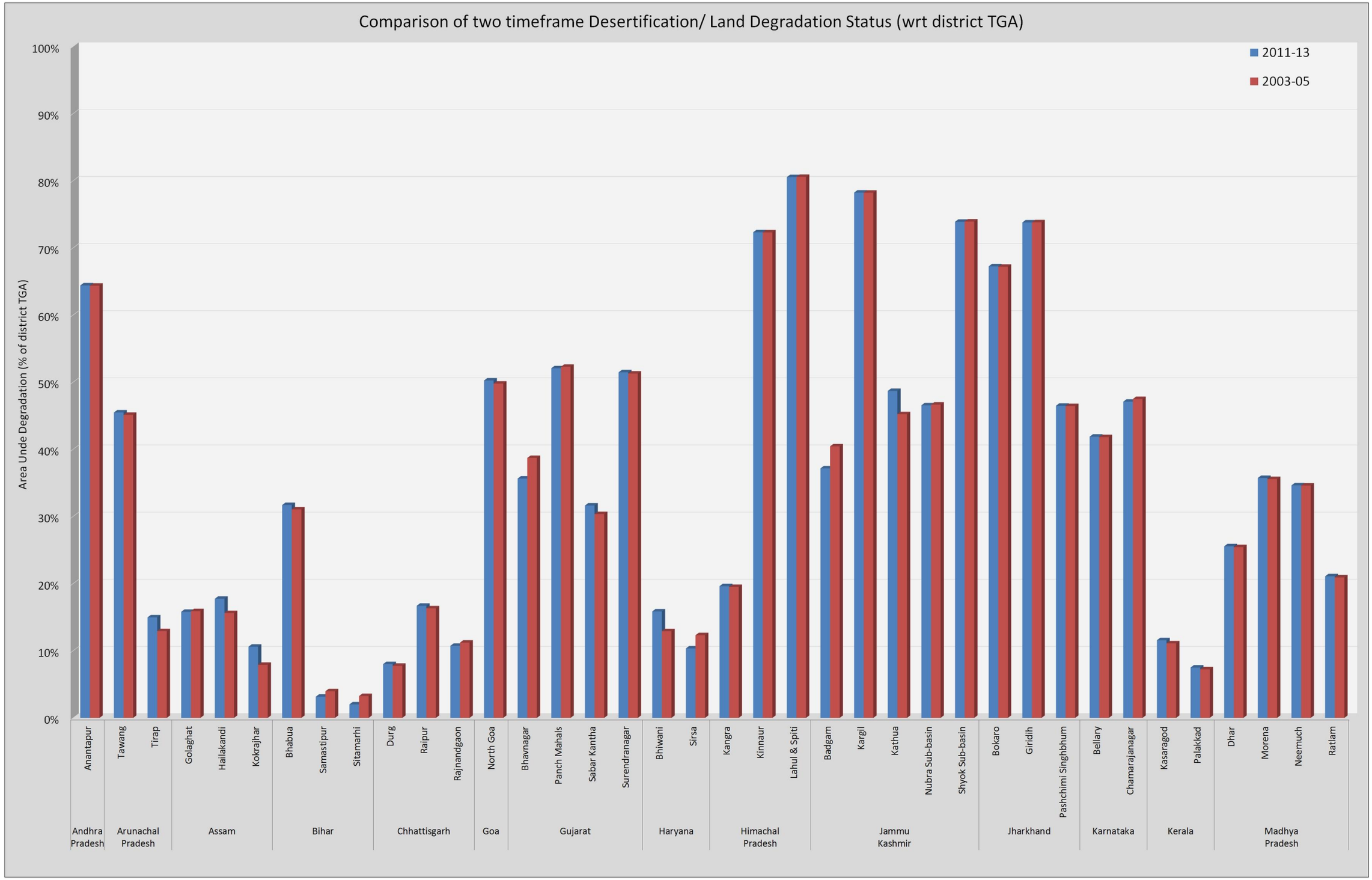
S.N.	State	District	Vegetation Degradation	Water Erosion	Wind Erosion	Salinity / Alkalinity	Water Logging	Mass Movement	Frost Heaving	Frost Shattering	Man Made	Barren/ Rocky	Settlement	Total Area under Desertification		No Apparent Degradation	Total Geographical Area
														ha	%		
56	Rajasthan	Ajmer	223256	125	-	30447	-	-	-	-	2785	-	12204	268817	31.70	543710	848100
57		Dausa	71521	2646	5257	-	-	-	-	-	107	150	2438	82120	23.93	251547	343200
58		Jaisalmer	4082	51406	2950456	21880	4449	-	-	-	61894	468566	6850	3569583	92.96	257513	3840100
59		Pali	156384	63228	30231	155332	-	-	-	-	2889	49419	7189	464673	37.51	743161	1238700
60-63	Sikkim (all four districts)	Sikkim	104225	1074	-	-	-	-	-	7262	93	-	505	113159	15.95	594034	709600
64	Tamil Nadu	Dharmapuri	188854	7327	-	-	-	-	-	-	28	52	1593	197853	44.00	248553	449700
65		Krishnagiri	131606	107014	-	-	-	-	-	-	1323	2550	3930	246424	48.05	264232	512900
66		Theni	115866	25993	-	-	-	-	-	-	70	-	4521	146450	51.06	137486	286800
67		Tirunelveli	113947	-	-	-	-	-	-	-	1915	-	6522	122384	18.29	527444	669300
68		Virudhunagar	36225	-	-	-	-	-	-	-	654	36	5786	42702	10.07	371416	424100
69	Telangana	Mahabubnagar	169129	252055	-	36921	-	-	-	-	2937	-	14389	475430	25.79	1301792	1843200
70	Tripura	South Tripura	59867	34595	-	-	-	-	-	-	75	-	2905	97443	31.88	207149	305700
71		West Tripura	97826	41817	-	-	-	-	-	-	-	-	2056	141699	47.34	156572	299300
72	Uttar Pradesh	Chitrakoot	72183	12660	-	1096	192	-	-	-	-	-	2852	88982	27.67	224061	321600
73		Etawah	-	73544	-	17267	473	-	-	-	-	-	5917	97202	42.06	127961	231100
74		Kanpur Dehat	287	31439	-	38073	1665	-	-	-	32	-	6371	77867	25.78	221052	302100
75	Uttarakhand	Chamoli	182094	16	-	-	-	1263	-	33058	-	42279	224	258935	32.25	542541	803000
76		Pauri Garhwal	24953	133	-	-	-	63	-	-	-	-	1918	27067	5.08	495995	532900
77	West Bengal	Bankura	31907	183990	-	-	-	-	-	-	2323	-	11270	229490	33.35	438376	688200
78		Purulia	49987	299403	-	-	-	-	-	-	1935	-	6004	357330	57.09	254092	625900

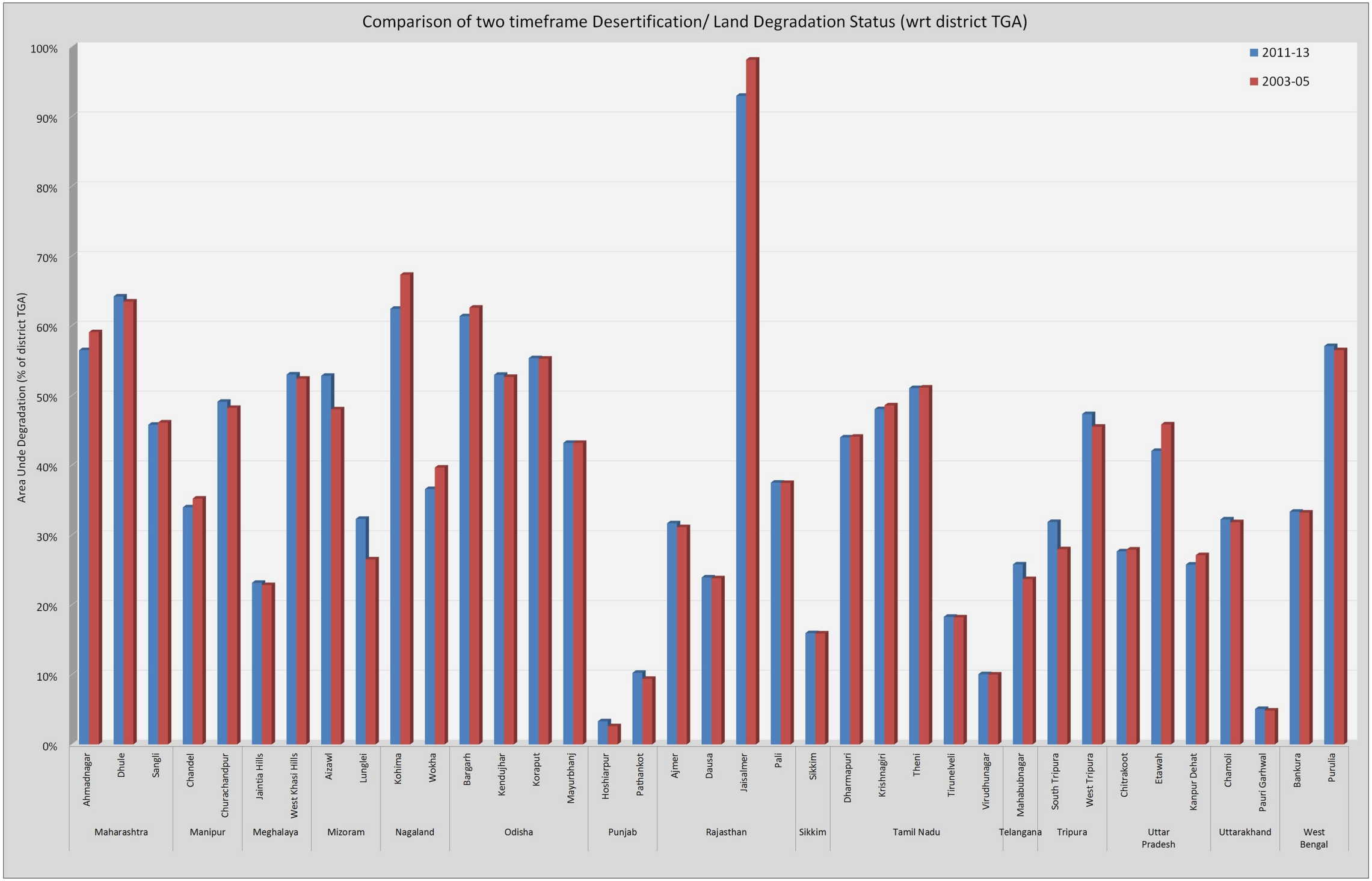
District wise status of Desertification/ Land Degradation for 2003-05 (area in ha)

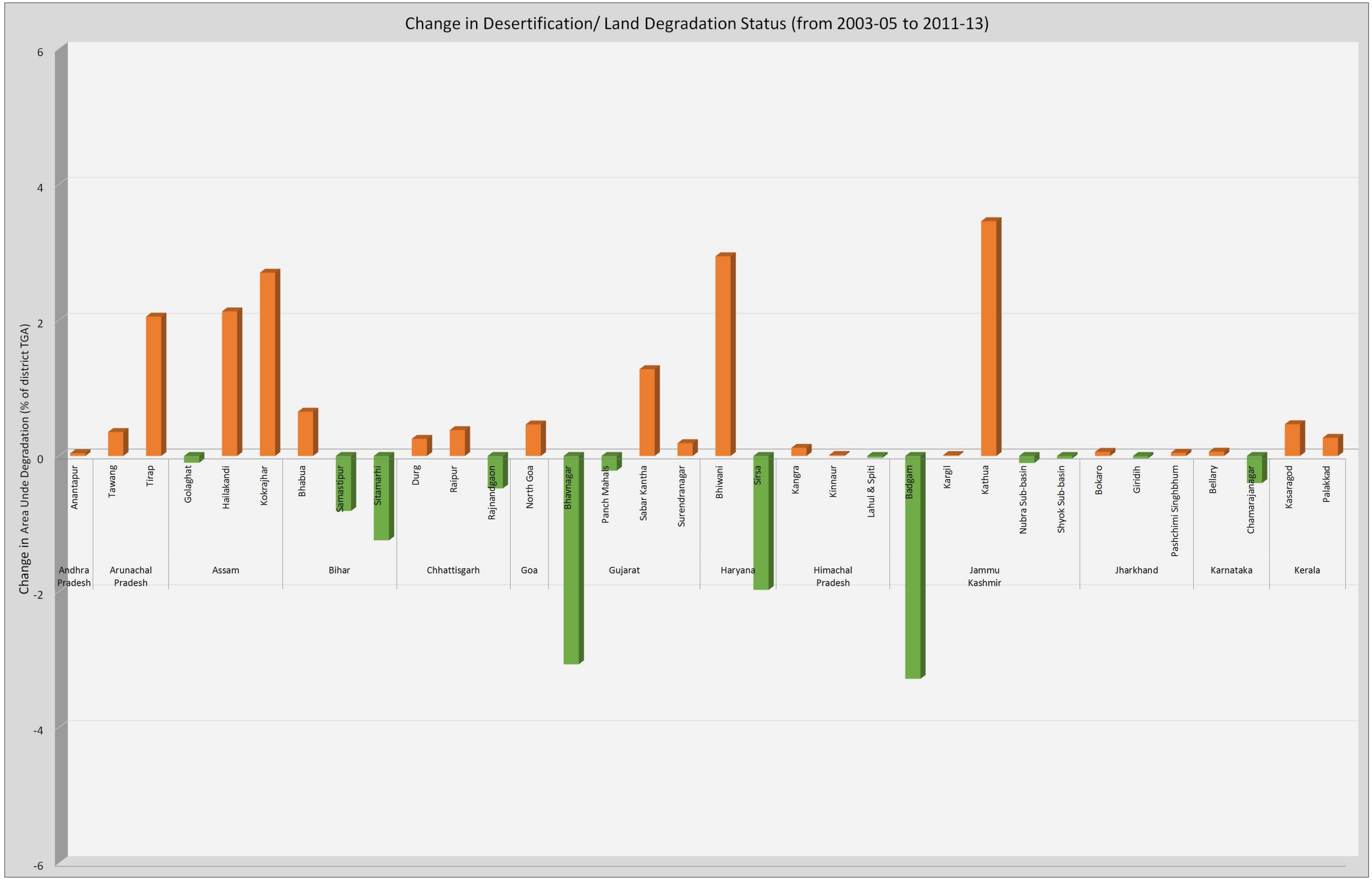
S.N.	State	District	Vegetation Degradation	Water Erosion	Wind Erosion	Salinity / Alkalinity	Water Logging	Mass Movement	Frost Heaving	Frost Shattering	Man Made	Barren/ Rocky	Settlement	Total Area under Desertification		No Apparent Degradation	Total Geographical Area
														ha	%		
1	Andhra Pradesh	Anantapur	416955	661225	-	137216	-	-	-	-	2204	1369	12428	1231397	64.37	651304	1913000
2	Arunachal Pradesh	Tawang	62583	-	-	-	-	-	-	34638	-	-	815	98036	45.14	118534	217200
3		Tirap	14546	-	-	-	-	-	-	-	-	-	469	15016	12.92	100160	116200
4	Assam	Golaghat	38252	-	-	-	15024	-	-	-	-	-	2400	55676	15.90	258870	350200
5		Hailakandi	19265	-	-	-	1274	-	-	-	-	-	179	20718	15.61	110540	132700
6		Kokrajhar	24774	-	-	-	-	-	-	-	-	-	1274	26048	7.90	287613	329600
7	Bihar	Bhabua	101674	942	-	209	-	-	-	-	-	-	634	103459	31.05	229676	333200
8		Samastipur	-	-	-	-	10541	-	-	-	-	-	977	11518	3.97	272524	290400
9		Sitamarhi	-	-	-	-	6184	-	-	-	-	-	969	7153	3.25	211699	220000
10	Chhattisgarh	Durg	35222	3439	-	-	1361	-	-	-	3692	160	22340	66214	7.76	763550	853525
11		Raipur	98014	72722	-	-	749	-	-	-	3866	7046	19647	202045	16.32	1006762	1238300
12		Rajnandgaon	49352	31645	-	-	1470	-	-	-	1071	1514	5422	90473	11.21	699810	807025
13	Goa	North Goa	75012	-	-	-	1573	-	-	-	11	640	9198	86434	49.79	79219	173600
14	Gujarat	Bhavnagar	95755	89907	-	100912	-	-	-	-	14147	7878	14022	322623	38.71	478146	833400
15		Panch Mahals	215926	55139	-	-	-	-	-	-	143	-	2311	273518	52.29	222747	523100
16		Sabar Kantha	194401	22887	-	-	-	-	-	-	1174	-	5945	224408	30.35	485707	739400
17		Surendranagar	130434	252734	-	143302	1648	-	-	-	648	-	5767	534534	51.28	482054	1042300
18	Haryana	Bhiwani	4313	-	38316	-	939	-	-	-	644	940	16544	61696	12.91	416088	477800
19		Sirsa	306	-	35879	-	428	-	-	-	532	-	15534	52679	12.32	374296	427700
20	Himachal Pradesh	Kangra	101021	-	-	-	-	191	-	9755	-	-	939	111906	19.50	426015	573900
21		Kinnaur	280590	-	3742	-	-	416	-	178132	-	-	-	462880	72.31	174516	640100
22		Lahul & Spiti	346720	-	14332	-	-	13240	-	740823	-	-	-	1115115	80.57	255249	1384100
23	Jammu & Kashmir	Badgam	17326	24880	-	-	5022	-	-	-	81	-	8138	55447	40.44	76973	137100
24		Kargil	434388	-	7180	-	-	21323	9	526863	-	107741	400	1097904	78.22	305696	1403600
25		Kathua	95570	15620	-	-	47	38	-	-	-	-	1892	113167	45.23	117334	250200
26		Nubra sub-basin	13027	-	23746	-	-	7964	-	155051	-	-	-	199788	46.66	218569	428200
27		Shyok sub-basin	193241	-	196633	-	-	114663	-	1464024	-	-	230	1968791	73.93	649092	2663200

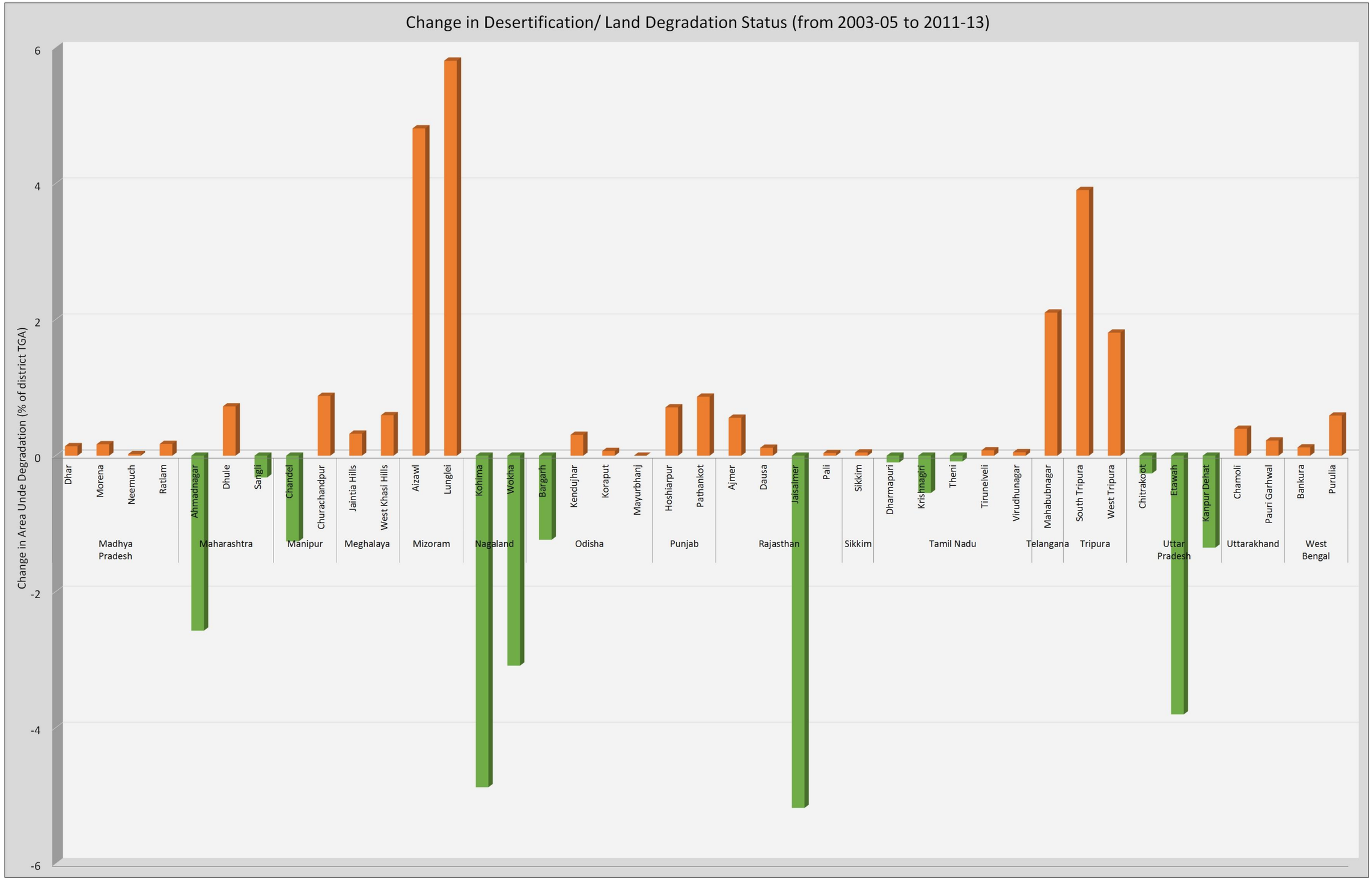
S.N.	State	District	Vegetation Degradation	Water Erosion	Wind Erosion	Salinity / Alkalinity	Water Logging	Mass Movement	Frost Heaving	Frost Shattering	Man Made	Barren/ Rocky	Settlement	Total Area under Desertification		No Apparent Degradation	Total Geographical Area
														ha	%		
28	Jharkhand	Bokaro	25380	155066	-	-	-	-	-	-	9928	-	3343	193717	67.19	84441	288300
29		Giridih	41425	299606	-	-	-	-	-	-	373	238	16653	358295	73.81	123004	485400
30		Pashchimi Singhbhum	90366	340229	-	-	-	-	-	-	1837	4267	11345	448044	46.44	504064	964800
31	Karnataka	Bellary	157340	157612	837	21237	-	-	-	-	7099	240	9473	353838	41.82	459054	846100
32		Chamarajanagar	161587	98325	-	4829	-	-	-	-	875	-	2652	268268	47.50	288833	564800
33	Kerala	Kasaragod	1966	18583	866	-	-	-	-	-	-	-	667	22082	11.10	170302	198900
34		Palakkad	27709	306	-	-	-	-	-	-	60	-	4309	32384	7.23	409930	448000
35	Madhya Pradesh	Dhar	45795	145573	-	2414	64	-	-	-	3118	4530	5790	207283	25.42	587915	815300
36		Morena	78414	90432	-	756	-	-	-	-	553	2341	4939	177436	35.57	308991	498900
37		Neemuch	131087	1837	-	4968	-	-	-	-	632	4512	4262	147296	34.61	251511	425600
38		Ratlam	43688	50043	-	347	270	-	-	-	510	1671	5155	101685	20.92	376262	486100
39	Maharashtra	Ahmadnagar	422800	503574	-	-	-	-	-	-	157	59606	20920	1007057	59.07	659801	1704800
40		Dhule	251927	166294	-	-	-	-	-	-	0	28245	10221	456688	63.47	243716	719500
41		Sangli	256982	82033	-	2622	-	-	-	-	-	35045	18765	395447	46.13	450122	857200
42	Manipur	Chandel	113996	-	-	-	-	-	-	-	-	-	2733	116730	35.23	214165	331300
43		Churachandpur	216841	-	-	-	-	-	-	-	-	-	3544	220385	48.22	233598	457000
44	Meghalaya	Jaintia Hills	84702	-	-	-	-	-	-	-	1935	-	587	87224	22.84	293108	381900
45		West Khasi Hills	266276	-	-	-	-	-	-	-	8500	-	259	275035	52.42	248071	524700
46	Mizoram	Aizawl	167471	-	-	-	-	-	-	-	-	-	4296	171767	48.02	184148	357700
47		Lunglei	117584	-	-	-	-	-	-	-	-	-	2740	120324	26.51	331431	453800
48	Nagaland	Kohima	94889	-	-	-	-	-	-	-	-	-	3578	98466	67.30	47402	146300
49		Wokha	63019	-	-	-	-	-	-	-	-	-	1578	64597	39.68	97244	162800
50	Odisha	Bargarh	46523	311697	-	-	-	-	-	-	611	4247	2296	365375	62.60	193331	583700
51		Kendujhar	138602	282285	-	-	-	-	-	-	7020	-	9778	437684	52.71	375469	830300
52		Koraput	139286	340291	-	-	-	-	-	-	757	621	5942	486896	55.29	369164	880700
53		Mayurbhanj	35454	402067	-	-	-	-	-	-	729	-	11975	450224	43.22	575619	1041800
54	Punjab	Hoshiarpur	5280	-	-	-	-	-	-	-	-	-	3547	8827	2.61	328386	338600
55		Pathankot	6689	-	-	-	-	-	-	-	29	-	2010	8728	9.39	78269	92900

S.N.	State	District	Vegetation Degradation	Water Erosion	Wind Erosion	Salinity / Alkalinity	Water Logging	Mass Movement	Frost Heaving	Frost Shattering	Man Made	Barren/ Rocky	Settlement	Total Area under Desertification		No Apparent Degradation	Total Geographical Area
														ha	%		
56	Rajasthan	Ajmer	225416	125	-	25512	-	-	-	-	2235	-	10800	264088	31.14	552554	848100
57		Dausa	71692	2646	5257	-	-	-	-	-	107	150	1868	81721	23.81	251946	343200
58		Jaisalmer	3487	57732	3077452	22127	5137	-	-	-	67366	530256	4845	3768402	98.13	60845	3840100
59		Pali	156100	63395	32230	154741	-	-	-	-	2816	49419	5484	464184	37.47	743851	1238700
60-63	Sikkim (all four districts)	Sikkim	103959	1074	-	-	-	-	-	7262	93	-	434	112822	15.90	594371	709600
64	Tamil Nadu	Dharmapuri	189658	7327	-	-	-	-	-	-	28	52	1235	198299	44.10	248032	449700
65		Krishnagiri	132616	109949	-	-	-	-	-	-	1132	2550	2986	249234	48.59	261421	512900
66		Theni	116027	26355	-	-	-	-	-	-	70	-	4237	146689	51.15	137247	286800
67		Tirunelveli	113947	-	-	-	-	-	-	-	1629	-	6282	121858	18.21	527970	669300
68		Virudhunagar	36225	-	-	-	-	-	-	-	603	36	5621	42485	10.02	371633	424100
69	Telangana	Mahabubnagar	167027	222200	-	34004	-	-	-	-	1177	-	12245	436653	23.69	1343601	1843200
70	Tripura	South Tripura	50233	32507	-	-	-	-	-	-	0	-	2766	85506	27.97	219044	305700
71		West Tripura	93492	40738	-	-	-	-	-	-	-	-	2056	136286	45.54	161985	299300
72	Uttar Pradesh	Chitrakoot	72616	13102	-	1095	192	-	-	-	-	-	2812	89817	27.93	222667	321600
73		Etawah	-	78000	-	21210	937	-	-	-	-	-	5842	105988	45.86	119330	231100
74		Kanpur Dehat	282	31740	-	39384	4167	-	-	-	25	-	6351	81948	27.13	217025	302100
75	Uttarakhand	Chamoli	178916	16	-	-	-	1263	-	33058	-	42279	224	255757	31.85	545719	803000
76		Pauri Garhwal	23985	194	-	-	-	25	-	-	-	-	1670	25873	4.86	497198	532900
77	West Bengal	Bankura	30610	185925	-	-	-	-	-	-	929	-	11189	228653	33.22	439213	688200
78		Purulia	49549	298064	-	-	-	-	-	-	236	-	5790	353639	56.50	258063	625900


Comparison of two timeframe Desertification/ Land Degradation Status (wrt district TGA)
2011-13
2003-05
Area Unde Degradation (% of district TGA)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Anantapur
Tawang
Tirap
Golaghat
Hailakandi
Kokrajhar
Bhabua
Samastipur
Sitamarhi
Durg
Raipur
Rajnandgaon
North Goa
Bhavnagar
Panch Mahals
Sabar Kantha
Surendranagar
Bhiwani
Sirsa
Kangra
Kinnaur
Lahul & Spiti
Badgam
Kargil
Kathua
Nubra Sub-basin
Shyok Sub-basin
Bokaro
Giridih
Pashchimi Singhbhum
Bellary
Chamarajanagar
Kasaragod
Palakkad
Dhar
Morena
Neemuch
Ratlam
Andhra Pradesh
Arunachal Pradesh
Assam
Bihar
Chhattisgarh
Goa
Gujarat
Haryana
Himachal Pradesh
Jammu Kashmir
Jharkhand
Karnataka
Kerala
Madhya Pradesh


Comparison of two timeframe Desertification/ Land Degradation Status (wrt district TGA)
2011-13
2003-05
Area Unde Degradation (% of district TGA)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Ahmadnagar
Dhule
Sangli
Maharashtra
Chandel
Churachandpur
Manipur
Jaintia Hills
West Khasi Hills
Meghalaya
Aizawl
Lunglei
Mizoram
Kohima
Wokha
Nagaland
Bargarh
Kendujhar
Koraput
Mayurbhanj
Odisha
Hoshiarpur
Pathankot
Punjab
Ajmer
Dausa
Jaisalmer
Pali
Rajasthan
Sikkim
Sikkim
Dharmapuri
Krishnagiri
Theni
Tirunelveli
Virudhunagar
Tamil Nadu
Mahabubnagar
Telangana
South Tripura
West Tripura
Tripura
Chitrakoot
Etawah
Kanpur Dehat
Uttar Pradesh
Chamoli
Pauri Garhwal
Uttarakhand
Bankura
Purulia
West Bengal


Change in Desertification/ Land Degradation Status (from 2003-05 to 2011-13)
Change in Area Unde Degradation (% of district TGA)
6
4
2
0
-2
-4
-6
Anantapur
Tawang
Tirap
Golaghat
Hailakandi
Kokrajhar
Bhabua
Samastipur
Sitamarhi
Durg
Raipur
Rajnandgaon
North Goa
Bhavnagar
Panch Mahals
Sabar Kantha
Surendranagar
Bhiwani
Sirsa
Kangra
Kinnaur
Lahul & Spiti
Badgam
Kargil
Kathua
Nubra Sub-basin
Shyok Sub-basin
Bokaro
Giridih
Pashchimi Singhbhum
Bellary
Chamarajanagar
Kasaragod
Palakkad
Andhra Pradesh
Arunachal Pradesh
Assam
Bihar
Chhattisgarh
Goa
Gujarat
Haryana
Himachal Pradesh
Jammu Kashmir
Jharkhand
Karnataka
Kerala


Change in Desertification/ Land Degradation Status (from 2003-05 to 2011-13)
Change in Area Unde Degradation (% of district TGA)
6
4
2
0
-2
-4
-6
Dhar
Morena
Neemuch
Ratlam
Madhya Pradesh
Ahmadnagar
Dhule
Sangli
Maharashtra
Chandel
Churachandpur
Manipur
Jaintia Hills
West Khasi Hills
Meghalaya
Aizawl
Lunglei
Mizoram
Kohima
Wokha
Nagaland
Bargarh
Kendujhar
Koraput
Mayurbhanj
Odisha
Hoshiarpur
Pathankot
Punjab
Ajmer
Dausa
Jaisalmer
Pali
Rajasthan
Sikkim
Sikkim
Dharmapuri
Krishnagiri
Theni
Tirunelveli
Virudhunagar
Tamil Nadu
Mahabubnagar
Telangana
South Tripura
West Tripura
Tripura
Chitrakoot
Etawah
Kanpur Dehat
Uttar Pradesh
Chamoli
Pauri Garhwal
Uttarakhand
Bankura
Purulia
West Bengal

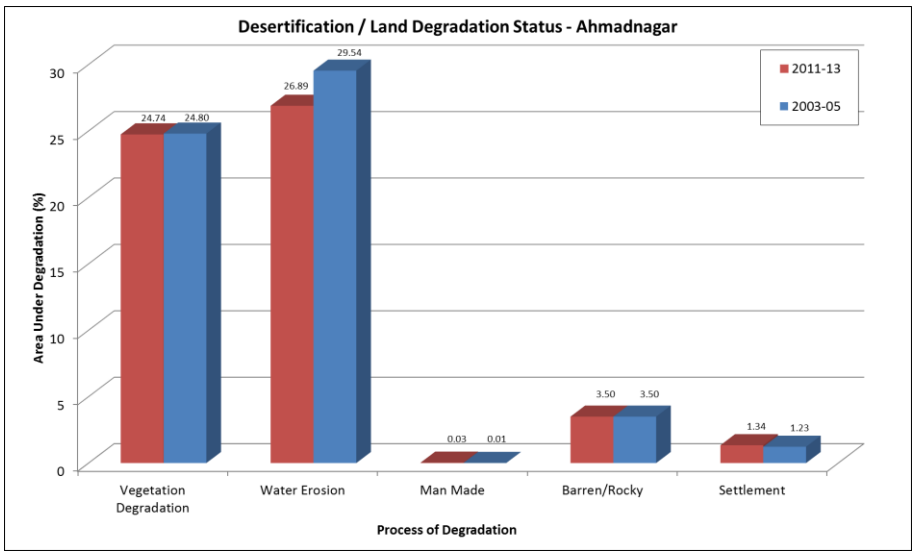
Ahmadnagar District, Maharashtra

Ahmadnagar district is situated in the central position in Maharashtra State. It is surrounded by Nashik district to the north, Aurangabad district to the north-east, Bid district to the east, Osmanabad and Solapur district to the south, Pune district to the West and Thane district to the North-West. The district occupies an area of 17,048 sq. km. It has a population of 45,43,159 with 266 population density, 939 sex ratio and a literacy rate of 79.05%. (Census 2011)

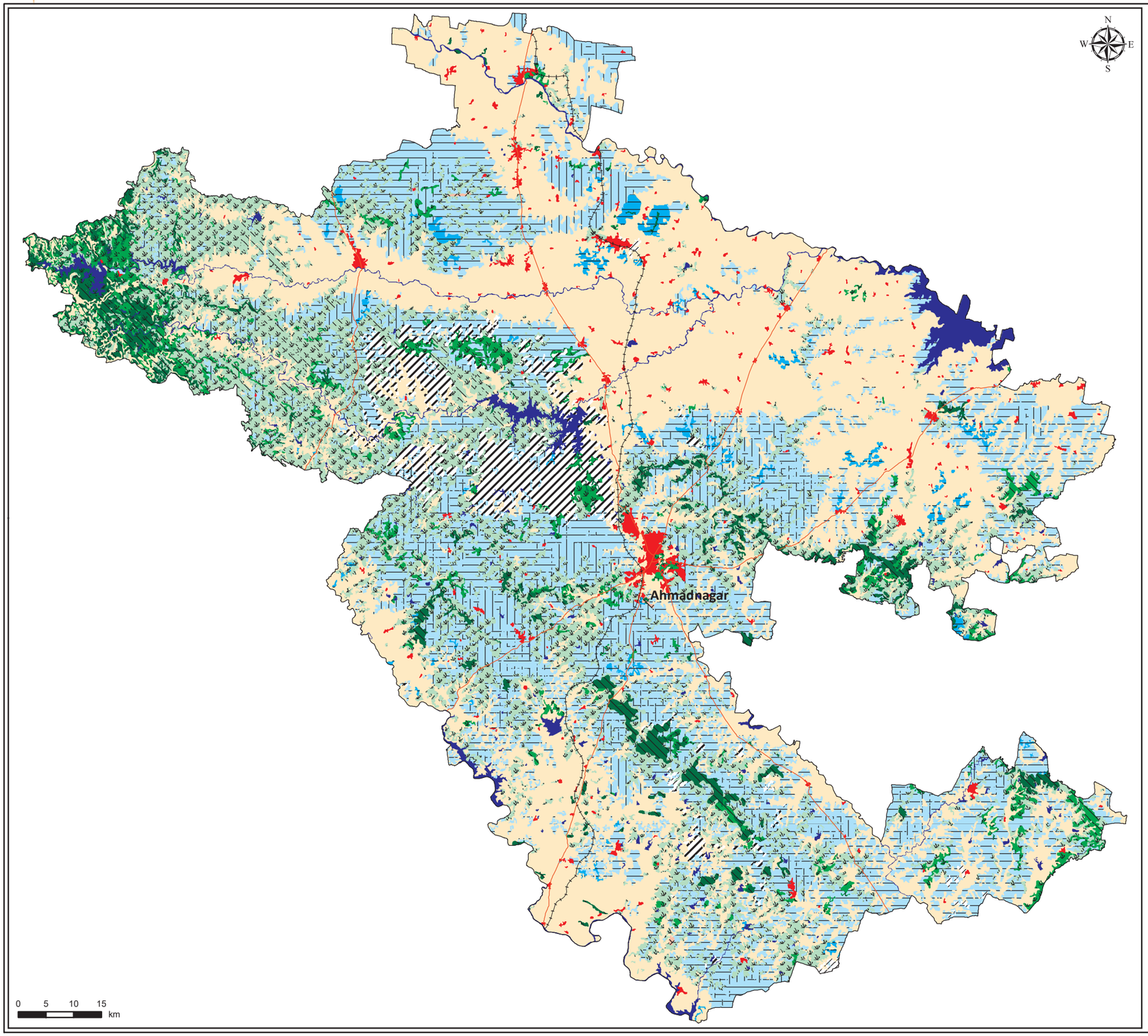
Physiographically, the District is broadly divisible into three parts, western hilly region, central plateau region, region of northern and southern plains. Hilly off-shoots of the Sahyadris lies in the western part of the district. Central plateau traverses from the western border to eastern border of the district. The plateau has fairly steep and highly dissected slopes by headward erosion of streams. The dissected scarp of this plateau on the North appears as a chain of hills which are often described as the Balaghat Ranges. In the northern and southern parts, plains are found along the banks of the rivers; Godavari and Pravara rivers in the northern parts and Bhima, Ghod and Sina rivers in the southern part.

Ahmadnagar is observed with 56.50% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has decreased about 2.57% since 2003-05. The most significant process of land degradation/ desertification in the district is Water Erosion (26.89% during 2011-13 and 29.54% during 2003-05) followed by Vegetation Degradation (24.74% during 2011-13 and 24.80% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	421757.38	24.74	422800.38	24.80	-1043.00
Water Erosion	458476.14	26.89	503573.61	29.54	-45097.46
Man Made	495.41	0.03	157.29	0.01	338.12
Barren/Rocky	59606.00	3.50	59606.00	3.50	0.00
Settlement	22897.78	1.34	20920.13	1.23	1977.65
Total Area under Desertification	**963232.72**	**56.50**	**1007057.42**	**59.07**	**-43824.70**
No Apparent Degradation	**703587.28**	**41.27**	**659800.85**	**38.70**	**43786.43**
Total Geographical Area (ha)	**1704800.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	41652.17	2.44	41652.17	2.44	0.00
2	Fv2	Forest, vegetation degradation, Moderate	18580.17	1.09	18580.17	1.09	0.00
3	Fv3	Forest, vegetation degradation, Severe	16027.68	0.94	16027.68	0.94	0.00
4	Sv1	Land with scrub, vegetation degradation, Slight	9664.18	0.57	9664.18	0.57	0.00
5	Sv2	Land with scrub, vegetation degradation, Moderate	38236.36	2.24	38510.52	2.26	-274.16
6	Sv3	Land with scrub, vegetation degradation, Severe	297596.82	17.46	298365.66	17.50	-768.84
7	Iw1	Agriculture irrigated, water erosion, Slight	121587.59	7.13	166895.92	9.79	-45308.34
8	Dw1	Agriculture unirrigated, water erosion, Slight	319272.56	18.73	322409.05	18.91	-3136.49
9	Dw2	Agriculture unirrigated, water erosion, Moderate	17616.00	1.03	14268.64	0.84	3347.36
10	Tm1	Others, man made, Slight	495.41	0.03	157.29	0.01	338.12
11	B	Barren	2531.12	0.15	2531.12	0.15	0.00
12	R	Rocky	57074.88	3.35	57074.88	3.35	0.00
13	S	Settlement	22897.78	1.34	20920.13	1.23	1977.65
Total Area Under Desertification/ Land Degradation			**963232.72**	**56.50**	**1007057.42**	**59.07**	**-43824.70**
14	W	Water body/ Drainage	37980.01	2.23	37941.74	2.23	38.27
15	NAD	No Apparent Degradation	703587.28	41.27	659800.85	38.70	43786.43
Total Geographical Area (ha)			**1704800.00**	**100.00**	**1704800.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Ahmadnagar District, Maharashtra
Timeframe - 2011-13

Legend

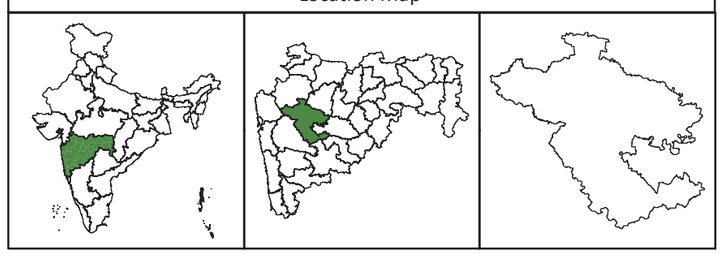
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Tm1	Others, man made, Slight
	B	Barren
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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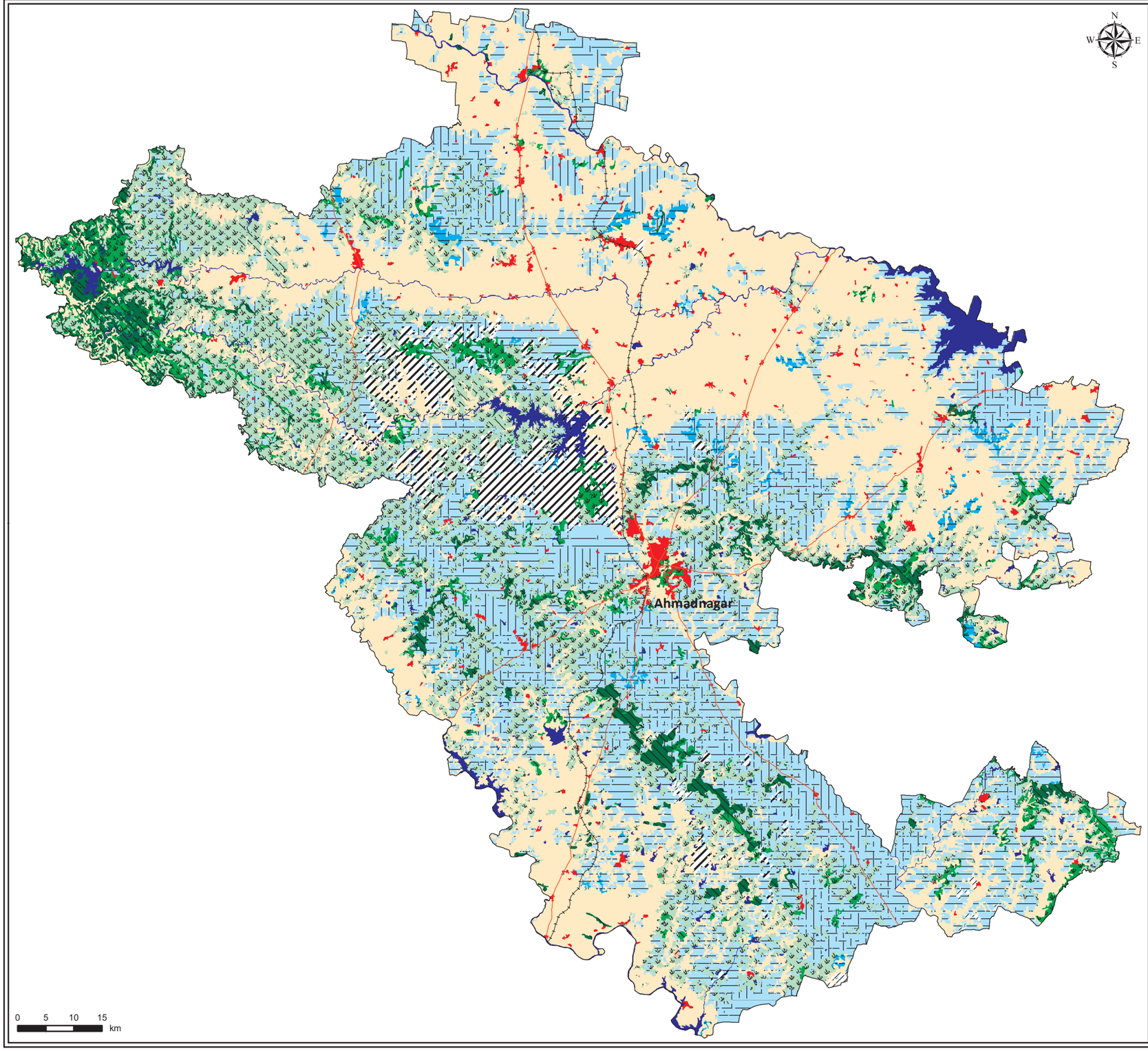
Space Applications Centre, ISRO, Ahmedabad

DESERTIFICATION / LAND DEGRADATION STATUS MAP
Ahmadnagar District, Maharashtra
Timeframe - 2003-05



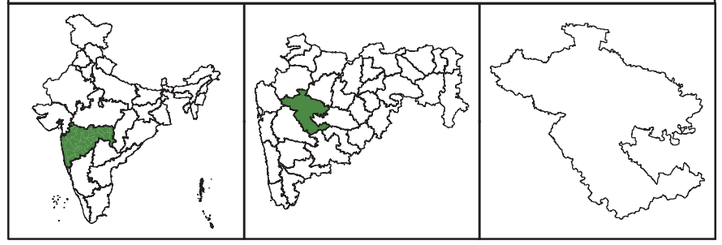
Legend		
Symbol	**Code**	**Description**
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Tm1	Others, man made, Slight
	B	Barren
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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Space Applications Centre, ISRO, Ahmedabad

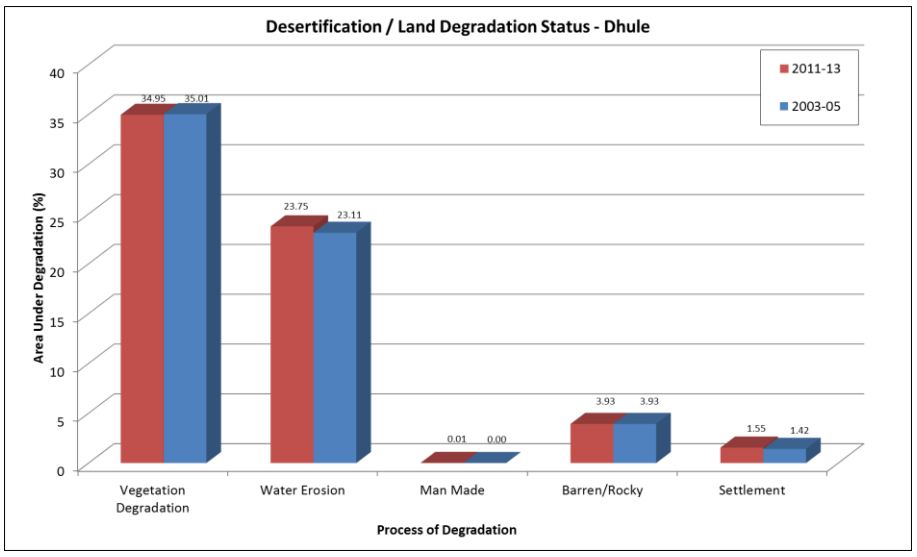
Dhule District, Maharashtra

Dhule district falls in the north-west portion of Maharashtra state. It is surrounded by Jalgaon District to its east, Nashik district to its south, Nandurbar district to its north side. It shares state borders with Gujarat on western side and Madhya Pradesh on northern side. It covers an area of 7,195 sq. km area. The district has a population of 20,50,862 with 285 population density, 946 sex ratio and a literacy rate of 72.80%. (Census 2011)

Dhule District falls under Tapi–Purna valley, the micro level physical division of Deccan plateau. In general, the District has two types of topography; hilly region and valley regions. The hilly tracts include the foot hills of the Satpuda Range in the northeast of the district and the Western Ghats in the south-western part of the district. These hills are covered with dense mixed forests. The valley region includes the Tapi river basin. The Tapi river valley forms a relatively smooth part of the district. River Tapi traverses through the north and middle of the District for about 65 km. The area is drained by numerous small streams, among which Arunavati and Kordi Nadi are the main ones.

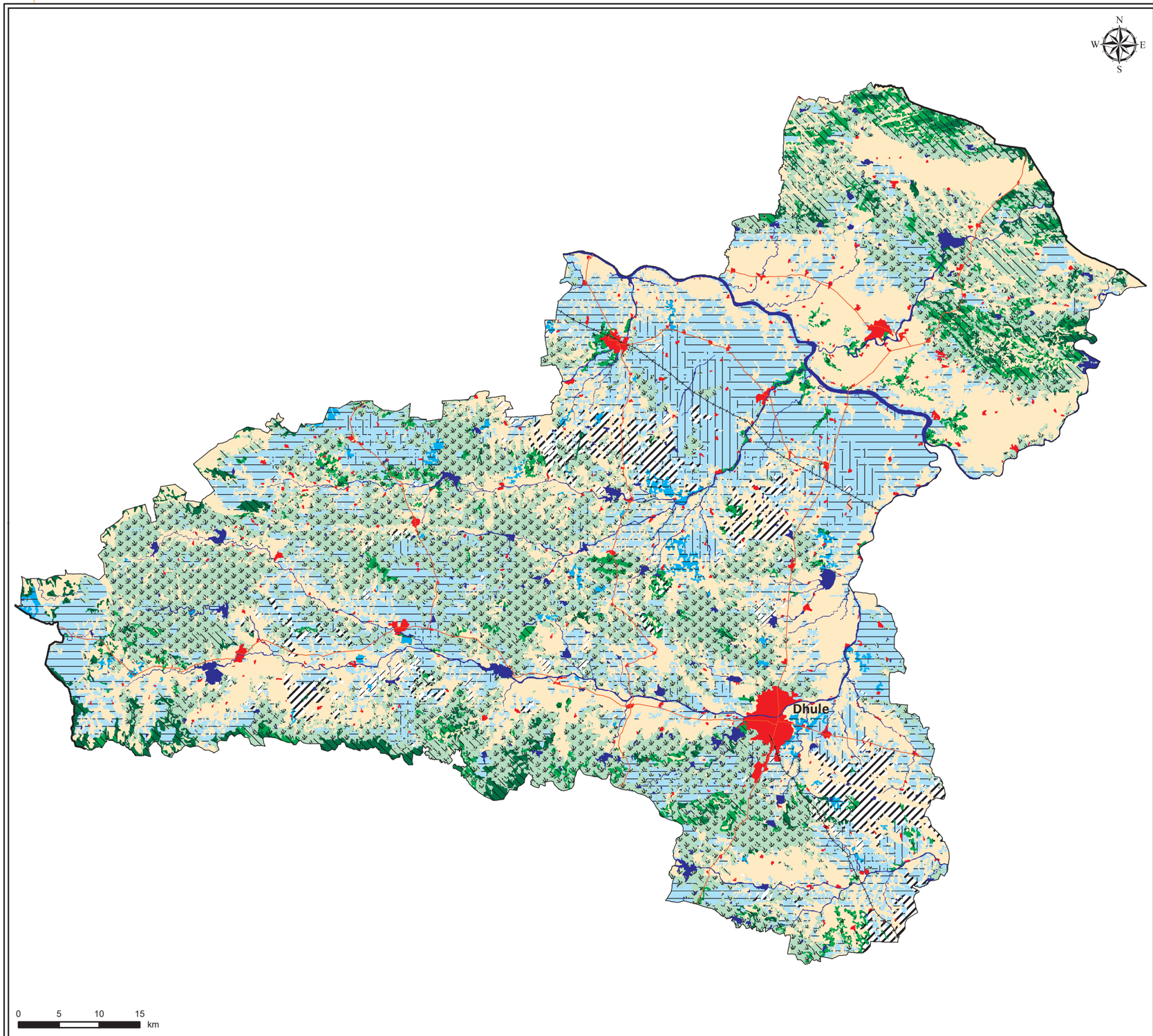
Dhule is observed with 64.20% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.73% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (34.95% during 2011-13 and 35.01% during 2003-05) followed by Water Erosion (23.75% during 2011-13 and 23.11% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	251500.54	34.95	251927.44	35.01	-426.90
Water Erosion	170913.17	23.75	166294.11	23.11	4619.07
Man Made	88.04	0.01	0.00	0.00	88.04
Barren/Rocky	28244.94	3.93	28244.94	3.93	0.00
Settlement	11155.16	1.55	10221.25	1.42	933.91
Total Area under Desertification	**461901.86**	**64.20**	**456687.74**	**63.47**	**5214.12**
No Apparent Degradation	**238167.69**	**33.10**	**243716.03**	**33.87**	**-5548.34**
Total Geographical Area (ha)	**719500.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	18108.41	2.52	18108.41	2.52	0.00
2	Fv2	Forest, vegetation degradation, Moderate	16037.18	2.23	16037.18	2.23	0.00
3	Fv3	Forest, vegetation degradation, Severe	25971.71	3.61	25971.71	3.61	0.00
4	Sv1	Land with scrub, vegetation degradation, Slight	685.28	0.10	706.35	0.10	-21.07
5	Sv2	Land with scrub, vegetation degradation, Moderate	10853.69	1.51	10801.03	1.50	52.66
6	Sv3	Land with scrub, vegetation degradation, Severe	179844.27	25.00	180302.76	25.06	-458.50
7	Iw1	Agriculture irrigated, water erosion, Slight	31104.61	4.32	39606.76	5.50	-8502.15
8	Dw1	Agriculture unirrigated, water erosion, Slight	133295.64	18.53	122259.09	16.99	11036.55
9	Dw2	Agriculture unirrigated, water erosion, Moderate	6512.92	0.91	4428.25	0.62	2084.66
10	Tm1	Others, man made, Slight	88.04	0.01	0.00	0.00	88.04
11	B	Barren	3781.18	0.53	3781.18	0.53	0.00
12	R	Rocky	24463.77	3.40	24463.77	3.40	0.00
13	S	Settlement	11155.16	1.55	10221.25	1.42	933.91
Total Area Under Desertification/ Land Degradation			**461901.86**	**64.20**	**456687.74**	**63.47**	**5214.12**
14	W	Water body/ Drainage	19430.45	2.70	19096.23	2.65	334.22
15	NAD	No Apparent Degradation	238167.69	33.10	243716.03	33.87	-5548.34
Total Geographical Area (ha)			**719500.00**	**100.00**	**719500.00**	**100.00**	

DESERTIFICATION / LAND DEGRADATION STATUS MAP
Dhule District, Maharashtra
Timeframe - 2011-13



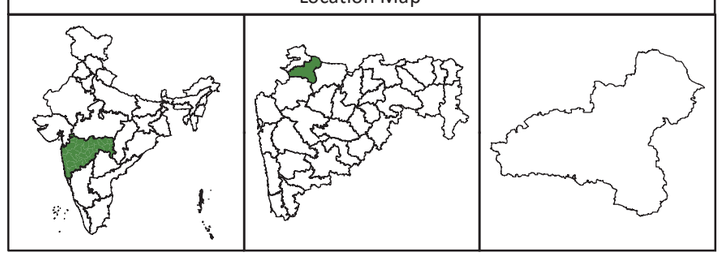
Legend		
Symbol	**Code**	**Description**
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Tm1	Others, man made, Slight
	B	Barren
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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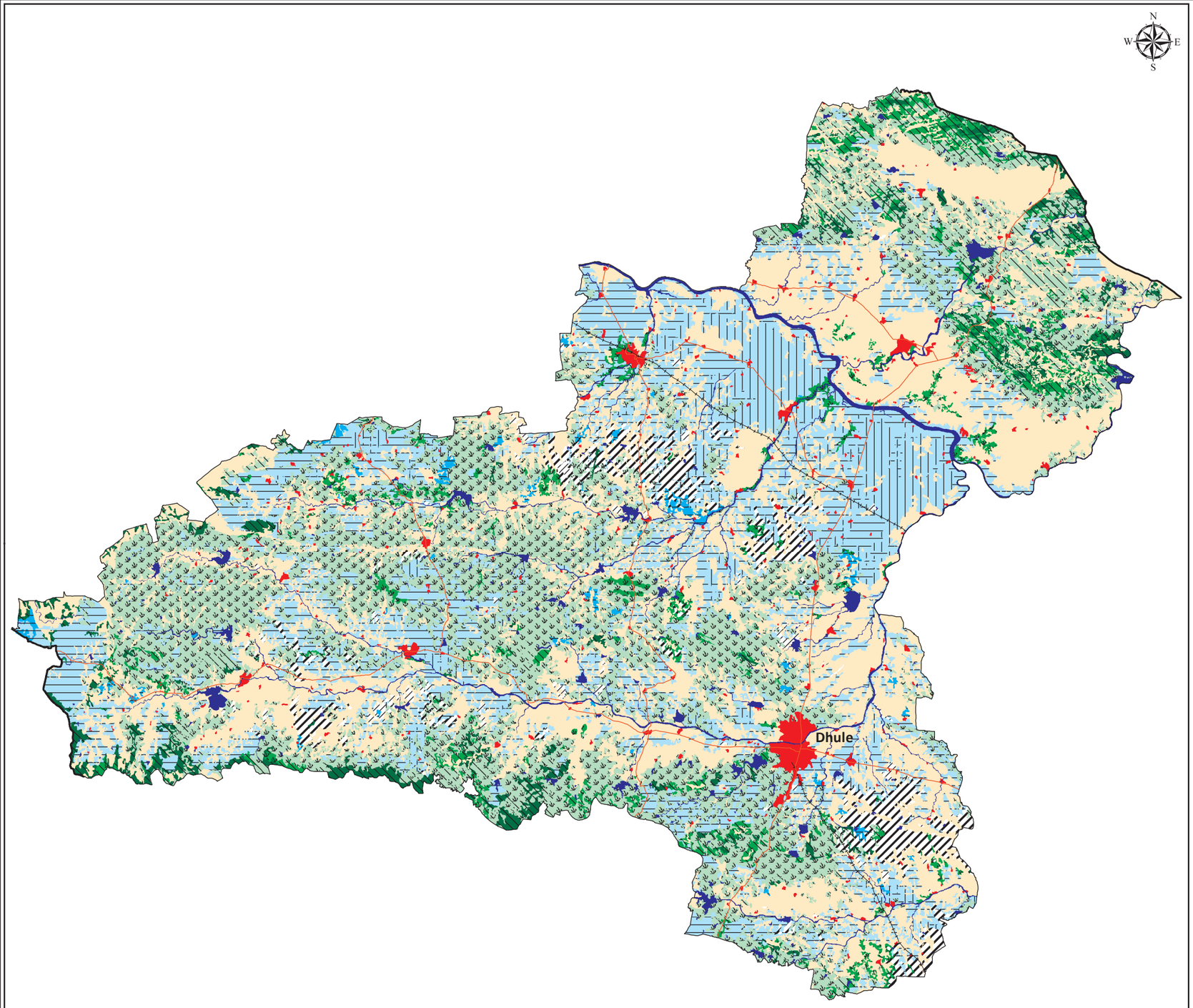
Space Applications Centre, ISRO, Ahmedabad

DESERTIFICATION / LAND DEGRADATION STATUS MAP
Dhule District, Maharashtra
Timeframe - 2003-05



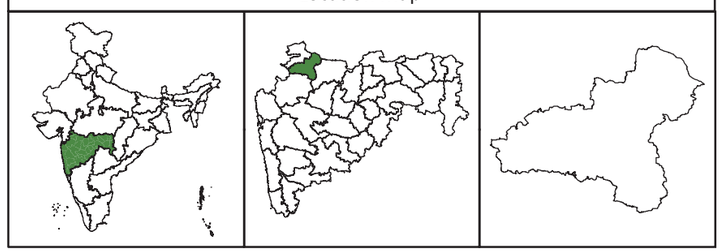
Legend		
Symbol	**Code**	**Description**
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	B	Barren
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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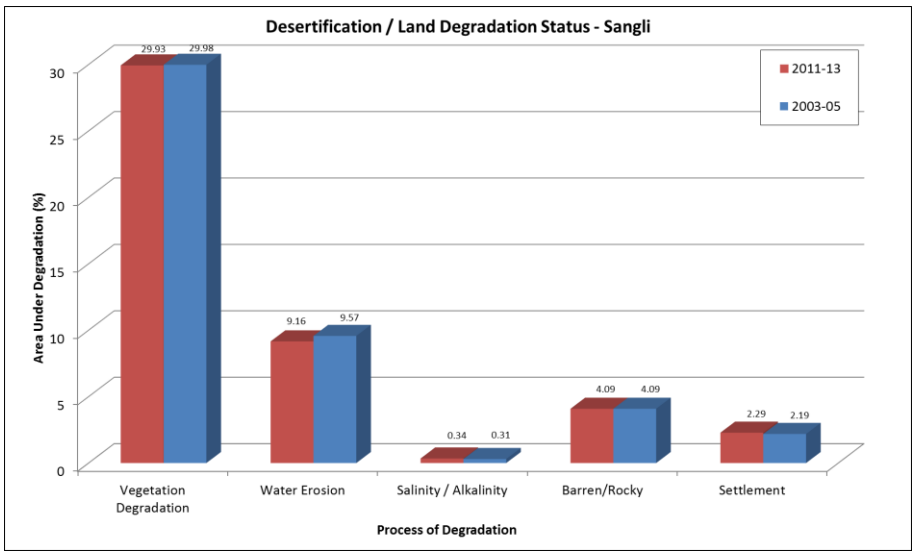
Sangli District, Maharashtra

Sangli district falls in the south-western portion of Maharashtra state. It is surrounded by Satara districts to the north, Solapur district to the north-east, Karnataka state to the east and south, Kolhapur district to the west. It occupies an area of 8572 sq. km. The district has a population of 28,22,143 with 329 population density, 966 sex ratio and a literacy rate of 81.48%. (Census 2011)

Sangli district is a part of eastern plateau; the micro level physical division of Deccan plateau. The whole district is an elevated land through which river Krishna and its tributaries flow in a general south-eastern direction, making a relatively flat basin. The physiography of the district may be grouped into three parts; the Sahyadri hills, the Plateau of Khanapur and Jat, and the Krishna-Yerla basin. The Krishna forms the main river system of the District.

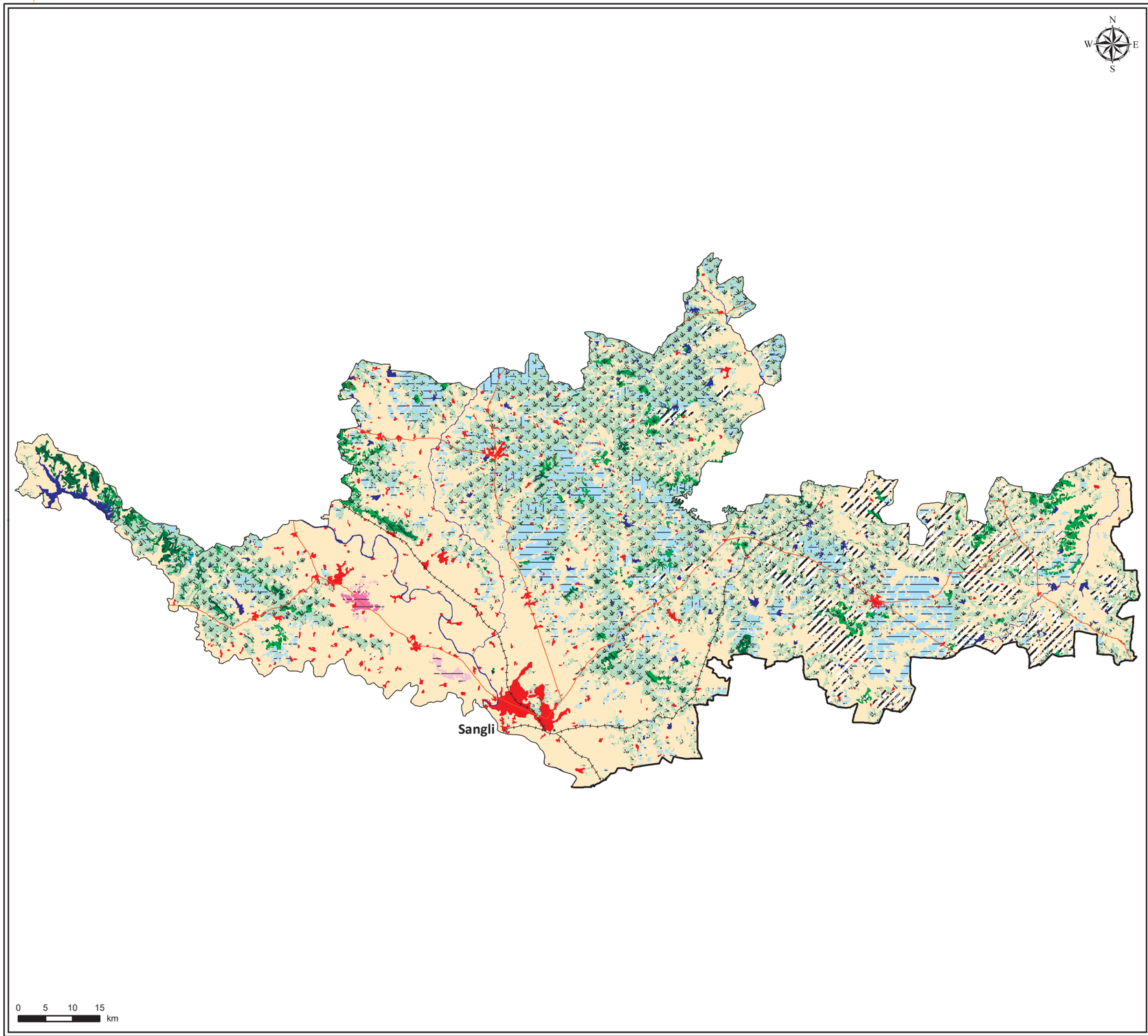
Sangli is observed with 45.81% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has decreased about 0.32% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (29.93% during 2011-13 and 29.98% during 2003-05) followed by Water Erosion (9.16% during 2011-13 and 9.57% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	256589.65	29.93	256982.05	29.98	-392.39
Water Erosion	78516.33	9.16	82032.87	9.57	-3516.54
Salinity / Alkalinity	2953.91	0.34	2621.81	0.31	332.10
Barren/Rocky	35044.66	4.09	35044.66	4.09	0.00
Settlement	19600.47	2.29	18765.28	2.19	835.19
Total Area under Desertification	**392705.03**	**45.81**	**395446.67**	**46.13**	**-2741.64**
No Apparent Degradation	**452586.13**	**52.80**	**450122.04**	**52.51**	**2464.09**
Total Geographical Area (ha)	**857200.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	6907.63	0.81	6907.63	0.81	0.00
2	Fv2	Forest, vegetation degradation, Moderate	5203.25	0.61	5203.25	0.61	0.00
3	Fv3	Forest, vegetation degradation, Severe	3542.74	0.41	3542.74	0.41	0.00
4	Sv1	Land with scrub, vegetation degradation, Slight	2524.56	0.29	2506.05	0.29	18.52
5	Sv2	Land with scrub, vegetation degradation, Moderate	17175.24	2.00	17262.41	2.01	-87.17
6	Sv3	Land with scrub, vegetation degradation, Severe	221236.22	25.81	221559.97	25.85	-323.75
7	Iw1	Agriculture irrigated, water erosion, Slight	9197.55	1.07	8851.18	1.03	346.37
8	Dw1	Agriculture unirrigated, water erosion, Slight	69145.58	8.07	73008.48	8.52	-3862.91
9	Dw2	Agriculture unirrigated, water erosion, Moderate	173.20	0.02	173.20	0.02	0.00
10	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight	1556.86	0.18	1510.92	0.18	45.94
11	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate	1397.05	0.16	1110.89	0.13	286.16
12	B	Barren	891.47	0.10	891.47	0.10	0.00
13	R	Rocky	34153.19	3.98	34153.19	3.98	0.00
14	S	Settlement	19600.47	2.29	18765.28	2.19	835.19
Total Area Under Desertification/ Land Degradation			**392705.03**	**45.81**	**395446.67**	**46.13**	**-2741.64**
15	W	Water body/ Drainage	11908.84	1.39	11631.29	1.36	277.55
16	NAD	No Apparent Degradation	452586.13	52.80	450122.04	52.51	2464.09
Total Geographical Area (ha)			**857200.00**	**100.00**	**857200.00**	**100.00**	

DESERTIFICATION / LAND DEGRADATION STATUS MAP
Sangli District, Maharashtra
Timeframe - 2011-13



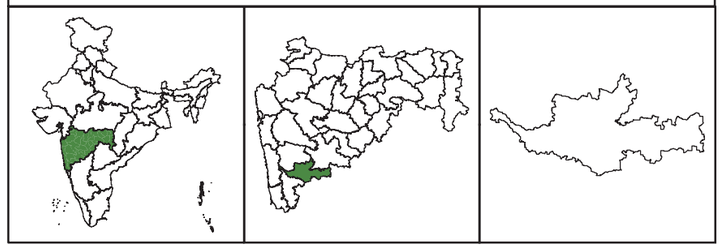
Legend		
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight
	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate
	B	Barren
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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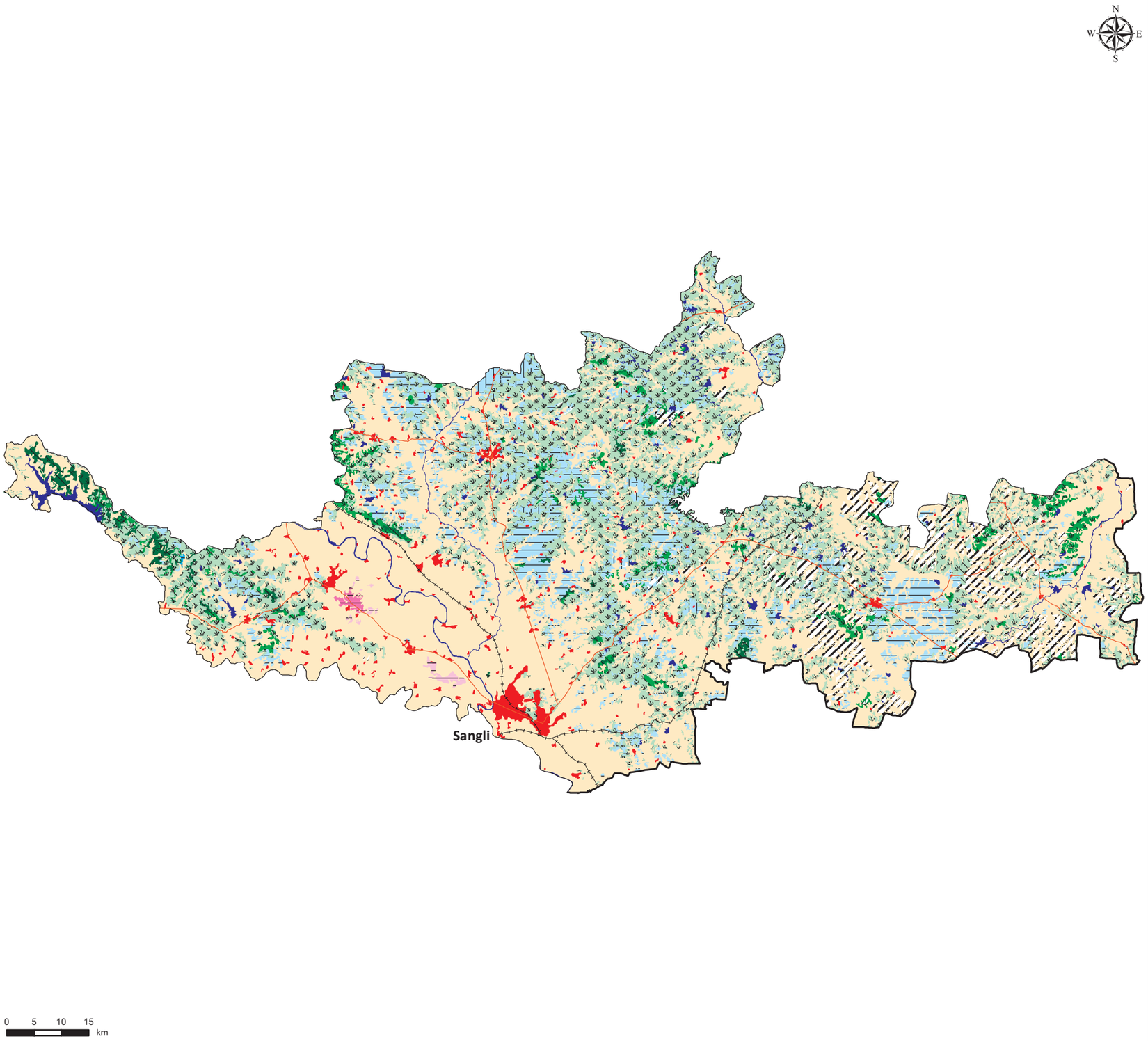


DESERTIFICATION / LAND DEGRADATION STATUS MAP
Sangli District, Maharashtra
Timeframe - 2003-05

Legend

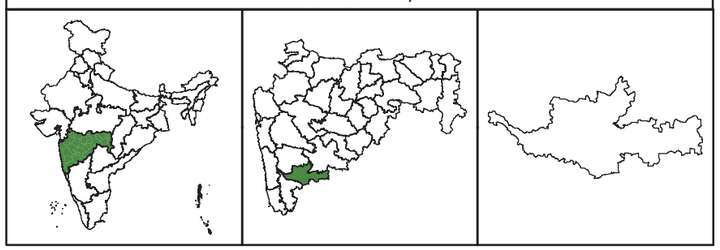
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight
	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate
	B	Barren
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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Space Applications Centre, ISRO, Ahmedabad

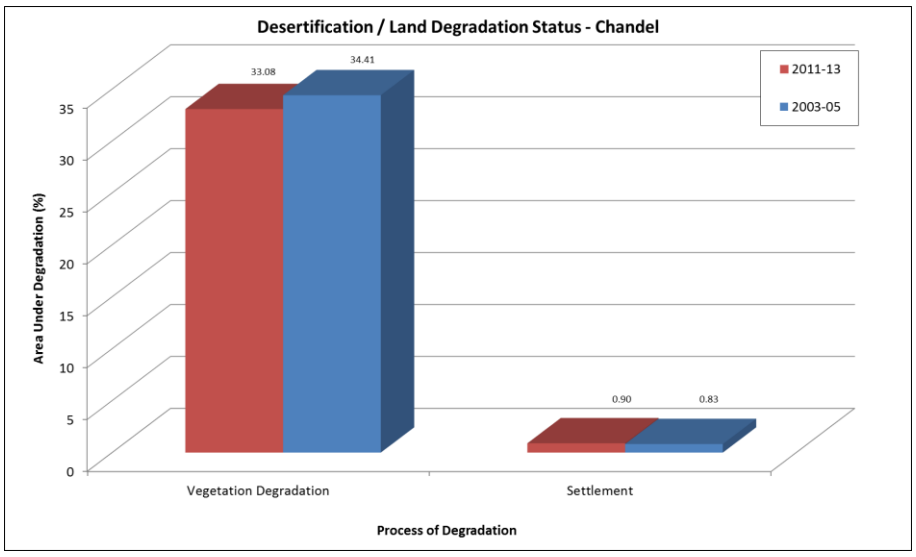
Chandel District, Manipur

Chandel district falls in the south eastern portion of Manipur State. it is bounded on the north by Ukhrul district, west by Thoubal and Churachandpur districts. It shares international border with Myanmar in south and east sides. It covers an area of 3,313 sq. km. The district has a population of 1,44,182 with 44 population density, 933 sex ratio and a literacy rate of 71.1%. (Census 2011)

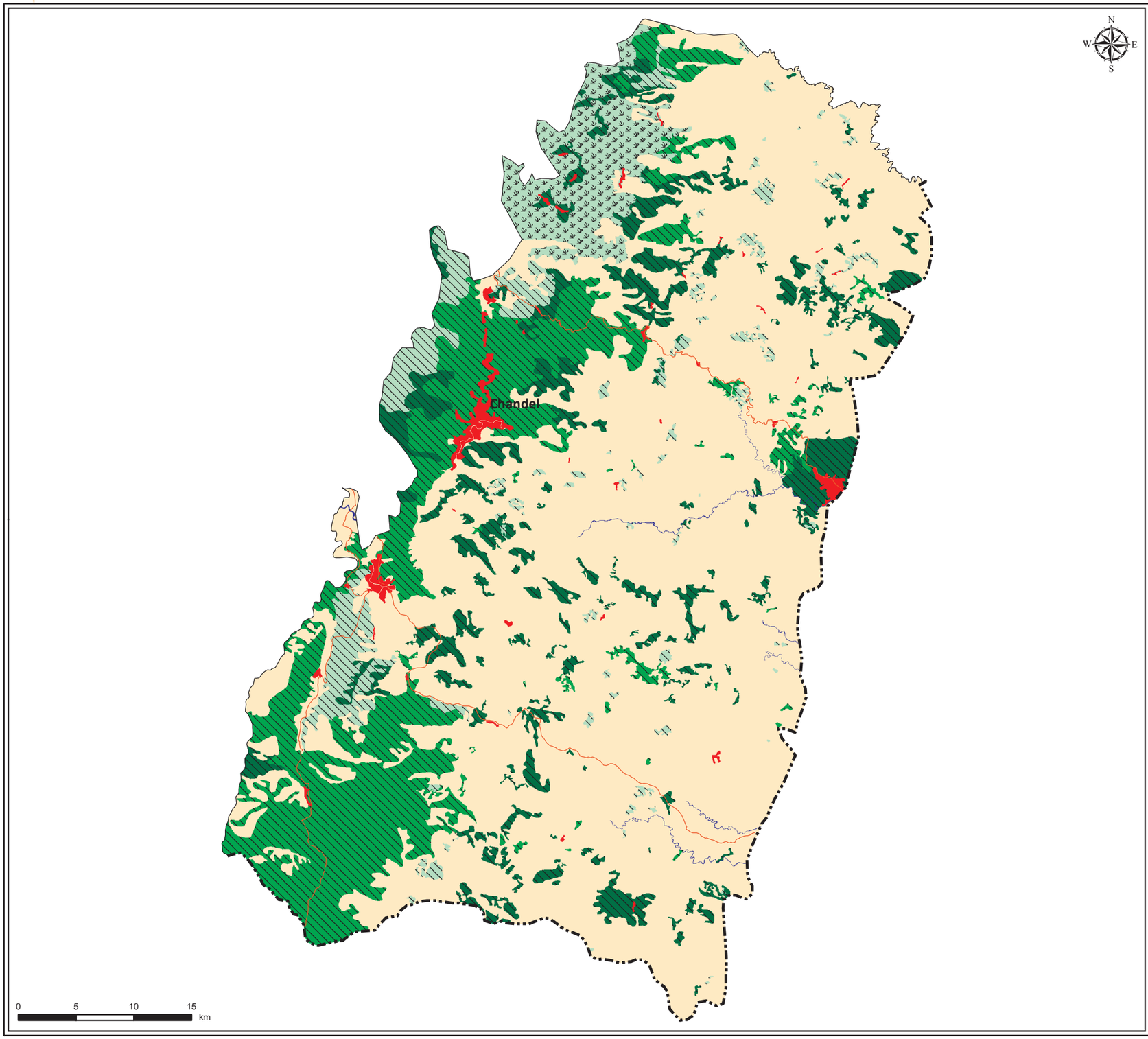
Topographically, the district consists of rugged hilly terrain sloping towards the east and west. Chandel district is divided into 3 hilly regions, viz. Western Hilly region, Eastern Hilly region, and Southern Hilly region. Chandel district is drained by the two river systems. The Manipur river and its tributaries drains the western portions of the district. While, a number of small rivers drain the eastern portions of the district, which falls into the Yu river of Myanmar.

Chandel is observed with 33.98 % of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has decreased about 1.25% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (33.08% during 2011-13 and 34.41% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	109584.66	33.08	113996.26	34.41	-4411.60
Settlement	2975.29	0.90	2733.30	0.83	241.99
Total Area under Desertification	**112559.96**	**33.98**	**116729.57**	**35.23**	**-4169.61**
No Apparent Degradation	**218334.81**	**65.90**	**214165.20**	**64.64**	**4169.61**
Total Geographical Area (ha)	**331300.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	30102.13	9.09	28246.18	8.53	1855.94
2	Fv2	Forest, vegetation degradation, Moderate	52035.26	15.71	52306.29	15.79	-271.03
3	Fv3	Forest, vegetation degradation, Severe	14052.04	4.24	20048.55	6.05	-5996.51
4	Sv1	Land with scrub, vegetation degradation, Slight	21.33	0.01	21.33	0.01	0.00
5	Sv3	Land with scrub, vegetation degradation, Severe	13373.91	4.04	13373.91	4.04	0.00
6	S	Settlement	2975.29	0.90	2733.30	0.83	241.99
Total Area Under Desertification/ Land Degradation			**112559.96**	**33.98**	**116729.57**	**35.23**	**-4169.61**
7	W	Water body/ Drainage	405.23	0.12	405.23	0.12	0.00
8	NAD	No Apparent Degradation	218334.81	65.90	214165.20	64.64	4169.61
Total Geographical Area (ha)			**331300.00**	**100.00**	**331300.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Chandel District, Manipur
Timeframe - 2011-13

Legend

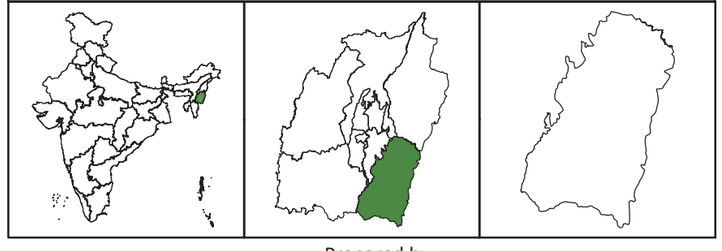
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv3	Land with scrub, vegetation degradation, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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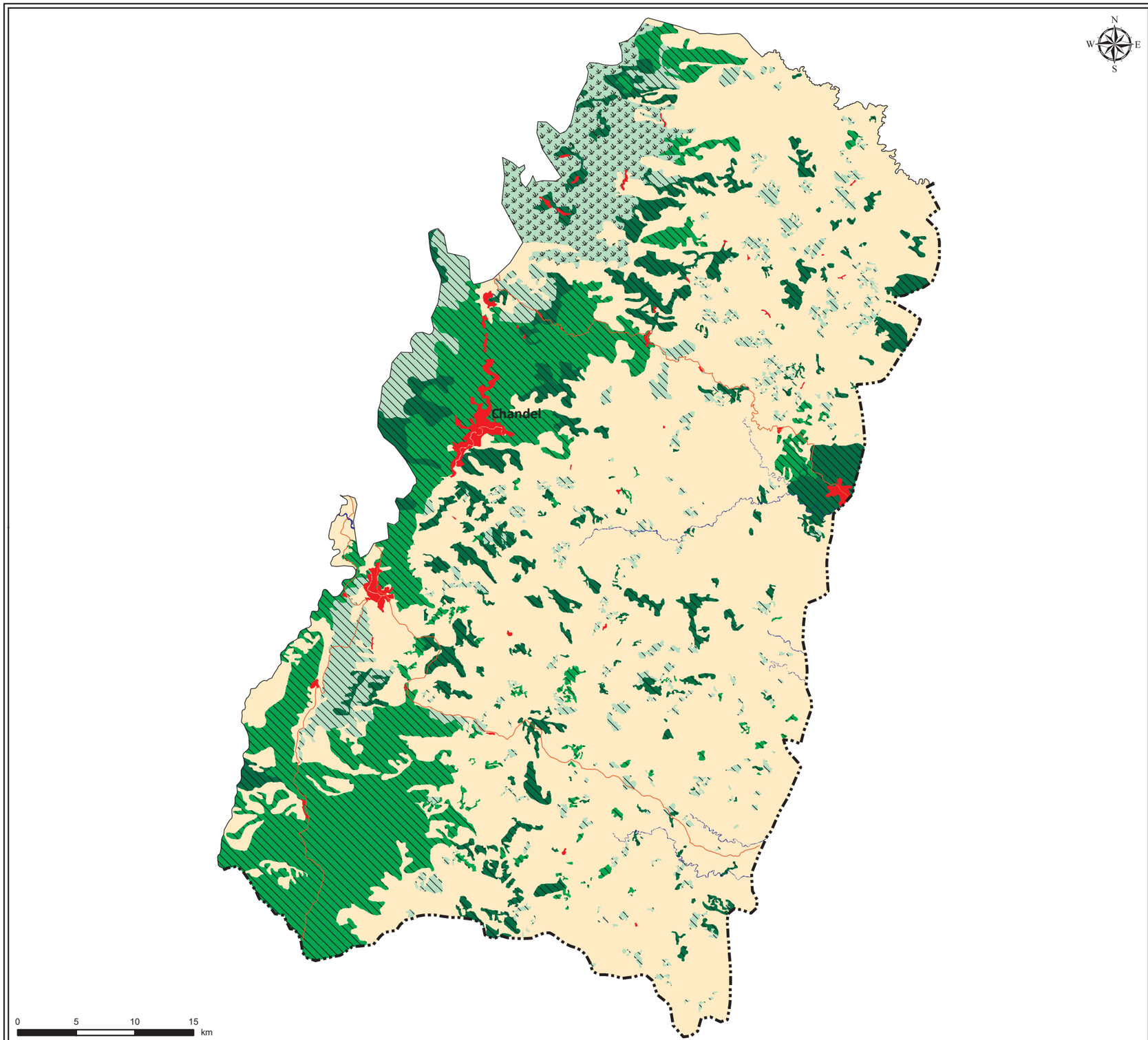


DESERTIFICATION / LAND DEGRADATION STATUS MAP
Chandel District, Manipur
Timeframe - 2003-05

Legend

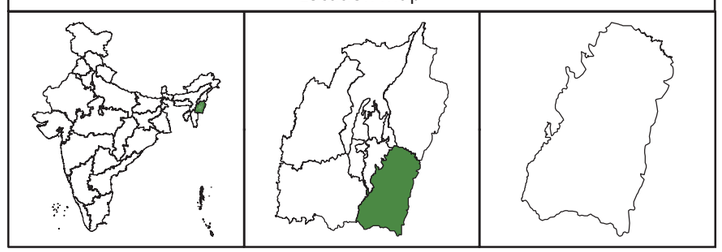
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv3	Land with scrub, vegetation degradation, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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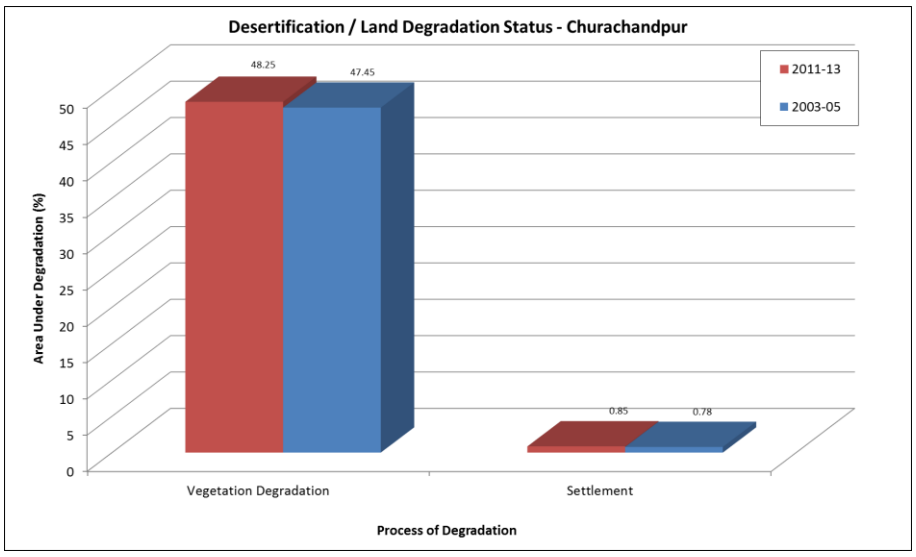
Churachandpur District, Manipur

Churachandpur district falls in the south-western portion of Manipur state. It is bounded by Tamenglong district to north, Bishnupur district to north-east, Chandel district to east. It shares state border with Mizoram to south and west sides and Assam to west side. It also shares international border with Myanmar to south side. It covers an area of 4,570 km. The district has a population of 2,74,143 with 60 population density, 975 sex ratio and a literacy rate of 82.78%. (Census 2011)

The major portion of the district is rugged hilly terrain with a small valley portion extended from Imphal valley along the Khuga river basin Churachandpur district is divided into 3 hilly regions, viz., Western Hilly region, Eastern Hilly region and Southern Hilly region, based on geology, soils, topography, climate and natural vegetation. The district is drained by two rivers systems, The Barak river and The Manipur river.

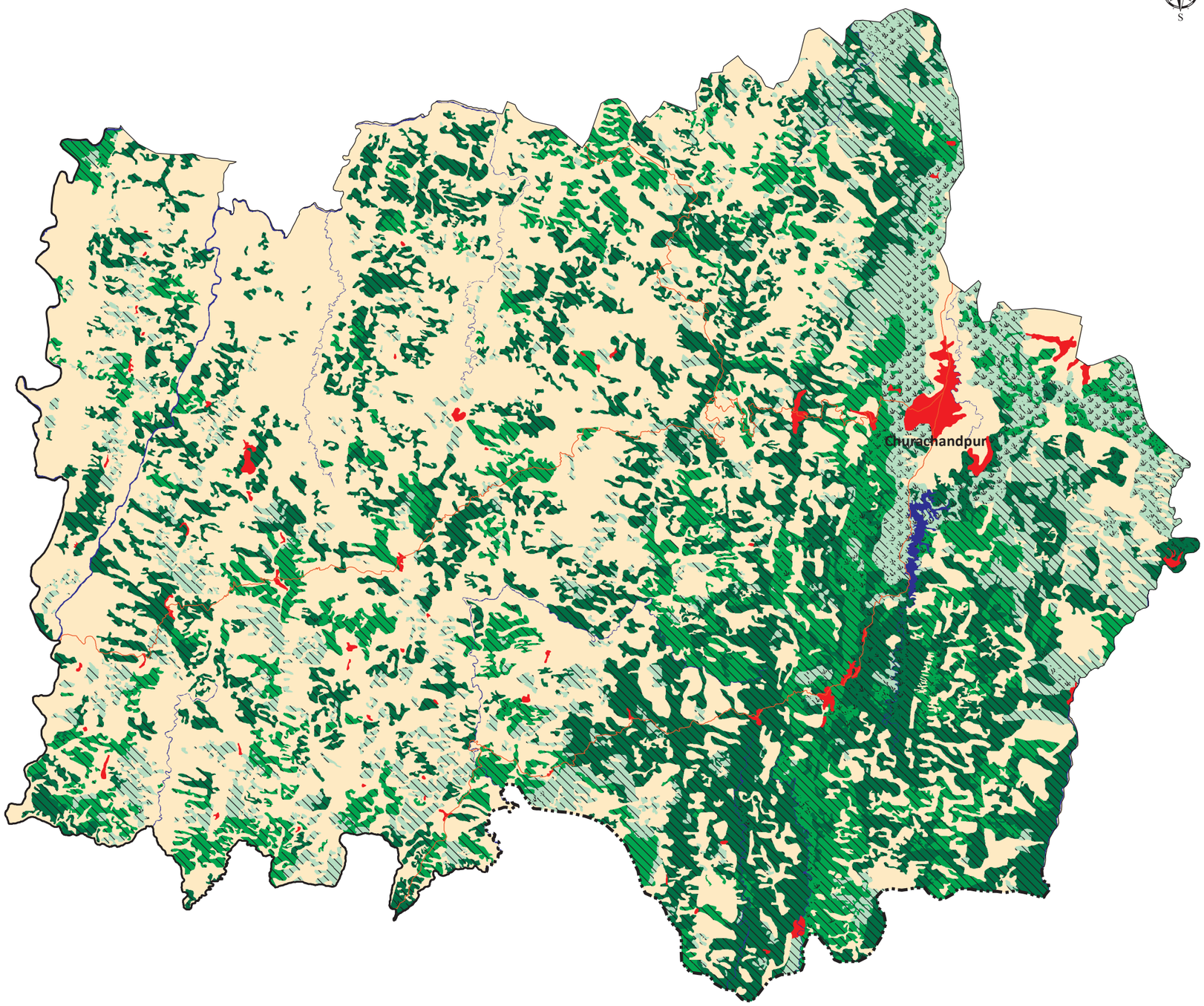
Churachandpur is observed with 49.10% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.88% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (48.25% during 2011-13 and 47.45% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	220495.46	48.25	216840.61	47.45	3654.85
Settlement	3906.65	0.85	3544.36	0.78	362.29
Total Area under Desertification	**224402.11**	**49.10**	**220384.97**	**48.22**	**4017.14**
No Apparent Degradation	**229581.16**	**50.24**	**233598.29**	**51.12**	**-4017.14**
Total Geographical Area (ha)	**457000.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	104572.22	22.88	101955.16	22.31	2617.05
2	Fv2	Forest, vegetation degradation, Moderate	53867.25	11.79	55216.32	12.08	-1349.07
3	Fv3	Forest, vegetation degradation, Severe	43002.25	9.41	40702.94	8.91	2299.31
4	Sv1	Land with scrub, vegetation degradation, Slight	3052.03	0.67	3028.77	0.66	23.26
5	Sv2	Land with scrub, vegetation degradation, Moderate	3823.96	0.84	3774.89	0.83	49.07
6	Sv3	Land with scrub, vegetation degradation, Severe	12177.75	2.66	12162.52	2.66	15.23
7	S	Settlement	3906.65	0.85	3544.36	0.78	362.29
Total Area Under Desertification/ Land Degradation			**224402.11**	**49.10**	**220384.97**	**48.22**	**4017.14**
8	W	Water body/ Drainage	3016.74	0.66	3016.74	0.66	0.00
9	NAD	No Apparent Degradation	229581.16	50.24	233598.29	51.12	-4017.14
Total Geographical Area (ha)			**457000.00**	**100.00**	**457000.00**	**100.00**	

DESERTIFICATION / LAND DEGRADATION STATUS MAP
Churachandpur District, Manipur
Timeframe - 2011-13



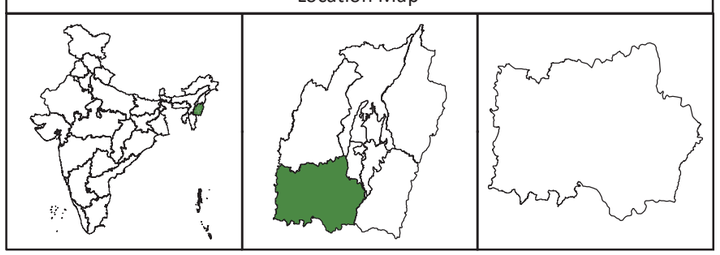
Legend		
Symbol	**Code**	**Description**
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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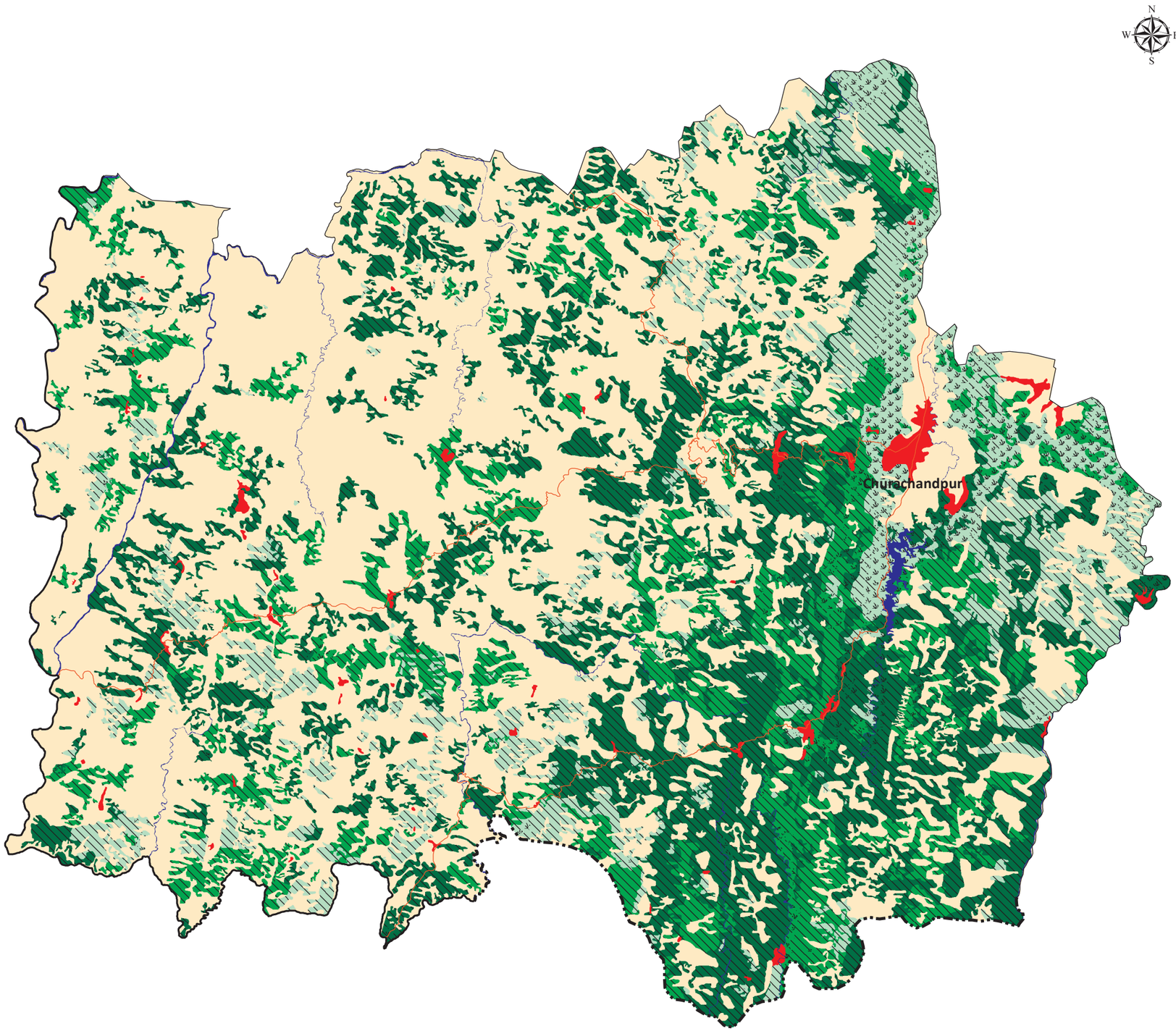


DESERTIFICATION / LAND DEGRADATION STATUS MAP
Churachandpur District, Manipur
Timeframe - 2003-05

Legend

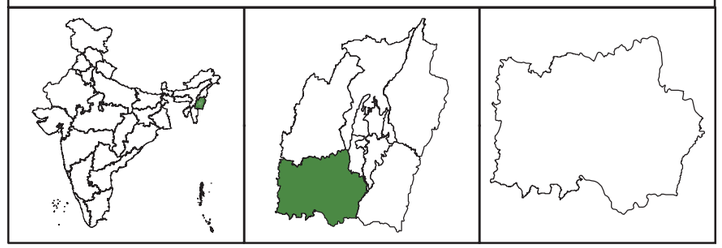
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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Space Applications Centre, ISRO, Ahmedabad

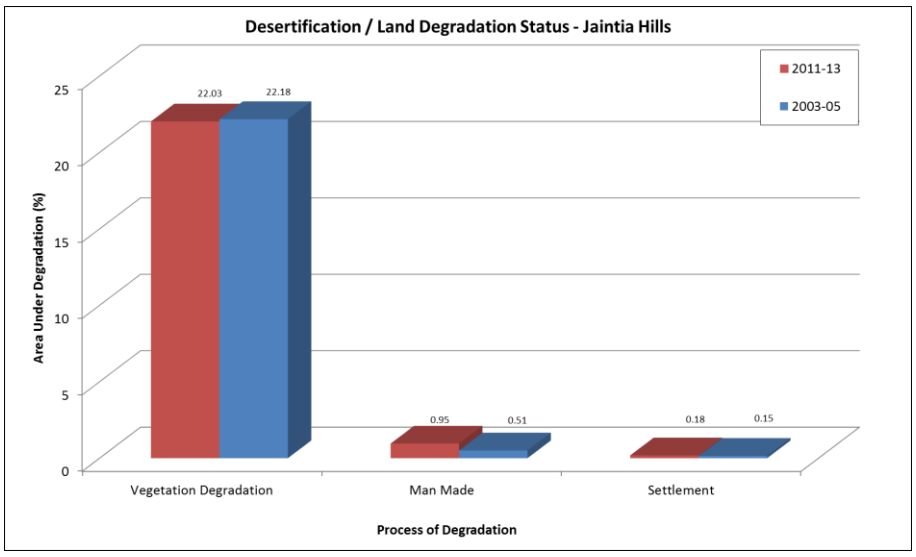
Jaintia Hills District, Meghalaya

Jaintia Hills district falls in the extreme eastern portion of Meghalaya state. It is bounded in the east and north by Assam state, in the west by East Khasi Hills district and it shares international border with Bangladesh in south. It covers an area of 3,819 sq. km. The district has a population of 3,95,124 with 103 population density, 1013 sex ratio and a literacy rate of 61.64%. (Census 2011)

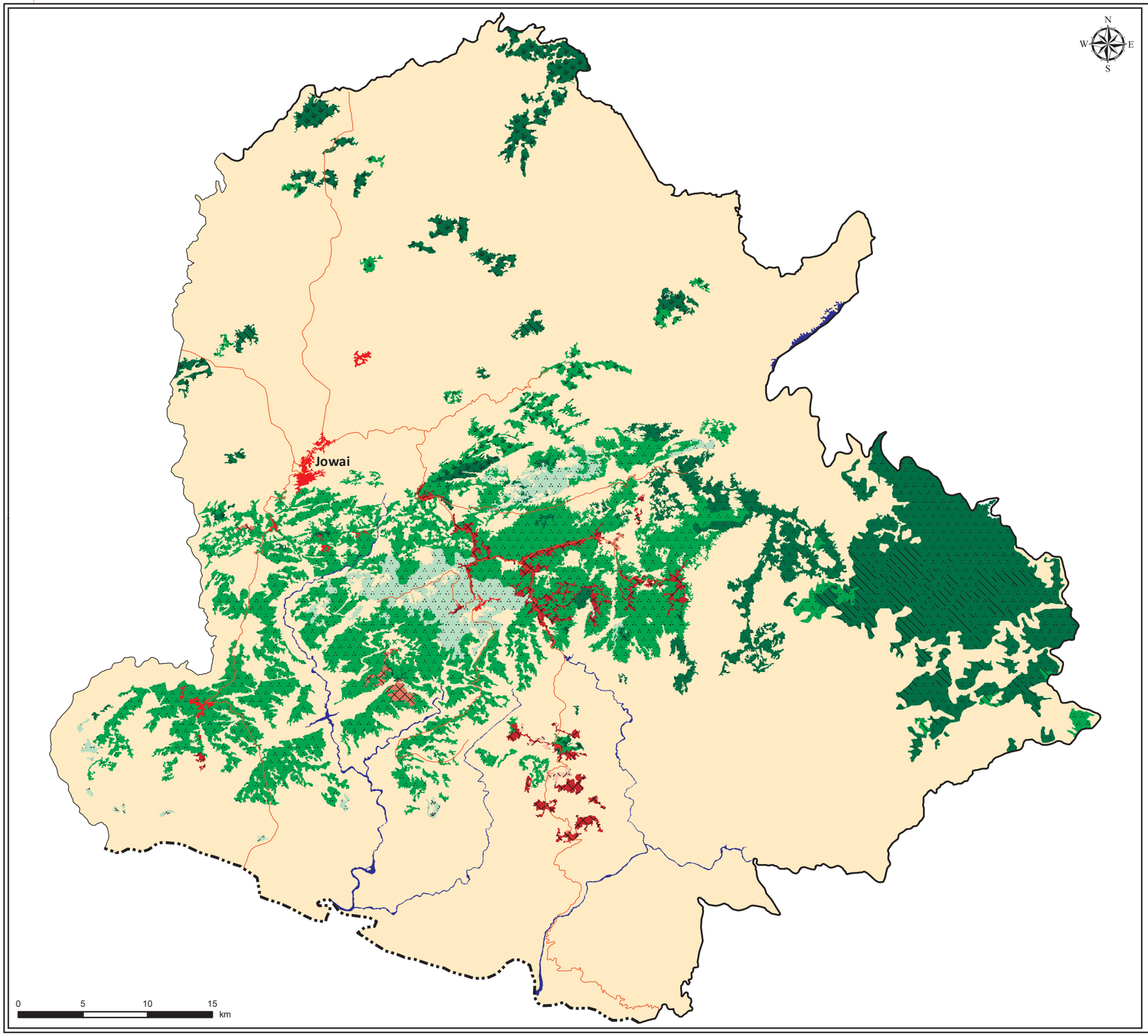
The district is divided into three lateral sections running east and west and is corresponding to those of Khasi Hills of which they are extensions. The district can be delineated into two sub-micro divisions; the East Shillong Plateau Region and the Narpuh-Saipung Forest Region. The East Shillong Plateau region is dominated by hilly and dissected terrain. There is a good deposit of minerals like coal, limestone, etc., in this region. The Narpuh-Saipung forest region lies on the south-eastern part of the district. This region is traversed by numerous rivers and streams. Laterite and red-yellow soil cover the entire area of the region. This region is heavily forested throughout.

Jaintia Hills is observed with 23.16% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.32% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (22.03% during 2011-13 and 22.18% during 2003-05)

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	84127.22	22.03	84702.02	22.18	-574.80
Man Made	3636.68	0.95	1934.78	0.51	1701.89
Settlement	694.53	0.18	587.26	0.15	107.26
Total Area under Desertification	**88458.43**	**23.16**	**87224.07**	**22.84**	**1234.36**
No Apparent Degradation	**291873.76**	**76.43**	**293108.12**	**76.75**	**-1234.36**
Total Geographical Area (ha)	**381900.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	6049.81	1.58	6049.81	1.58	0.00
2	Fv2	Forest, vegetation degradation, Moderate	305.39	0.08	305.39	0.08	0.00
3	Gv1	Grassland / Grazing land, vegetation degradation, Slight	21443.67	5.61	21443.67	5.61	0.00
4	Gv2	Grassland / Grazing land, vegetation degradation, Moderate	41638.47	10.90	42319.88	11.08	-681.42
5	Gv3	Grassland / Grazing land, vegetation degradation, Severe	6348.92	1.66	6338.31	1.66	10.61
6	Sv1	Land with scrub, vegetation degradation, Slight	5234.31	1.37	5014.96	1.31	219.35
7	Sv2	Land with scrub, vegetation degradation, Moderate	2926.28	0.77	3049.62	0.80	-123.34
8	Sv3	Land with scrub, vegetation degradation, Severe	180.38	0.05	180.38	0.05	0.00
9	Tm1	Others, man made, Slight	152.41	0.04	0.00	0.00	152.41
10	Tm2	Others, man made, Moderate	476.91	0.12	476.91	0.12	0.00
11	Tm3	Others, man made, Severe	3007.36	0.79	1457.87	0.38	1549.48
12	S	Settlement	694.53	0.18	587.26	0.15	107.26
Total Area Under Desertification/ Land Degradation			**88458.43**	**23.16**	**87224.07**	**22.84**	**1234.36**
13	W	Water body/ Drainage	1567.81	0.41	1567.81	0.41	0.00
14	NAD	No Apparent Degradation	291873.76	76.43	293108.12	76.75	-1234.36
Total Geographical Area (ha)			**381900.00**	**100.00**	**381900.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Jaintia Hills District, Meghalaya
Timeframe - 2011-13

Legend

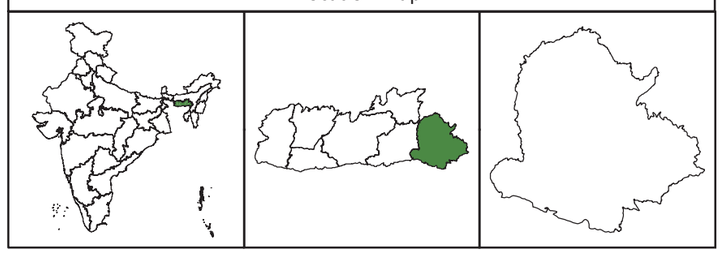
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Gv1	Grassland / Grazing land, vegetation degradation, Slight
	Gv2	Grassland / Grazing land, vegetation degradation, Moderate
	Gv3	Grassland / Grazing land, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

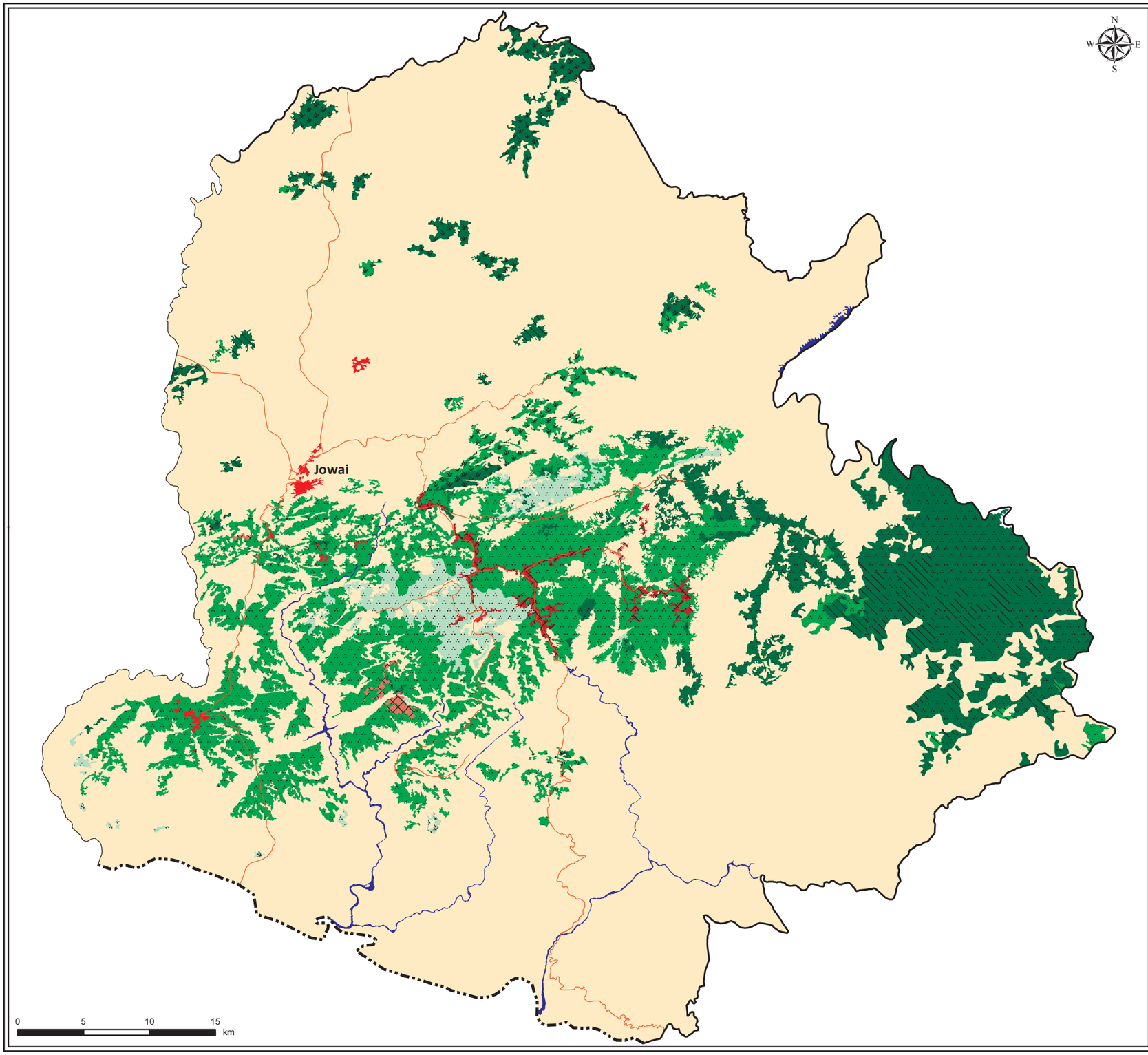
International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



Prepared by:
North eastern Hill University, Shillong
&
Space Applications Centre, ISRO, Ahmedabad



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Jaintia Hills District, Meghalaya
Timeframe - 2003-05

Legend

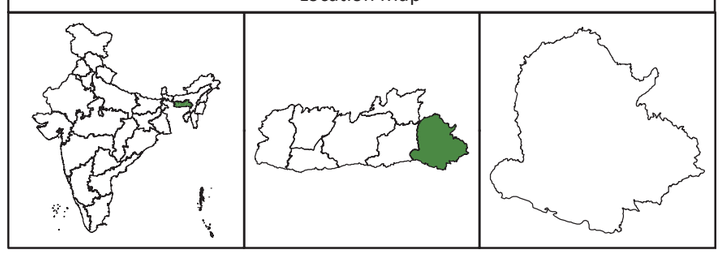
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Gv1	Grassland / Grazing land, vegetation degradation, Slight
	Gv2	Grassland / Grazing land, vegetation degradation, Moderate
	Gv3	Grassland / Grazing land, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



Prepared by:
North eastern Hill University, Shillong
&
Space Applications Centre, ISRO, Ahmedabad

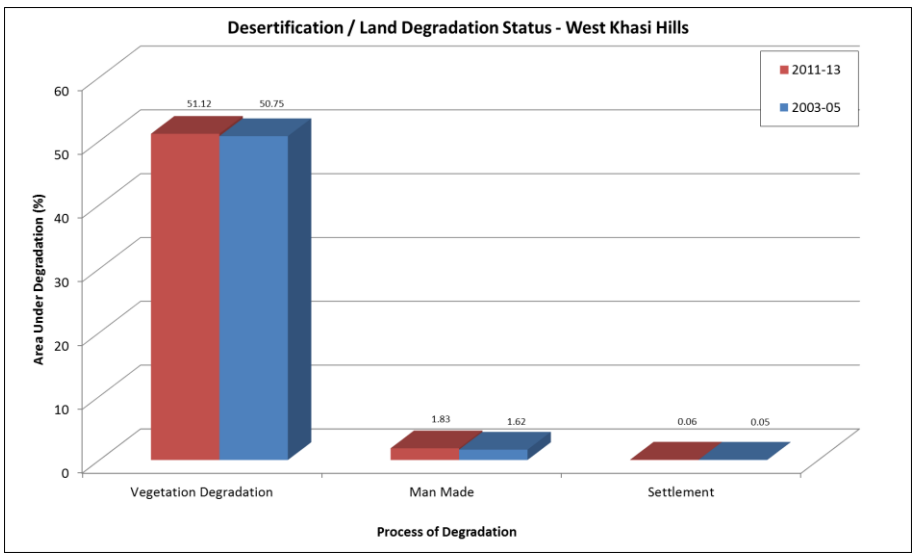
West Khasi Hills District, Meghalaya

West Khasi Hills district lies in the central portion of Meghalaya state. It is bounded in the east by the East Khasi Hills and the Ri Bhoi district, in the North by the Ri Bhoi district and Assam state, in the west by the East Garo Hills and the South Garo Hills districts, and in the south by Bangladesh. It covers an area 5,247sq km area. The district has a population of 3,83,461 with 73 population density, 980 sex ratio and a literacy rate of 77.87%. (Census 2011)

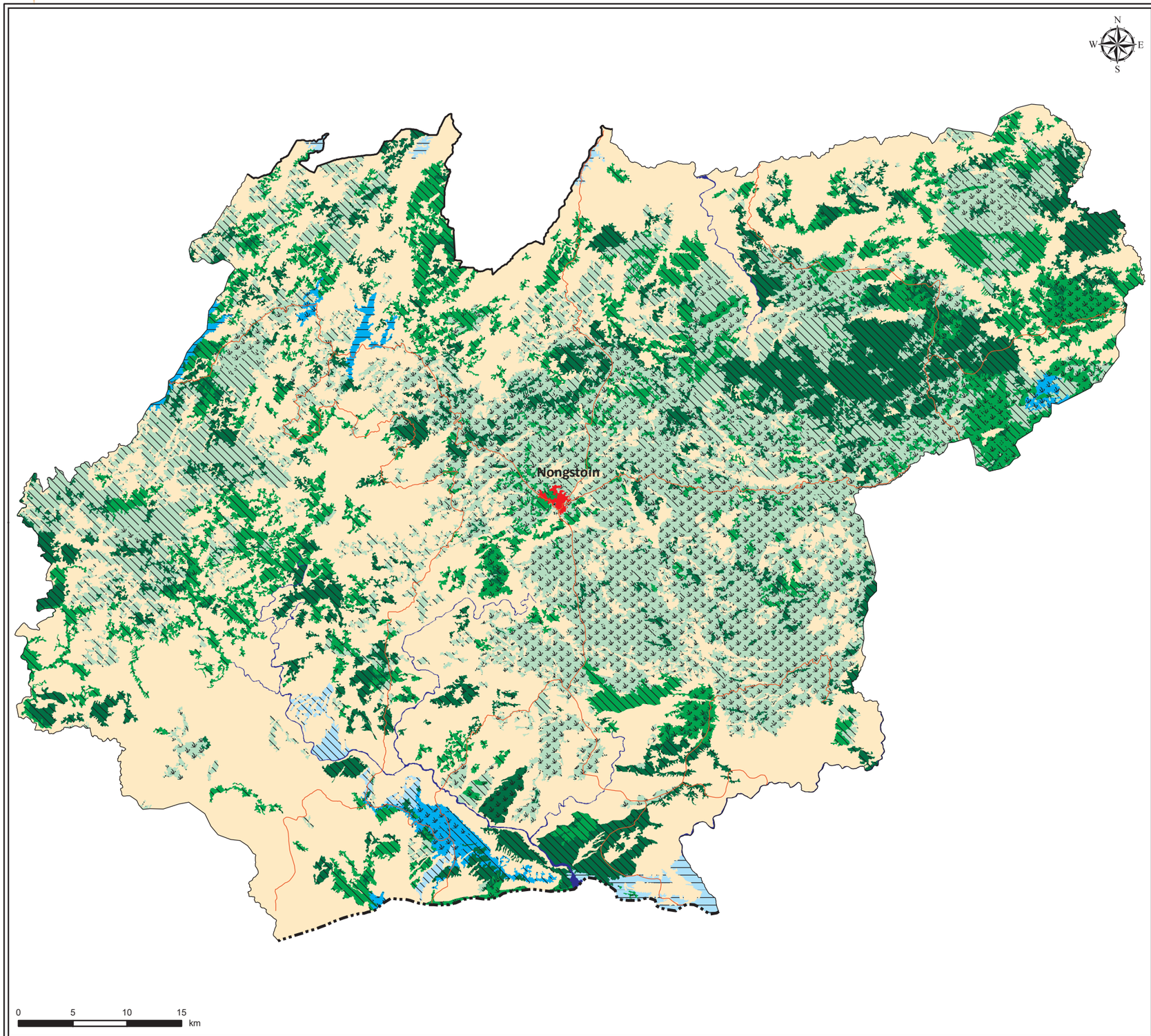
The West Khasi Hills District can be divided into two regional divisions, the West Shillong Plateau region (northern part) and the Kynshiang Umngi Basin (southern part). Both the regions are characterised by hilly rugged terrain and plateau dissected by rivers and streams. The district is rich in forest resources, finest class of timber abounds in the district. The drainage pattern of the district represents a most spectacular feature, revealing extra ordinary straight course of the rivers and streams evidently along joints and faults. The main rivers of the districts are the Khrisynnia, Khri and Riangdo. The district is endowed with economically important minerals viz. coal, limestone, sillimanite and uranium.

West Khasi Hills is observed with 53.01% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.59% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (51.12% during 2011-13 and 50.75% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	268221.34	51.12	266276.21	50.75	1945.13
Man Made	9617.37	1.83	8499.68	1.62	1117.69
Settlement	320.23	0.06	259.09	0.05	61.14
Total Area under Desertification	**278158.95**	**53.01**	**275034.99**	**52.42**	**3123.96**
No Apparent Degradation	**244947.45**	**46.68**	**248071.42**	**47.28**	**-3123.96**
Total Geographical Area (ha)	**524700.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	59793.30	11.40	58509.07	11.15	1284.23
2	Fv2	Forest, vegetation degradation, Moderate	53175.60	10.13	49941.59	9.52	3234.01
3	Fv3	Forest, vegetation degradation, Severe	54341.65	10.36	56910.66	10.85	-2569.01
4	Sv1	Land with scrub, vegetation degradation, Slight	1507.30	0.29	1626.82	0.31	-119.52
5	Sv2	Land with scrub, vegetation degradation, Moderate	12582.71	2.40	12461.01	2.37	121.71
6	Sv3	Land with scrub, vegetation degradation, Severe	86820.78	16.55	86827.07	16.55	-6.28
7	Dw1	Agriculture unirrigated, water erosion, Slight	2335.40	0.45	2335.40	0.45	0.00
8	Dw2	Agriculture unirrigated, water erosion, Moderate	1399.24	0.27	1399.24	0.27	0.00
9	Fw1	Forest, water erosion, Slight	2034.73	0.39	917.04	0.17	1117.69
10	Fw2	Forest, water erosion, Moderate	1354.61	0.26	1354.61	0.26	0.00
11	Sw2	Land with scrub, water erosion, Moderate	2493.39	0.48	2493.39	0.48	0.00
12	S	Settlement	320.23	0.06	259.09	0.05	61.14
Total Area Under Desertification/ Land Degradation			**278158.95**	**53.01**	**275034.99**	**52.42**	**3123.96**
13	W	Water body/ Drainage	1593.60	0.30	1593.60	0.30	0.00
14	NAD	No Apparent Degradation	244947.45	46.68	248071.42	47.28	-3123.96
Total Geographical Area (ha)			**524700.00**	**100.00**	**524700.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
West Khasi Hills District, Meghalaya
Timeframe - 2011-13

Legend

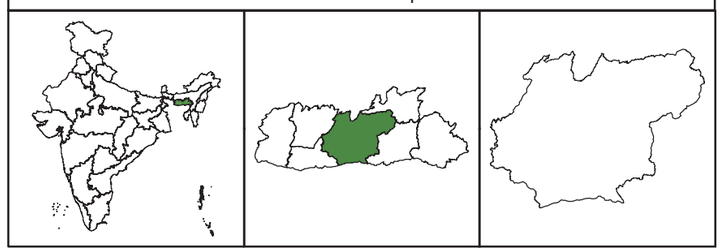
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Fw1	Forest, water erosion, Slight
	Fw2	Forest, water erosion, Moderate
	Sw2	Land with scrub, water erosion, Moderate
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

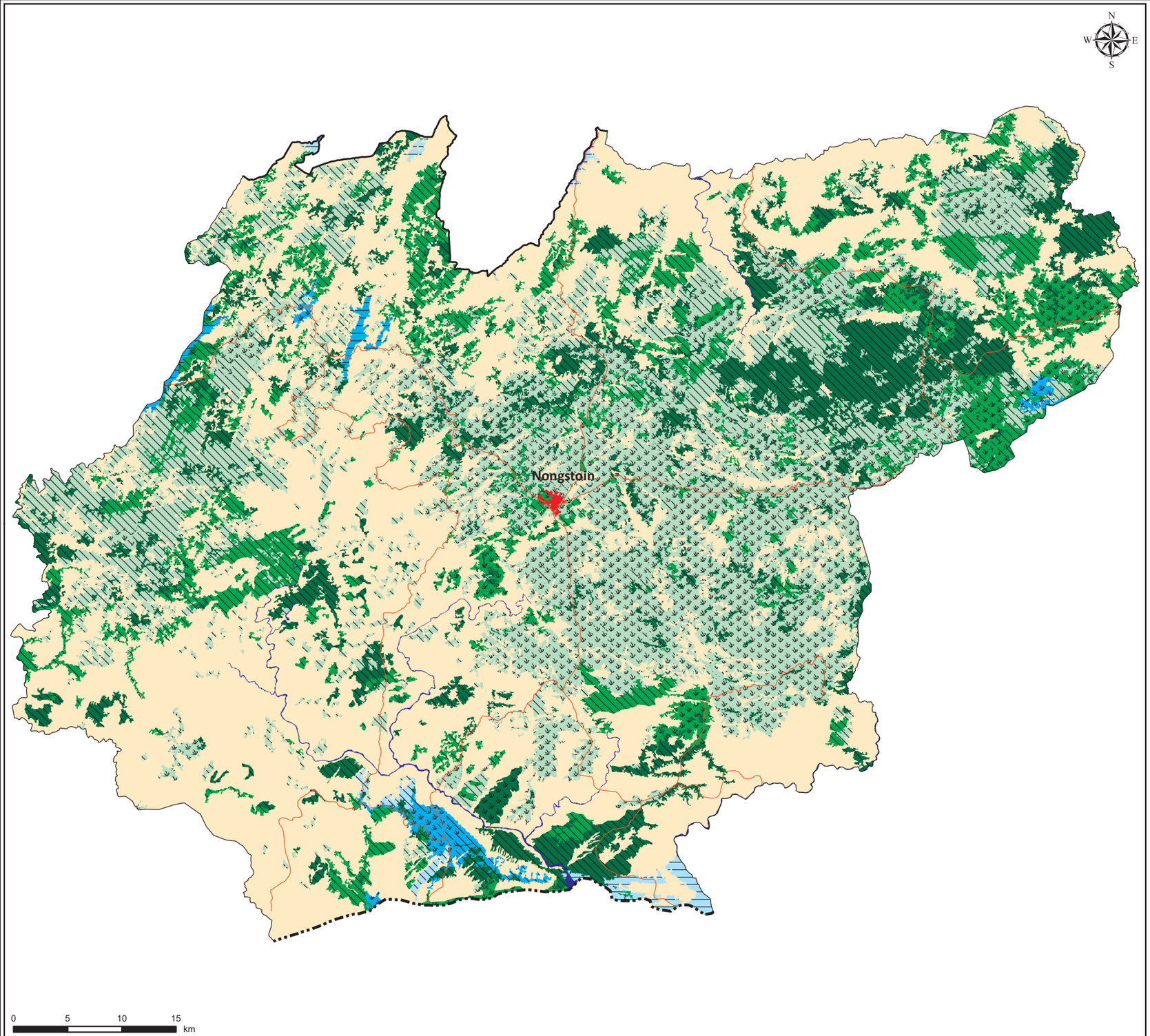
Major Road
Major Rail

Location Map



Prepared by:
North eastern Hill University, Shillong
&
Space Applications Centre, ISRO, Ahmedabad

DESERTIFICATION / LAND DEGRADATION STATUS MAP
West Khasi Hills District, Meghalaya
Timeframe - 2003-05



Legend

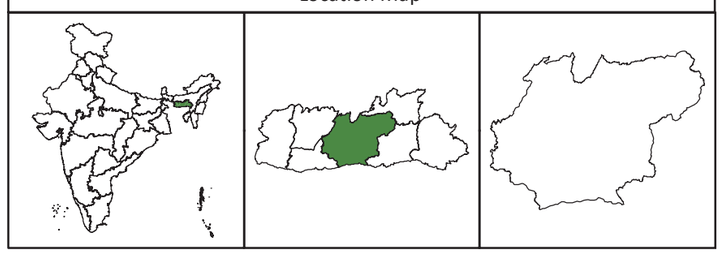
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Fw1	Forest, water erosion, Slight
	Fw2	Forest, water erosion, Moderate
	Sw2	Land with scrub, water erosion, Moderate
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



Prepared by:
North eastern Hill University, Shillong
&
Space Applications Centre, ISRO, Ahmedabad

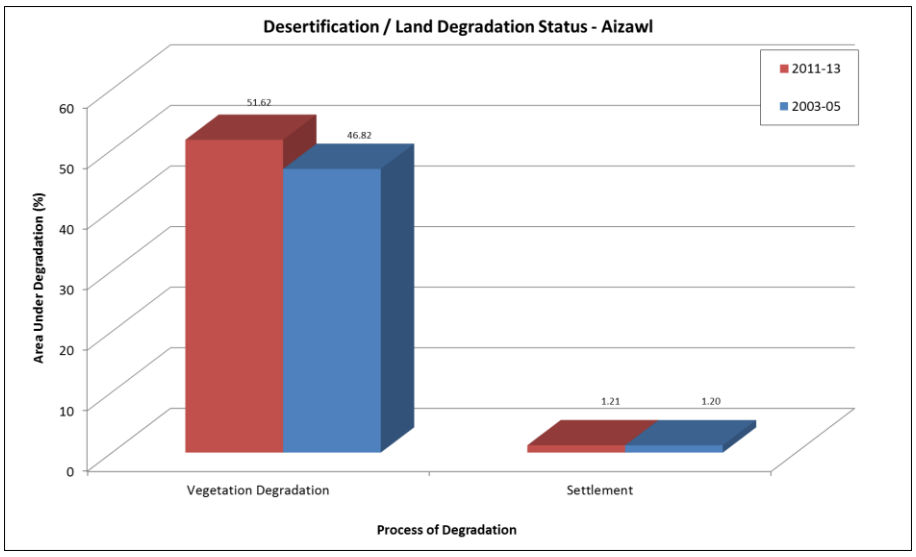
Aizawl District, Mizoram

Aizawl district lies in north part of Mizoram state. It is bounded by Kolasib district on north-west side, Mamit district on west, Serchhip district on south, and Champhai district on east side. It also shares state border with Assam on north and Manipur on north-east side. It occupies an area of 3,577 sq. km. The district has a population of 4,04,054 with 113 population density, 1009 sex ratio and a literacy rate of 98.5%. (Census 2011)

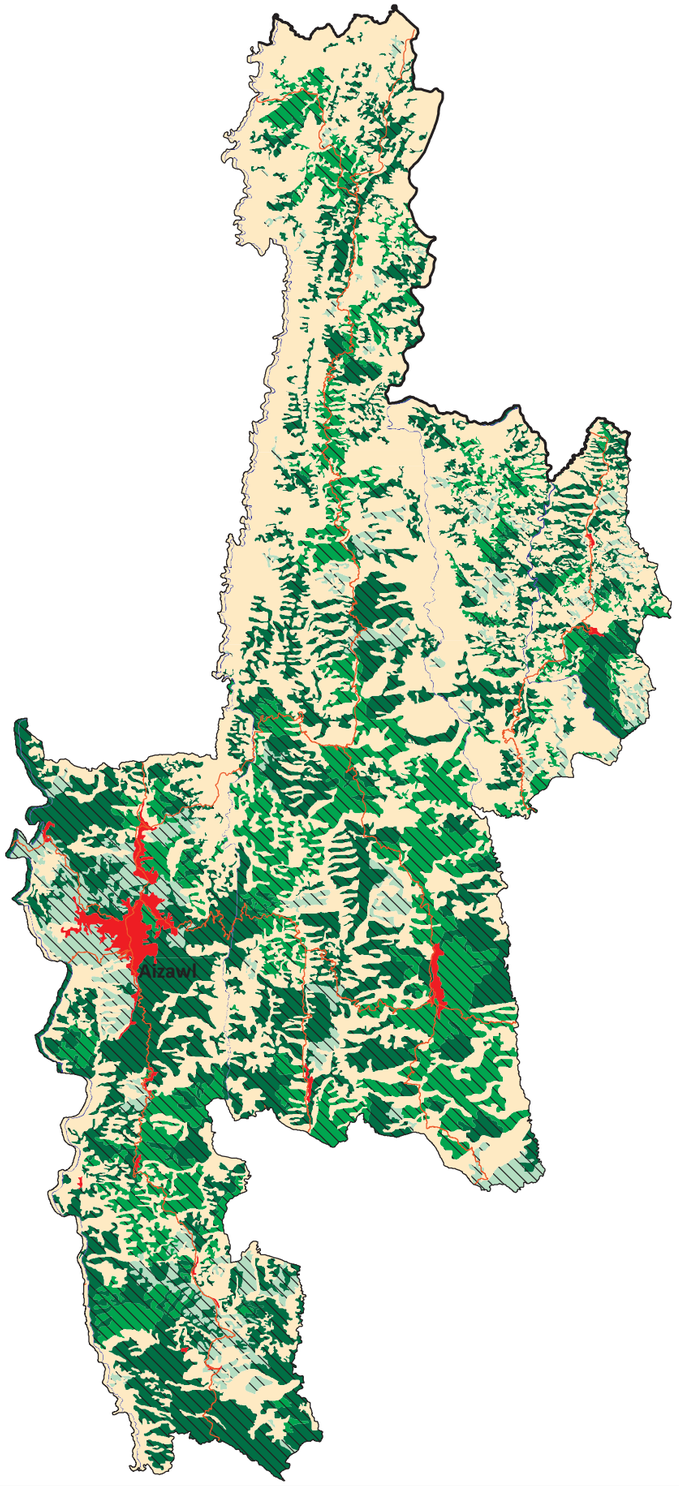
The topography of the district is undulant with broken mountain/hilly ranges and between them lies the valley lands suitable for cultivation of field crops. Horticulture practice is very common in gentle and moderate slopes. The soil in the hills are rich in humus due to forest cover. Though the district mainly comprises of hilly terrain there are low lying valley lands in few pockets, where altitudes is rather low having warm and humid climate facilitating paddy cultivation.

Aizawl is observed with 52.83% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 4.81% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (51.62% during 2011-13 and 46.82% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	184637.66	51.62	167471.12	46.82	17166.54
Settlement	4338.14	1.21	4295.70	1.20	42.44
Total Area under Desertification	**188975.80**	**52.83**	**171766.82**	**48.02**	**17208.98**
No Apparent Degradation	**166938.99**	**46.67**	**184147.86**	**51.48**	**-17208.86**
Total Geographical Area (ha)	**357700.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	103737.10	29.00	75520.08	21.11	28217.02
2	Fv2	Forest, vegetation degradation, Moderate	58296.16	16.30	59207.83	16.55	-911.67
3	Fv3	Forest, vegetation degradation, Severe	22604.41	6.32	32743.22	9.15	-10138.81
4	S	Settlement	4338.14	1.21	4295.70	1.20	42.44
Total Area Under Desertification/ Land Degradation			**188975.80**	**52.83**	**171766.82**	**48.02**	**17208.98**
5	W	Water body/ Drainage	1785.21	0.50	1785.32	0.50	-0.12
6	NAD	No Apparent Degradation	166938.99	46.67	184147.86	51.48	-17208.86
Total Geographical Area (ha)			**357700.00**	**100.00**	**357700.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Aizawl District, Mizoram
Timeframe - 2011-13

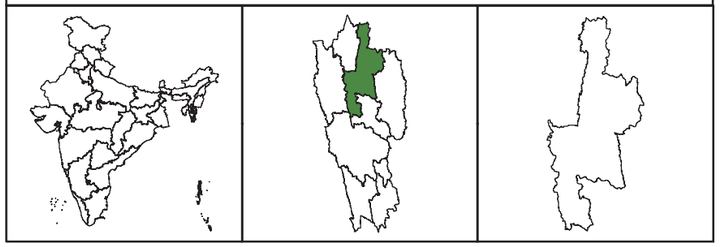
Legend

Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

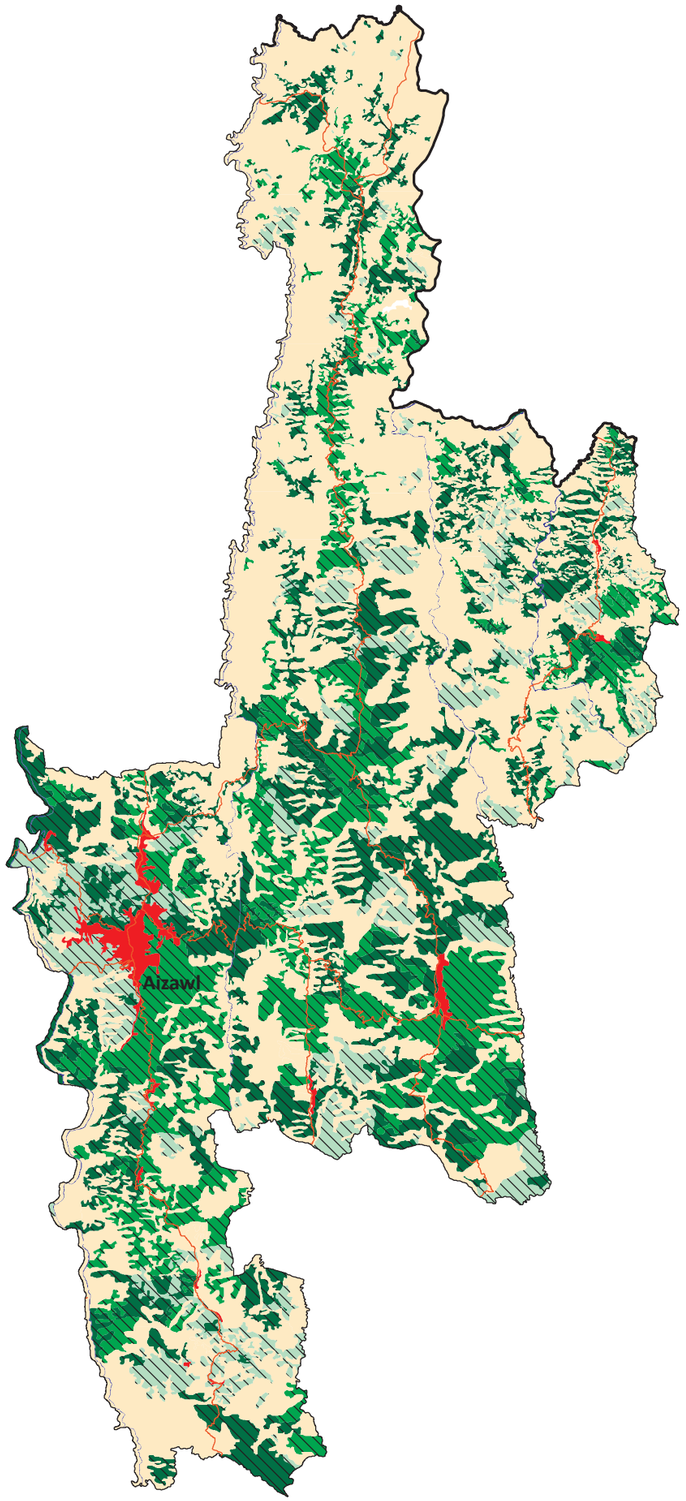
Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary
Major Road
Major Rail

Location Map



Prepared by:
Mizoram Remote Sensing Application Centre, Aizawl
&
Space Applications Centre, ISRO, Ahmedabad



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Aizawl District, Mizoram
Timeframe - 2003-05

Legend

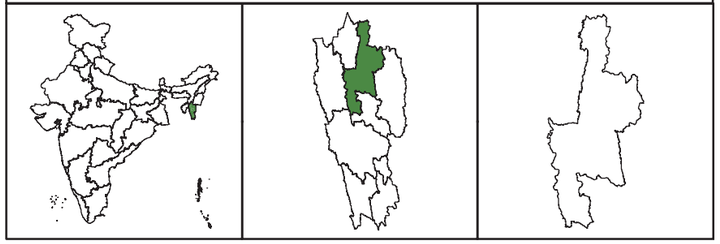
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



Prepared by:
Mizoram Remote Sensing Application Centre, Aizawl
&
Space Applications Centre, ISRO, Ahmedabad

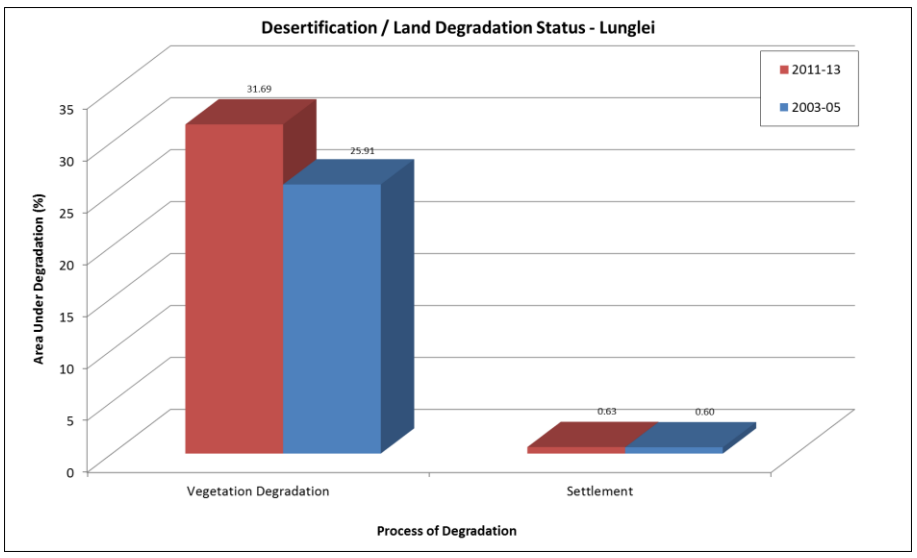
Lunglei District, Mizoram

Lunglei district lies in the central part of Mizoram state. It is bounded on the North by Mamit, Aizawl and Serchhip districts; and Lawngtlai and Saiha districts are on the south side. It shares international border with Bangladesh on west side and Myanmar on east side. It covers an area of 4538 sq. km. The district has a population of 1,54,094 with 34 population density, 947 sex ratio and a literacy rate of 88.86%. (Census 2011)

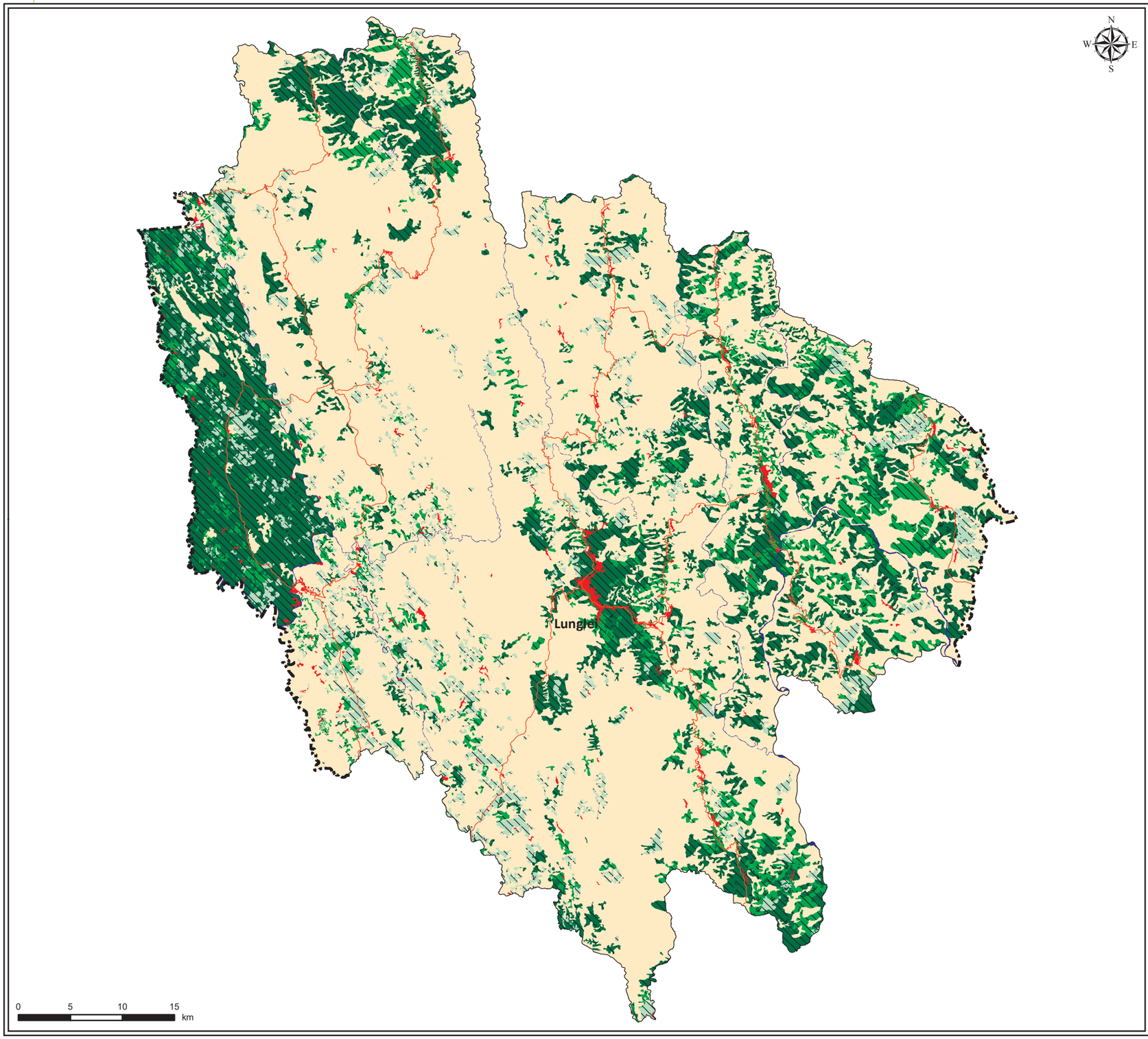
The topography of the district is undulant with broken mountain/hilly ranges and between them lies the valley lands suitable for cultivation of crops. The hills are situated for Horticulture practice, where ever the slopes are gentle & moderate. The soils in the hills are rich in humus due to forest cover. Though the district mainly comprises of hilly terrain there are low dying valley lands in few pockets suitable for paddy cultivation.

Lunglei is observed with 32.32% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 5.81% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (31.69% during 2011-13 and 25.91% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	143821.20	31.69	117583.90	25.91	26237.31
Settlement	2851.88	0.63	2740.31	0.60	111.57
Total Area under Desertification	**146673.08**	**32.32**	**120324.20**	**26.51**	**26348.87**
No Apparent Degradation	**305058.23**	**67.22**	**331431.18**	**73.03**	**-26372.96**
Total Geographical Area (ha)	**453800.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	79208.90	17.45	39914.06	8.80	39294.84
2	Fv2	Forest, vegetation degradation, Moderate	29756.92	6.56	30818.03	6.79	-1061.11
3	Fv3	Forest, vegetation degradation, Severe	26773.57	5.90	39122.29	8.62	-12348.72
4	Sv1	Land with scrub, vegetation degradation, Slight	3614.39	0.80	3894.13	0.86	-279.74
5	Sv2	Land with scrub, vegetation degradation, Moderate	2935.02	0.65	3653.77	0.81	-718.75
6	Sv3	Land with scrub, vegetation degradation, Severe	1532.40	0.34	181.62	0.04	1350.78
7	S	Settlement	2851.88	0.63	2740.31	0.60	111.57
Total Area Under Desertification/ Land Degradation			**146673.08**	**32.32**	**120324.20**	**26.51**	**26348.87**
8	W	Water body/ Drainage	2068.69	0.46	2044.61	0.45	24.08
9	NAD	No Apparent Degradation	305058.23	67.22	331431.18	73.03	-26372.96
Total Geographical Area (ha)			**453800.00**	**100.00**	**453800.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Lunglei District, Mizoram
Timeframe - 2011-13

Legend

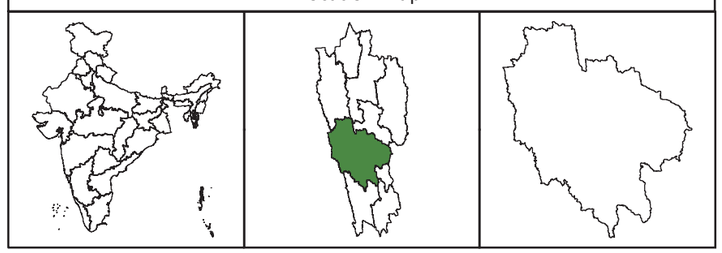
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

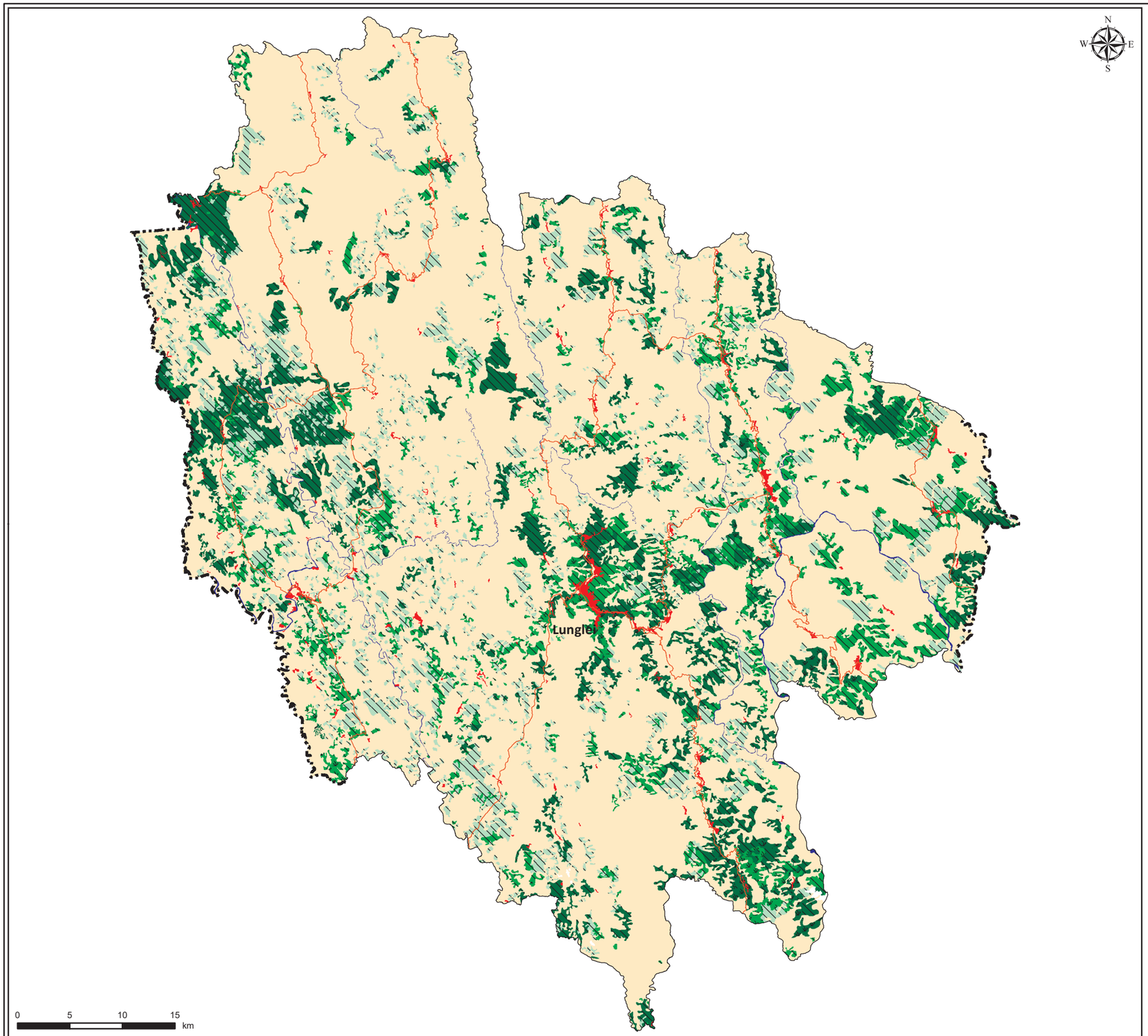
International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



Prepared by:
Mizoram Remote Sensing Application Centre, Aizawl
&
Space Applications Centre, ISRO, Ahmedabad



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Lunglei District, Mizoram
Timeframe - 2003-05

Legend

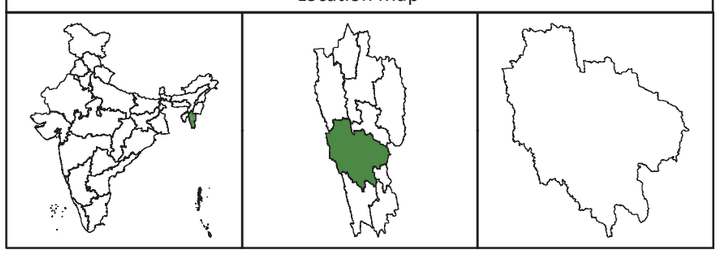
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



Prepared by:
Mizoram Remote Sensing Application Centre, Aizawl
&
Space Applications Centre, ISRO, Ahmedabad

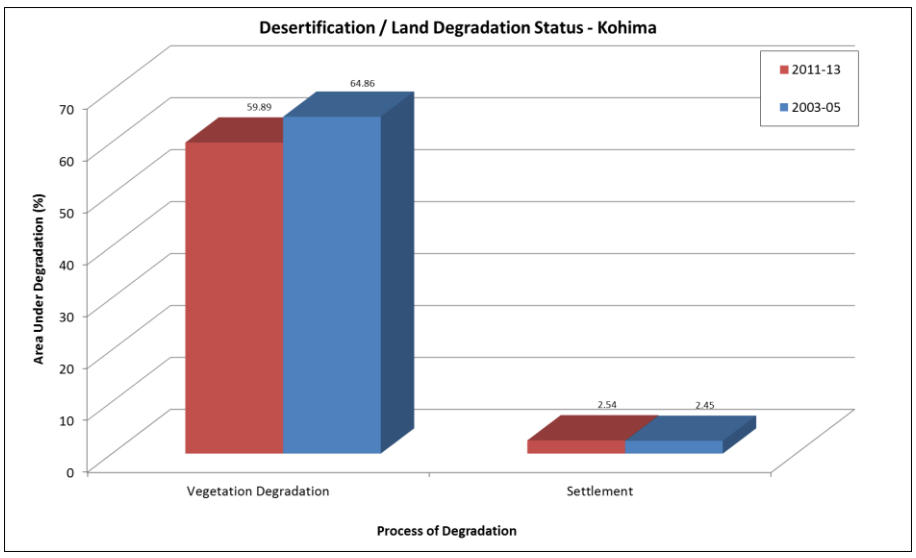
Kohima District, Nagaland

Kohima district lies in the south west part of Nagaland state. It borders with Dimapur and Peren districts in west, Phek and Zunheboto districts in the east, Wokha district in the north and Manipur state in south. It covers an area of 1463 sq. km. The district has a population of 2,67,988 with 183 population density, 928 sex ratio and a literacy rate of 85.23%. (Census 2011)

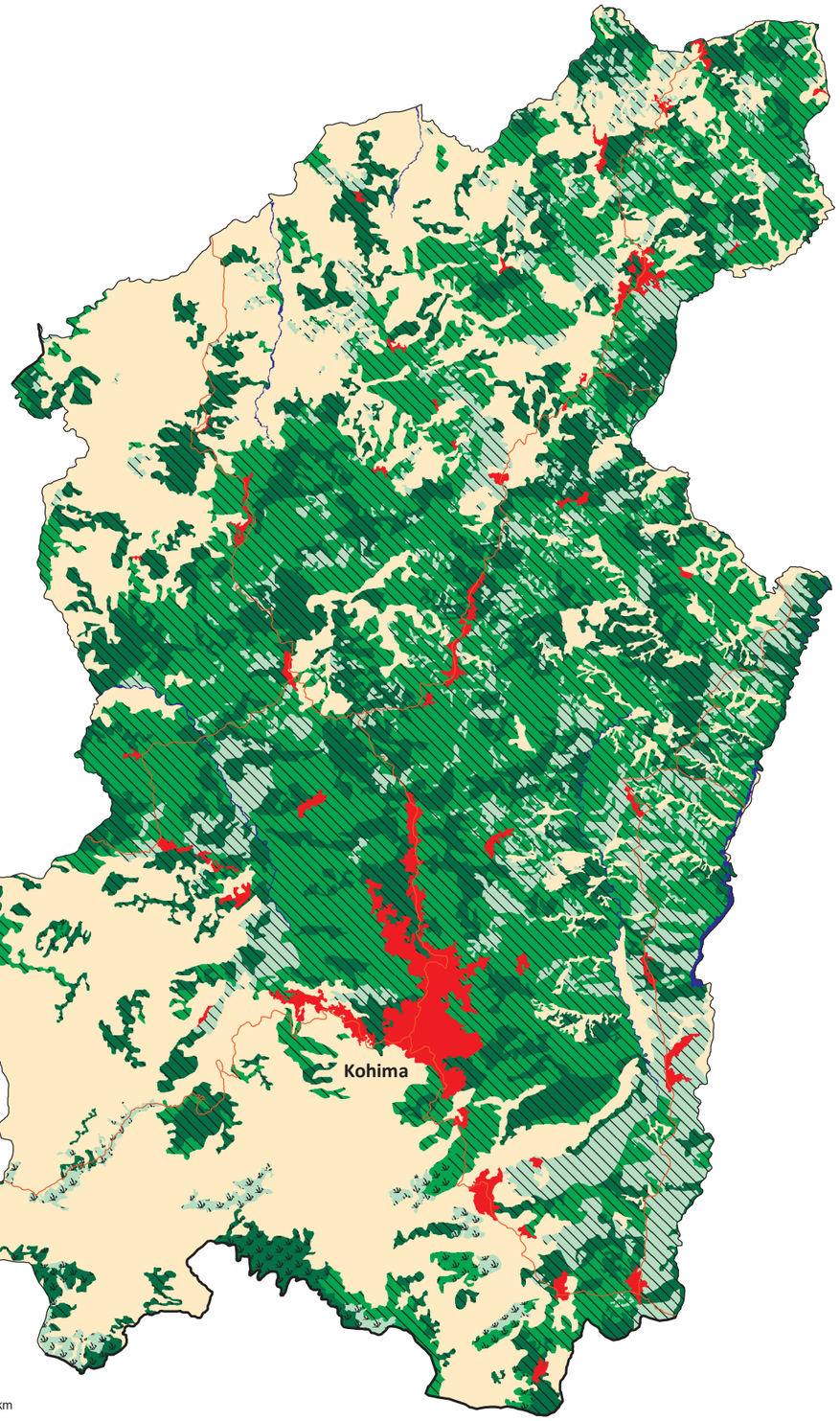
The district forms an irregular plateau with the elevated ridges and peaks. The Barail range enters the district from the south-west, follows northward direction and continues through Wokha into Mokokchung and Tuensang. The highest peak in the district is Japfu (3,014 metres) and is situated in southern part of this region. On the basis of physical features, the district can be divided into two distinct regional and natural divisions, viz. Kohima Hills, spread over the northeast-south-western portion, and Tseminyu Hills, situated on the north-western part of the district. Main rivers in the district are Diyung, Zubza andm Dzudza.

Kohima is observed with 62.43% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has decreased about 4.87% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (59.89% during 2011-13 and 64.86% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	87616.72	59.89	94888.56	64.86	-7271.85
Settlement	3721.12	2.54	3577.91	2.45	143.21
Total Area under Desertification	**91337.84**	**62.43**	**98466.47**	**67.30**	**-7128.63**
No Apparent Degradation	**54530.86**	**37.27**	**47402.23**	**32.40**	**7128.63**
Total Geographical Area (ha)	**146300.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	27093.04	18.52	30423.86	20.80	-3330.82
2	Fv2	Forest, vegetation degradation, Moderate	42160.60	28.82	44785.88	30.61	-2625.27
3	Fv3	Forest, vegetation degradation, Severe	15059.74	10.29	16450.12	11.24	-1390.38
4	Sv1	Land with scrub, vegetation degradation, Slight	1405.90	0.96	1700.51	1.16	-294.61
5	Sv2	Land with scrub, vegetation degradation, Moderate	564.40	0.39	564.40	0.39	0.00
6	Sv3	Land with scrub, vegetation degradation, Severe	1333.03	0.91	963.80	0.66	369.23
7	S	Settlement	3721.12	2.54	3577.91	2.45	143.21
Total Area Under Desertification/ Land Degradation			**91337.84**	**62.43**	**98466.47**	**67.30**	**-7128.63**
8	W	Water body/ Drainage	431.30	0.29	431.30	0.29	0.00
9	NAD	No Apparent Degradation	54530.86	37.27	47402.23	32.40	7128.63
Total Geographical Area (ha)			**146300.00**	**100.00**	**146300.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Kohima District, Nagaland
Timeframe - 2011-13

Legend

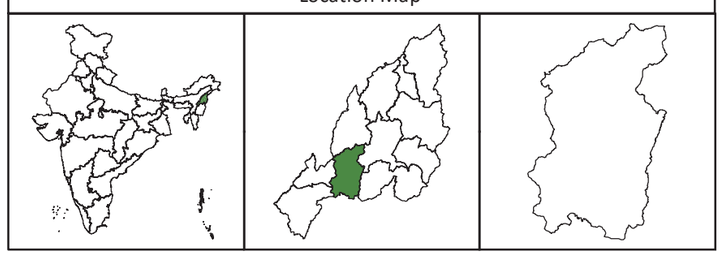
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

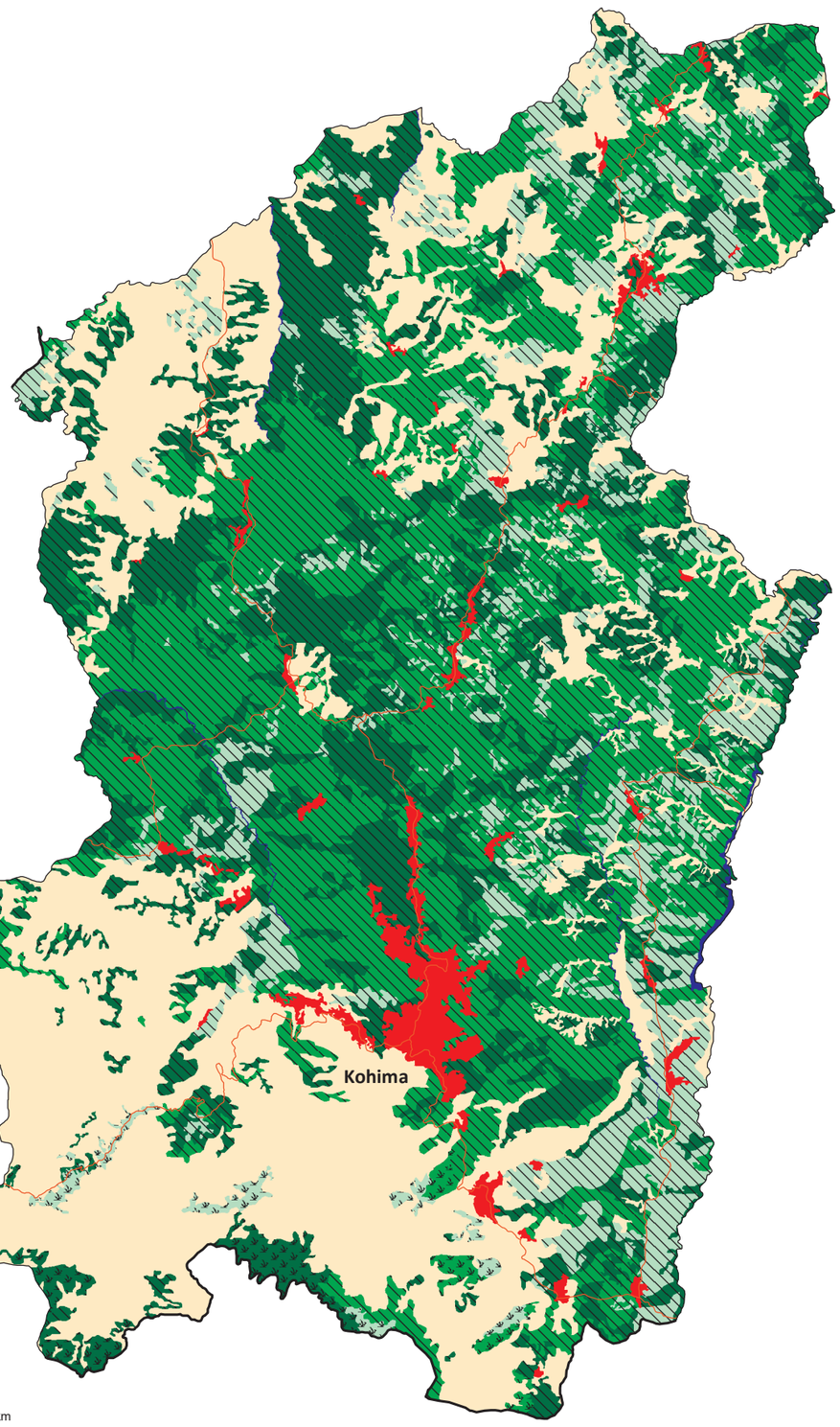
International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



Prepared by:
Nagaland GIS & RS Centre, Kohima
&
Space Applications Centre, ISRO, Ahmedabad



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Kohima District, Nagaland
Timeframe - 2003-05

Legend

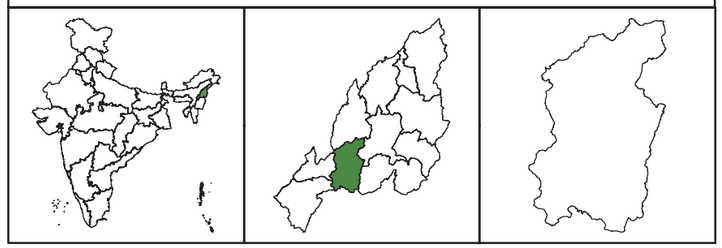
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



Prepared by:
Nagaland GIS & RS Centre, Kohima
&
Space Applications Centre, ISRO, Ahmedabad

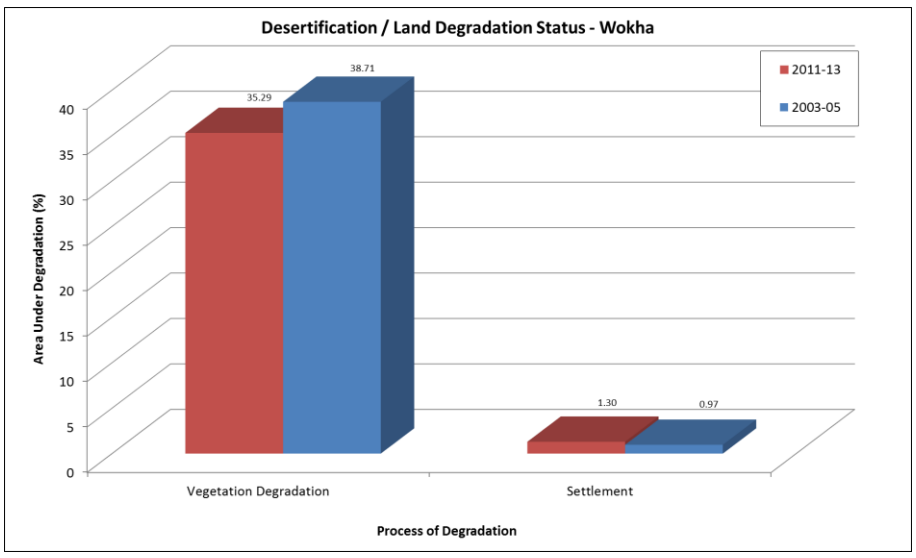
Wokha District, Nagaland

Wokha district lies in the mid-western portion of Nagaland state. It is bounded by Mokokchung district in the north-east, Zunheboto district in the south-east, Kohima district in the south and Assam state in north and west directions. It covers an area of 1628 sq. km. The district has a population of 1,66,343 with 102 population density, 968 sex ratio and a literacy rate of 87.69%. (Census 2011)

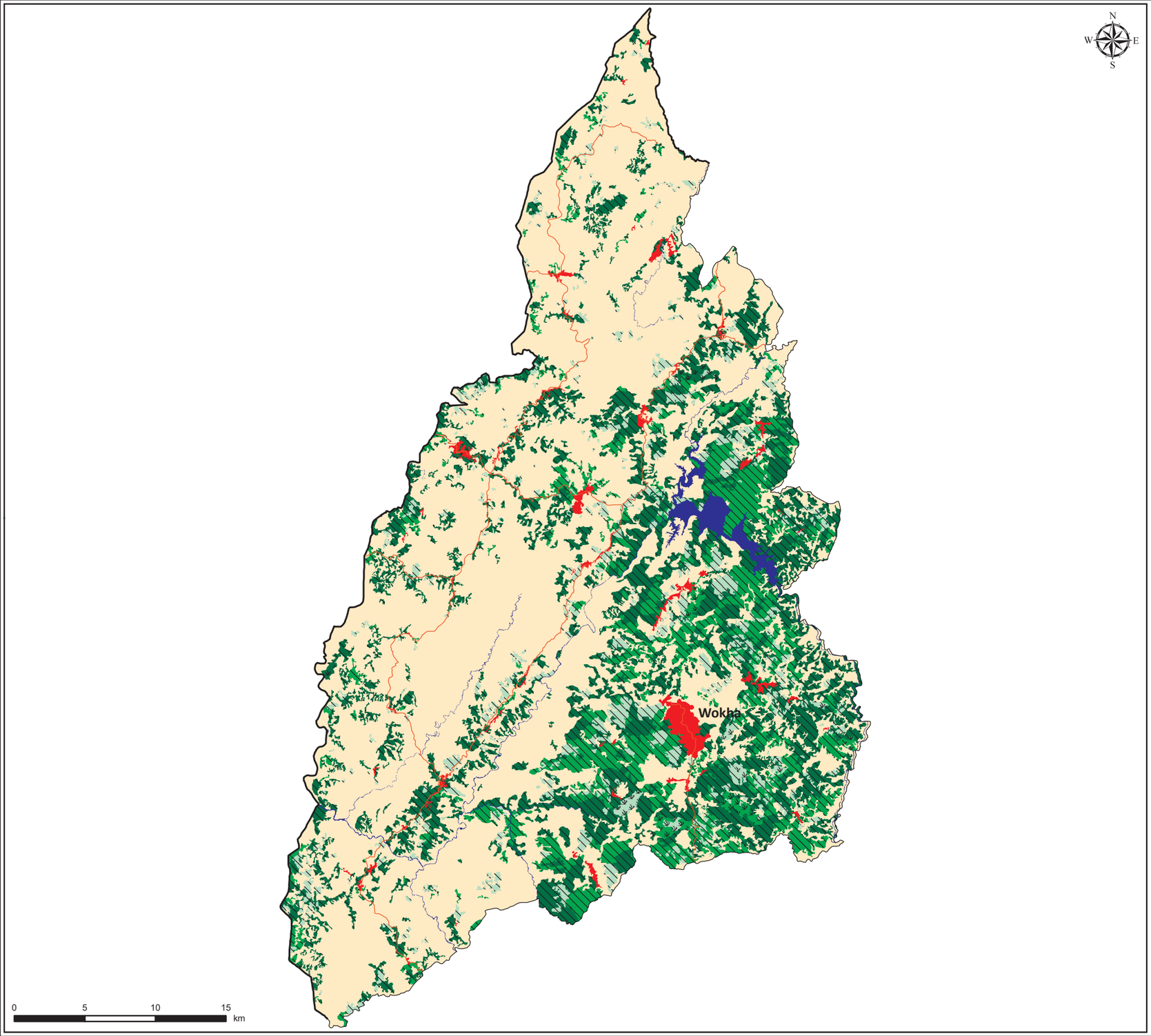
Topographically, the district comprises of ranges and ridges bisected by seasonal streams. The district can be divided into three regions, Bhandari range, Sanis range and Wokha range. Bhandari/ lower range is the outer most part of the district. The Sanis/ middle range is separated distinctly from the upper range by the Doyang River. This range covers the upper area and lies in the eastern and northern parts of the district. Wokha/ upper range covers the upper area and lies in the eastern and northern parts of the district and is dominated and characterized by hilly terrains and rugged topography. The major rivers of the district are Doyang, Chubi and Nzhu.

Wokha is observed with 36.59% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has decreased about 3.09% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (35.29% during 2011-13 and 38.71% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	57450.97	35.29	63019.21	38.71	-5568.24
Settlement	2122.59	1.30	1577.82	0.97	544.77
Total Area under Desertification	**59573.56**	**36.59**	**64597.03**	**39.68**	**-5023.47**
No Apparent Degradation	**101115.63**	**62.11**	**97243.92**	**59.73**	**3871.71**
Total Geographical Area (ha)	**162800.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	31164.29	19.14	34978.74	21.49	-3814.45
2	Fv2	Forest, vegetation degradation, Moderate	15284.50	9.39	9243.82	5.68	6040.68
3	Fv3	Forest, vegetation degradation, Severe	8783.03	5.39	17935.38	11.02	-9152.35
4	Sv1	Land with scrub, vegetation degradation, Slight	614.25	0.38	66.62	0.04	547.63
5	Sv2	Land with scrub, vegetation degradation, Moderate	956.46	0.59	329.86	0.20	626.60
6	Sv3	Land with scrub, vegetation degradation, Severe	648.44	0.40	464.78	0.29	183.66
7	S	Settlement	2122.59	1.30	1577.82	0.97	544.77
Total Area Under Desertification/ Land Degradation			**59573.56**	**36.59**	**64597.03**	**39.68**	**-5023.47**
8	W	Water body/ Drainage	2110.81	1.30	959.05	0.59	1151.76
9	NAD	No Apparent Degradation	101115.63	62.11	97243.92	59.73	3871.71
Total Geographical Area (ha)			**162800.00**	**100.00**	**162800.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Wokha District, Nagaland
Timeframe - 2011-13

Legend

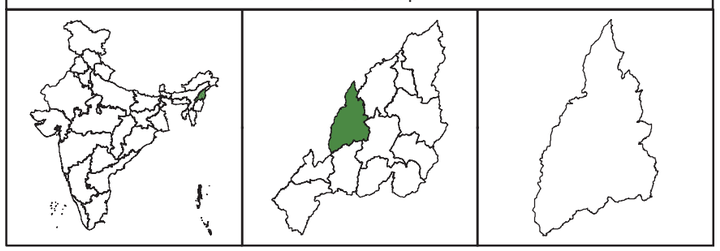
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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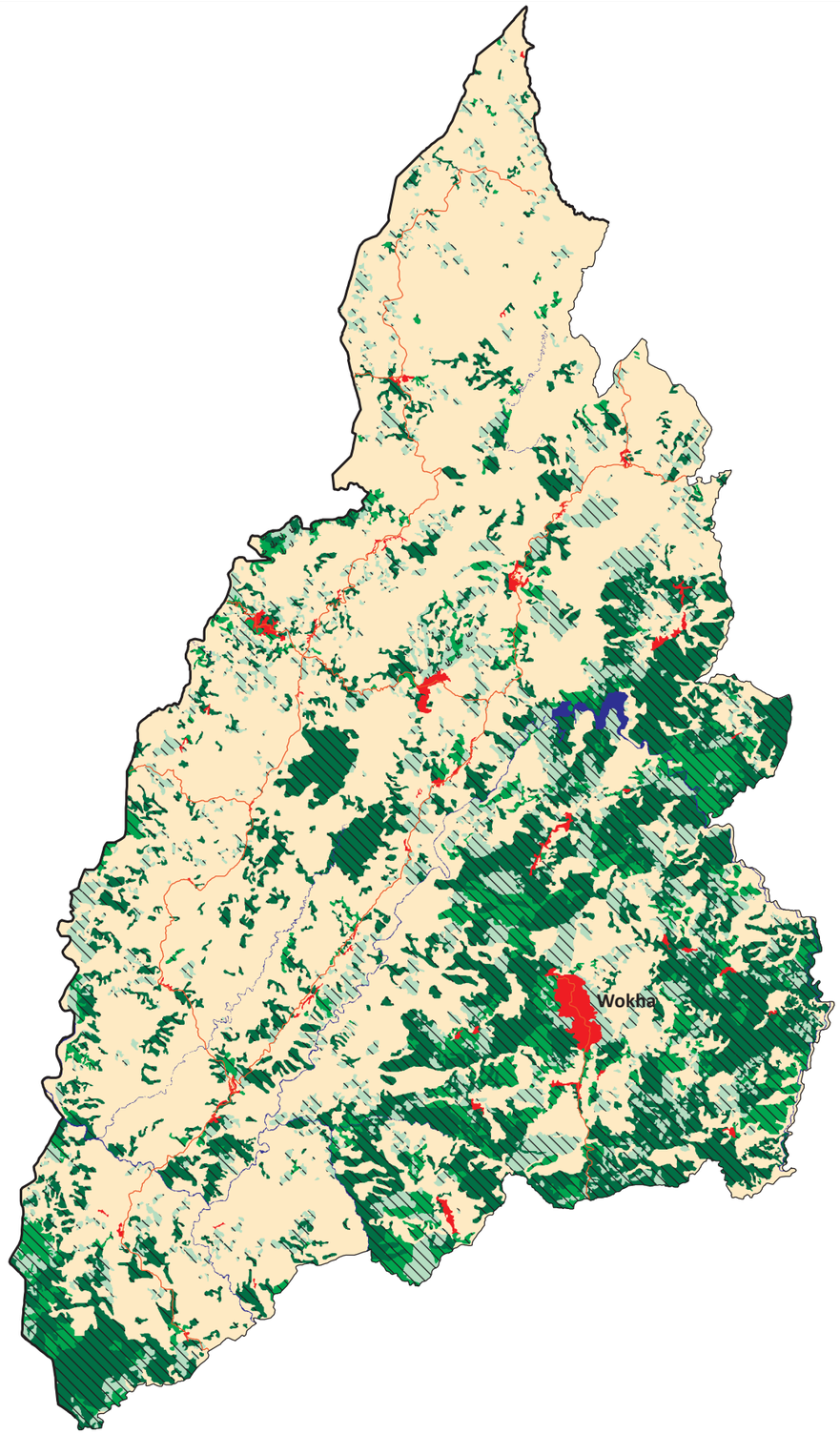


DESERTIFICATION / LAND DEGRADATION STATUS MAP
Wokha District, Nagaland
Timeframe - 2003-05

Legend

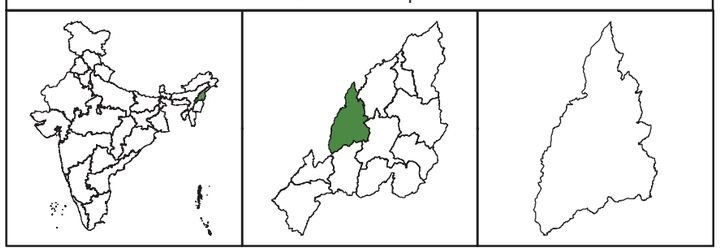
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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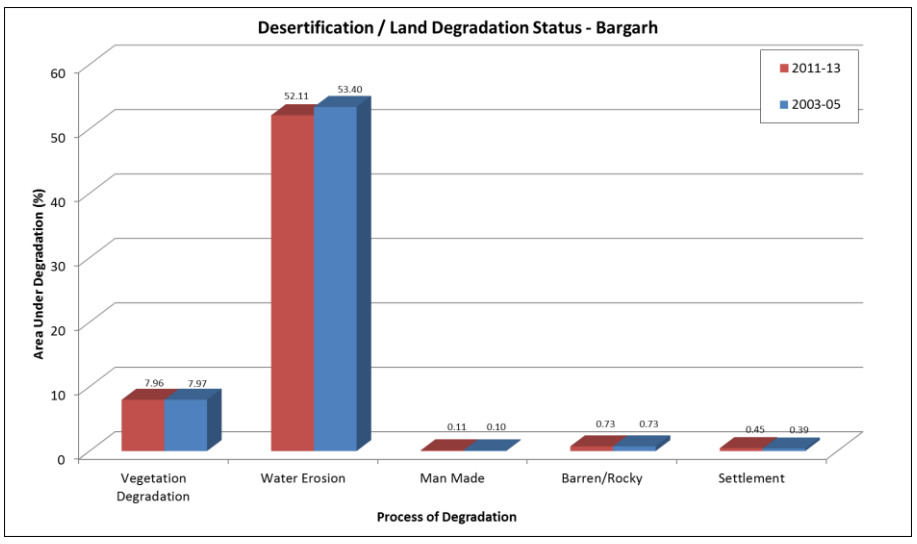
Bargarh District, Odisha

Bargarh district is located in the western portion of Odisha state. It is bounded by the Jharsuguda district on the north, Subarnapur and Balangir on the south, Sambalpur on the east, Nuapada and Chhattisgarh state on the west. It covers an area of 5,837 sq. km area. The district has a population of 14,81,255 with 253 population density, 977 sex ratio and a literacy rate of 74.62%. (Census 2011)

The district may be divided into three natural divisions. The greater portion on open plain of fertile land drained by the Danta and Jira rivers, the tributaries of the Mahanadi. To the North of this plain runs the Barapahar range of hills and to the South West lies the valley or river Ang. The district consists of a wide expanse of fairly open country fringed by forest clad hills as well as a series of low hill ranges of extremely irregular shape. The Barapahar are the main hill ranges in the district. The Bargarh plain is not a flat alluvial track but an expanse of undulating slope from the Barahpahar hills in the North to the Mahanadi valley in the East. The district consists of a wide expanse of fairly open country fringed by forest clad hills.

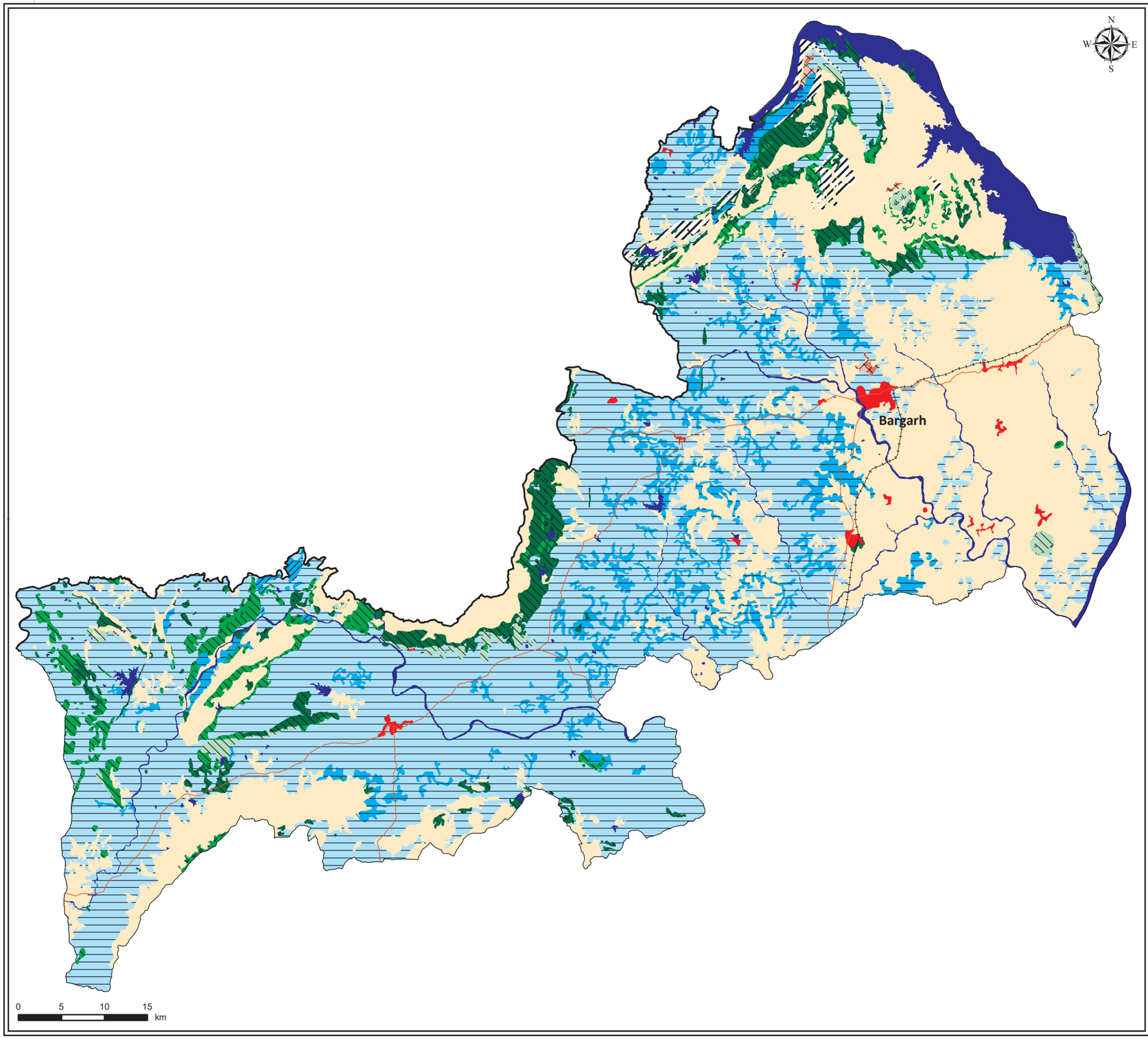
Bargarh is observed with 61.36% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has decreased about 1.24% since 2003-05. The most significant process of land degradation/ desertification in the district is Water Erosion (52.11% during 2011-13 and 53.40% during 2003-05) followed by Vegetation Degradation (7.96% during 2011-13 and 7.97% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	46437.35	7.96	46523.26	7.97	-85.91
Water Erosion	304159.87	52.11	311697.10	53.40	-7537.23
Man Made	668.40	0.11	611.20	0.10	57.20
Barren/Rocky	4247.24	0.73	4247.24	0.73	0.00
Settlement	2649.14	0.45	2296.08	0.39	353.06
Total Area under Desertification	**358162.00**	**61.36**	**365374.88**	**62.60**	**-7212.88**
No Apparent Degradation	**200544.00**	**34.36**	**193331.11**	**33.12**	**7212.88**
Total Geographical Area (ha)	**583700.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	19809.12	3.39	19809.12	3.39	0.00
2	Fv2	Forest, vegetation degradation, Moderate	12920.57	2.21	12920.57	2.21	0.00
3	Fv3	Forest, vegetation degradation, Severe	3767.01	0.65	3767.01	0.65	0.00
4	Sv1	Land with scrub, vegetation degradation, Slight	4229.14	0.72	4315.05	0.74	-85.91
5	Sv2	Land with scrub, vegetation degradation, Moderate	4164.68	0.71	4164.68	0.71	0.00
6	Sv3	Land with scrub, vegetation degradation, Severe	1546.84	0.27	1546.84	0.27	0.00
7	Dw1	Agriculture unirrigated, water erosion, Slight	266171.72	45.60	273188.29	46.80	-7016.57
8	Dw2	Agriculture unirrigated, water erosion, Moderate	37178.14	6.37	37698.80	6.46	-520.67
9	Bw2	Barren, water erosion, Moderate	810.01	0.14	810.01	0.14	0.00
10	Tm1	Others, man made, Slight	432.33	0.07	441.46	0.08	-9.13
11	Tm2	Others, man made, Moderate	236.07	0.04	169.74	0.03	66.32
12	R	Rocky	4247.24	0.73	4247.24	0.73	0.00
13	S	Settlement	2649.14	0.45	2296.08	0.39	353.06
Total Area Under Desertification/ Land Degradation			**358162.00**	**61.36**	**365374.88**	**62.60**	**-7212.88**
14	W	Water body/ Drainage	24994.00	4.28	24994.00	4.28	0.00
15	NAD	No Apparent Degradation	200544.00	34.36	193331.11	33.12	7212.88
Total Geographical Area (ha)			**583700.00**	**100.00**	**583700.00**	**100.00**	

DESERTIFICATION / LAND DEGRADATION STATUS MAP
Bargarh District, Odisha
Timeframe - 2011-13



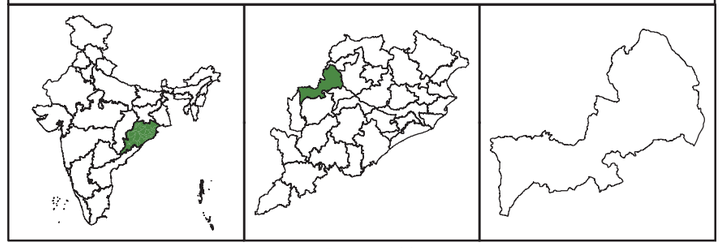
Legend		
Symbol	**Code**	**Description**
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Bw2	Barren, water erosion, Moderate
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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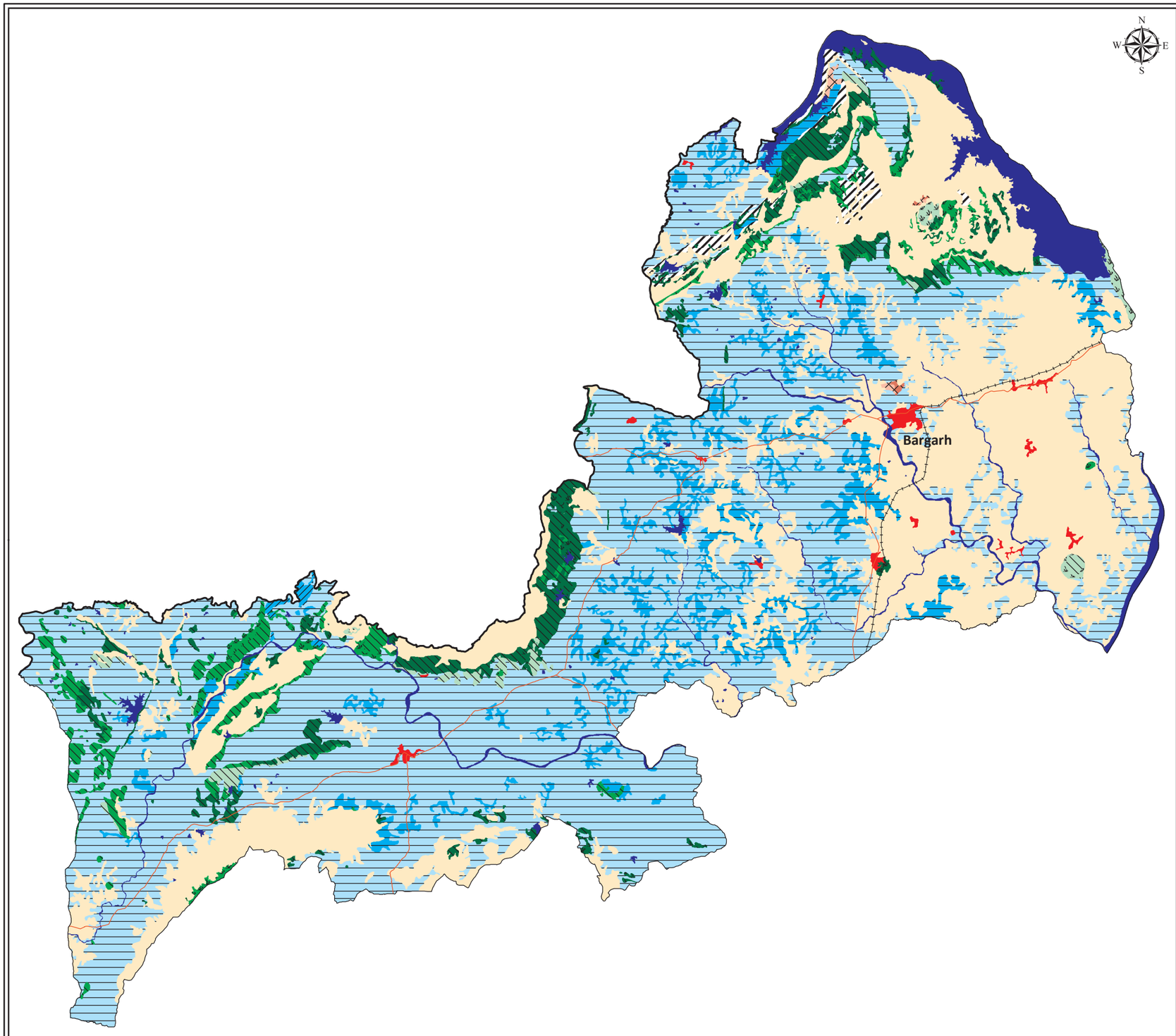
&
Space Applications Centre, ISRO, Ahmedabad

DESERTIFICATION / LAND DEGRADATION STATUS MAP
Bargarh District, Odisha
Timeframe - 2003-05



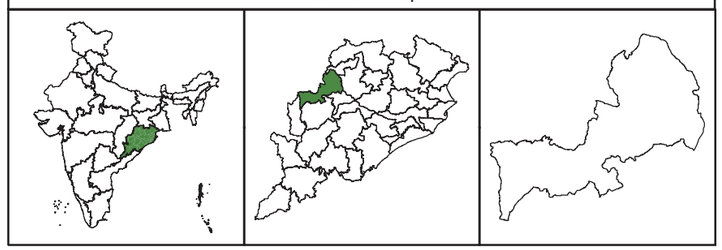
Legend		
Symbol	**Code**	**Description**
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Bw2	Barren, water erosion, Moderate
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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Space Applications Centre, ISRO, Ahmedabad

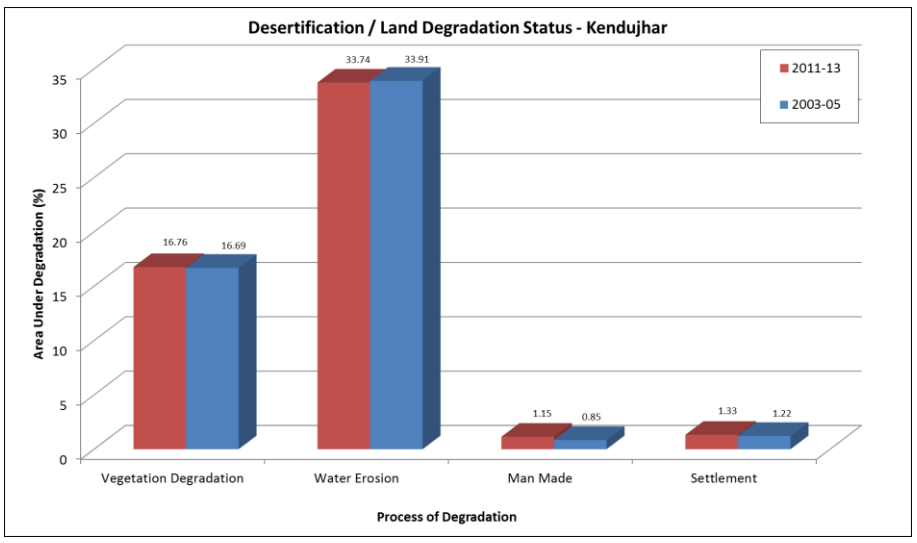
Kendujhar District, Odisha

Kendujhar district lies in northern part of Odisha state. It shares state border with Jharkhand in the north, bounded by Mayurbhanj and Balasore districts in the east, Bhadrakh, Jajpur and Dhenkanal districts in the south and Angul and Sundargarh districts in the west. It covers an area of 8,303 sq. km area. Kendujhar district has a population of 18,01,733 with 217 population density, 988 sex ratio and a literacy rate of 68.24%. (Census 2011)

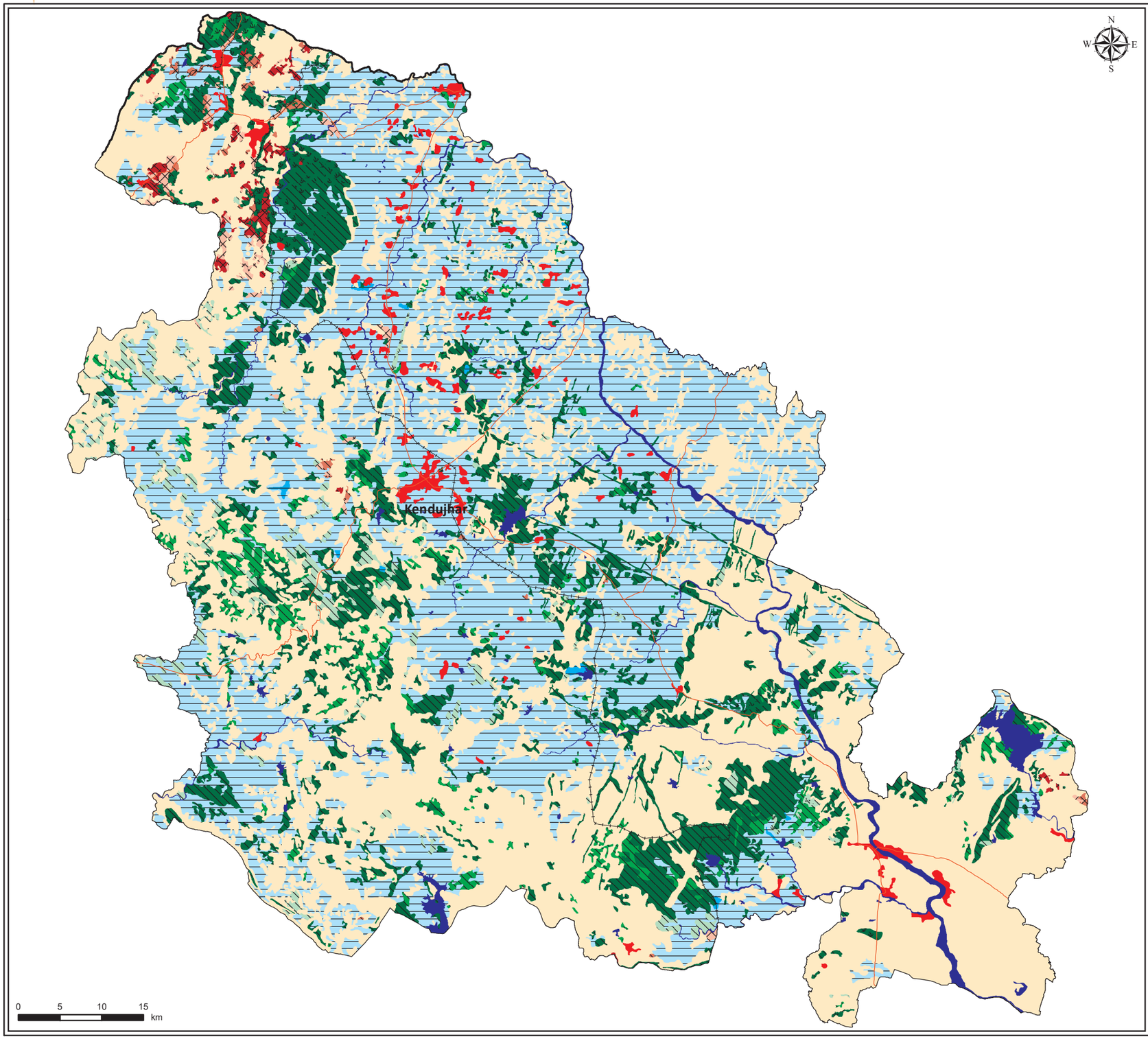
Physiographically, the district can be divided into two parts, viz. Lower part and Upper part. The lower part consists of Keonjhar valley and low lands of Anandapur. The upper part is mountainous and undulating plain, compriseing a range of lofty hills which contains some of the highest peaks of Orissa namely Gandhamardan, Mankadnacha. The district has a chain of mountains on its western and southern borders with distinct slopes towards river Baitarani on the north and river Brahmani on the south. About half of the area of the district is covered by forests. Baitarani is the main river in the district. The district is rich in minerals viz. Iron, Manganese and Chromites.

Kendujhar is observed with 52.97% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.30% since 2003-05. The most significant process of land degradation/ desertification in the district is Water Erosion (33.74% during 2011-13 and 33.91% during 2003-05) followed by Vegetation Degradation (16.76% during 2011-13 and 16.69% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	139159.48	16.76	138601.57	16.69	557.91
Water Erosion	280149.62	33.74	281517.43	33.91	-1367.81
Man Made	9511.86	1.15	7019.83	0.85	2492.03
Settlement	11026.76	1.33	10157.24	1.22	869.53
Total Area under Desertification	**439847.72**	**52.97**	**437296.07**	**52.67**	**2551.66**
No Apparent Degradation	**373305.25**	**44.96**	**375856.90**	**45.27**	**-2551.66**
Total Geographical Area (ha)	**830300.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	90815.16	10.94	90131.64	10.86	683.53
2	Fv2	Forest, vegetation degradation, Moderate	18219.81	2.19	18405.69	2.22	-185.88
3	Fv3	Forest, vegetation degradation, Severe	14667.98	1.77	14607.72	1.76	60.26
4	Sv1	Land with scrub, vegetation degradation, Slight	11216.03	1.35	11216.03	1.35	0.00
5	Sv2	Land with scrub, vegetation degradation, Moderate	2708.37	0.33	2708.37	0.33	0.00
6	Sv3	Land with scrub, vegetation degradation, Severe	1532.13	0.18	1532.13	0.18	0.00
7	Dw1	Agriculture unirrigated, water erosion, Slight	279160.35	33.62	280528.16	33.79	-1367.81
8	Dw2	Agriculture unirrigated, water erosion, Moderate	989.27	0.12	989.27	0.12	0.00
9	Fm1	Forest, man made, Slight	864.59	0.10	1016.21	0.12	-151.63
10	Fm2	Forest, man made, Moderate	436.71	0.05	224.83	0.03	211.88
11	Fm3	Forest, man made, Severe	1246.77	0.15	52.18	0.01	1194.59
12	Tm1	Others, man made, Slight	3037.33	0.37	2632.37	0.32	404.96
13	Tm2	Others, man made, Moderate	1442.20	0.17	1328.08	0.16	114.12
14	Tm3	Others, man made, Severe	2484.27	0.30	1766.15	0.21	718.11
15	S	Settlement	11026.76	1.33	10157.24	1.22	869.53
Total Area Under Desertification/ Land Degradation			**439847.72**	**52.97**	**437296.07**	**52.67**	**2551.66**
16	W	Water body/ Drainage	17147.03	2.07	17147.03	2.07	0.00
17	NAD	No Apparent Degradation	373305.25	44.96	375856.90	45.27	-2551.66
Total Geographical Area (ha)			**830300.00**	**100.00**	**830300.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Kendujhar District, Odisha
Timeframe - 2011-13

Legend

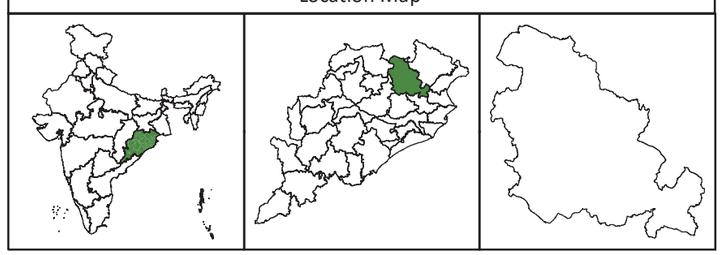
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Fm1	Forest, man made, Slight
	Fm2	Forest, man made, Moderate
	Fm3	Forest, man made, Severe
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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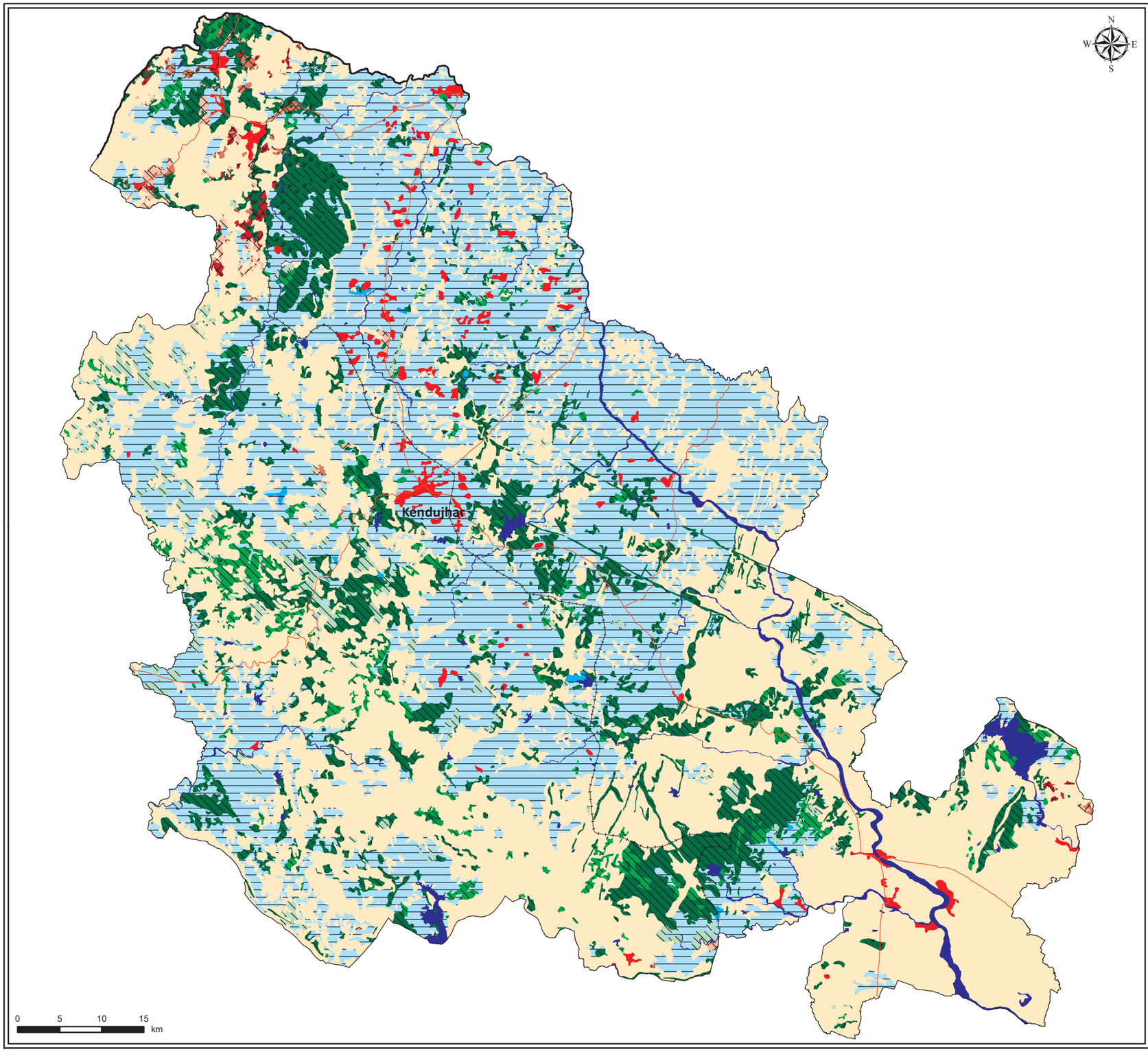


DESERTIFICATION / LAND DEGRADATION STATUS MAP
Kendujhar District, Odisha
Timeframe - 2003-05

Legend

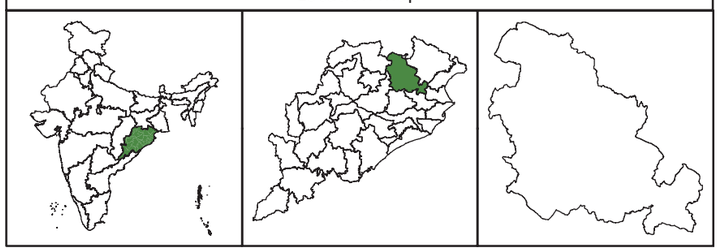
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Fm1	Forest, man made, Slight
	Fm2	Forest, man made, Moderate
	Fm3	Forest, man made, Severe
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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Space Applications Centre, ISRO, Ahmedabad

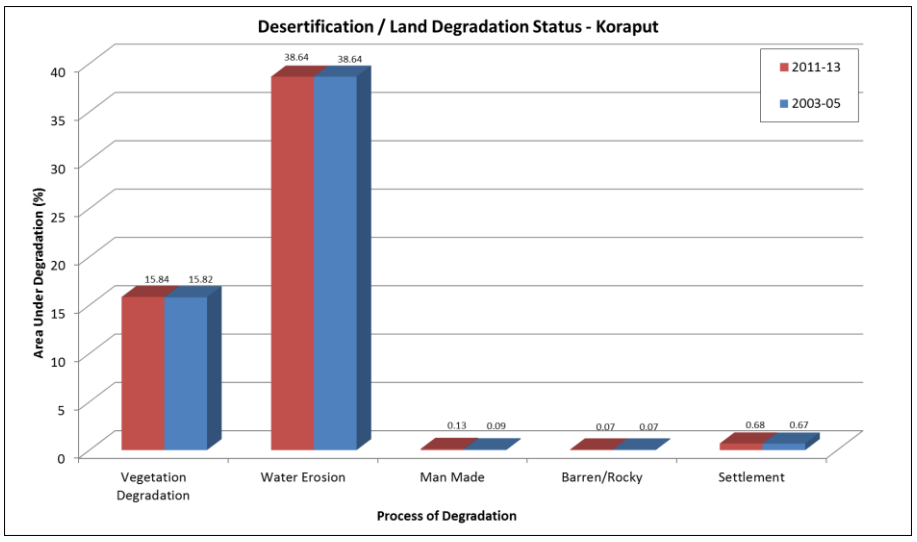
Koraput District, Odisha

Koraput district is located in extreme southern portion of Odisha state. It is bounded by Nabarangapur, Kalahandi and Rayagada districts in the north, Andhra Pradesh state in the east and south sides, Malkangiri district in the south-west side and Chhattisgarh state in the west side. It has an area of 8,807 sq. km. The district has a population of 13,79,647 with 156 population density, 1,032 sex ratio and a literacy rate of 49.21%. (Census 2011)

The district has vast expanse of mountain ranges along with hill streams. It is a section of Eastern Ghat hill ranges giving a wavy form of topography. The district comes under two natural divisions, namely, Eastern Ghat High land and South Eastern Ghat Hill region. On the whole, numerous small and high hills profusely scattered in the district, protect it from natural calamity like cyclone and scorching heat. The district has many rivers and streams. Important rivers are the Kolab, the Indravati, the Machhkund that flow through the district.

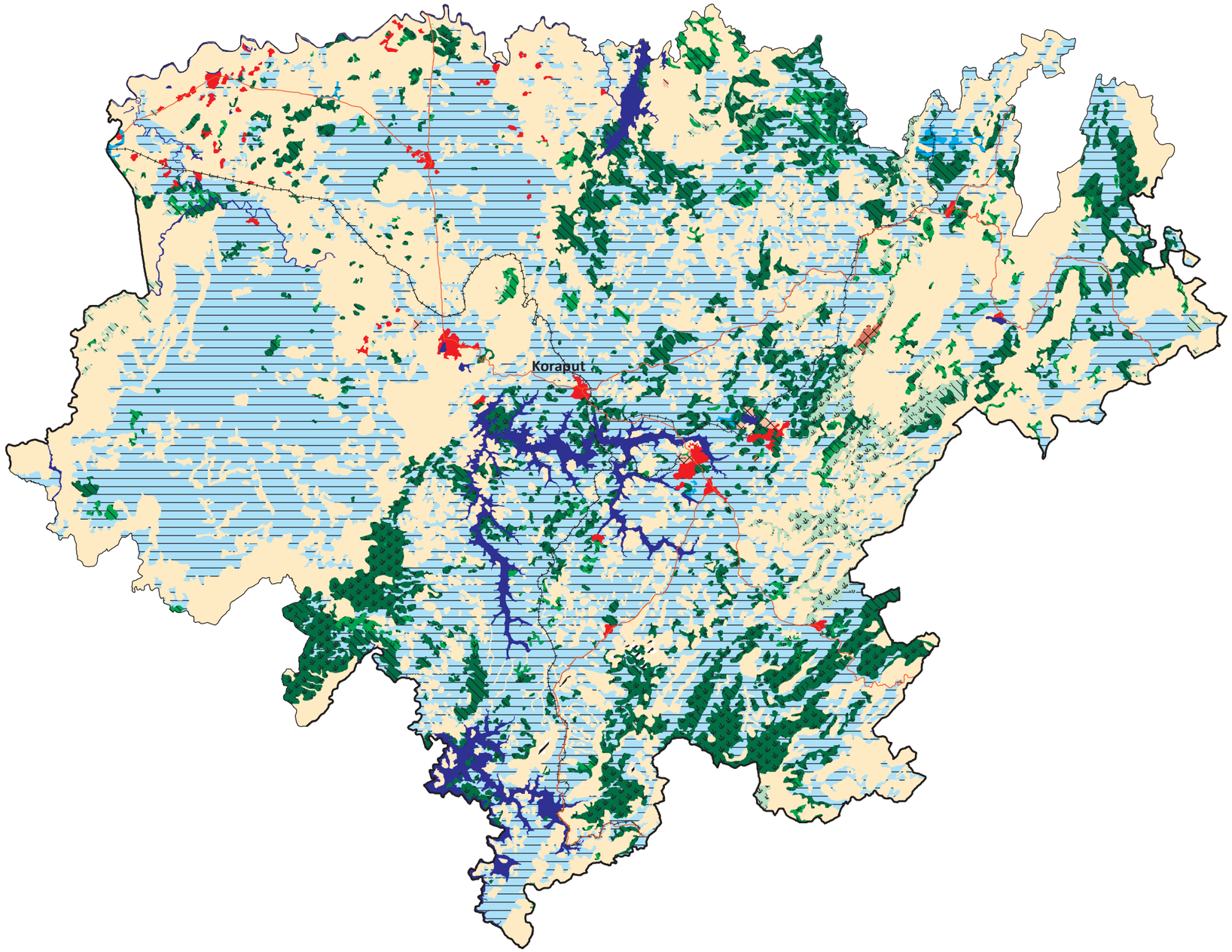
Koraput is observed with 55.35% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.06% since 2003-05. The most significant process of land degradation/ desertification in the district is Water Erosion (38.64% during 2011-13 and 2003-05) followed by Vegetation Degradation (15.84% during 2011-13 and 15.82% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	139478.94	15.84	139285.99	15.82	192.95
Water Erosion	340265.22	38.64	340290.61	38.64	-25.39
Man Made	1127.50	0.13	756.81	0.09	370.69
Barren/Rocky	621.09	0.07	621.09	0.07	0.00
Settlement	6011.03	0.68	5941.84	0.67	69.19
Total Area under Desertification	**487503.79**	**55.35**	**486896.34**	**55.29**	**607.45**
No Apparent Degradation	**368556.58**	**41.85**	**369163.86**	**41.92**	**-607.28**
Total Geographical Area (ha)	**880700.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	43251.43	4.91	43143.47	4.90	107.96
2	Fv2	Forest, vegetation degradation, Moderate	10514.76	1.19	10700.74	1.22	-185.98
3	Fv3	Forest, vegetation degradation, Severe	3801.19	0.43	3297.09	0.37	504.10
4	Sv1	Land with scrub, vegetation degradation, Slight	64432.68	7.32	64383.39	7.31	49.29
5	Sv2	Land with scrub, vegetation degradation, Moderate	5347.04	0.61	5445.31	0.62	-98.27
6	Sv3	Land with scrub, vegetation degradation, Severe	12131.84	1.38	12315.99	1.40	-184.15
7	Dw1	Agriculture unirrigated, water erosion, Slight	338879.88	38.48	338905.27	38.48	-25.39
8	Dw2	Agriculture unirrigated, water erosion, Moderate	1385.34	0.16	1385.34	0.16	0.00
9	Fm1	Forest, man made, Slight	51.09	0.01	0.00	0.00	51.09
10	Tm1	Others, man made, Slight	595.60	0.07	542.83	0.06	52.78
11	Tm2	Others, man made, Moderate	480.80	0.05	213.98	0.02	266.82
12	R	Rocky	621.09	0.07	621.09	0.07	0.00
13	S	Settlement	6011.03	0.68	5941.84	0.67	69.19
Total Area Under Desertification/ Land Degradation			**487503.79**	**55.35**	**486896.34**	**55.29**	**607.45**
14	W	Water body/ Drainage	24639.63	2.80	24639.80	2.80	-0.17
15	NAD	No Apparent Degradation	368556.58	41.85	369163.86	41.92	-607.28
Total Geographical Area (ha)			**880700.00**	**100.00**	**880700.00**	**100.00**	

DESERTIFICATION / LAND DEGRADATION STATUS MAP
Koraput District, Odisha
Timeframe - 2011-13



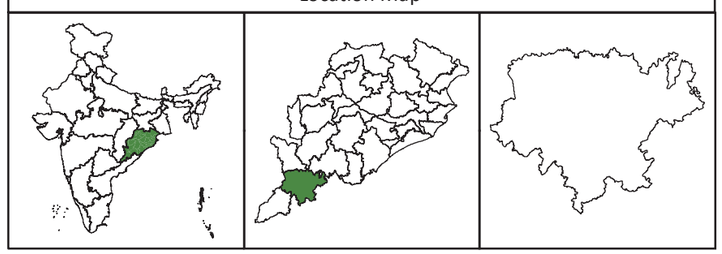
Legend		
Symbol	**Code**	**Description**
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Fm1	Forest, man made, Slight
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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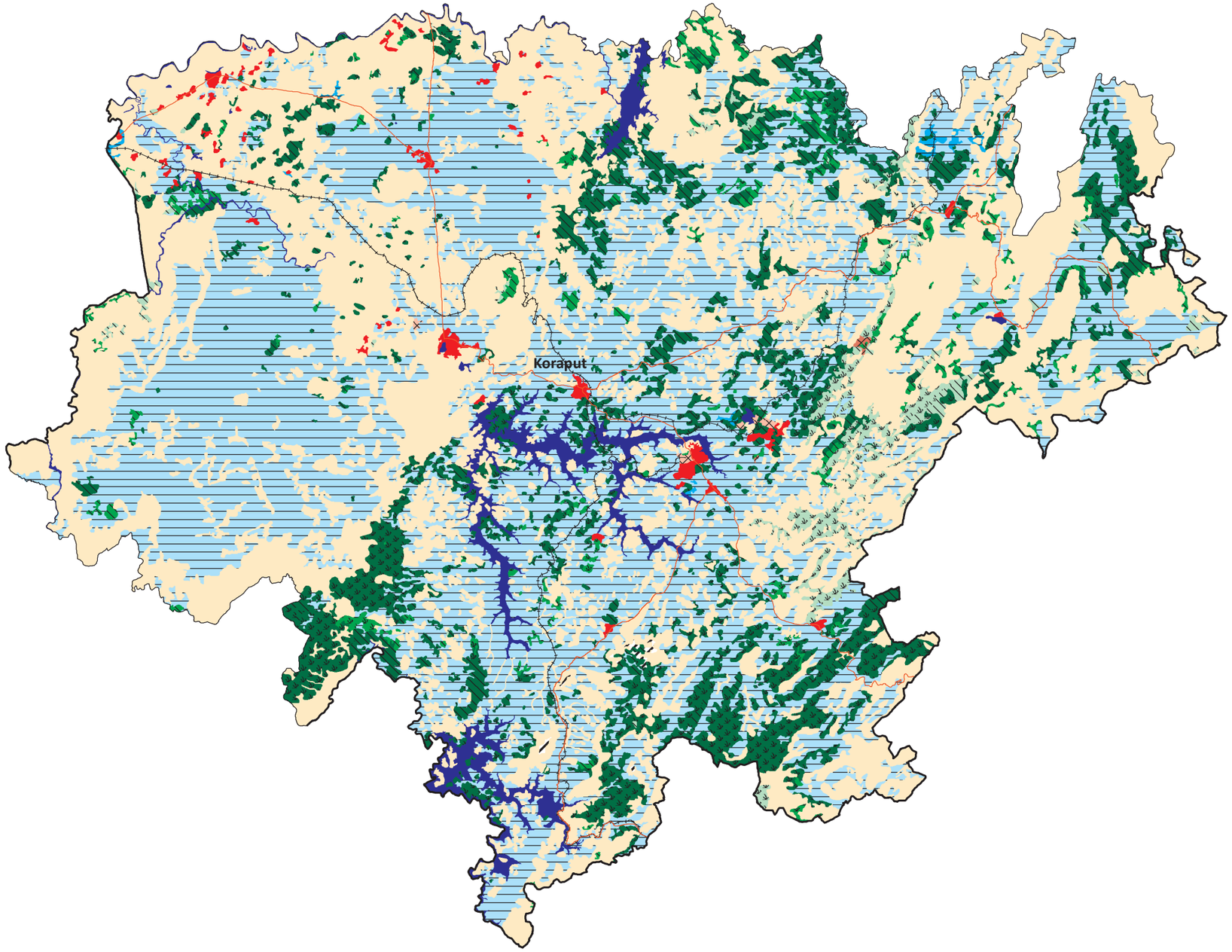
&
Space Applications Centre, ISRO, Ahmedabad



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Koraput District, Odisha
Timeframe - 2003-05

Legend

Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map

Prepared by:
Orissa Remote Sensing Applications Centre, Bhubaneshwar
&
Space Applications Centre, ISRO, Ahmedabad

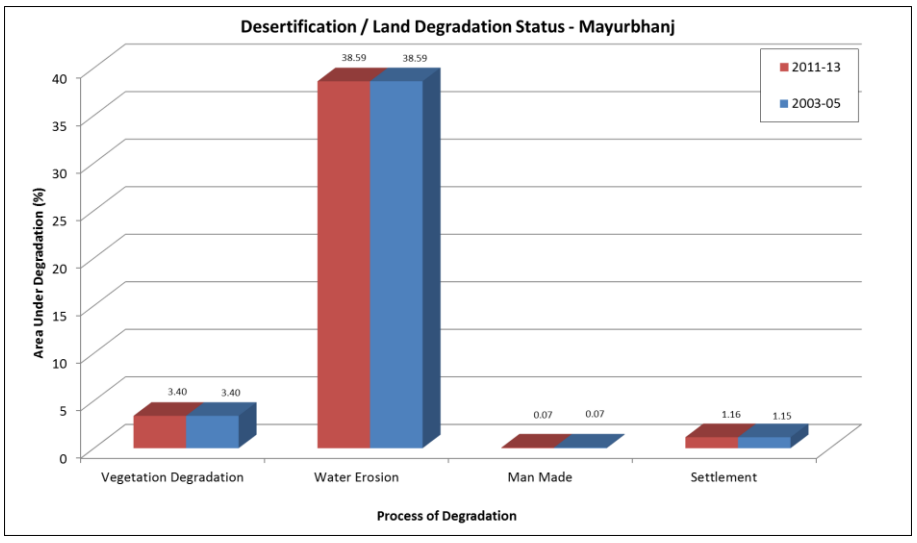
Mayurbhanj District, Odisha

Mayurbhanj district is located in the northern portion of Odisha state. It is bounded on the north-west, north sides by Jharkhand state, on the north-east by West Bengals state, on the south-east by the Baleshwar district and south-west side by Kendujhar district. It covers an area of 10,418 sq. km. The district has a population of 25,19,738 with 242 population density, 1006 sex ratio and a literacy rate of 63.17%. (Census 2011)

The district comes under North Central Plateau agro-climatic region. Being away from the coastal belt, the district experiences a sub-tropical climate with a hot summer, chilling winter with good precipitation. Red-laterite category of soil dominates all over the district including Bamanghati and Panchpir plateau. Mayurbhanj occupies a unique position being endowed with lush green vegetation, different fauna and rich cultural heritage. The district has a rich mineral base and is home to the Similipal Biosphere. More than 39 % of total geographical area is covered with forest and hills. Burhabalanga, Kharkhai are the major rivers in the district.

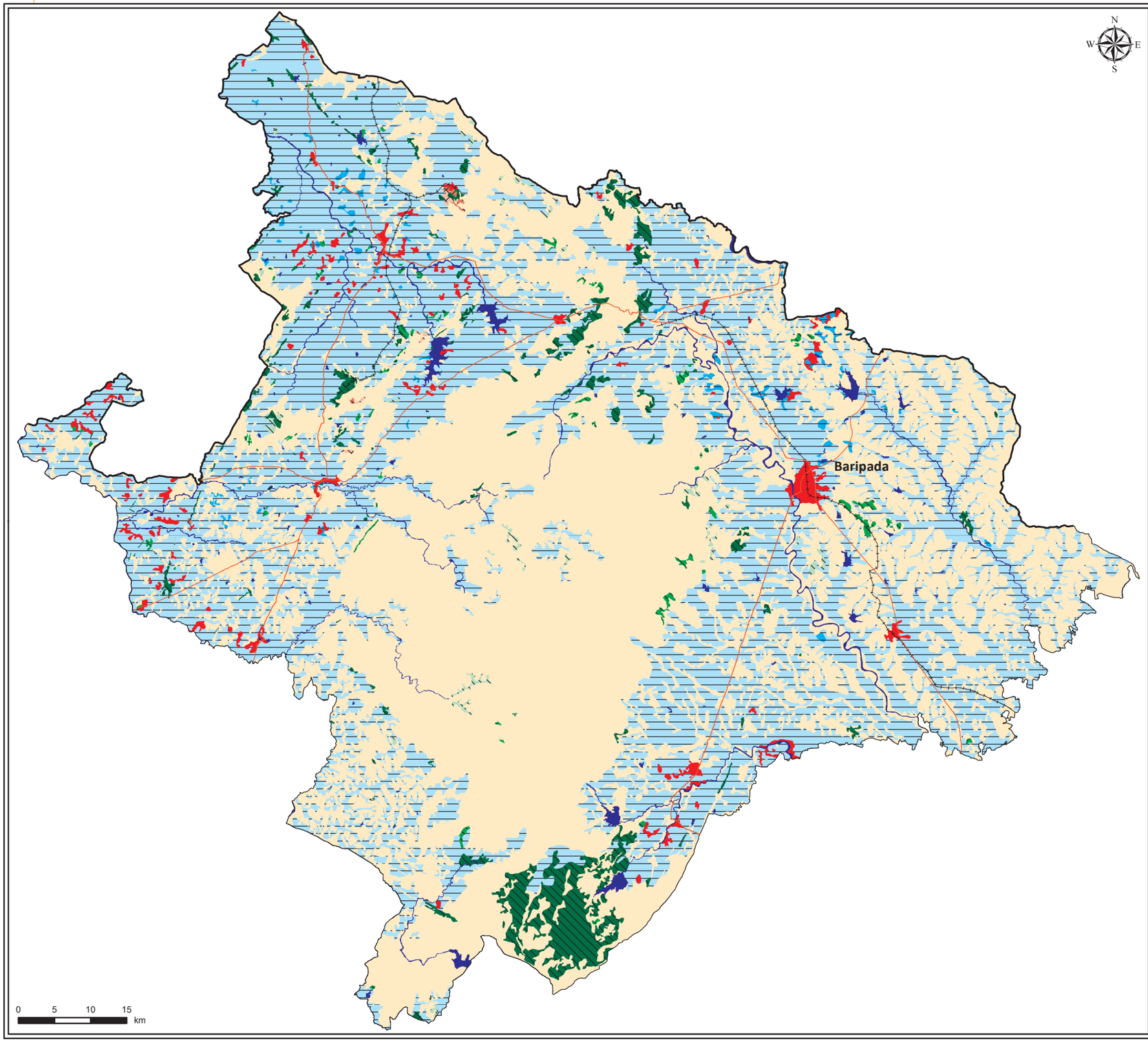
Mayurbhanj is observed with 43.22% of total geographical area under land degradation/ desertification for the period 2011-13. No change is observed since 2003-05 in this district. The most significant process of land degradation/ desertification in the district is Water Erosion (38.59% during 2011-13 and 2003-05) followed by Vegetation Degradation (3.40% during 2011-13 and 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	35453.90	3.40	35453.90	3.40	0.00
Water Erosion	401996.96	38.59	402067.27	38.59	-70.31
Man Made	728.57	0.07	728.57	0.07	0.00
Settlement	12044.97	1.16	11974.66	1.15	70.31
Total Area under Desertification	**450224.40**	**43.22**	**450224.40**	**43.22**	**0.00**
No Apparent Degradation	**575618.86**	**55.25**	**575618.86**	**55.25**	**0.00**
Total Geographical Area (ha)	**1041800.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	25632.31	2.46	25632.31	2.46	0.00
2	Fv2	Forest, vegetation degradation, Moderate	3520.69	0.34	3520.69	0.34	0.00
3	Fv3	Forest, vegetation degradation, Severe	2964.62	0.28	2964.62	0.28	0.00
4	Sv1	Land with scrub, vegetation degradation, Slight	2114.98	0.20	2114.98	0.20	0.00
5	Sv2	Land with scrub, vegetation degradation, Moderate	758.91	0.07	758.91	0.07	0.00
6	Sv3	Land with scrub, vegetation degradation, Severe	462.40	0.04	462.40	0.04	0.00
7	Dw1	Agriculture unirrigated, water erosion, Slight	397413.69	38.15	397483.99	38.15	-70.31
8	Dw2	Agriculture unirrigated, water erosion, Moderate	4583.28	0.44	4583.28	0.44	0.00
9	Fm1	Forest, man made, Slight	166.38	0.02	166.38	0.02	0.00
10	Fm2	Forest, man made, Moderate	132.87	0.01	132.87	0.01	0.00
11	Tm1	Others, man made, Slight	244.93	0.02	244.93	0.02	0.00
12	Tm2	Others, man made, Moderate	152.49	0.01	152.49	0.01	0.00
13	Tm3	Others, man made, Severe	31.90	0.00	31.90	0.00	0.00
14	S	Settlement	12044.97	1.16	11974.66	1.15	70.31
Total Area Under Desertification/ Land Degradation			**450224.40**	**43.22**	**450224.40**	**43.22**	**0.00**
15	W	Water body/ Drainage	15956.74	1.53	15956.74	1.53	0.00
16	NAD	No Apparent Degradation	575618.86	55.25	575618.86	55.25	0.00
Total Geographical Area (ha)			**1041800.00**	**100.00**	**1041800.00**	**100.00**	

DESERTIFICATION / LAND DEGRADATION STATUS MAP
Mayurbhanj District, Odisha
Timeframe - 2011-13



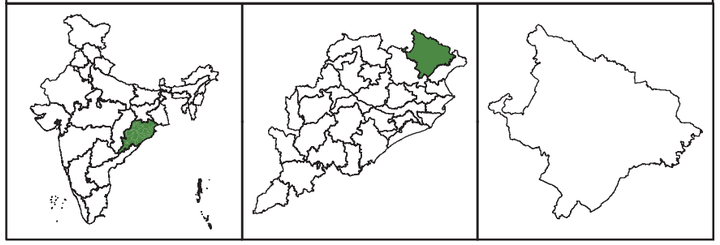
Legend		
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Fm1	Forest, man made, Slight
	Fm2	Forest, man made, Moderate
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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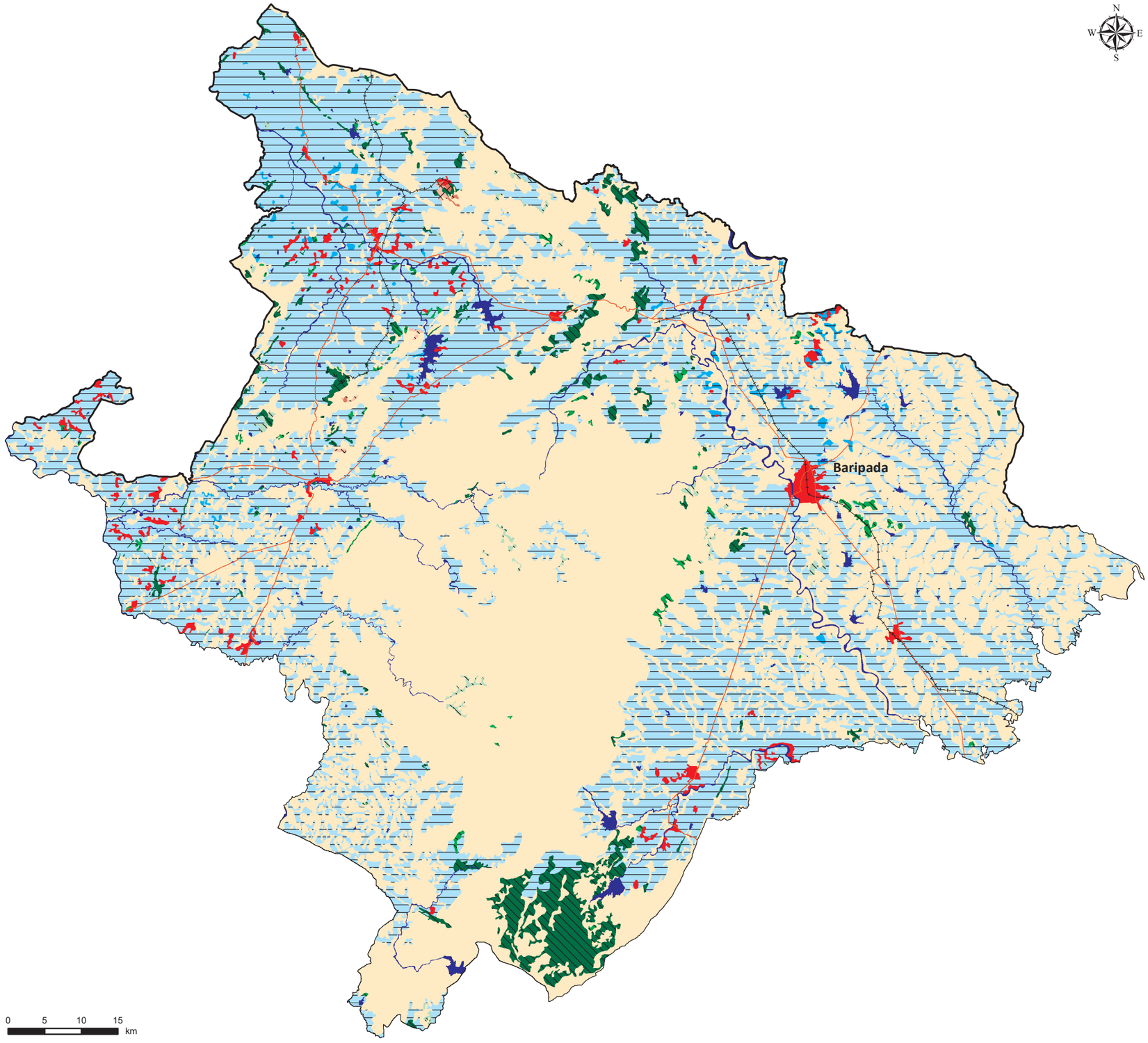
&
Space Applications Centre, ISRO, Ahmedabad



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Mayurbhanj District, Odisha
Timeframe - 2003-05

Legend

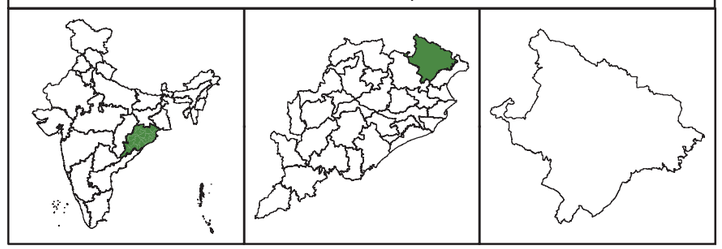
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Fm1	Forest, man made, Slight
	Fm2	Forest, man made, Moderate
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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Space Applications Centre, ISRO, Ahmedabad

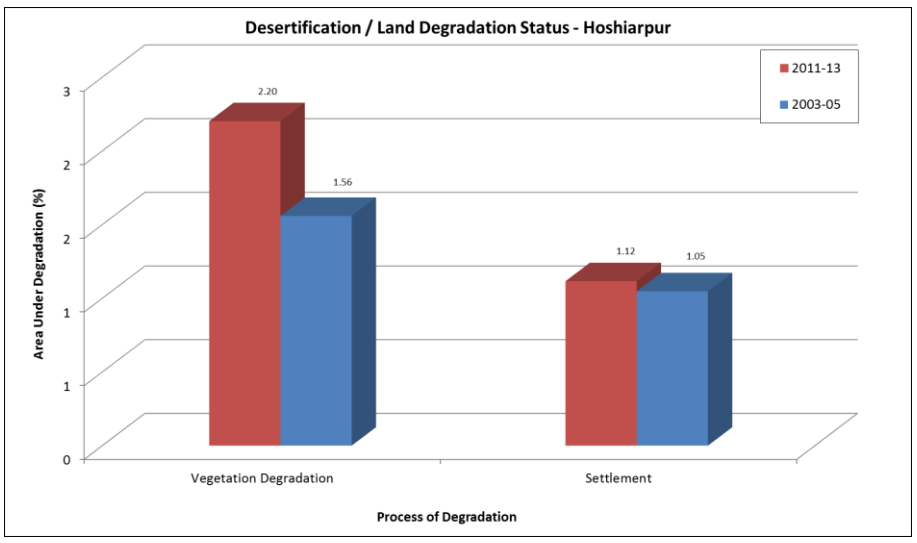
Hoshiarpur District, Punjab

Hoshiarpur district lies in the north east portion of Punjab state. It shares common boundaries with Gurdaspur district in the north, Himachal Pradesh and Rupnagar district in the east; Jalandhar and Kapurthala districts in the west and Nawanshahr in the south. It covers an area of 3,386 sq. km area. The district has a population of 15,86,625 with 469 population density, 961 sex ratio and a literacy rate of 84.6%. (Census 2011)

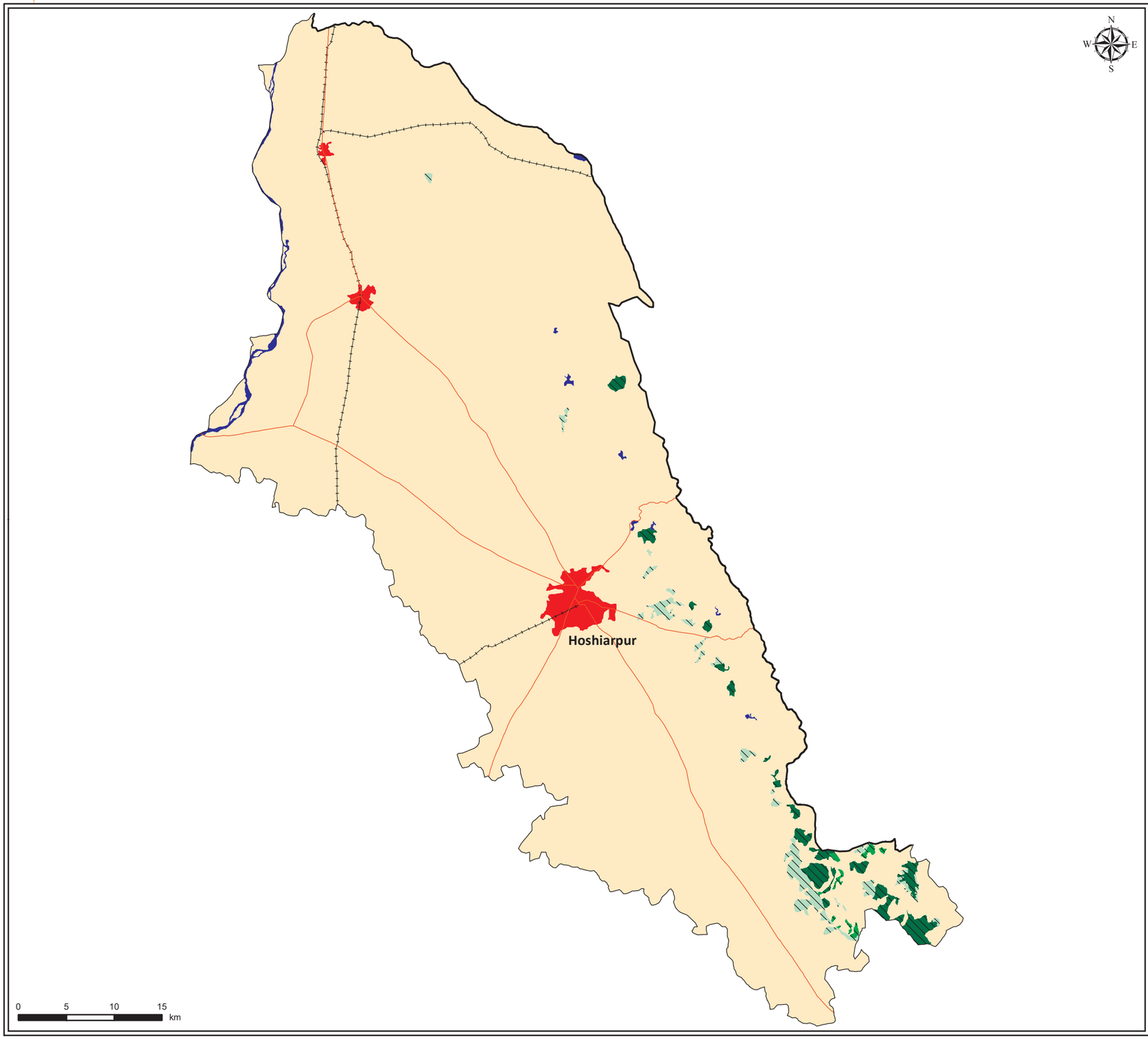
Hoshiarpur district has a transitional location between the upland plain of central Punjab and the outer Himalayan section of Himachal Pradesh. As compared to other districts of Punjab, Hoshiarpur plays the greatest topography variety. The Shivalik Hills which follow a northwest-southeast alignment and run almost through the length of the district, have influence of the disposition of their other physiographic units. These units are clearly identifiable on the basis of significant attributes of physical landscape. Hoshiarpur district is drained by river Beas and many Choes.

Hoshiarpur is observed with 3.32% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.71% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (2.20% during 2011-13 and 1.56% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	7455.32	2.20	5280.01	1.56	2175.31
Settlement	3778.10	1.12	3547.43	1.05	230.67
Total Area under Desertification	**11233.42**	**3.32**	**8827.43**	**2.61**	**2405.98**
No Apparent Degradation	**325976.20**	**96.27**	**328386.06**	**96.98**	**-2409.86**
Total Geographical Area (ha)	**338600.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	3854.33	1.14	2219.90	0.66	1634.43
2	Fv2	Forest, vegetation degradation, Moderate	473.19	0.14	102.09	0.03	371.10
3	Fv3	Forest, vegetation degradation, Severe	3127.79	0.92	2958.02	0.87	169.78
4	S	Settlement	3778.10	1.12	3547.43	1.05	230.67
Total Area Under Desertification/ Land Degradation			**11233.42**	**3.32**	**8827.43**	**2.61**	**2405.98**
5	W	Water body/ Drainage	1390.39	0.41	1386.51	0.41	3.88
6	NAD	No Apparent Degradation	325976.20	96.27	328386.06	96.98	-2409.86
Total Geographical Area (ha)			**338600.00**	**100.00**	**338600.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Hoshiarpur District, Punjab
Timeframe - 2011-13

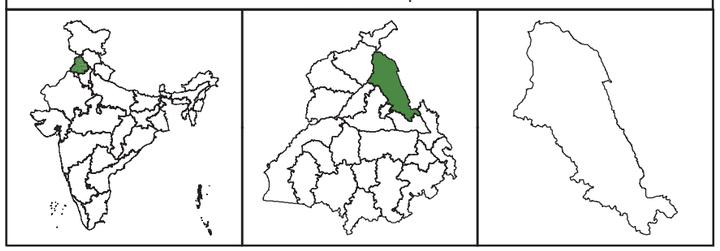
Legend

Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary
Major Road
Major Rail

Location Map



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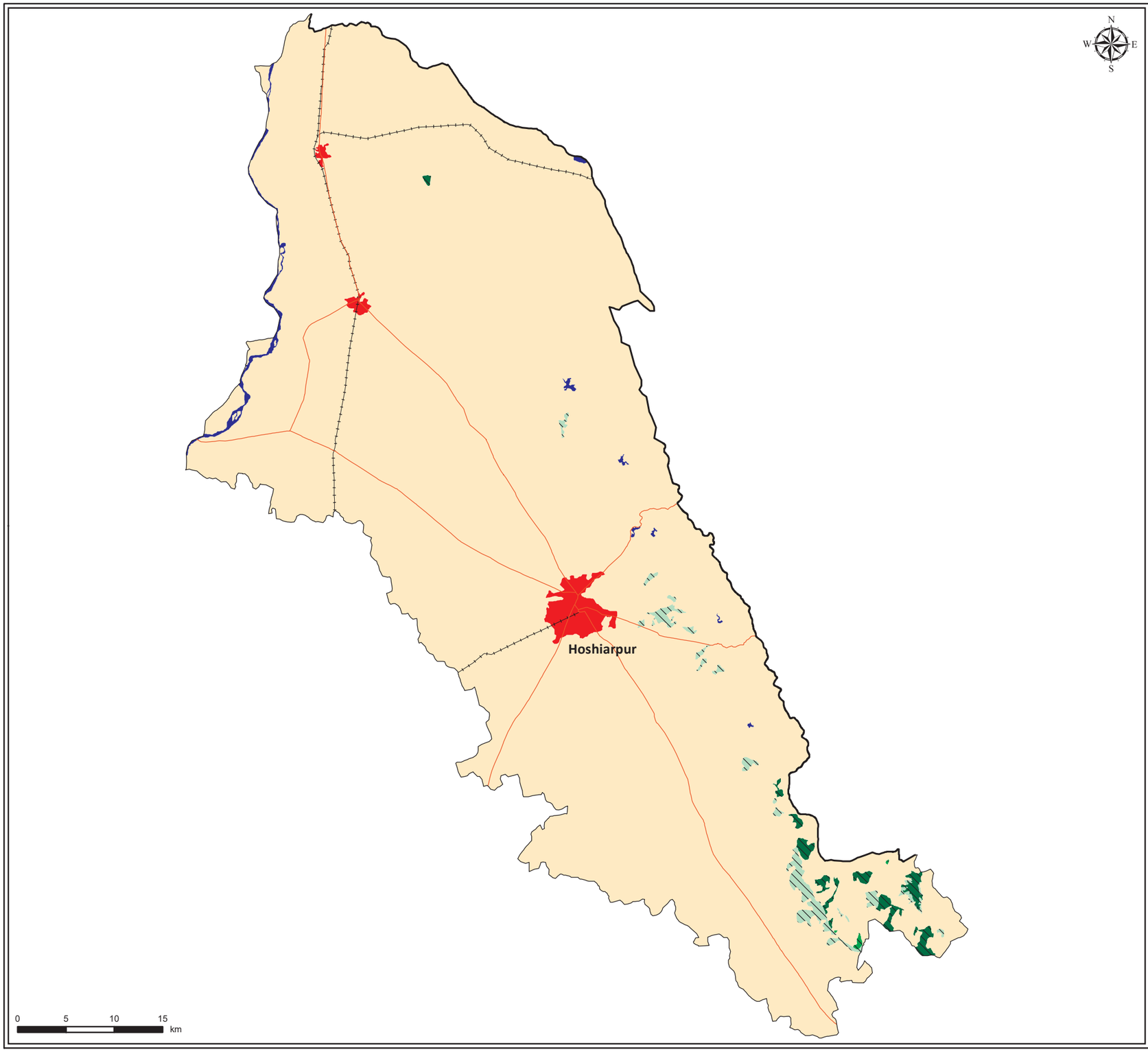
Soil and Land Use Survey of India, Delhi
&
Space Applications Centre, ISRO, Ahmedabad



DESERTIFICATION / LAND DEGRADATION STATUS MAP

Hoshiarpur District, Punjab

Timeframe - 2003-05

Legend

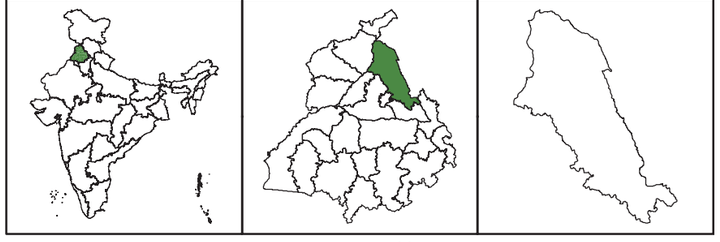
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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Soil and Land Use Survey of India, Delhi
&
Space Applications Centre, ISRO, Ahmedabad

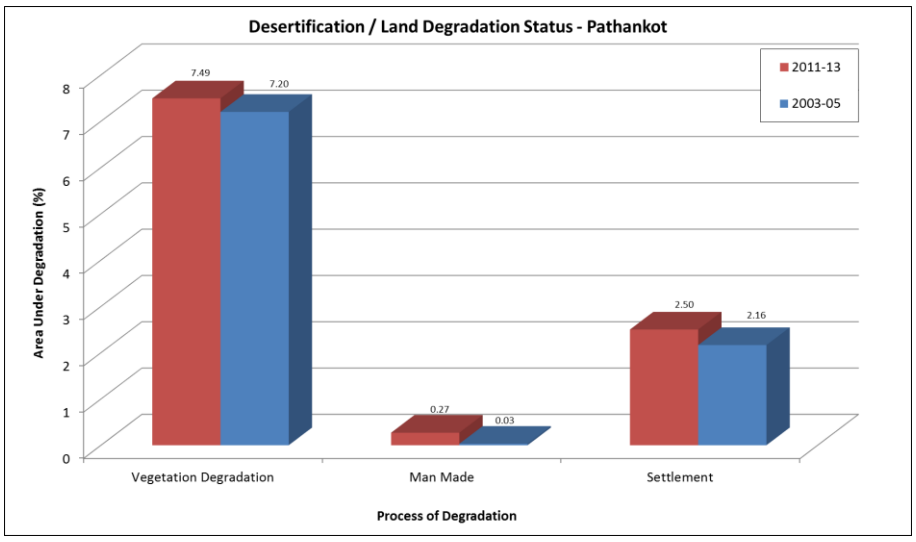
Pathankot District, Punjab

Pathankot is the northern most district of Punjab state. It is bounded by Jammu & Kashmir on north, north-west sides, Himachal Pradesh on east and south-east sides, Gurdaspur district on south-west side and it shares international border with Pakistan on west side. It covers an area of 929 sq.km. The district has a population of 6,26,154 with 674 population density, 857 sex ratio and a literacy rate of 81.18%. (Census 2011)

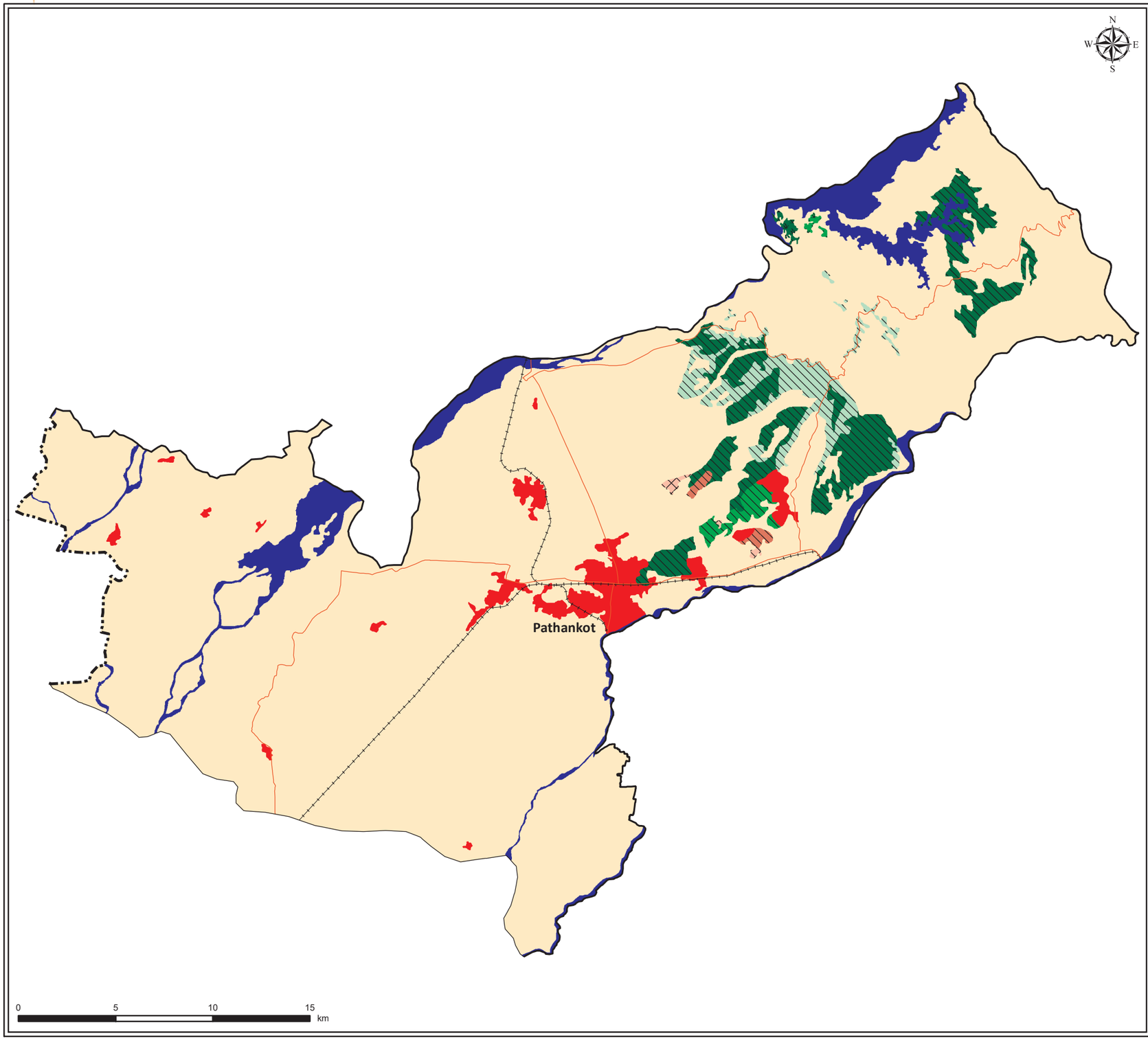
Pathankot district has varied topography comprising of hilly tract, undulating plan, flood plains and the upland plain. The hilly tract covers the north-eastern parts of the district, from north to south the tract consists of three small ranges. To its south lies the highly dissected undulating plain. It is travessed by a number of choas and has an undulating topography. The flood plains of the Ravi and the Beas are separated from the upland plain by sharp river cut bluffs. They are low lying, with slightly uneven topography. Sand dominates in the soil structure of the flood plains, but it diminishes in both quantity and coarseness in the upland plain.

Pathankot is observed with 10.26% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.87% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (7.49% during 2011-13 and 7.20% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	6960.40	7.49	6688.93	7.20	271.46
Man Made	251.38	0.27	29.29	0.03	222.08
Settlement	2321.89	2.50	2009.66	2.16	312.23
Total Area under Desertification	**9533.66**	**10.26**	**8727.89**	**9.39**	**805.78**
No Apparent Degradation	**77791.29**	**83.74**	**78269.08**	**84.25**	**-477.80**
Total Geographical Area (ha)	**92900.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	4413.67	4.75	4142.21	4.46	271.46
2	Fv2	Forest, vegetation degradation, Moderate	409.97	0.44	409.97	0.44	0.00
3	Fv3	Forest, vegetation degradation, Severe	2004.61	2.16	2004.61	2.16	0.00
4	Sv1	Land with scrub, vegetation degradation, Slight	79.78	0.09	79.78	0.09	0.00
5	Sv2	Land with scrub, vegetation degradation, Moderate	52.36	0.06	52.36	0.06	0.00
6	Fm2	Forest, man made, Moderate	164.29	0.18	0.00	0.00	164.29
7	Tm1	Others, man made, Slight	87.09	0.09	29.29	0.03	57.80
8	S	Settlement	2321.89	2.50	2009.66	2.16	312.23
Total Area Under Desertification/ Land Degradation			**9533.66**	**10.26**	**8727.89**	**9.39**	**805.78**
9	W	Water body/ Drainage	5575.05	6.00	5903.03	6.35	-327.98
10	NAD	No Apparent Degradation	77791.29	83.74	78269.08	84.25	-477.80
Total Geographical Area (ha)			**92900.00**	**100.00**	**92900.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Pathankot District, Punjab
Timeframe - 2011-13

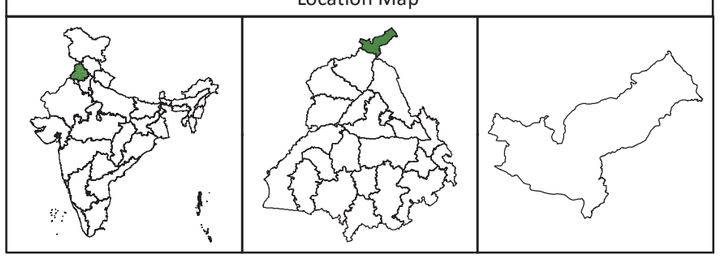
Legend

Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Fm2	Forest, man made, Moderate
	Tm1	Others, man made, Slight
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary
Major Road
Major Rail

Location Map



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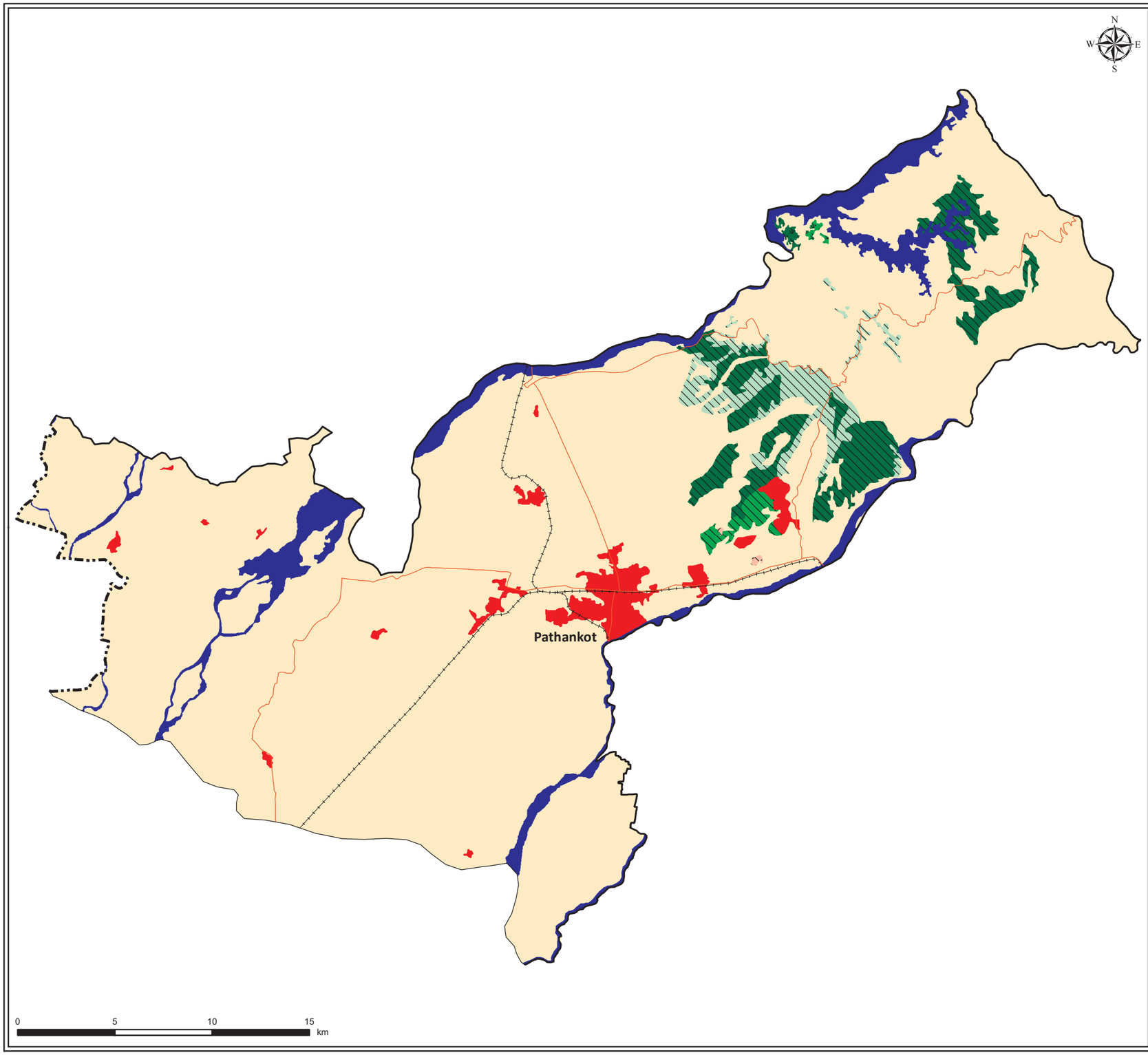
Space Applications Centre, ISRO, Ahmedabad



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Pathankot District, Punjab
Timeframe - 2003-05

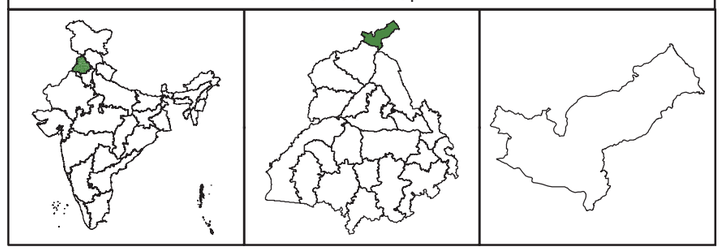
Legend

Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Tm1	Others, man made, Slight
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary
Major Road
Major Rail

Location Map



Prepared by:
Soil and Land Use Survey of India, Delhi
&
Space Applications Centre, ISRO, Ahmedabad

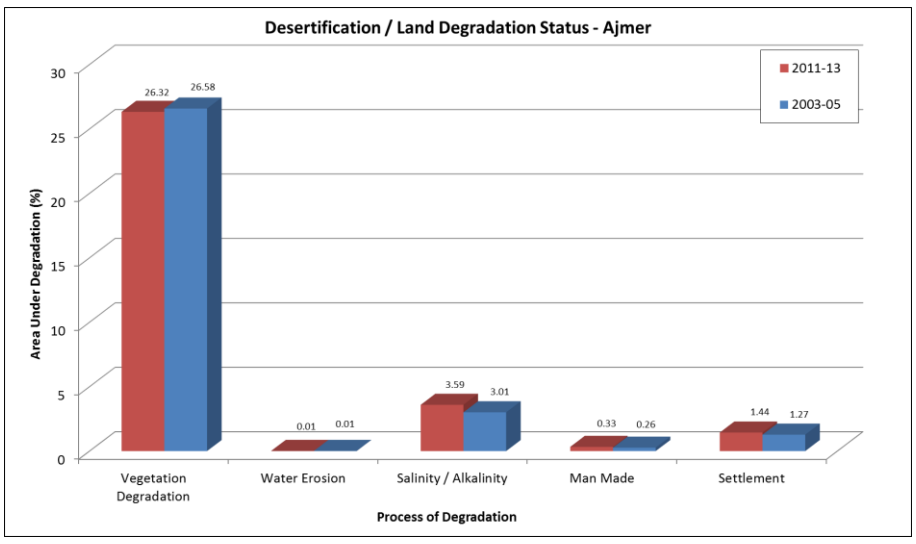
Ajmer District, Rajasthan

Ajmer district is located in the central portion of Rajasthan state. It is bounded on the north, north-west sides by Nagaur district, on the east by Jaipur and Tonk districts, on the south by Bhilwara district, and on the west by Pali district. It covers an area of 8,481 sq.km. The district has a population of 25,83,052 with 305 population density, 951 sex ratio and a literacy rate of 69.33%. (Census 2011)

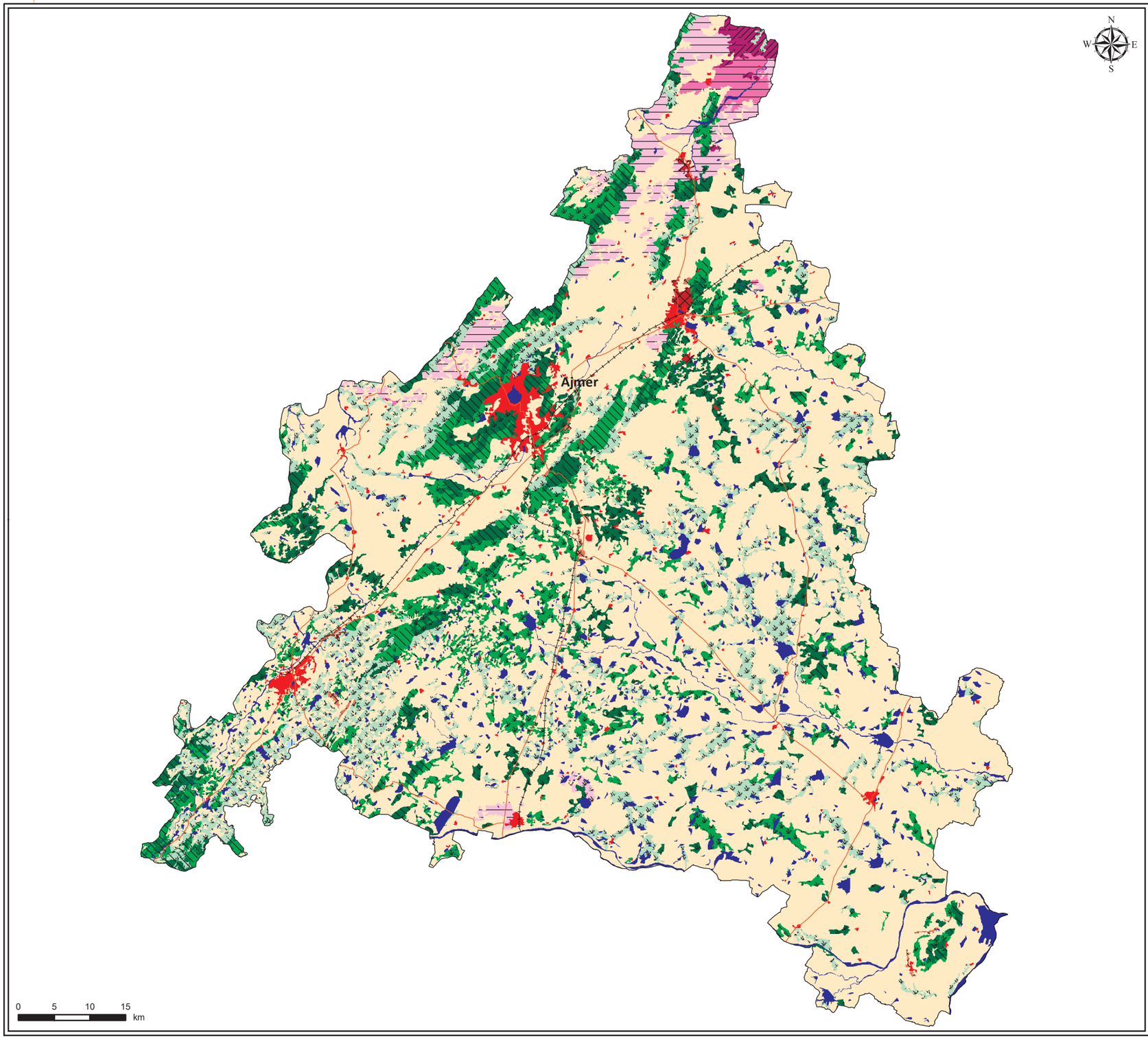
The district is triangular in shape. It is generally a level plain interspersed with low hills. Aravali range which divides the plains of Marwar from the high table-land of Mewar passes through the district. The range comes into prominence near Ajmer City, where it appears in a parallel succession of hills. West of Ajmer City attains a scarcely low elevation. The range of hills between Ajmer and Nasirabad marks the dividing watershed of the continent of India. The rain which falls on the southern Nasirabad side, finds its way through the Chambal into the Bay of Bengal and that which fall on the other side is discharged by the Luni into the Gulf of Kutch. There are five rivers which flow through the district viz. Banas, Khari, Sagarmati, Saraswati, and Rupnagar.

Ajmer is observed with 31.70% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.56% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (26.32% during 2011-13 and 26.58% during 2003-05) followed by Salinity/ Alkalinity (3.59% during 2011-13 and 3.01% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	223255.85	26.32	225416.14	26.58	-2160.28
Water Erosion	124.73	0.01	124.73	0.01	0.00
Salinity / Alkalinity	30447.49	3.59	25511.96	3.01	4935.53
Man Made	2785.30	0.33	2235.40	0.26	549.90
Settlement	12203.66	1.44	10799.61	1.27	1404.05
Total Area under Desertification	**268817.02**	**31.70**	**264087.83**	**31.14**	**4729.20**
No Apparent Degradation	**543709.77**	**64.11**	**552554.04**	**65.15**	**-8844.27**
Total Geographical Area (ha)	**848100.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	22012.99	2.60	20828.49	2.46	1184.50
2	Fv2	Forest, vegetation degradation, Moderate	21171.30	2.50	21208.54	2.50	-37.24
3	Fv3	Forest, vegetation degradation, Severe	2186.24	0.26	2186.24	0.26	0.00
4	Sv1	Land with scrub, vegetation degradation, Slight	35460.28	4.18	35268.81	4.16	191.47
5	Sv2	Land with scrub, vegetation degradation, Moderate	58764.42	6.93	59264.26	6.99	-499.83
6	Sv3	Land with scrub, vegetation degradation, Severe	83660.62	9.86	86659.80	10.22	-2999.17
7	Iw1	Agriculture irrigated, water erosion, Slight	124.73	0.01	124.73	0.01	0.00
8	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight	21102.22	2.49	20372.54	2.40	729.67
9	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate	4888.23	0.58	1457.96	0.17	3430.27
10	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe	626.13	0.07	0.00	0.00	626.13
11	Fs2	Forest, salinity / alkalinity, Moderate	93.56	0.01	93.56	0.01	0.00
12	Ss1	Land with scrub, salinity / alkalinity, Slight	1248.64	0.15	1269.26	0.15	-20.62
13	Bs1	Barren, salinity / alkalinity, Slight	72.34	0.01	72.34	0.01	0.00
14	Bs3	Barren, salinity / alkalinity, Severe	2416.37	0.28	2246.29	0.26	170.08
15	Tm1	Others, man made, Slight	102.28	0.01	102.28	0.01	0.00
16	Tm2	Others, man made, Moderate	1231.52	0.15	1088.22	0.13	143.31
17	Tm3	Others, man made, Severe	1451.49	0.17	1044.90	0.12	406.60
18	S	Settlement	12203.66	1.44	10799.61	1.27	1404.05
Total Area Under Desertification/ Land Degradation			**268817.02**	**31.70**	**264087.83**	**31.14**	**4729.20**
19	W	Water body/ Drainage	35573.20	4.19	31458.13	3.71	4115.07
20	NAD	No Apparent Degradation	543709.77	64.11	552554.04	65.15	-8844.27
Total Geographical Area (ha)			**848100.00**	**100.00**	**848100.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Ajmer District, Rajasthan
Timeframe - 2011-13

Legend

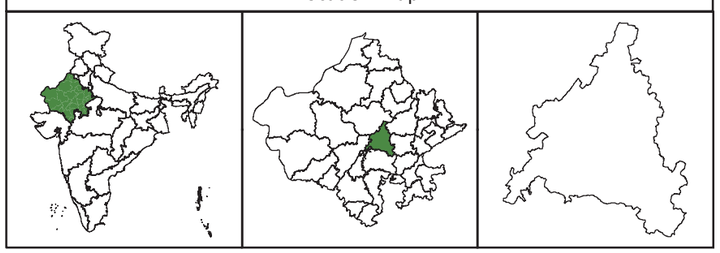
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Iw1	Agriculture irrigated, water erosion, Slight
	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight
	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate
	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe
	Fs2	Forest, salinity / alkalinity, Moderate
	Ss1	Land with scrub, salinity / alkalinity, Slight
	Bs1	Barren, salinity / alkalinity, Slight
	Bs3	Barren, salinity / alkalinity, Severe
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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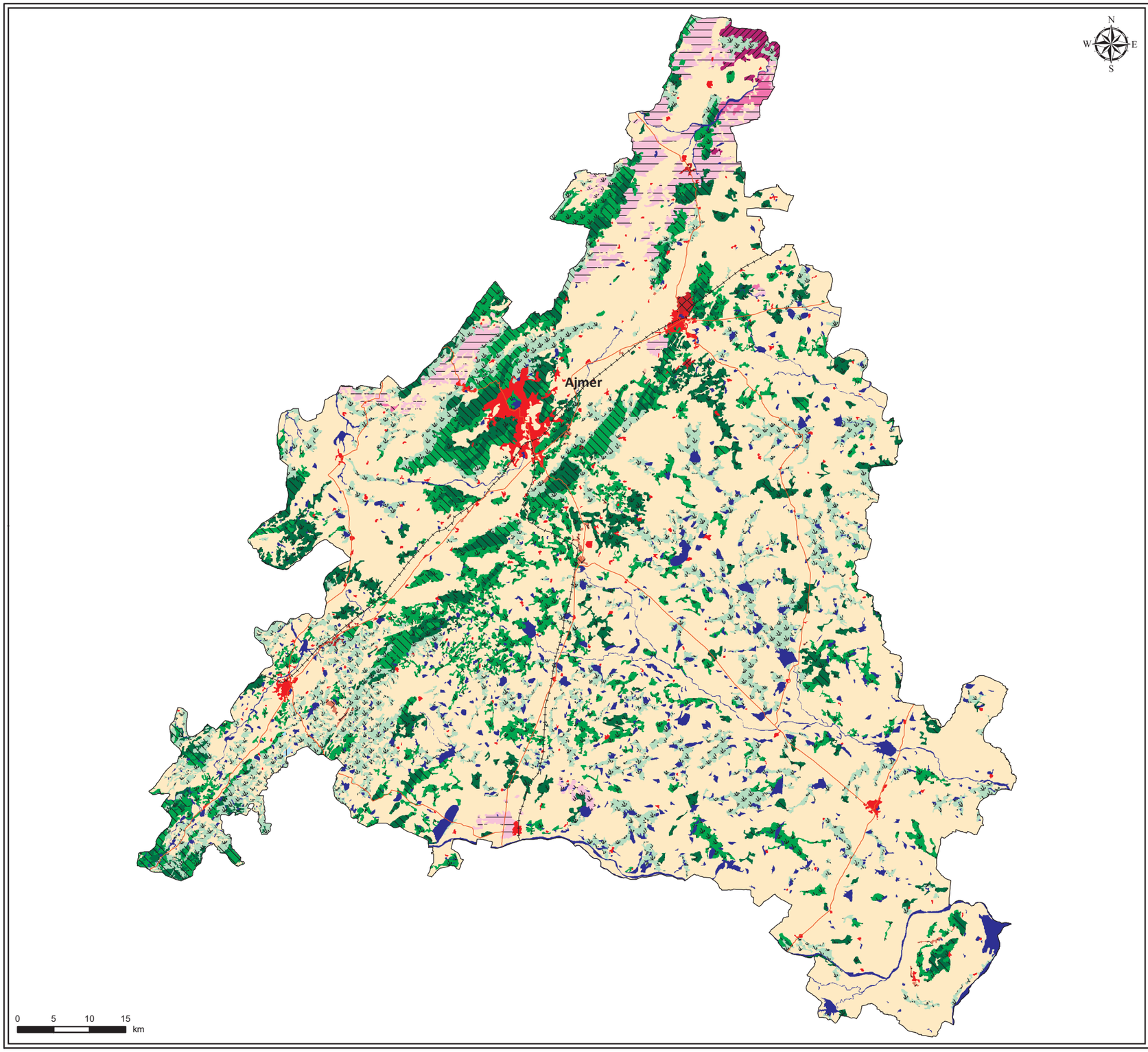


DESERTIFICATION / LAND DEGRADATION STATUS MAP
Ajmer District, Rajasthan
Timeframe - 2003-05

Legend

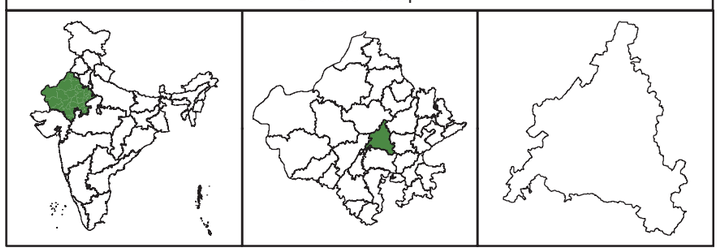
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Iw1	Agriculture irrigated, water erosion, Slight
	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight
	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate
	Fs2	Forest, salinity / alkalinity, Moderate
	Ss1	Land with scrub, salinity / alkalinity, Slight
	Bs1	Barren, salinity / alkalinity, Slight
	Bs3	Barren, salinity / alkalinity, Severe
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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Space Applications Centre, ISRO, Ahmedabad

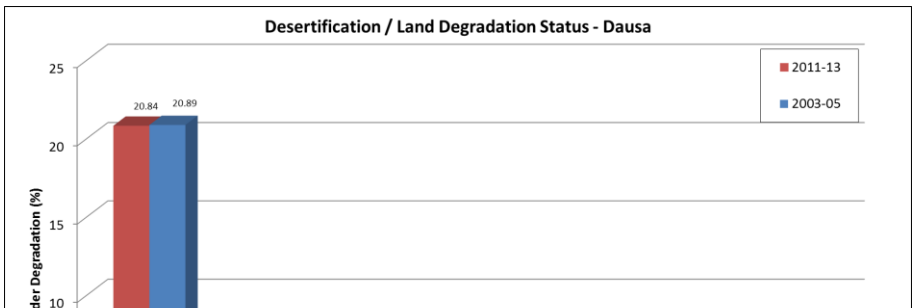
Dausa District, Rajasthan

Dausa district lies in the north-eastern part of Rajasthan state. It is surrounded by Alwar district on north side, Bharatpur district on east side, Karauli, Sawai Madhopur on south side and Jaipur on west side. It covers an area of 3,432 sq.km. The district has a population of 16,34,409 with 476 population density, 905 sex ratio and a literacy rate of 68.16%. (Census 2011)

Physiographically, most part of the district is plain and is intersected with several ranges of Aravali hills running from north-northeast to south-southwest. Hills of the district are parts or branches of the north Aravali ranges. There is no perennial river in the district and thus district is depending wholly on rainy water. A large part of the district is covered by a thick mantle of soil blown sand alluvium. The water arrangements are being done by seasonal rivers, streams and allied rivers. There are two rivers, Ban Ganga and Morel

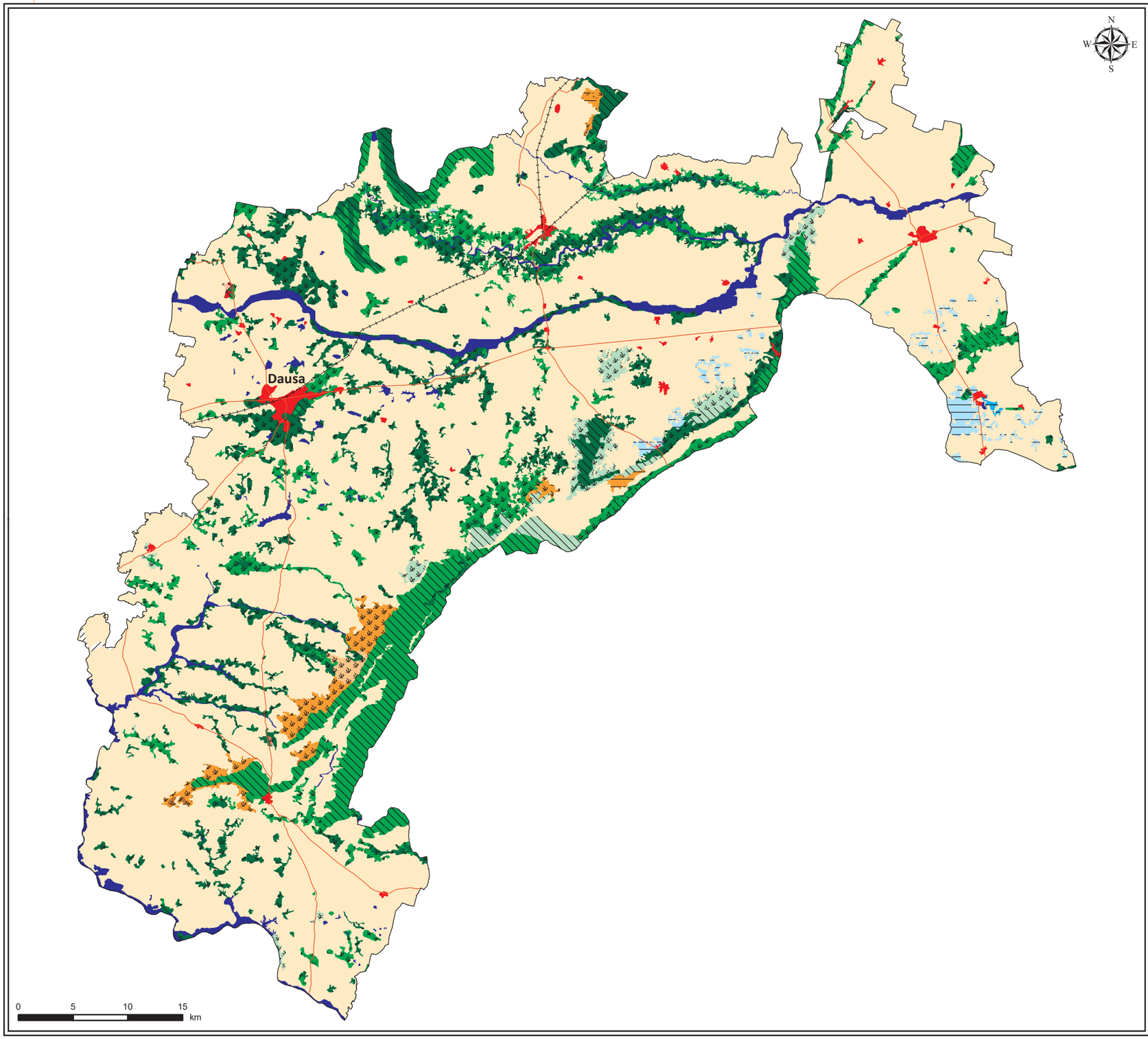
Dausa is observed with 23.93% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.12% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (20.84% during 2011-13 and 20.89% during 2003-05) followed by Wind Erosion (1.53% during 2011-13 and 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	71521.07	20.84	71691.89	20.89	-170.82
Water Erosion	2646.25	0.77	2646.25	0.77	0.00
Wind Erosion	5257.08	1.53	5257.08	1.53	0.00
Man Made	107.37	0.03	107.37	0.03	0.00
Barren/Rocky	150.49	0.04	150.49	0.04	0.00
Settlement	2438.21	0.71	1867.90	0.54	570.31
Total Area under Desertification	**82120.46**	**23.93**	**81720.98**	**23.81**	**399.48**
No Apparent Degradation	**251546.51**	**73.29**	**251945.99**	**73.41**	**-399.48**
Total Geographical Area (ha)	**343200.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	4321.17	1.26	4321.17	1.26	0.00
2	Fv2	Forest, vegetation degradation, Moderate	17368.15	5.06	17368.15	5.06	0.00
3	Fv3	Forest, vegetation degradation, Severe	2124.55	0.62	2124.55	0.62	0.00
4	Sv1	Land with scrub, vegetation degradation, Slight	25579.38	7.45	25702.70	7.49	-123.32
5	Sv2	Land with scrub, vegetation degradation, Moderate	18458.39	5.38	18505.89	5.39	-47.51
6	Sv3	Land with scrub, vegetation degradation, Severe	3669.43	1.07	3669.43	1.07	0.00
7	Dw1	Agriculture unirrigated, water erosion, Slight	2540.11	0.74	2540.11	0.74	0.00
8	Dw2	Agriculture unirrigated, water erosion, Moderate	106.15	0.03	106.15	0.03	0.00
9	De2	Agriculture unirrigated, wind erosion, Moderate	387.18	0.11	387.18	0.11	0.00
10	Se1	Land with scrub, wind erosion, Slight	599.14	0.17	599.14	0.17	0.00
11	Se2	Land with scrub, wind erosion, Moderate	4174.30	1.22	4174.30	1.22	0.00
12	Se3	Land with scrub, wind erosion, Severe	96.46	0.03	96.46	0.03	0.00
13	Tm1	Others, man made, Slight	31.00	0.01	31.00	0.01	0.00
14	Tm2	Others, man made, Moderate	19.27	0.01	19.27	0.01	0.00
15	Tm3	Others, man made, Severe	57.10	0.02	57.10	0.02	0.00
16	B	Barren	150.49	0.04	150.49	0.04	0.00
17	S	Settlement	2438.21	0.71	1867.90	0.54	570.31
Total Area Under Desertification/ Land Degradation			**82120.46**	**23.93**	**81720.98**	**23.81**	**399.48**
18	W	Water body/ Drainage	9533.03	2.78	9533.03	2.78	0.00
19	NAD	No Apparent Degradation	251546.51	73.29	251945.99	73.41	-399.48
Total Geographical Area (ha)			**343200.00**	**100.00**	**343200.00**	**100.00**	

DESERTIFICATION / LAND DEGRADATION STATUS MAP
Dausa District, Rajasthan
Timeframe - 2011-13



Legend

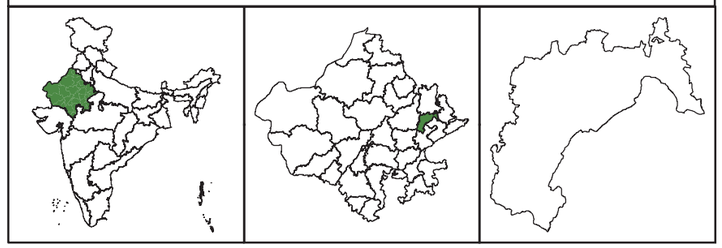
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	De2	Agriculture unirrigated, wind erosion, Moderate
	Se1	Land with scrub, wind erosion, Slight
	Se2	Land with scrub, wind erosion, Moderate
	Se3	Land with scrub, wind erosion, Severe
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	B	Barren
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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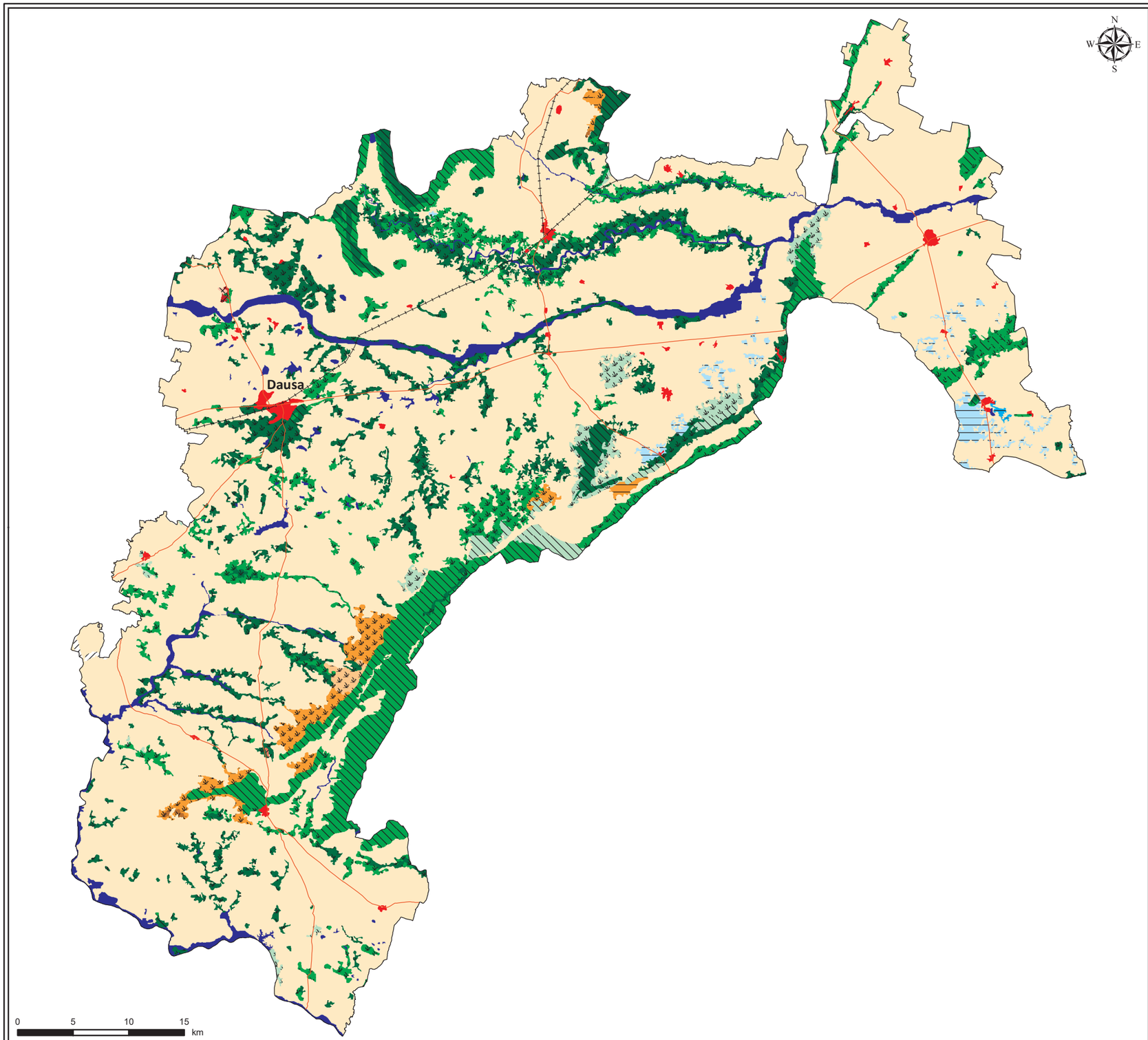


DESERTIFICATION / LAND DEGRADATION STATUS MAP
Dausa District, Rajasthan
Timeframe - 2003-05

Legend

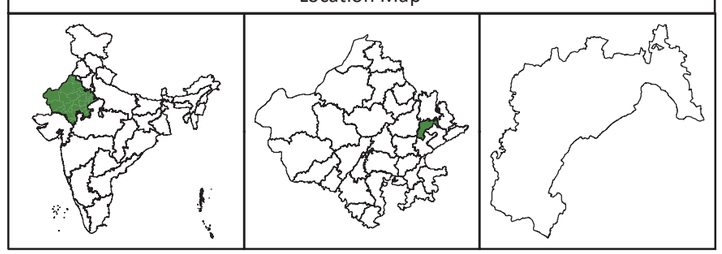
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	De2	Agriculture unirrigated, wind erosion, Moderate
	Se1	Land with scrub, wind erosion, Slight
	Se2	Land with scrub, wind erosion, Moderate
	Se3	Land with scrub, wind erosion, Severe
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	B	Barren
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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&
Space Applications Centre, ISRO, Ahmedabad

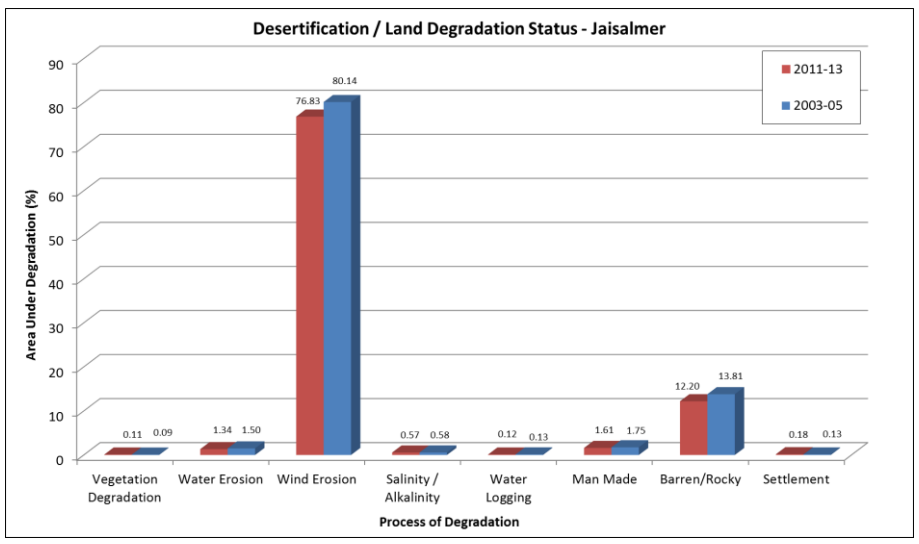
Jaisalmer District, Rajasthan

Jaisalmer district lies along the International border on the western part of Rajasthan as well as India and. It shares international border with Pakistan on north and west sides. It is bounded by Bikaner, Jodhpur district on east side and Barmer district on south side. It covers an area of 38,401 sq.km. The district has a population of 6,69,919 with 17 population density, 852 sex ratio and a literacy rate of 57.22%. (Census 2011)

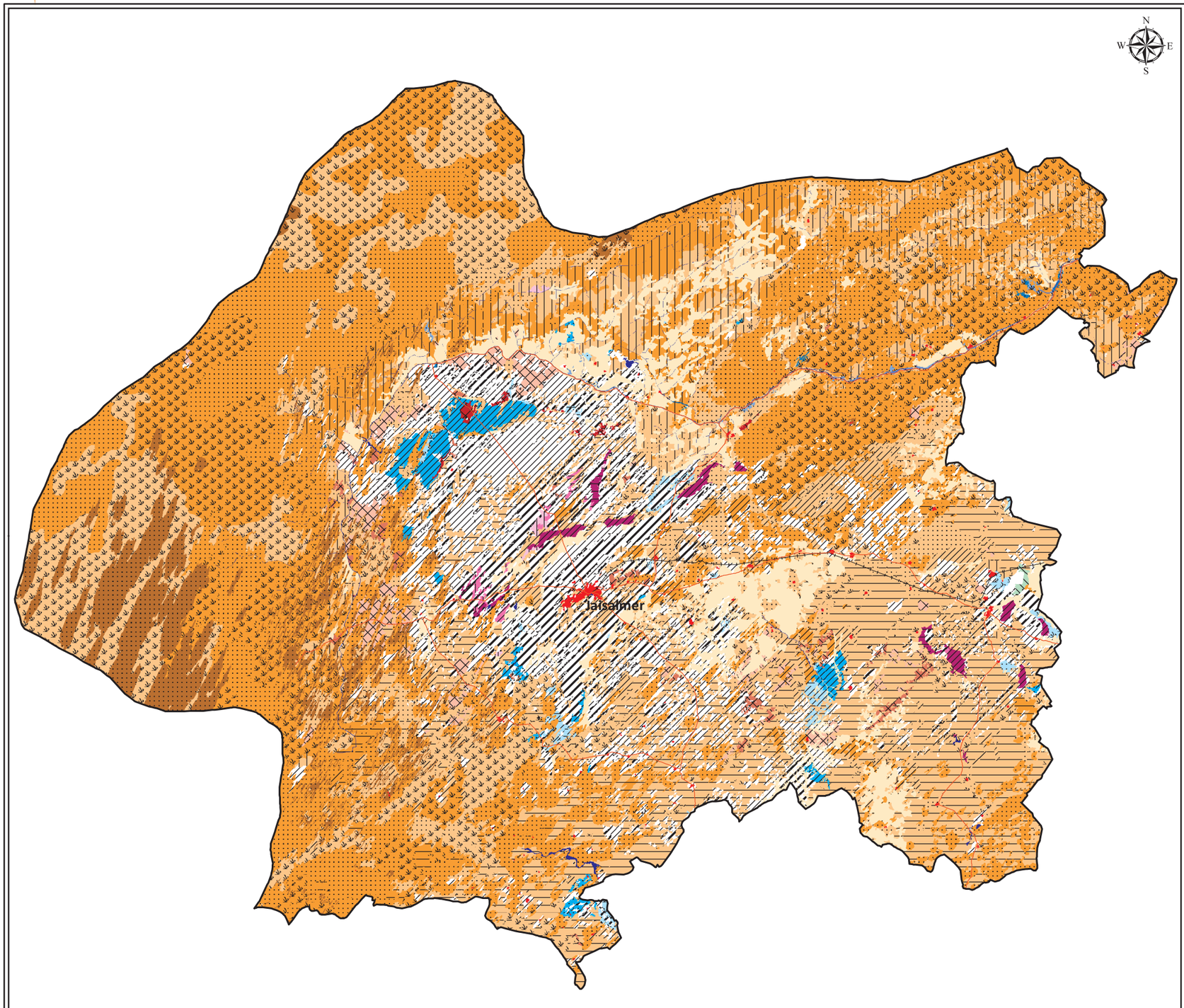
The district forms the major part of the Thar Desert. It is almost sandy dry and witness lack of water. The general nature of land in the district looks like a limitless sea of sand dunes of different shapes and varying sizes. However, surrounding area of Jaisalmer town (radius of about 64 km), the soil is stony containing numerous rocky ridges and hard undulating plains. Most of these are deeply stabilized and look like sand hills. The biggest sand dunes are found in Ramgarh and Sam. Most of these are deeply stabilized and look like sand hills. It is, however, surprising to note that even a little rain turn this waste area into greenery and becomes good pasture land. There is no perennial river in the district.

Jaisalmer is observed with 92.96% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has decreased about 5.17% since 2003-05. The most significant process of land degradation/ desertification in the district is Wind Erosion (76.83% during 2011-13 and 80.14% during 2003-05) followed by Man made (1.61% during 2011-13 and 1.75% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	4081.57	0.11	3486.73	0.09	594.84
Water Erosion	51405.82	1.34	57731.69	1.50	-6325.87
Wind Erosion	2950455.84	76.83	3077451.65	80.14	-126995.81
Salinity / Alkalinity	21879.87	0.57	22127.32	0.58	-247.45
Water Logging	4448.87	0.12	5136.96	0.13	-688.09
Man Made	61894.43	1.61	67365.94	1.75	-5471.50
Barren/Rocky	468566.23	12.20	530256.07	13.81	-61689.83
Settlement	6850.27	0.18	4845.48	0.13	2004.79
Total Area under Desertification	**3569582.91**	**92.96**	**3768401.83**	**98.13**	**-198818.92**
No Apparent Degradation	**257513.13**	**6.71**	**60845.34**	**1.58**	**196667.79**
Total Geographical Area (ha)	**3840100.00**				



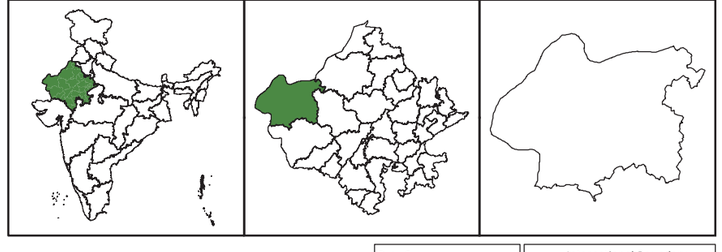
SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	845.83	0.02	652.71	0.02	193.12
2	Fv2	Forest, vegetation degradation, Moderate	803.48	0.02	715.95	0.02	87.53
3	Fv3	Forest, vegetation degradation, Severe	1195.59	0.03	1318.26	0.03	-122.67
4	Sv1	Land with scrub, vegetation degradation, Slight	515.71	0.01	799.81	0.02	-284.10
5	Sv2	Land with scrub, vegetation degradation, Moderate	720.96	0.02	0.00	0.00	720.96
6	Dw1	Agriculture unirrigated, water erosion, Slight	1266.19	0.03	802.30	0.02	463.89
7	Sw1	Land with scrub, water erosion, Slight	5120.83	0.13	4108.30	0.11	1012.52
8	Sw2	Land with scrub, water erosion, Moderate	177.62	0.00	3.49	0.00	174.13
9	Bw1	Barren, water erosion, Slight	8736.71	0.23	10975.73	0.29	-2239.02
10	Bw2	Barren, water erosion, Moderate	31041.18	0.81	33162.11	0.86	-2120.93
11	Ew1	Dune / Sandy area, water erosion, Slight	1717.09	0.04	1417.63	0.04	299.46
12	Ew2	Dune / Sandy area, water erosion, Moderate	3346.21	0.09	7262.12	0.19	-3915.91
13	Ie1	Agriculture irrigated, wind erosion, Slight	188138.67	4.90	51725.85	1.35	136412.83
14	Ie2	Agriculture irrigated, wind erosion, Moderate	120421.03	3.14	82187.85	2.14	38233.18
15	De1	Agriculture unirrigated, wind erosion, Slight	416513.07	10.85	365283.79	9.51	51229.29
16	De2	Agriculture unirrigated, wind erosion, Moderate	24773.06	0.65	94022.51	2.45	-69249.44
17	Fe1	Forest, wind erosion, Slight	31.87	0.00	0.00	0.00	31.87
18	Se1	Land with scrub, wind erosion, Slight	427861.07	11.14	589592.18	15.35	-161731.11
19	Se2	Land with scrub, wind erosion, Moderate	523666.45	13.64	479515.93	12.49	44150.52
20	Se3	Land with scrub, wind erosion, Severe	5156.06	0.13	3886.43	0.10	1269.63
21	Be1	Barren, wind erosion, Slight	122650.30	3.19	170628.26	4.44	-47977.96
22	Be2	Barren, wind erosion, Moderate	24096.86	0.63	30794.86	0.80	-6698.00
23	Ee1	Dune / Sandy area, wind erosion, Slight	156187.07	4.07	257381.38	6.70	-101194.31
24	Ee2	Dune / Sandy area, wind erosion, Moderate	769503.47	20.04	778309.52	20.27	-8806.06
25	Ee3	Dune / Sandy area, wind erosion, Severe	171456.85	4.46	174123.09	4.53	-2666.24
26	Is1	Agriculture irrigated, salinity / alkalinity, Slight	2410.48	0.06	1027.22	0.03	1383.25
27	Is2	Agriculture irrigated, salinity / alkalinity, Moderate	2099.50	0.05	3747.20	0.10	-1647.70
28	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight	60.06	0.00	329.30	0.01	-269.24
29	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate	944.28	0.02	925.27	0.02	19.01
30	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe	2469.58	0.06	2515.20	0.07	-45.62
31	Bs2	Barren, salinity / alkalinity, Moderate	831.55	0.02	426.12	0.01	405.42
32	Bs3	Barren, salinity / alkalinity, Severe	13064.43	0.34	13157.00	0.34	-92.57
33	Il1	Agriculture irrigated, water logging, Slight	513.62	0.01	1696.66	0.04	-1183.04
34	Il2	Agriculture irrigated, water logging, Moderate	66.36	0.00	367.12	0.01	-300.76
35	Sl1	Land with scrub, water logging, Slight	714.53	0.02	0.00	0.00	714.53
36	El1	Dune / Sandy area, water logging, Slight	2138.11	0.06	1932.22	0.05	205.88
37	El2	Dune / Sandy area, water logging, Moderate	1016.26	0.03	1140.97	0.03	-124.70
38	Tm1	Others, man made, Slight	43729.46	1.14	50974.73	1.33	-7245.27
39	Tm2	Others, man made, Moderate	14514.66	0.38	13387.40	0.35	1127.26
40	Tm3	Others, man made, Severe	3650.30	0.10	3003.80	0.08	646.50
41	B	Barren	286762.27	7.47	346880.71	9.03	-60118.43
42	R	Rocky	181803.96	4.73	183375.36	4.78	-1571.40
43	S	Settlement	6850.27	0.18	4845.48	0.13	2004.79
Total Area Under Desertification/ Land Degradation			**3569582.91**	**92.96**	**3768401.83**	**98.13**	**-198818.92**
44	W	Water body/ Drainage	13003.97	0.34	10852.83	0.28	2151.14
45	NAD	No Apparent Degradation	257513.13	6.71	60845.34	1.58	196667.79
Total Geographical Area (ha)			**3840100.00**	**100.00**	**3840100.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Jaisalmer District, Rajasthan
Timeframe - 2011-13

Legend		
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Dw1	Agriculture unirrigated, water erosion, Slight
	Sw1	Land with scrub, water erosion, Slight
	Sw2	Land with scrub, water erosion, Moderate
	Bw1	Barren, water erosion, Slight
	Bw2	Barren, water erosion, Moderate
	Ew1	Dune / Sandy area, water erosion, Slight
	Ew2	Dune / Sandy area, water erosion, Moderate
	Ie1	Agriculture irrigated, wind erosion, Slight
	Ie2	Agriculture irrigated, wind erosion, Moderate
	De1	Agriculture unirrigated, wind erosion, Slight
	De2	Agriculture unirrigated, wind erosion, Moderate
	Fe1	Forest, wind erosion, Slight
	Se1	Land with scrub, wind erosion, Slight
	Se2	Land with scrub, wind erosion, Moderate
	Se3	Land with scrub, wind erosion, Severe
	Be1	Barren, wind erosion, Slight
	Be2	Barren, wind erosion, Moderate
	Ee1	Dune / Sandy area, wind erosion, Slight
	Ee2	Dune / Sandy area, wind erosion, Moderate
	Ee3	Dune / Sandy area, wind erosion, Severe
	Is1	Agriculture irrigated, salinity / alkalinity, Slight
	Is2	Agriculture irrigated, salinity / alkalinity, Moderate
	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight
	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate
	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe
	Bs2	Barren, salinity / alkalinity, Moderate
	Bs3	Barren, salinity / alkalinity, Severe
	Il1	Agriculture irrigated, water logging, Slight
	Il2	Agriculture irrigated, water logging, Moderate
	Sl1	Land with scrub, water logging, Slight
	El1	Dune / Sandy area, water logging, Slight
	El2	Dune / Sandy area, water logging, Moderate
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	B	Barren
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Location Map



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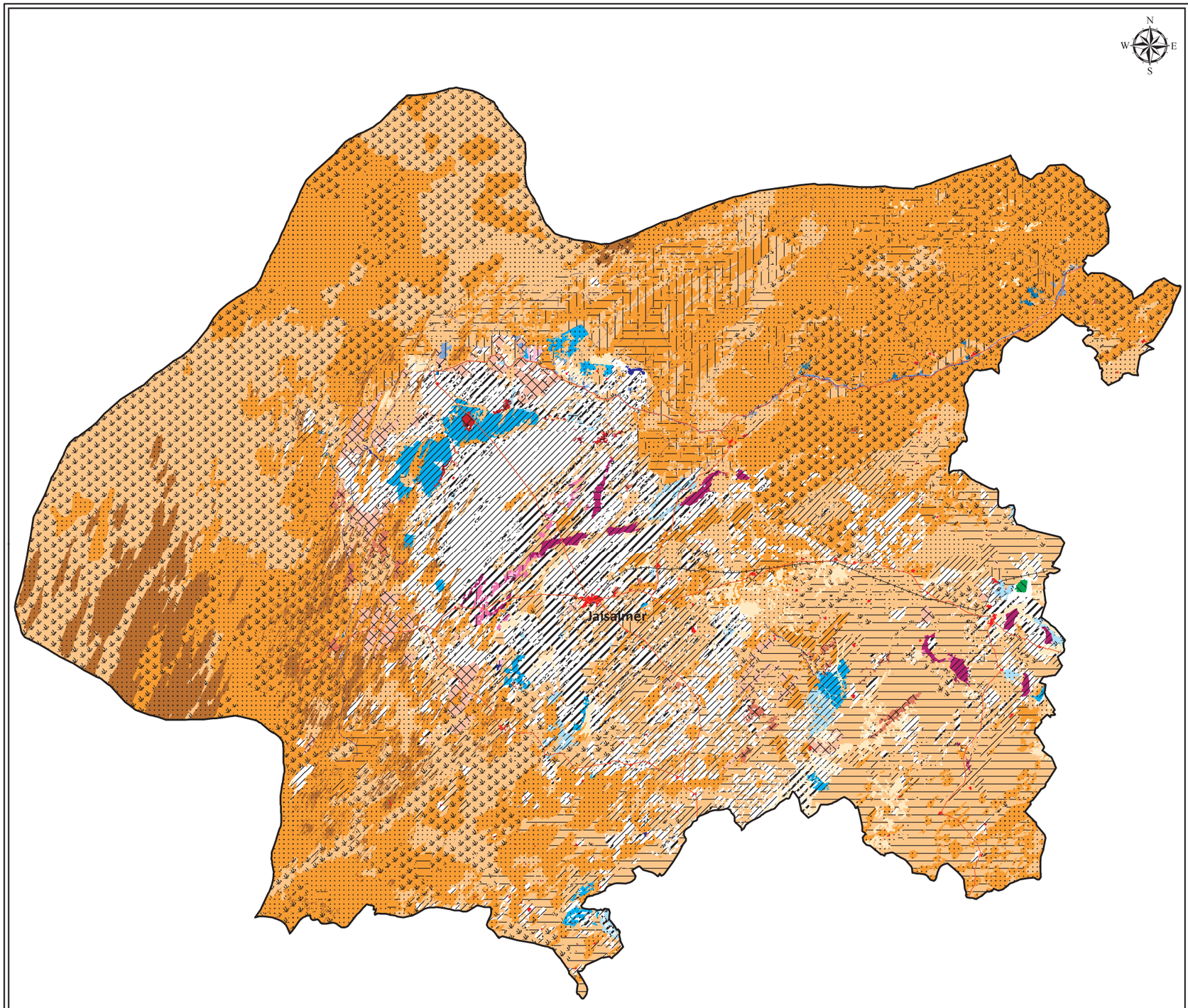
&
Space Applications Centre, ISRO, Ahmedabad

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

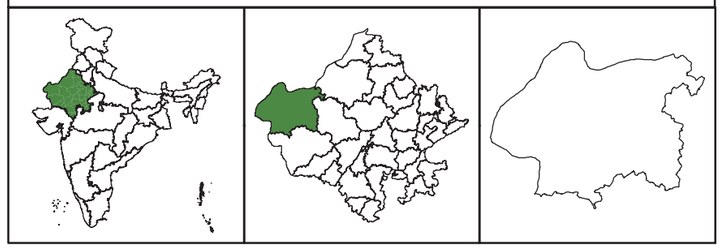
International Boundary
State Boundary
District Bundary
Major Road
Major Rail

DESERTIFICATION / LAND DEGRADATION STATUS MAP
Jaisalmer District, Rajasthan
Timeframe - 2003-05



Legend		
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Sw1	Land with scrub, water erosion, Slight
	Sw2	Land with scrub, water erosion, Moderate
	Bw1	Barren, water erosion, Slight
	Bw2	Barren, water erosion, Moderate
	Ew1	Dune / Sandy area, water erosion, Slight
	Ew2	Dune / Sandy area, water erosion, Moderate
	Ie1	Agriculture irrigated, wind erosion, Slight
	Ie2	Agriculture irrigated, wind erosion, Moderate
	De1	Agriculture unirrigated, wind erosion, Slight
	De2	Agriculture unirrigated, wind erosion, Moderate
	Se1	Land with scrub, wind erosion, Slight
	Se2	Land with scrub, wind erosion, Moderate
	Se3	Land with scrub, wind erosion, Severe
	Be1	Barren, wind erosion, Slight
	Be2	Barren, wind erosion, Moderate
	Ee1	Dune / Sandy area, wind erosion, Slight
	Ee2	Dune / Sandy area, wind erosion, Moderate
	Ee3	Dune / Sandy area, wind erosion, Severe
	Is1	Agriculture irrigated, salinity / alkalinity, Slight
	Is2	Agriculture irrigated, salinity / alkalinity, Moderate
	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight
	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate
	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe
	Bs2	Barren, salinity / alkalinity, Moderate
	Bs3	Barren, salinity / alkalinity, Severe
	Il1	Agriculture irrigated, water logging, Slight
	Il2	Agriculture irrigated, water logging, Moderate
	El1	Dune / Sandy area, water logging, Slight
	El2	Dune / Sandy area, water logging, Moderate
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	B	Barren
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Location Map



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Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary
Major Road
Major Rail

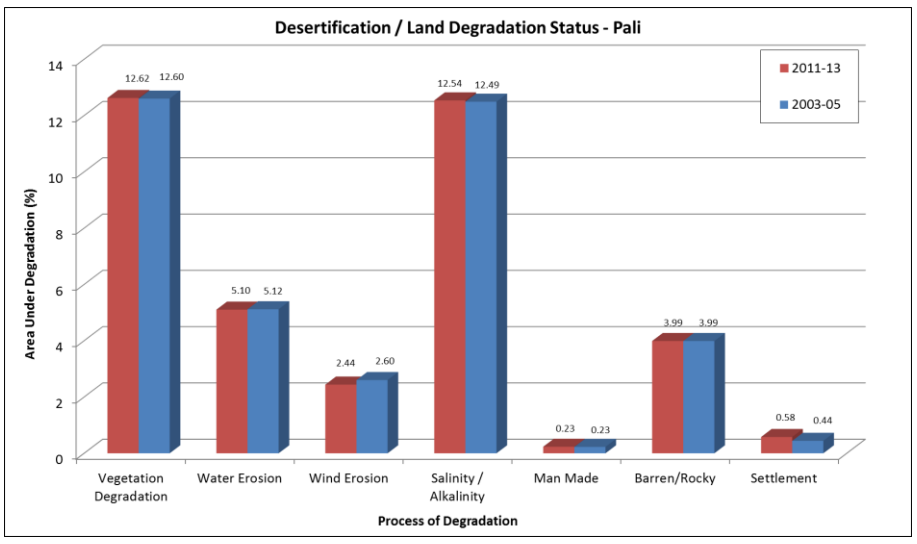
Pali District, Rajasthan

Pali district lies in certral-southern part of Rajasthan state. The district is bounded by Jodhpur district on north-west side, Nagaur district on north side, Ajmer and Rajsamand districts on east side, Udaipur and Sirohi on south side and Jalore and Barmer districts on west side. It covers an area of 12,387 sq. km. The district has a population of 2,037,573 with 164 population density, 987 sex ratio and a literacy rate of 62.39%. (Census 2011)

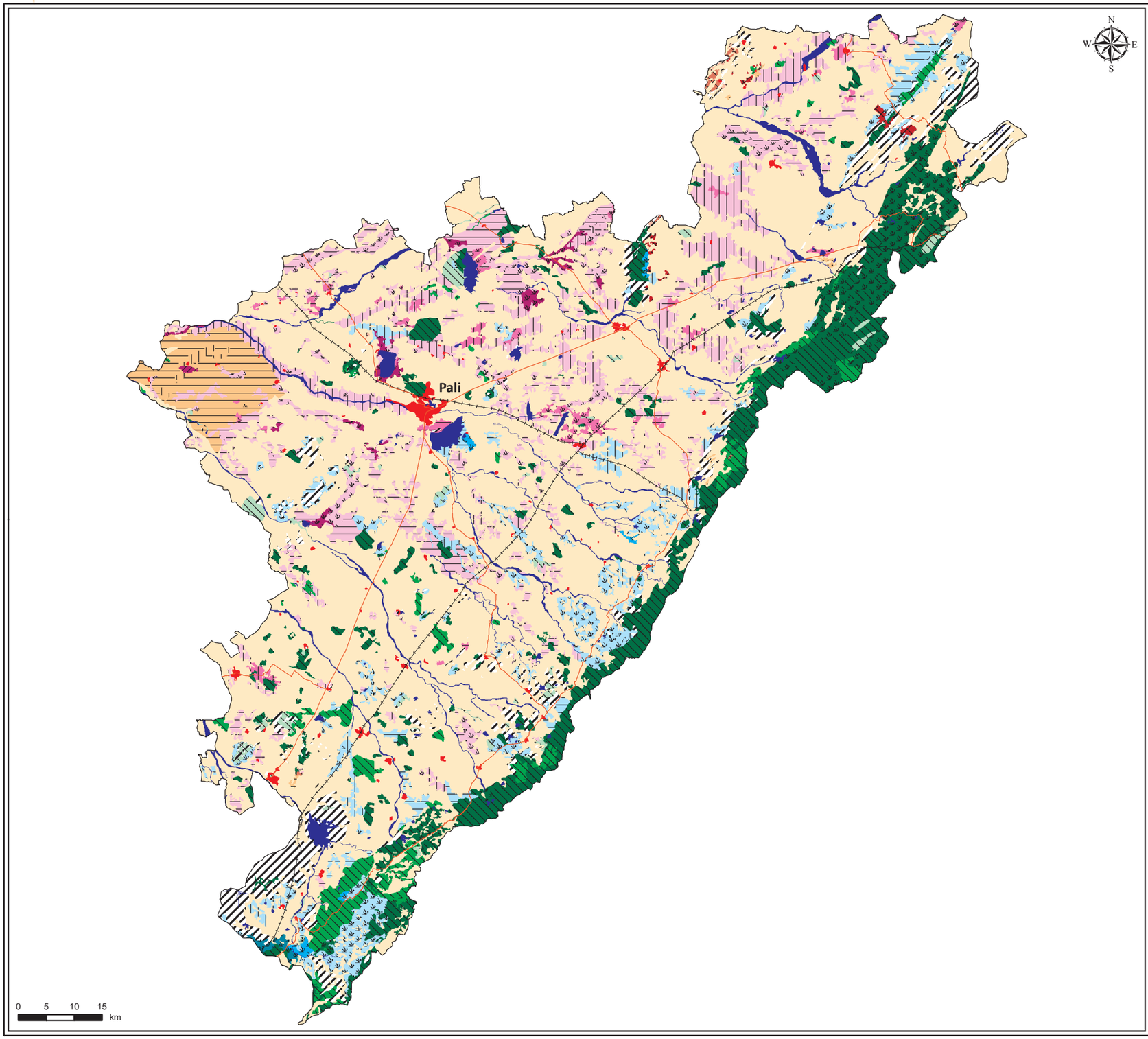
The topography of the district is sub mountainous and has undulated plains with scattered hills here and there. A long chain of Aravalli hills from Ajmer, Rajsamnd, Daipur and Sirohi districts connect the district. The highest hill peak of Aravali in the district is 1099-meter high. There is no perennial river in the district. The soil of the district is mostly sandy loan. The lower level of the sand is made of rocks of calium carbonate. The soils in the lower part of district have good permeability and therefore appropriate for agricultural operations. Whereas, the soil in upper half area have less permeability, saline in nature and not unusable for cultivation. The major river in the district are Luni, Sukri, Bandi and Jawai.

Pali is observed with 37.51% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.04% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (12.62% during 2011-13 and 12.60% during 2003-05) followed by Salinity/Alkalinity (12.54% during 2011-13 & 12.49% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	156384.25	12.62	156099.59	12.60	284.67
Water Erosion	63227.51	5.10	63394.59	5.12	-167.08
Wind Erosion	30231.18	2.44	32229.76	2.60	-1998.58
Salinity / Alkalinity	155331.98	12.54	154740.71	12.49	591.27
Man Made	2889.41	0.23	2816.01	0.23	73.39
Barren/Rocky	49419.37	3.99	49419.37	3.99	0.00
Settlement	7188.92	0.58	5483.63	0.44	1705.29
Total Area under Desertification	**464672.62**	**37.51**	**464183.66**	**37.47**	**488.96**
No Apparent Degradation	**743161.05**	**60.00**	**743851.38**	**60.05**	**-690.33**
Total Geographical Area (ha)	**1238700.00**				



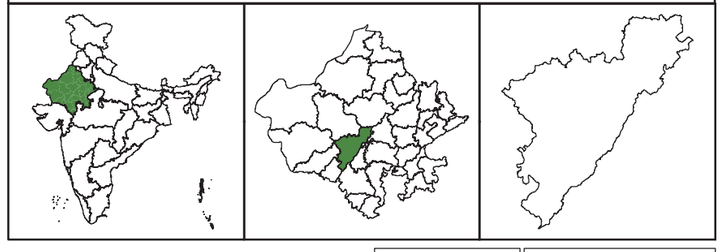
SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	83417.95	6.73	83133.28	6.71	284.67
2	Fv2	Forest, vegetation degradation, Moderate	27734.65	2.24	27734.65	2.24	0.00
3	Fv3	Forest, vegetation degradation, Severe	8843.70	0.71	8843.70	0.71	0.00
4	Sv1	Land with scrub, vegetation degradation, Slight	32145.08	2.60	32145.08	2.60	0.00
5	Sv2	Land with scrub, vegetation degradation, Moderate	2745.94	0.22	2745.94	0.22	0.00
6	Sv3	Land with scrub, vegetation degradation, Severe	1496.94	0.12	1496.94	0.12	0.00
7	Iw1	Agriculture irrigated, water erosion, Slight	10410.08	0.84	10535.60	0.85	-125.52
8	Dw1	Agriculture unirrigated, water erosion, Slight	10774.79	0.87	10816.35	0.87	-41.56
9	Sw1	Land with scrub, water erosion, Slight	38744.13	3.13	38744.13	3.13	0.00
10	Sw2	Land with scrub, water erosion, Moderate	1884.16	0.15	1884.16	0.15	0.00
11	Sw3	Land with scrub, water erosion, Severe	1414.34	0.11	1414.34	0.11	0.00
12	Ie1	Agriculture irrigated, wind erosion, Slight	1885.41	0.15	0.00	0.00	1885.41
13	De1	Agriculture unirrigated, wind erosion, Slight	27668.64	2.23	31552.63	2.55	-3883.99
14	Se1	Land with scrub, wind erosion, Slight	299.61	0.02	299.61	0.02	0.00
15	Ee1	Dune / Sandy area, wind erosion, Slight	377.53	0.03	377.53	0.03	0.00
16	Is1	Agriculture irrigated, salinity / alkalinity, Slight	58703.66	4.74	58873.91	4.75	-170.25
17	Is2	Agriculture irrigated, salinity / alkalinity, Moderate	3305.71	0.27	3305.71	0.27	0.00
18	Is3	Agriculture irrigated, salinity / alkalinity, Severe	116.32	0.01	116.32	0.01	0.00
19	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight	54277.71	4.38	53358.81	4.31	918.90
20	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate	2464.10	0.20	2464.10	0.20	0.00
21	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe	165.96	0.01	165.96	0.01	0.00
22	Ss1	Land with scrub, salinity / alkalinity, Slight	24846.62	2.01	25004.00	2.02	-157.38
23	Ss2	Land with scrub, salinity / alkalinity, Moderate	5920.38	0.48	5920.38	0.48	0.00
24	Ss3	Land with scrub, salinity / alkalinity, Severe	5223.31	0.42	5223.31	0.42	0.00
25	Bs3	Barren, salinity / alkalinity, Severe	308.20	0.02	308.20	0.02	0.00
26	Tm1	Others, man made, Slight	352.18	0.03	330.37	0.03	21.81
27	Tm2	Others, man made, Moderate	850.64	0.07	850.64	0.07	0.00
28	Tm3	Others, man made, Severe	1686.59	0.14	1635.01	0.13	51.58
29	B	Barren	352.56	0.03	352.56	0.03	0.00
30	R	Rocky	49066.81	3.96	49066.81	3.96	0.00
31	S	Settlement	7188.92	0.58	5483.63	0.44	1705.29
Total Area Under Desertification/ Land Degradation			**464672.62**	**37.51**	**464183.66**	**37.47**	**488.96**
32	W	Water body/ Drainage	30866.33	2.49	30664.96	2.48	201.37
33	NAD	No Apparent Degradation	743161.05	60.00	743851.38	60.05	-690.33
Total Geographical Area (ha)			**1238700.00**	**100.00**	**1238700.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Pali District, Rajasthan
Timeframe - 2011-13

Legend		
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Sw1	Land with scrub, water erosion, Slight
	Sw2	Land with scrub, water erosion, Moderate
	Sw3	Land with scrub, water erosion, Severe
	Ie1	Agriculture irrigated, wind erosion, Slight
	De1	Agriculture unirrigated, wind erosion, Slight
	Se1	Land with scrub, wind erosion, Slight
	Ee1	Dune / Sandy area, wind erosion, Slight
	Is1	Agriculture irrigated, salinity / alkalinity, Slight
	Is2	Agriculture irrigated, salinity / alkalinity, Moderate
	Is3	Agriculture irrigated, salinity / alkalinity, Severe
	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight
	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate
	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe
	Ss1	Land with scrub, salinity / alkalinity, Slight
	Ss2	Land with scrub, salinity / alkalinity, Moderate
	Ss3	Land with scrub, salinity / alkalinity, Severe
	Bs3	Barren, salinity / alkalinity, Severe
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	B	Barren
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Location Map



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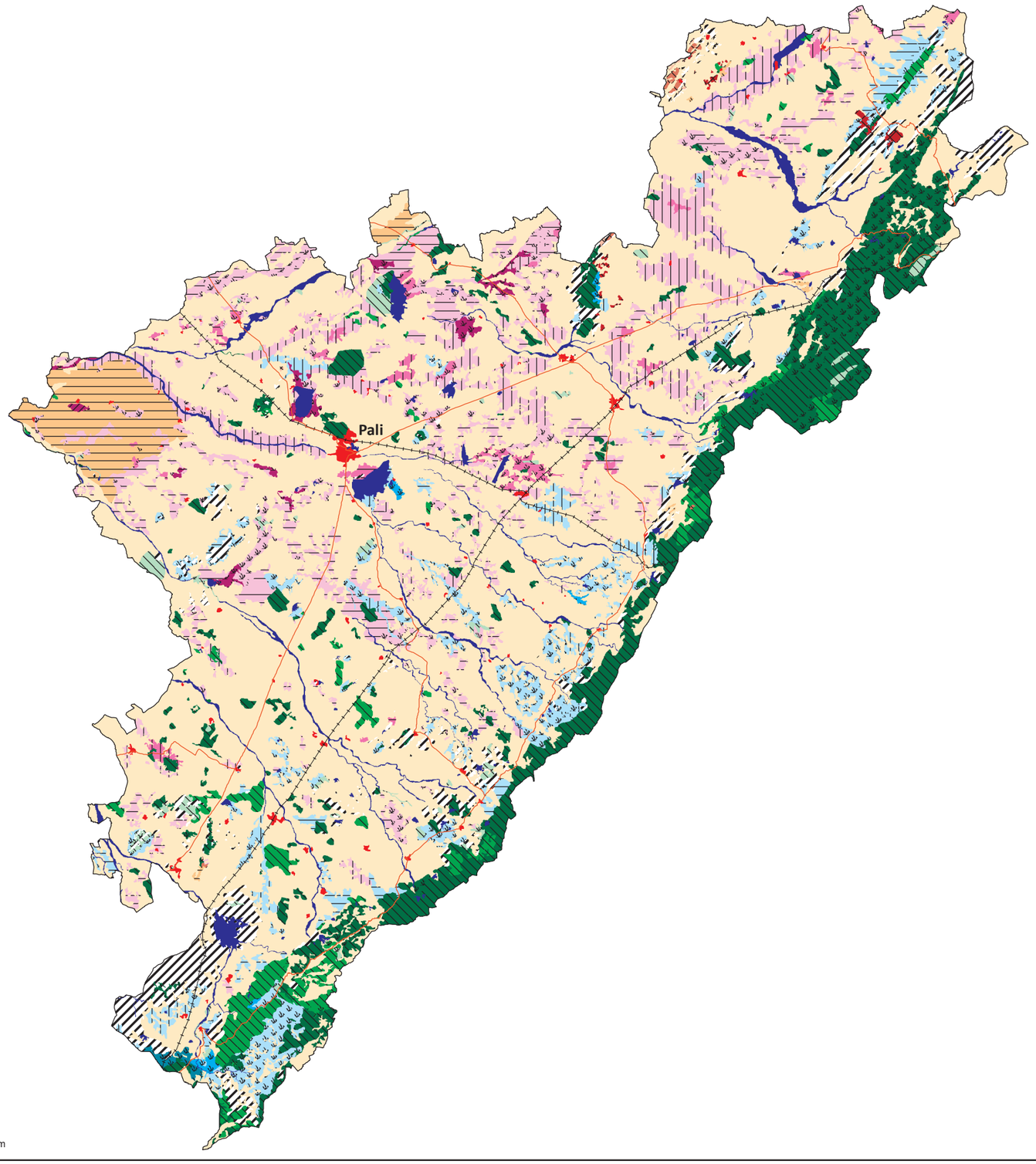
&
Space Applications Centre, ISRO, Ahmedabad

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary
Major Road
Major Rail

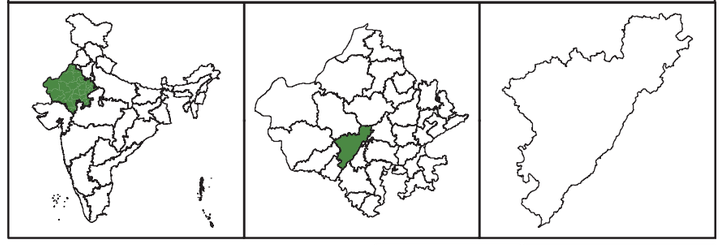


DESERTIFICATION / LAND DEGRADATION STATUS MAP
Pali District, Rajasthan
Timeframe - 2003-05

Legend

Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Sw1	Land with scrub, water erosion, Slight
	Sw2	Land with scrub, water erosion, Moderate
	Sw3	Land with scrub, water erosion, Severe
	De1	Agriculture unirrigated, wind erosion, Slight
	Se1	Land with scrub, wind erosion, Slight
	Ee1	Dune / Sandy area, wind erosion, Slight
	Is1	Agriculture irrigated, salinity / alkalinity, Slight
	Is2	Agriculture irrigated, salinity / alkalinity, Moderate
	Is3	Agriculture irrigated, salinity / alkalinity, Severe
	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight
	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate
	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe
	Ss1	Land with scrub, salinity / alkalinity, Slight
	Ss2	Land with scrub, salinity / alkalinity, Moderate
	Ss3	Land with scrub, salinity / alkalinity, Severe
	Bs3	Barren, salinity / alkalinity, Severe
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	B	Barren
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Location Map



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&
Space Applications Centre, ISRO, Ahmedabad

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

- International Boundary
- State Boundary
- District Bundary
- Major Road
- Major Rail

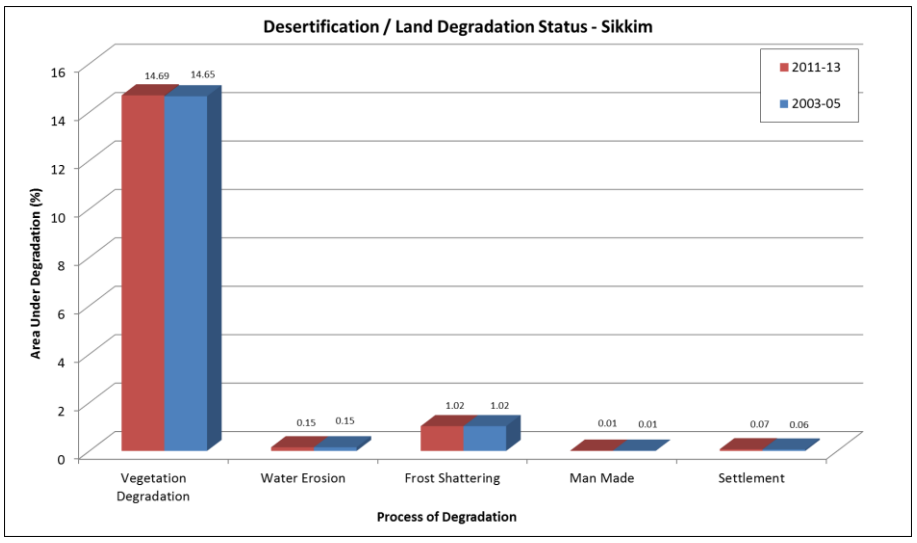
Sikkim

Sikkim state has four districts North Sikkim, South Sikkim, East Sikkim and West Sikkim. The state shares international border with Nepal on the West side, China on the north side, Bhutan on the east side. It shares state border with West Bengal to its south. It covers an area of 7,096 sq. km area. The state has a population of 6,10,577 with 86 population density, 890 sex ratio and a literacy rate of 81.42%.

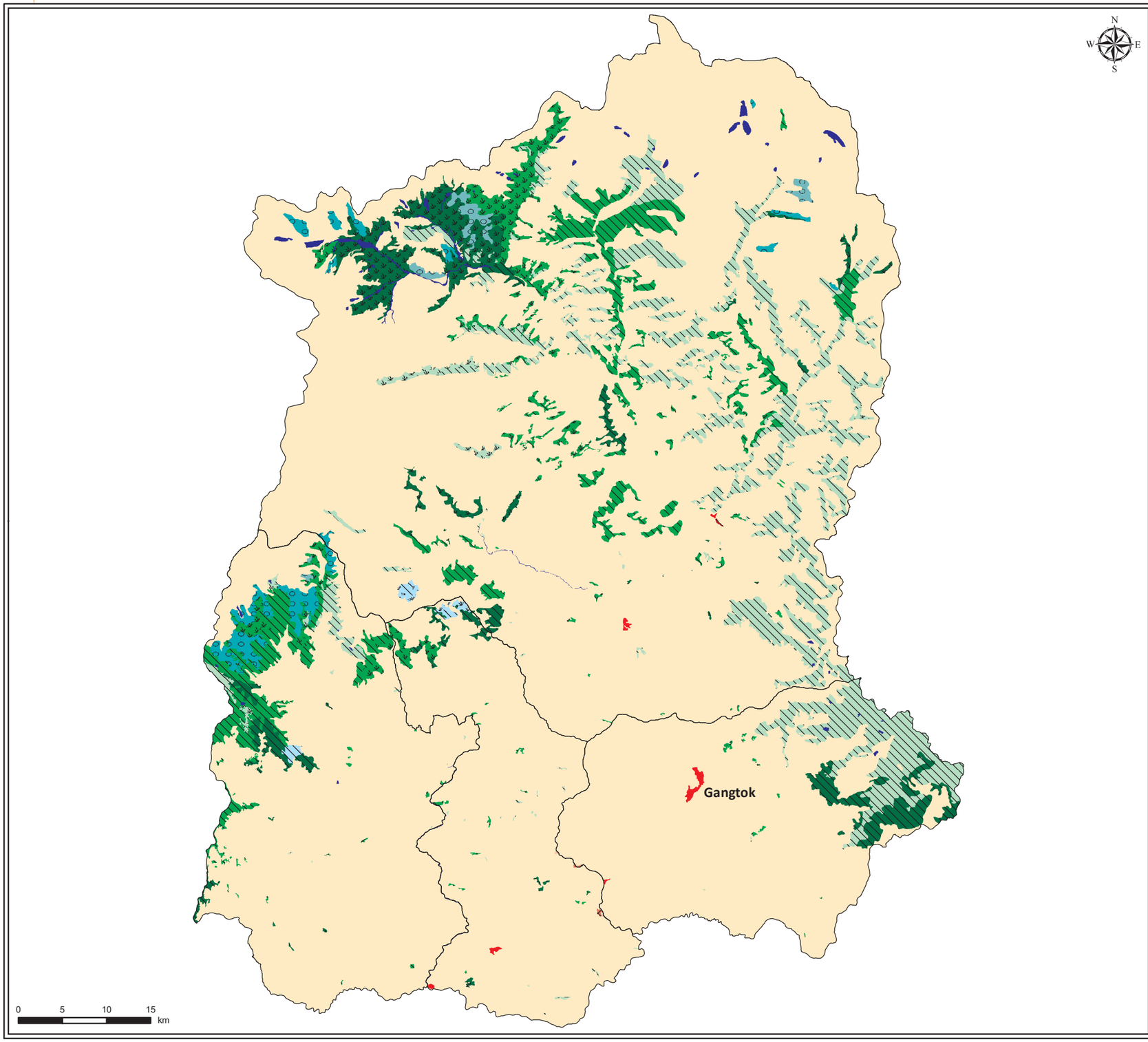
Sikkim is a mountain state of eastern Himalaya having world's third largest peak Kanchanjunga, 28,162 feet height. Two principle mountain ranges are the Singilela and Chola, which start in the north and continue, following a more or less southerly direction. Between these ranges are the major rivers, Rangit and Teesta, forming the main channels of drainage. Sikkim experiences temperate Alpine climate with snowfall in winter season. The temperature ranges from below 0^{o}C in winter to 20^{o}C in summer.

Sikkim is observed with 15.95% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.05% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (14.69% during 2011-13 and 14.65% during 2003-05) followed by Frost Shattering (1.02% during 2011-13 and 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	104225.28	14.69	103958.95	14.65	266.32
Water Erosion	1074.31	0.15	1074.31	0.15	0.00
Frost Shattering	7262.16	1.02	7262.16	1.02	0.00
Man Made	93.02	0.01	93.02	0.01	0.00
Settlement	504.66	0.07	433.78	0.06	70.87
Total Area under Desertification	**113159.42**	**15.95**	**112822.22**	**15.90**	**337.20**
No Apparent Degradation	**594033.84**	**83.71**	**594371.04**	**83.76**	**-337.20**
Total Geographical Area (ha)	**709600.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	9914.53	1.40	9623.08	1.36	291.44
2	Fv2	Forest, vegetation degradation, Moderate	23949.25	3.38	23974.37	3.38	-25.12
3	Fv3	Forest, vegetation degradation, Severe	45831.15	6.46	45831.15	6.46	0.00
4	Sv1	Land with scrub, vegetation degradation, Slight	11806.02	1.66	11806.02	1.66	0.00
5	Sv2	Land with scrub, vegetation degradation, Moderate	10951.20	1.54	10951.20	1.54	0.00
6	Sv3	Land with scrub, vegetation degradation, Severe	1773.13	0.25	1773.13	0.25	0.00
7	Fw1	Forest, water erosion, Slight	654.95	0.09	654.95	0.09	0.00
8	Sw1	Land with scrub, water erosion, Slight	419.36	0.06	419.36	0.06	0.00
9	Lf1	Periglacial, frost shattering, Slight	1951.89	0.28	1951.89	0.28	0.00
10	Lf2	Periglacial, frost shattering, Moderate	5310.27	0.75	5310.27	0.75	0.00
11	Fm3	Forest, man made, Severe	25.12	0.00	25.12	0.00	0.00
12	Tm1	Others, man made, Slight	9.41	0.00	9.41	0.00	0.00
13	Tm2	Others, man made, Moderate	58.48	0.01	58.48	0.01	0.00
14	S	Settlement	504.66	0.07	433.78	0.06	70.87
Total Area Under Desertification/ Land Degradation			**113159.42**	**15.95**	**112822.22**	**15.90**	**337.20**
15	W	Water body/ Drainage	2406.74	0.34	2406.74	0.34	0.00
16	NAD	No Apparent Degradation	594033.84	83.71	594371.04	83.76	-337.20
Total Geographical Area (ha)			**709600.00**	**100.00**	**709600.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Sikkim
Timeframe - 2011-13

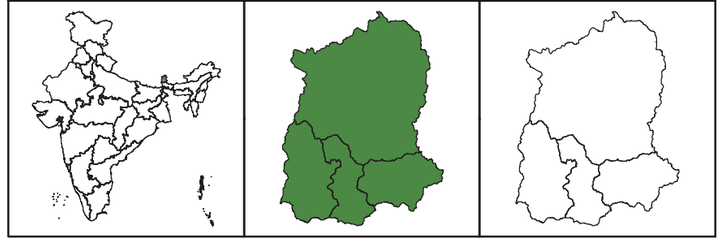
Legend

Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Fw1	Forest, water erosion, Slight
	Sw1	Land with scrub, water erosion, Slight
	Lf1	Periglacial, frost shattering, Slight
	Lf2	Periglacial, frost shattering, Moderate
	Fm3	Forest, man made, Severe
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Location Map



Prepared by:
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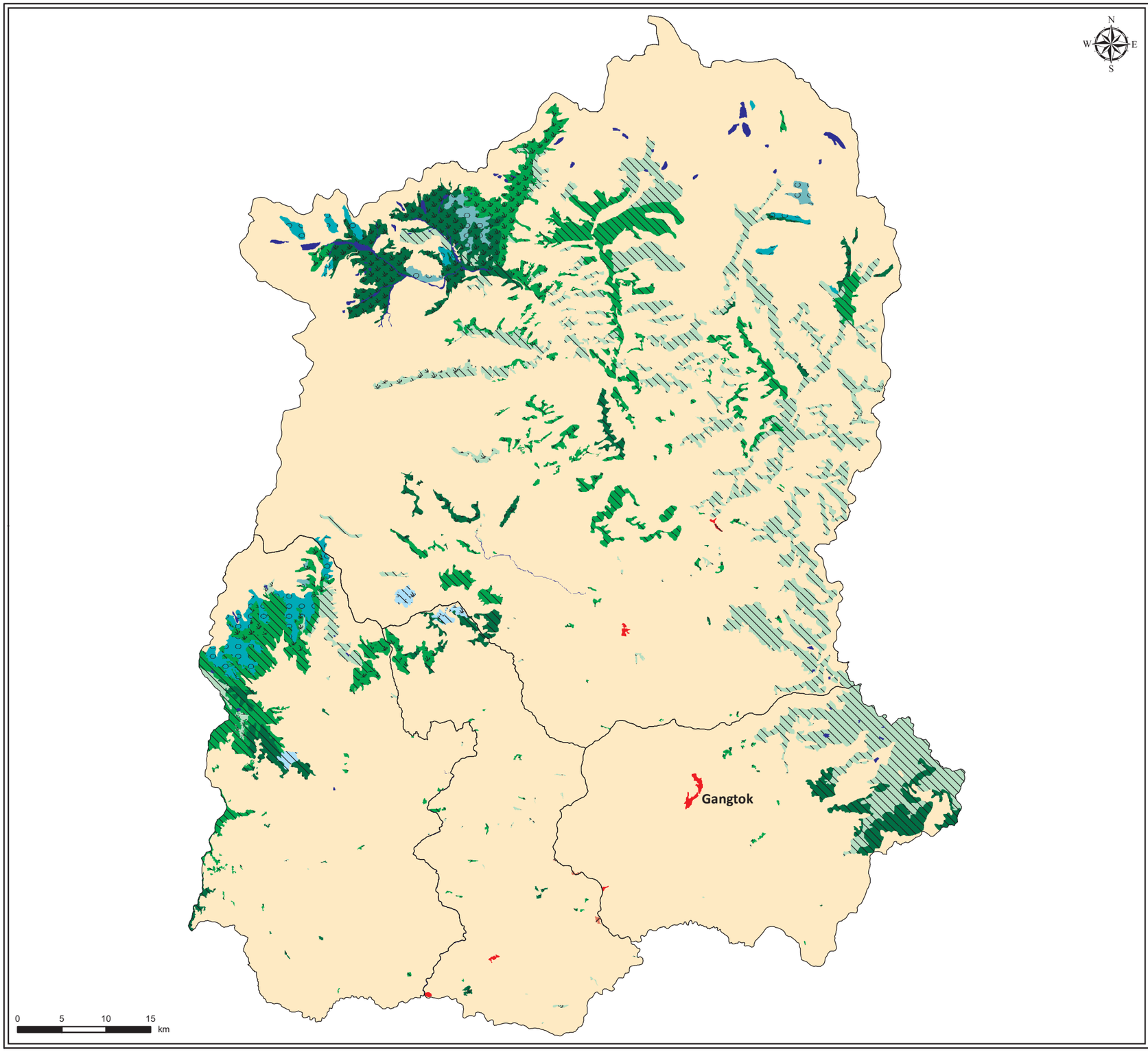
and
Sikkim State Centre of Space Technology, Sikkim



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Sikkim
Timeframe - 2003-05

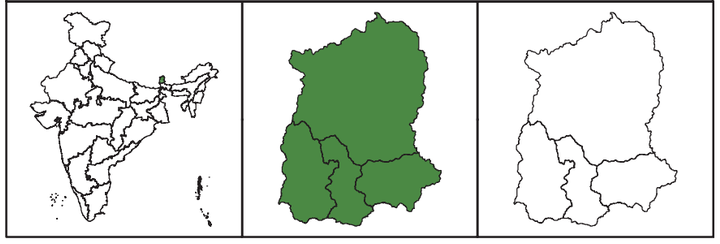
Legend

Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Fw1	Forest, water erosion, Slight
	Sw1	Land with scrub, water erosion, Slight
	Lf1	Periglacial, frost shattering, Slight
	Lf2	Periglacial, frost shattering, Moderate
	Fm3	Forest, man made, Severe
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Location Map



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and
Sikkim State Centre of Space Technology, Sikkim

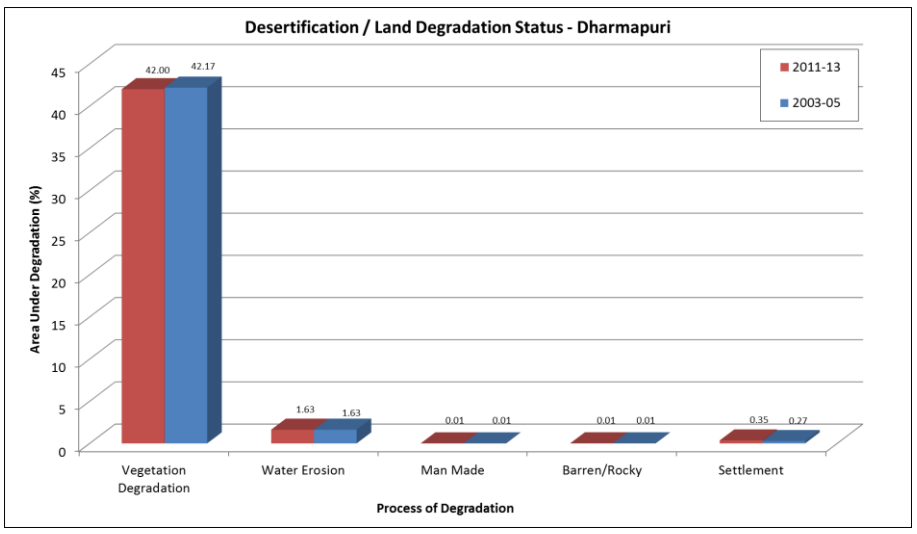
Dharmapuri District, Tamil Nadu

Dharmapuri district lies in northern part of Tamil Nadu state. It is bounded on the north by Krishnagiri district, on the east by Tiruvannamalai and Villupuram districts, on the south by Salem district, and on the west by Karnataka state. It covers an area of 4,497 sq. km. The district has a population of 15,06,843 with 335 population density, 946 sex ratio and a literacy rate of 68.50%. (Census 2011)

Dharmapuri district forms part of the upland plateau region of Tamil Nadu with many hilly ranges and undulating plains. The western part of the district has hill ranges of Mysore Plateau with a chain of undulating hills. The southern boundary of the district is occupied by the Servarayan hill ranges. The plains occupying the central, eastern and southern parts of the district. The district is drained by Cauvery and Ponnaiyar rivers and their tributaries.

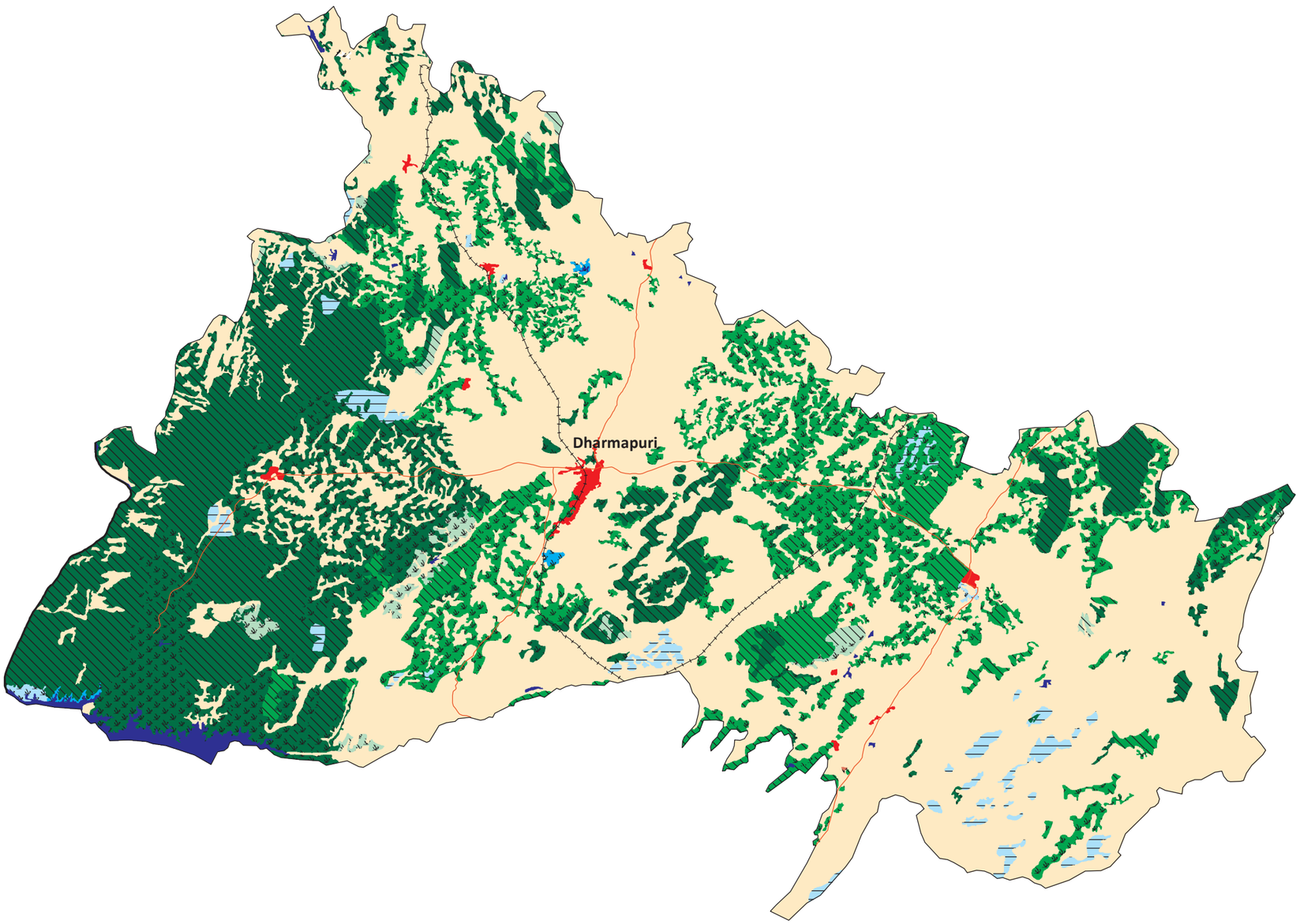
Dharmapuri is observed with 44.00% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has decreased about 0.1% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (42.00% during 2011-13 and 42.17% during 2003-05) followed by Water Erosion (1.63% during 2011-13 and 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	188854.48	42.00	189657.55	42.17	-803.07
Water Erosion	7326.61	1.63	7326.61	1.63	0.00
Man Made	27.57	0.01	27.57	0.01	0.00
Barren/Rocky	51.70	0.01	51.70	0.01	0.00
Settlement	1593.15	0.35	1235.38	0.27	357.77
Total Area under Desertification	**197853.49**	**44.00**	**198298.80**	**44.10**	**-445.31**
No Apparent Degradation	**248552.52**	**55.27**	**248031.93**	**55.15**	**520.59**
Total Geographical Area (ha)	**449700.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	75532.95	16.80	75508.91	16.79	24.04
2	Fv2	Forest, vegetation degradation, Moderate	16700.82	3.71	16700.82	3.71	0.00
3	Fv3	Forest, vegetation degradation, Severe	1512.61	0.34	1512.61	0.34	0.00
4	Sv1	Land with scrub, vegetation degradation, Slight	34746.62	7.73	35308.93	7.85	-562.31
5	Sv2	Land with scrub, vegetation degradation, Moderate	57319.07	12.75	57583.87	12.80	-264.80
6	Sv3	Land with scrub, vegetation degradation, Severe	3042.42	0.68	3042.42	0.68	0.00
7	Dw1	Agriculture unirrigated, water erosion, Slight	6289.21	1.40	6289.21	1.40	0.00
8	Sw1	Land with scrub, water erosion, Slight	542.28	0.12	542.28	0.12	0.00
9	Sw2	Land with scrub, water erosion, Moderate	495.12	0.11	495.12	0.11	0.00
10	Tm1	Others, man made, Slight	11.26	0.00	11.26	0.00	0.00
11	Tm2	Others, man made, Moderate	16.31	0.00	16.31	0.00	0.00
12	R	Rocky	51.70	0.01	51.70	0.01	0.00
13	S	Settlement	1593.15	0.35	1235.38	0.27	357.77
Total Area Under Desertification/ Land Degradation			**197853.49**	**44.00**	**198298.80**	**44.10**	**-445.31**
14	W	Water body/ Drainage	3293.98	0.73	3369.26	0.75	-75.28
15	NAD	No Apparent Degradation	248552.52	55.27	248031.93	55.15	520.59
Total Geographical Area (ha)			**449700.00**	**100.00**	**449700.00**	**100.00**	

DESERTIFICATION / LAND DEGRADATION STATUS MAP
Dharmapuri District, Tamil Nadu
Timeframe - 2011-13



Legend

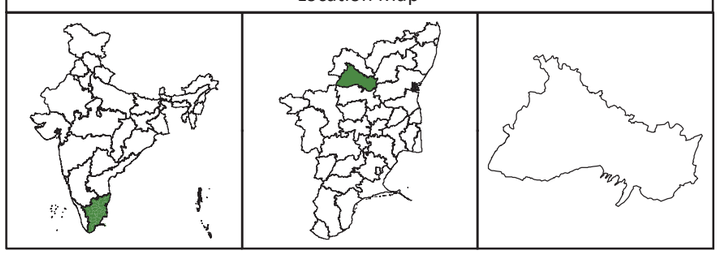
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Sw1	Land with scrub, water erosion, Slight
	Sw2	Land with scrub, water erosion, Moderate
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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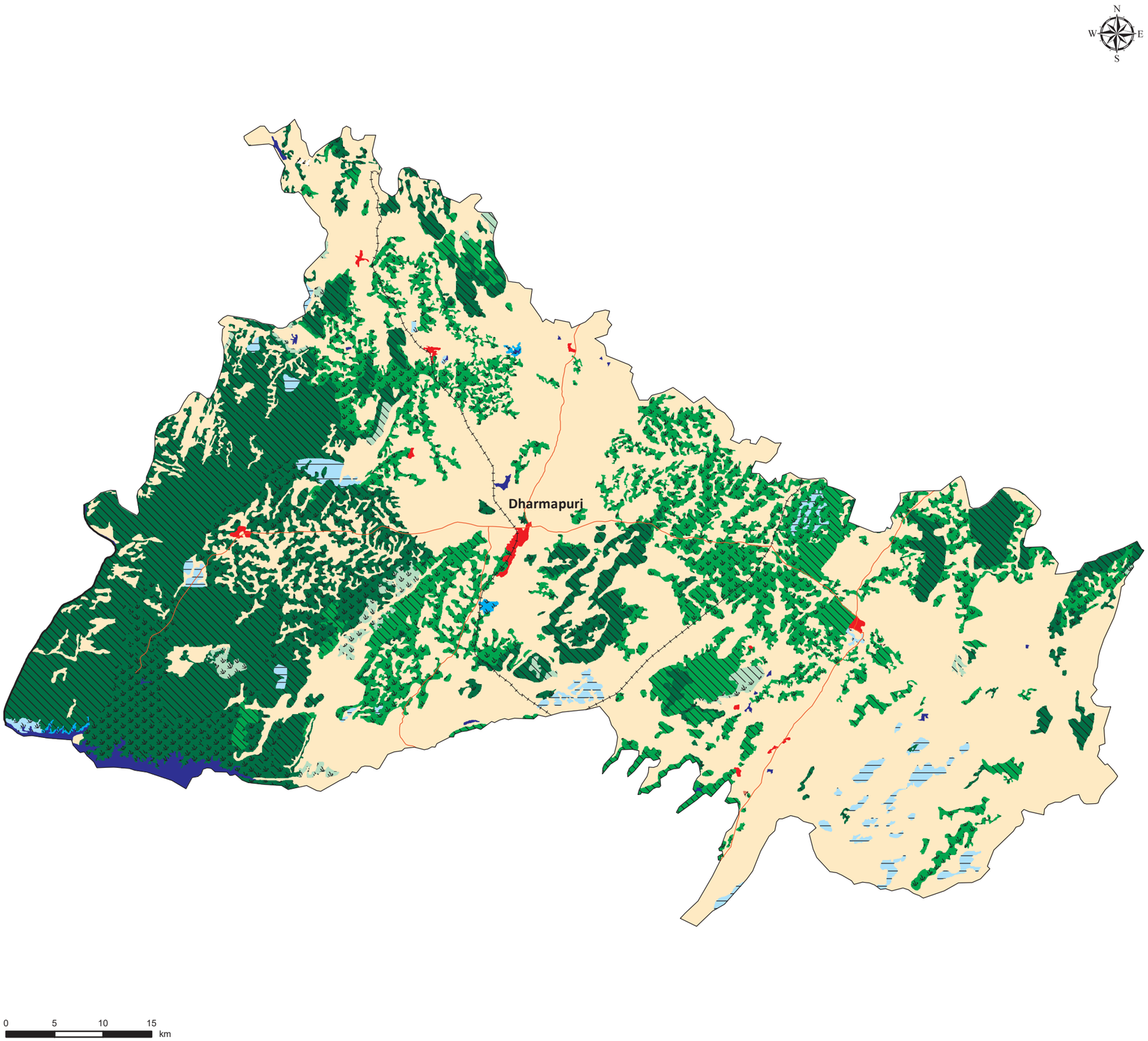
&
Space Applications Centre, ISRO, Ahmedabad



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Dharmapuri District, Tamil Nadu
Timeframe - 2003-05

Legend

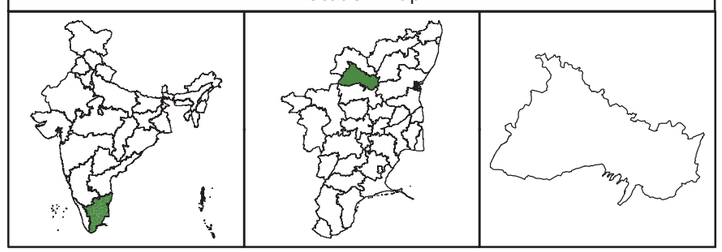
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Sw1	Land with scrub, water erosion, Slight
	Sw2	Land with scrub, water erosion, Moderate
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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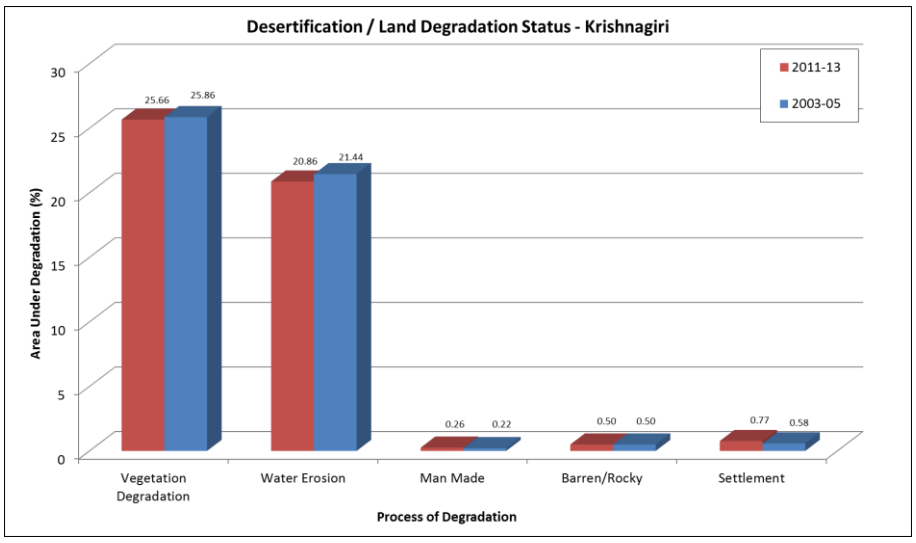
Krishnagiri District, Tamil Nadu

Krishnagiri district is located in northern part of Tamil Nadu state. It is bounded by Karnataka state on north-west and north sides, Andhra Pradesh state on north-east side, Vellore and Tiruvannamalai districts on east side and Dharmapuri district on south side. It covers an area of 5,129 sq. km. The district has a population of 18,79,809 with 367 population density, 958 sex ratio and a literacy rate of 71.50%. (Census 2011)

The district is mostly a mountainous terrain, elevation rages between 300 - 1400 mts above the mean sea level. The south western part of Deccan Plateau lies in this district. Eastern part of the district experiences hot climate and Western part has a contrasting cold climate. Around 40% area of the district is covered with forest. The hill ranges of this district are called by the name Melagiri. The main rivers that flow across the district are Cauvery and South Pennar.

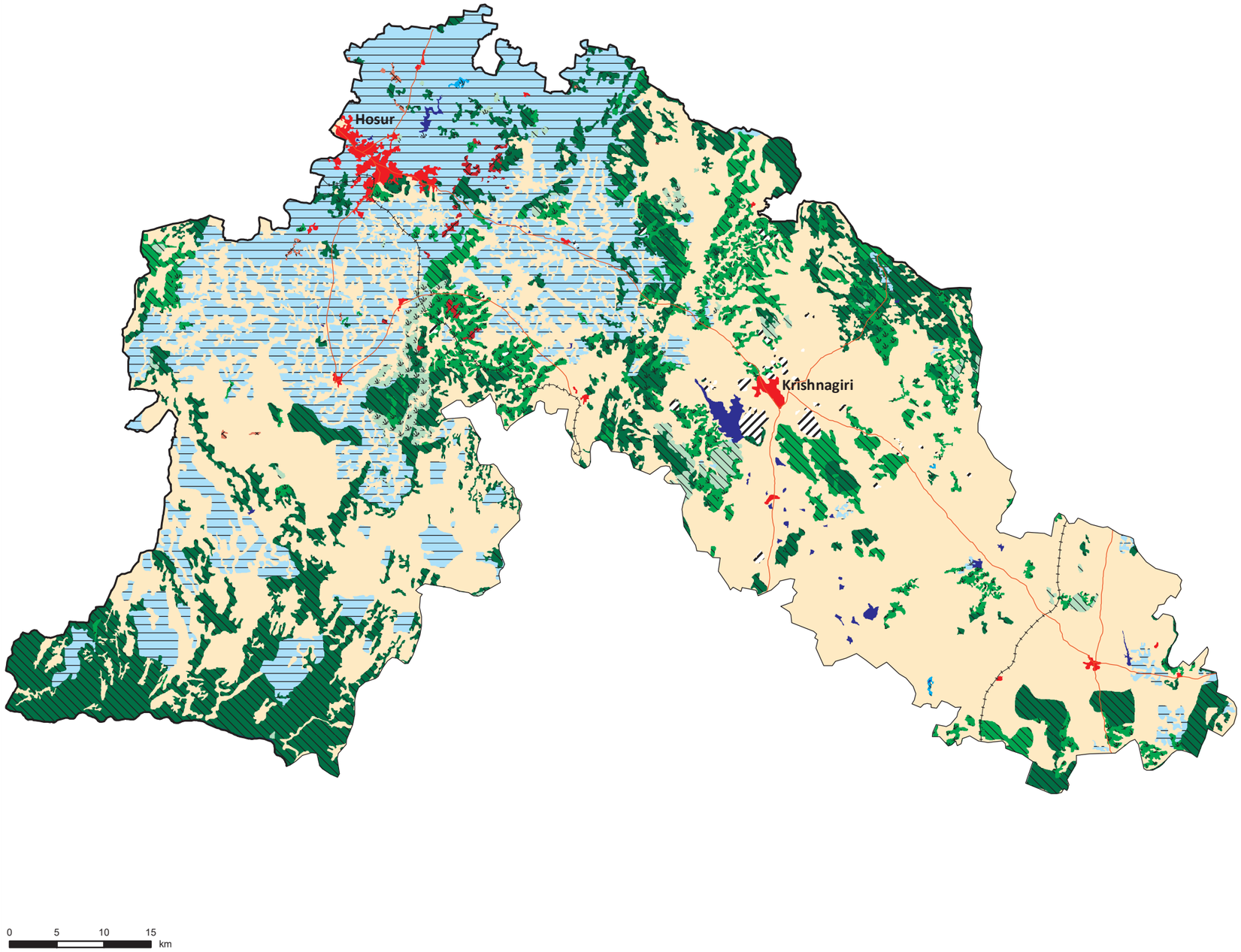
Krishnagiri is observed with 48.05% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has decreased about 0.54% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (25.66% during 2011-13 and 25.86% during 2003-05) followed by Water Erosion (20.86% during 2011-13 and 21.44% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	131605.91	25.66	132616.03	25.86	-1010.12
Water Erosion	107014.32	20.86	109948.58	21.44	-2934.26
Man Made	1323.03	0.26	1132.16	0.22	190.88
Barren/Rocky	2550.49	0.50	2550.49	0.50	0.00
Settlement	3929.81	0.77	2986.48	0.58	943.33
Total Area under Desertification	**246423.56**	**48.05**	**249233.73**	**48.59**	**-2810.17**
No Apparent Degradation	**264231.52**	**51.52**	**261421.36**	**50.97**	**2810.17**
Total Geographical Area (ha)	**512900.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	76705.50	14.96	76705.50	14.96	0.00
2	Fv2	Forest, vegetation degradation, Moderate	14320.20	2.79	14320.20	2.79	0.00
3	Fv3	Forest, vegetation degradation, Severe	3691.31	0.72	3691.31	0.72	0.00
4	Sv1	Land with scrub, vegetation degradation, Slight	8530.39	1.66	8530.39	1.66	0.00
5	Sv2	Land with scrub, vegetation degradation, Moderate	24293.61	4.74	25320.03	4.94	-1026.43
6	Sv3	Land with scrub, vegetation degradation, Severe	4064.90	0.79	4048.59	0.79	16.31
7	Dw1	Agriculture unirrigated, water erosion, Slight	106654.86	20.79	109589.12	21.37	-2934.26
8	Sw1	Land with scrub, water erosion, Slight	166.01	0.03	166.01	0.03	0.00
9	Sw2	Land with scrub, water erosion, Moderate	193.44	0.04	193.44	0.04	0.00
10	Tm1	Others, man made, Slight	0.00	0.00	185.50	0.04	-185.50
11	Tm2	Others, man made, Moderate	367.36	0.07	139.94	0.03	227.41
12	Tm3	Others, man made, Severe	955.68	0.19	806.72	0.16	148.96
13	R	Rocky	2550.49	0.50	2550.49	0.50	0.00
14	S	Settlement	3929.81	0.77	2986.48	0.58	943.33
Total Area Under Desertification/ Land Degradation			**246423.56**	**48.05**	**249233.73**	**48.59**	**-2810.17**
15	W	Water body/ Drainage	2244.92	0.44	2244.92	0.44	0.00
16	NAD	No Apparent Degradation	264231.52	51.52	261421.36	50.97	2810.17
Total Geographical Area (ha)			**512900.00**	**100.00**	**512900.00**	**100.00**	

DESERTIFICATION / LAND DEGRADATION STATUS MAP
Krishnagiri District, Tamil Nadu
Timeframe - 2011-13



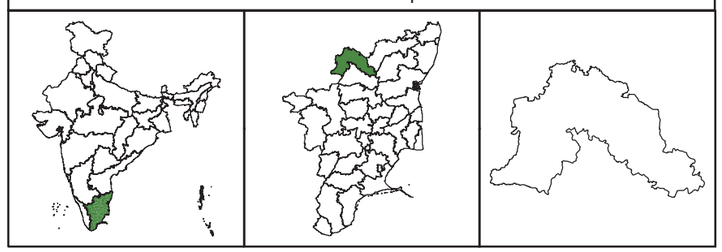
Legend

Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Sw1	Land with scrub, water erosion, Slight
	Sw2	Land with scrub, water erosion, Moderate
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary
Major Road
Major Rail

Location Map



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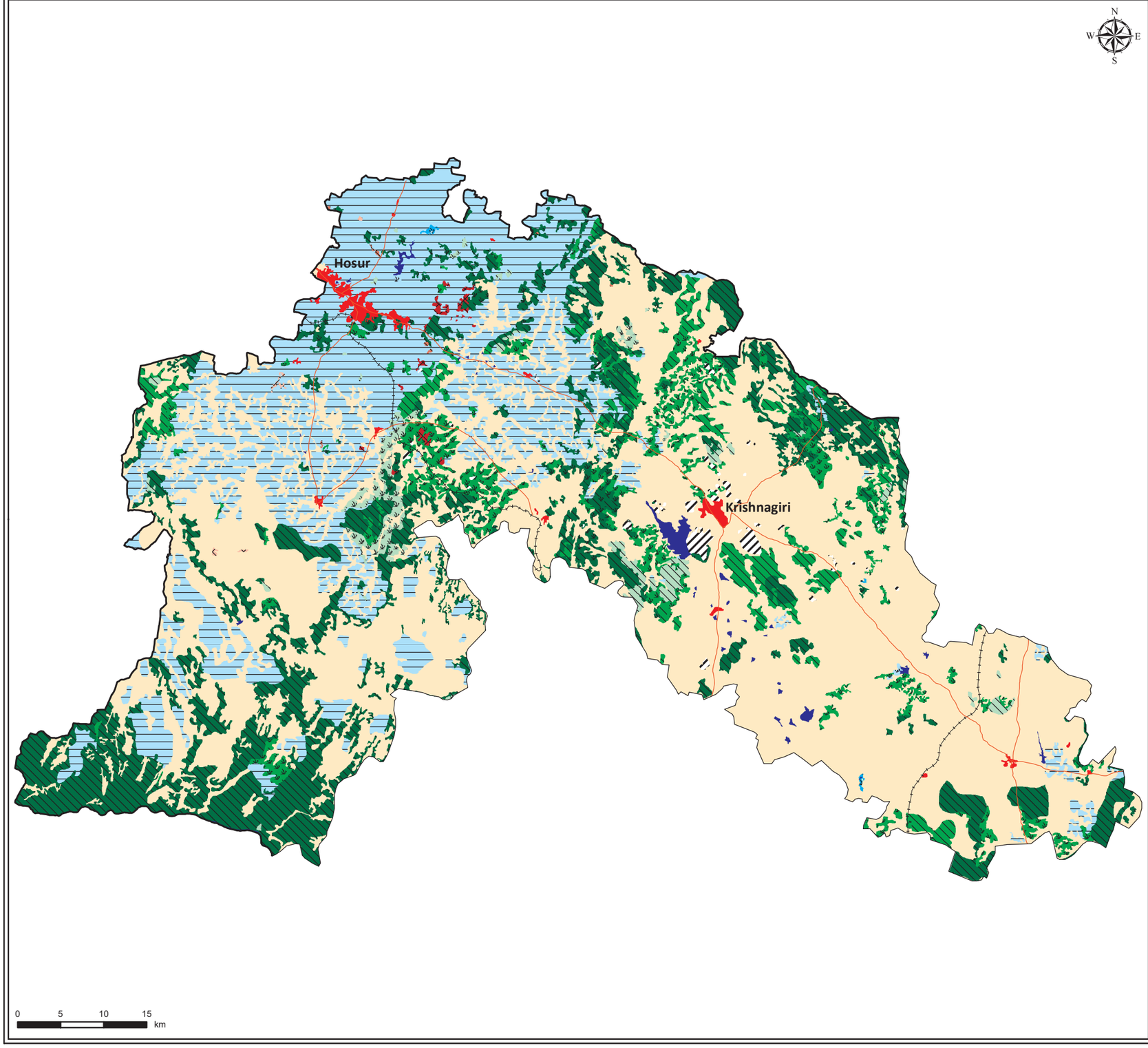


DESERTIFICATION / LAND DEGRADATION STATUS MAP
Krishnagiri District, Tamil Nadu
Timeframe - 2003-05

Legend

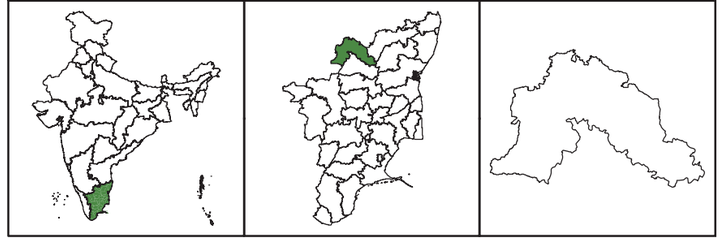
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Sw1	Land with scrub, water erosion, Slight
	Sw2	Land with scrub, water erosion, Moderate
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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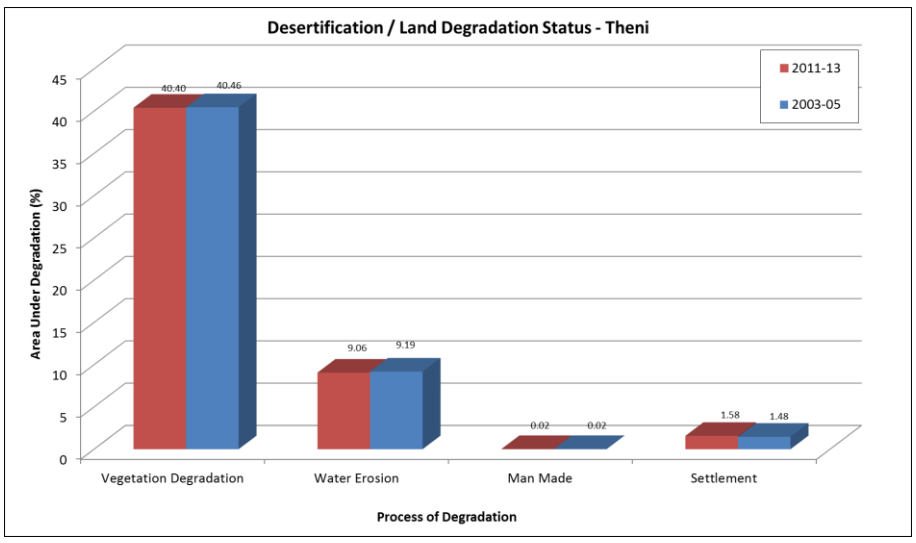
Theni District, Tamil Nadu

Theni district lies in the southern part of Tamil Nadu state. It is bordering the Kerala state on the west and south sides, bounded by Dindigul district on north and north-east sides, Madurai district on east side and Virudhunagar district on south side. It covers an area of 2,868 sq. km. The district has a population of 12,45,899 with 434 population density, 991 sex ratio and a literacy rate of 77.26%. (Census 2011)

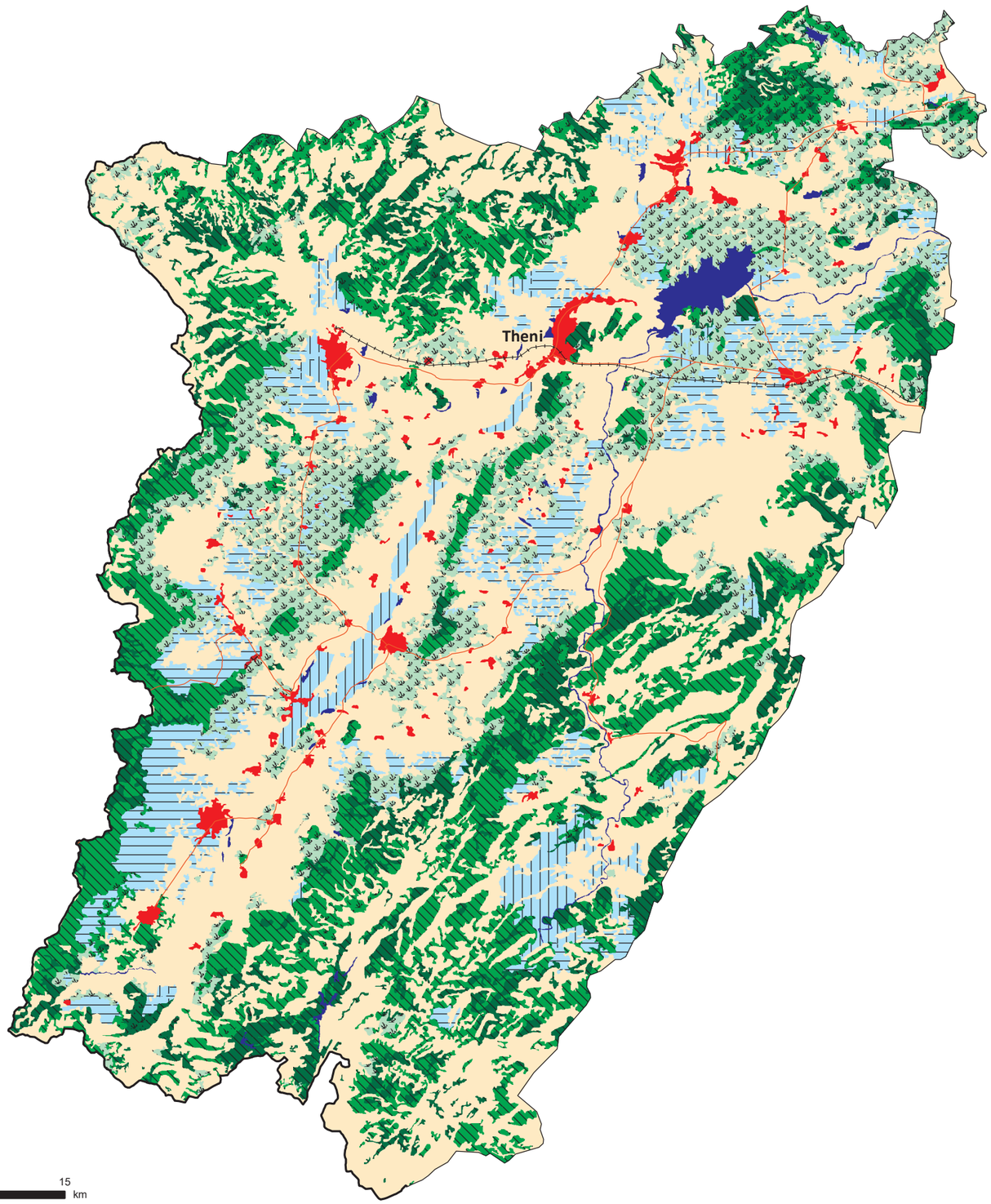
The Western Ghats separate the district from the neighboring State of Kerala on the west side. The district is protected by hills on the western and northern sides. About 33.70% area of the district is covered with forest. The important rivers in the district are Periyar and Vaigai. These rivers are contiguous by the natural formation of the several hills and valleys. Periyar, Vaigai and Manjalar are the major dams support irrigation in the districts.

Theni is observed with 51.06% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has decreased about 0.09% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (40.40% during 2011-13 and 40.46% during 2003-05) followed by Water Erosion (9.06% during 2011-13 and 9.19% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	115865.68	40.40	116026.99	40.46	-161.31
Water Erosion	25992.94	9.06	26355.08	9.19	-362.14
Man Made	69.80	0.02	69.80	0.02	0.00
Settlement	4521.34	1.58	4237.00	1.48	284.34
Total Area under Desertification	**146449.76**	**51.06**	**146688.88**	**51.15**	**-239.12**
No Apparent Degradation	**137485.71**	**47.94**	**137246.60**	**47.85**	**239.12**
Total Geographical Area (ha)	**286800.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	23507.61	8.20	23615.93	8.23	-108.32
2	Fv2	Forest, vegetation degradation, Moderate	41118.98	14.34	41054.39	14.31	64.60
3	Sv1	Land with scrub, vegetation degradation, Slight	3229.41	1.13	3216.18	1.12	13.23
4	Sv2	Land with scrub, vegetation degradation, Moderate	10385.43	3.62	10466.52	3.65	-81.09
5	Sv3	Land with scrub, vegetation degradation, Severe	37624.24	13.12	37673.97	13.14	-49.73
6	Iw1	Agriculture irrigated, water erosion, Slight	8327.64	2.90	8419.14	2.94	-91.50
7	Dw1	Agriculture unirrigated, water erosion, Slight	17665.30	6.16	17935.94	6.25	-270.64
8	Tm3	Others, man made, Severe	69.80	0.02	69.80	0.02	0.00
9	S	Settlement	4521.34	1.58	4237.00	1.48	284.34
Total Area Under Desertification/ Land Degradation			**146449.76**	**51.06**	**146688.88**	**51.15**	**-239.12**
10	W	Water body/ Drainage	2864.52	1.00	2864.52	1.00	0.00
11	NAD	No Apparent Degradation	137485.71	47.94	137246.60	47.85	239.12
Total Geographical Area (ha)			**286800.00**	**100.00**	**286800.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Theni District, Tamil Nadu
Timeframe - 2011-13

Legend

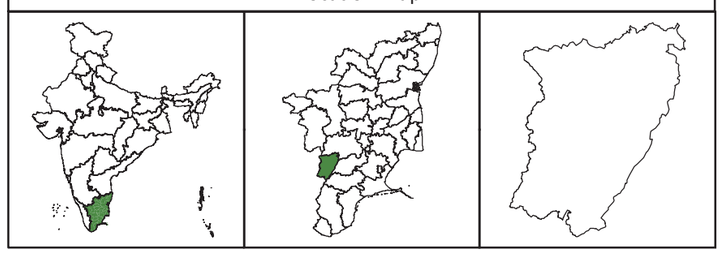
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Tm3	Others, man made, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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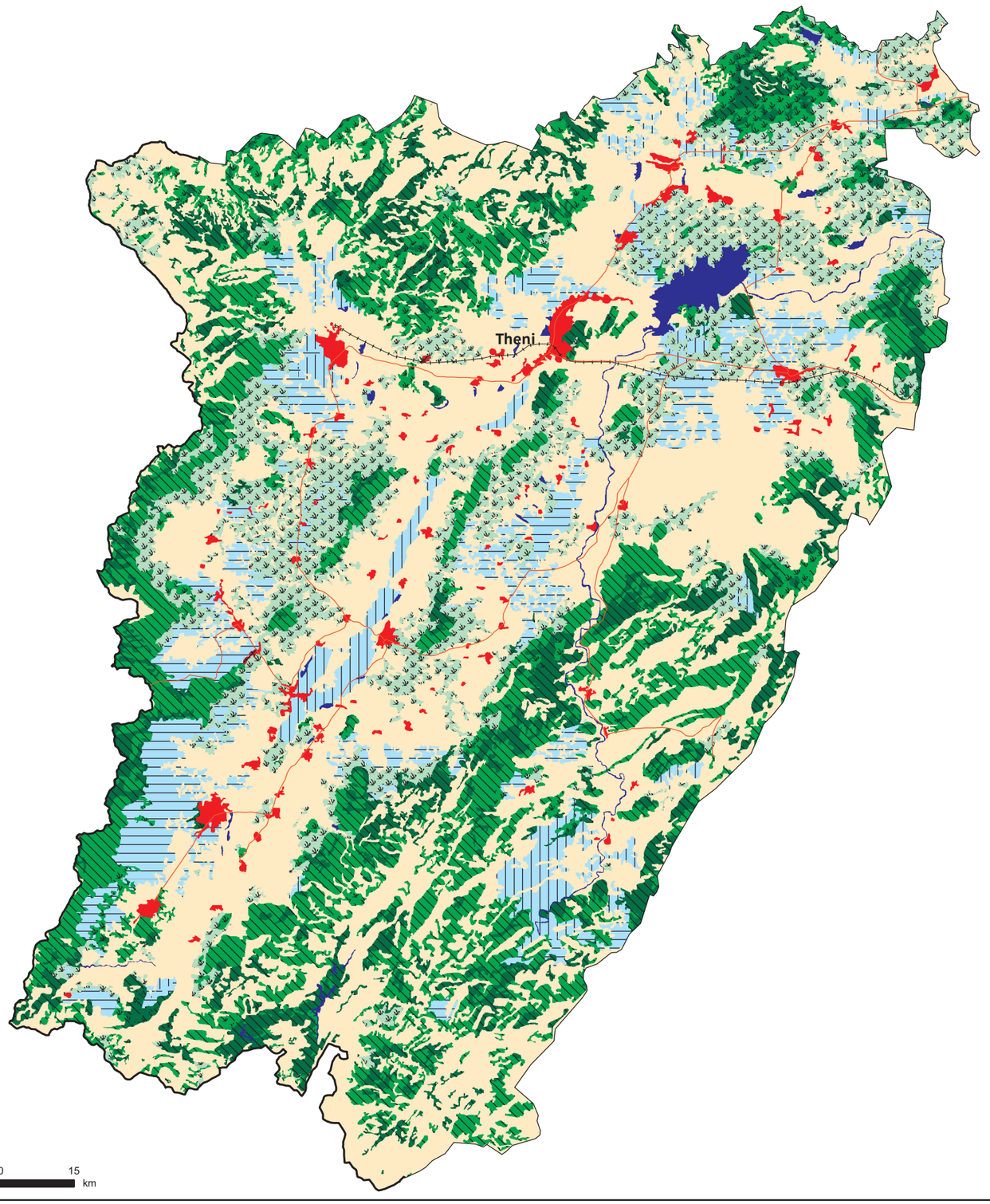


DESERTIFICATION / LAND DEGRADATION STATUS MAP
Theni District, Tamil Nadu
Timeframe - 2003-05

Legend

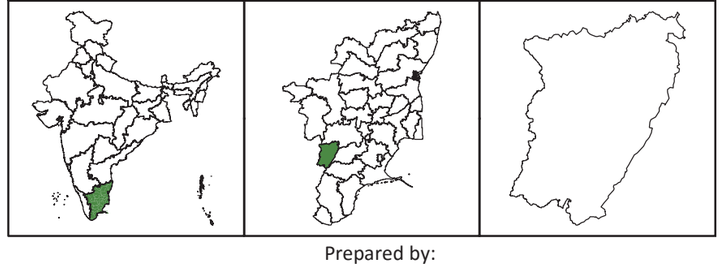
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Tm3	Others, man made, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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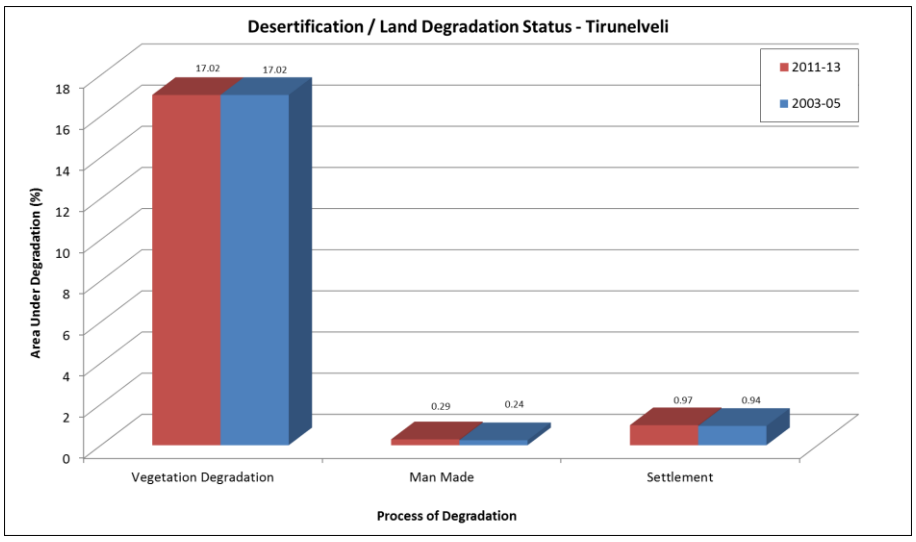
Tirunelveli District, Tamil Nadu

Tirunelveli district located in southern part of Tamil Nadu state, bordering Kerala on west side, Virudhunagar district in north side, Thoothukkudi district on east side and Kanniyakumari district on south-west side and Gulf of Mannar on south side. It covers an area of 6,693 sq. km. The district has a population of 30,77,233 with 460 population density, 1023 sex ratio and a literacy rate of 82.50%. (Census 2011)

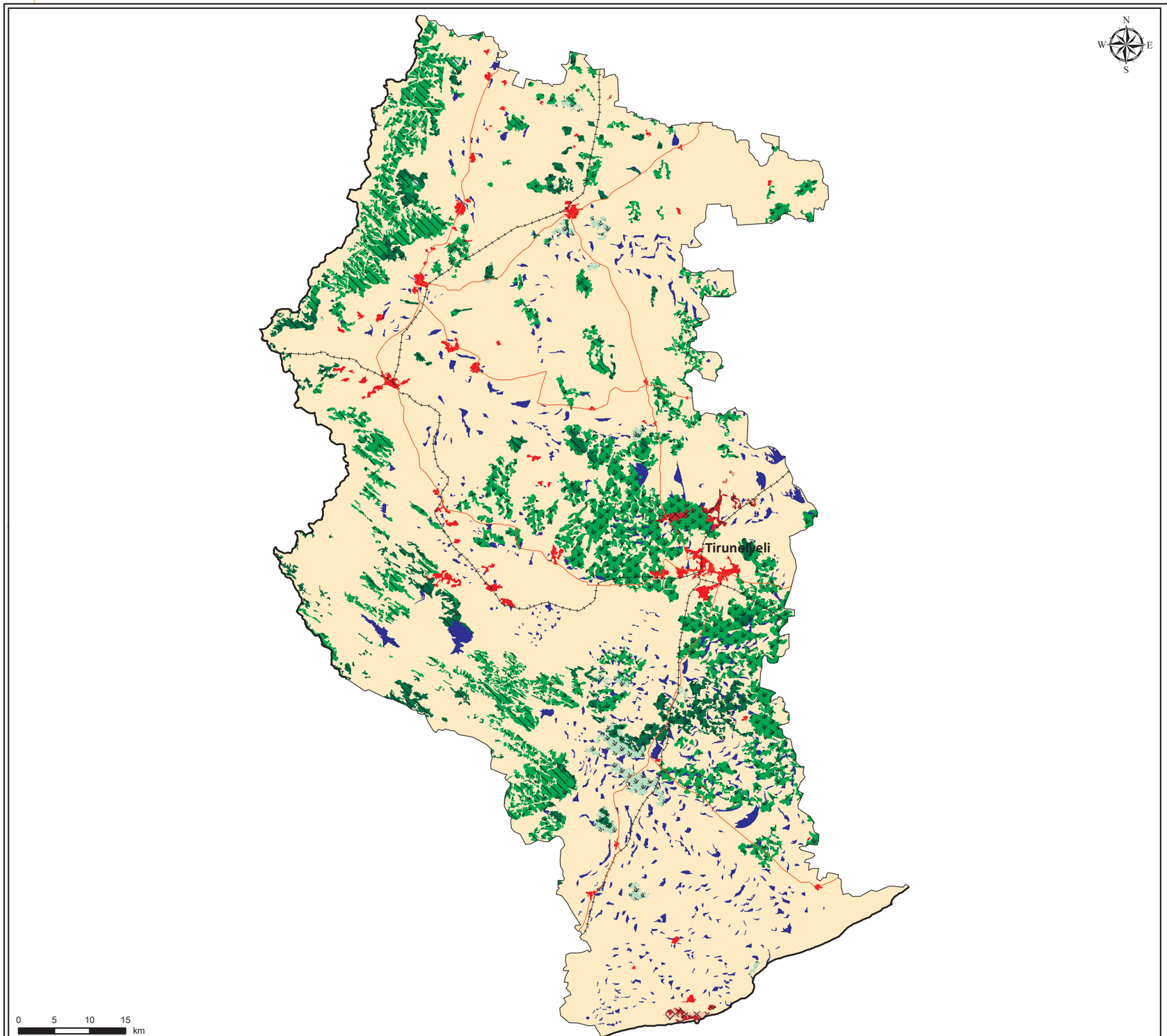
Western Ghats form a boundary with Kerala on the western side of the district. The Western Ghats run to a length of about 160 kms in the district. The district receives sufficient rainfall due to its position along the Western Ghats. The district is partly surrounded by the coast on the south. Thamirabarani is the main river traversing through this district. The lands on both sides of the river are very fertile and suited for paddy cultivation.

Tirunelveli is observed with 18.29% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.08% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (17.02% during 2011-13 and 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	113947.13	17.02	113947.13	17.02	0.00
Man Made	1915.10	0.29	1629.21	0.24	285.89
Settlement	6522.18	0.97	6281.67	0.94	240.51
Total Area under Desertification	**122384.41**	**18.29**	**121858.01**	**18.21**	**526.40**
No Apparent Degradation	**527443.85**	**78.81**	**527970.25**	**78.88**	**-526.40**
Total Geographical Area (ha)	**669300.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	9100.94	1.36	9100.94	1.36	0.00
2	Fv2	Forest, vegetation degradation, Moderate	27008.24	4.04	27008.24	4.04	0.00
3	Fv3	Forest, vegetation degradation, Severe	126.98	0.02	126.98	0.02	0.00
4	Sv1	Land with scrub, vegetation degradation, Slight	10060.76	1.50	10060.76	1.50	0.00
5	Sv2	Land with scrub, vegetation degradation, Moderate	61801.65	9.23	61801.65	9.23	0.00
6	Sv3	Land with scrub, vegetation degradation, Severe	5848.56	0.87	5848.56	0.87	0.00
7	Tm1	Others, man made, Slight	518.64	0.08	547.90	0.08	-29.26
8	Tm2	Others, man made, Moderate	108.64	0.02	144.56	0.02	-35.92
9	Tm3	Others, man made, Severe	1287.82	0.19	936.76	0.14	351.07
10	S	Settlement	6522.18	0.97	6281.67	0.94	240.51
Total Area Under Desertification/ Land Degradation			**122384.41**	**18.29**	**121858.01**	**18.21**	**526.40**
11	W	Water body/ Drainage	19471.74	2.91	19471.74	2.91	-0.01
12	NAD	No Apparent Degradation	527443.85	78.81	527970.25	78.88	-526.40
Total Geographical Area (ha)			**669300.00**	**100.00**	**669300.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Tirunelveli District, Tamil Nadu
Timeframe - 2011-13

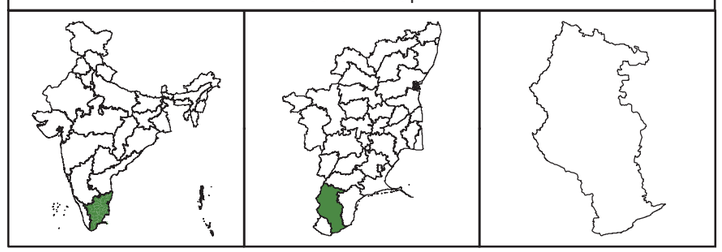
Legend

Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary
Major Road
Major Rail

Location Map



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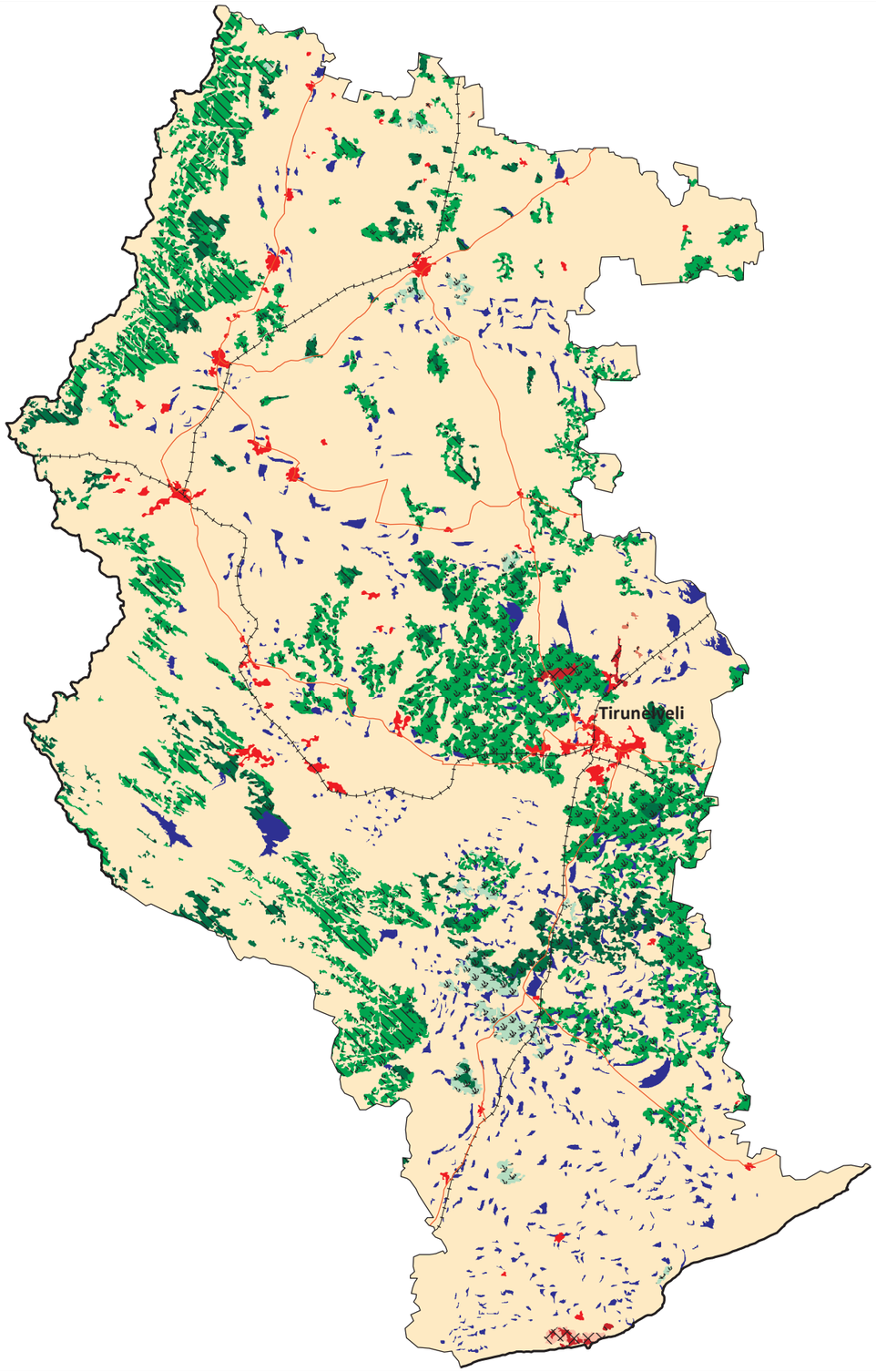

DESERTIFICATION / LAND DEGRADATION STATUS MAP
Tirunelveli District, Tamil Nadu
Timeframe - 2003-05

Legend

Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

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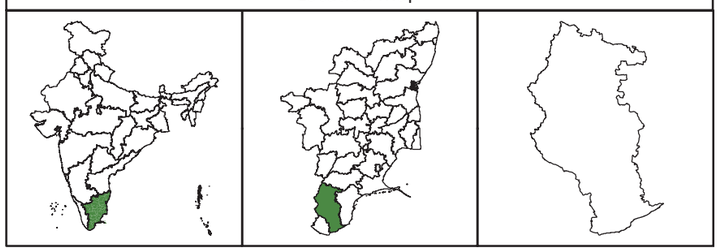
Location Map



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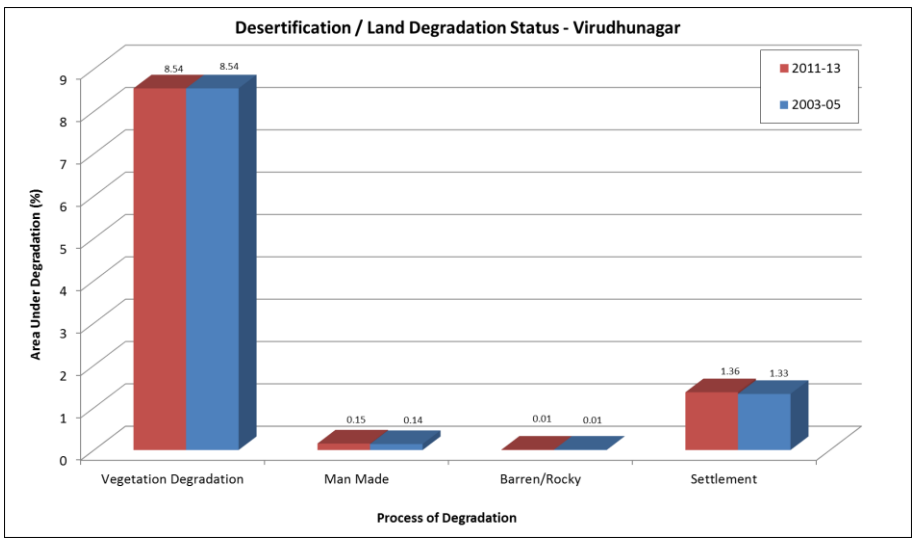
Virudhunagar District, Tamil Nadu

Virudhunagar district lies in the southern part of Tamil Nadu state. It shares border with Kerala on west side, Theni and Madurai districts on north side, Sivaganga and Ramanathapuram districts on east side and Tirunelveli and Thoothukkudi districts on south side. It covers an area of 4,241 sq. km. The district has a population of 19,42,288 with 458 population density, 1007 sex ratio and a literacy rate of 72.02%. (Census 2011)

The district consists of two distinct regions, viz. the eastern slopes of the Western Ghats and the black soil plains. The average height of the hills of the eastern slopes of the Western Ghats is 1500 m, the highest peaks are Peyimalai Mottai and Kottamalai. The foothills have rich loamy soil with good vegetation cover. The plains with black cotton soil have underlying calcarious formations. Virudhunagar does not have any perennial rivers. The Vaippar, Arjuna Nadi and Gundar constitute the river network of the district.

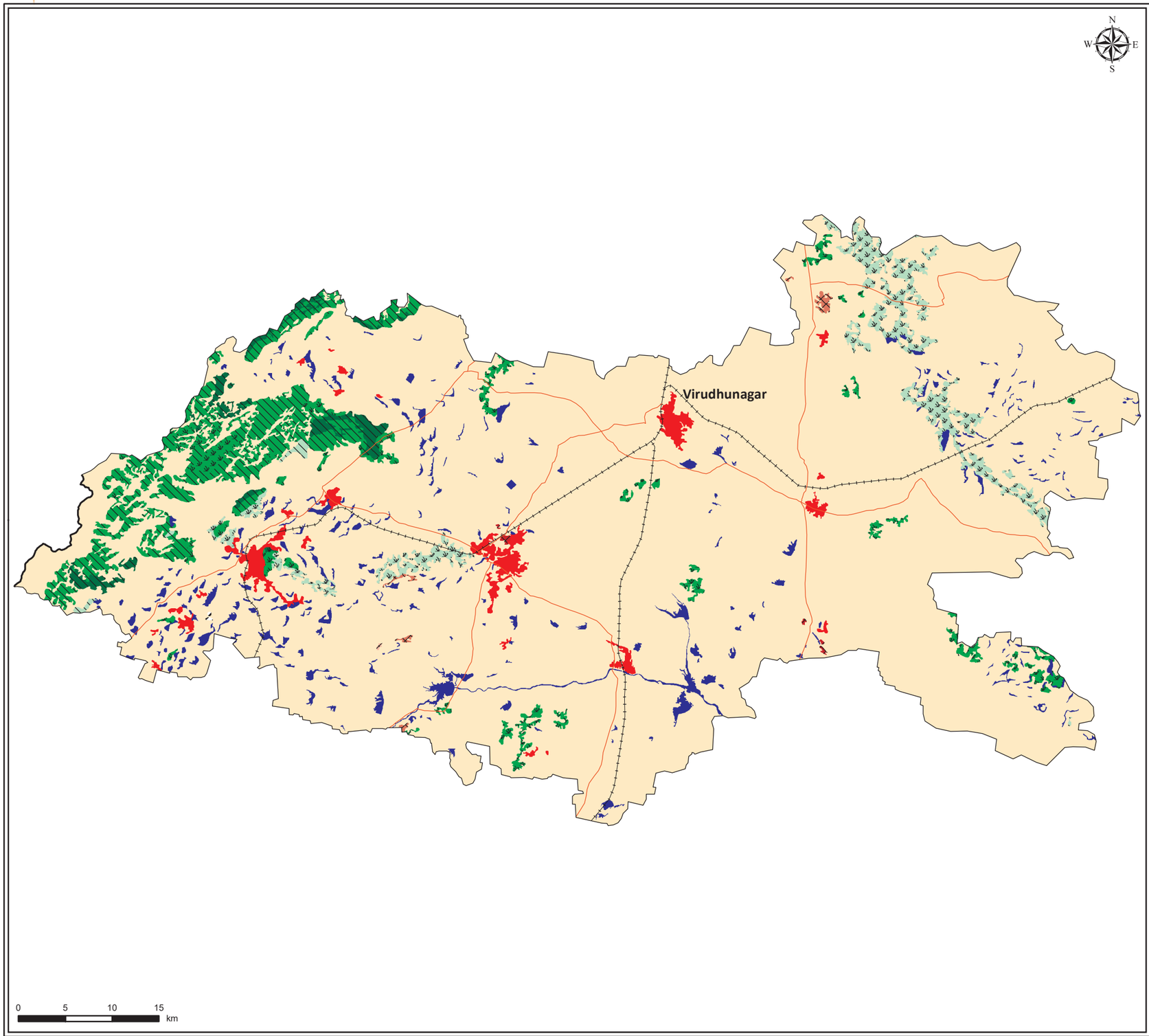
Virudhunagar is observed with 10.07% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.05% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (8.54% during 2011-13 and 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	36225.05	8.54	36225.05	8.54	0.00
Man Made	654.00	0.15	602.89	0.14	51.11
Barren/Rocky	36.06	0.01	36.06	0.01	0.00
Settlement	5786.46	1.36	5620.99	1.33	165.47
Total Area under Desertification	**42701.57**	**10.07**	**42484.99**	**10.02**	**216.58**
No Apparent Degradation	**371415.97**	**87.58**	**371632.55**	**87.63**	**-216.58**
Total Geographical Area (ha)	**424100.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	3558.18	0.84	3558.18	0.84	0.00
2	Fv2	Forest, vegetation degradation, Moderate	15393.57	3.63	15393.57	3.63	0.00
3	Fv3	Forest, vegetation degradation, Severe	456.27	0.11	456.27	0.11	0.00
4	Sv1	Land with scrub, vegetation degradation, Slight	69.30	0.02	69.30	0.02	0.00
5	Sv2	Land with scrub, vegetation degradation, Moderate	7297.58	1.72	7297.58	1.72	0.00
6	Sv3	Land with scrub, vegetation degradation, Severe	9450.15	2.23	9450.15	2.23	0.00
7	Tm1	Others, man made, Slight	24.04	0.01	24.04	0.01	0.00
8	Tm2	Others, man made, Moderate	468.02	0.11	440.79	0.10	27.23
9	Tm3	Others, man made, Severe	161.94	0.04	138.06	0.03	23.88
10	R	Rocky	36.06	0.01	36.06	0.01	0.00
11	S	Settlement	5786.46	1.36	5620.99	1.33	165.47
Total Area Under Desertification/ Land Degradation			**42701.57**	**10.07**	**42484.99**	**10.02**	**216.58**
12	W	Water body/ Drainage	9982.45	2.35	9982.45	2.35	0.00
13	NAD	No Apparent Degradation	371415.97	87.58	371632.55	87.63	-216.58
Total Geographical Area (ha)			**424100.00**	**100.00**	**424100.00**	**100.00**	

DESERTIFICATION / LAND DEGRADATION STATUS MAP
Virudhunagar District, Tamil Nadu
Timeframe - 2011-13



Legend

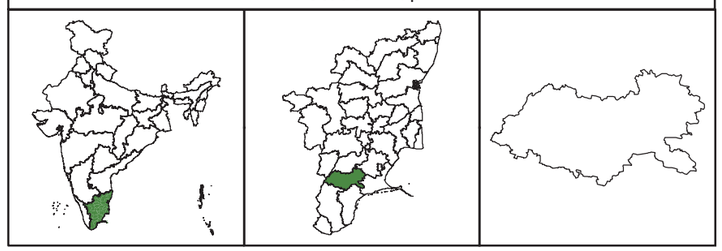
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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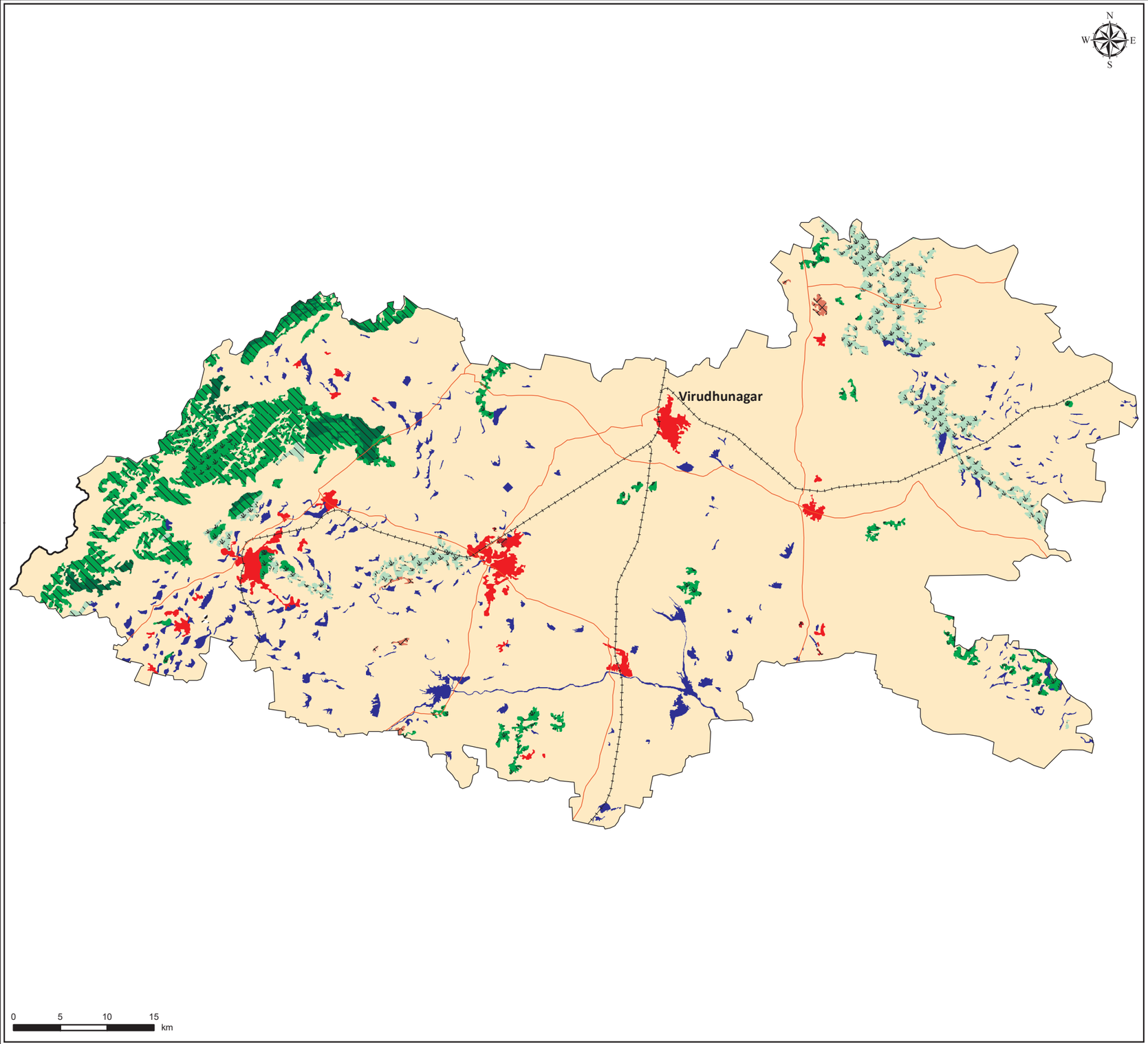


DESERTIFICATION / LAND DEGRADATION STATUS MAP

Virudhunagar District, Tamil Nadu

Timeframe - 2003-05

Legend

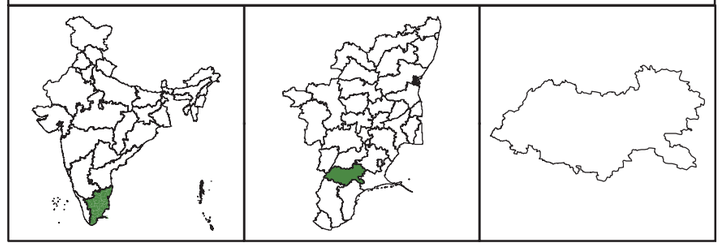
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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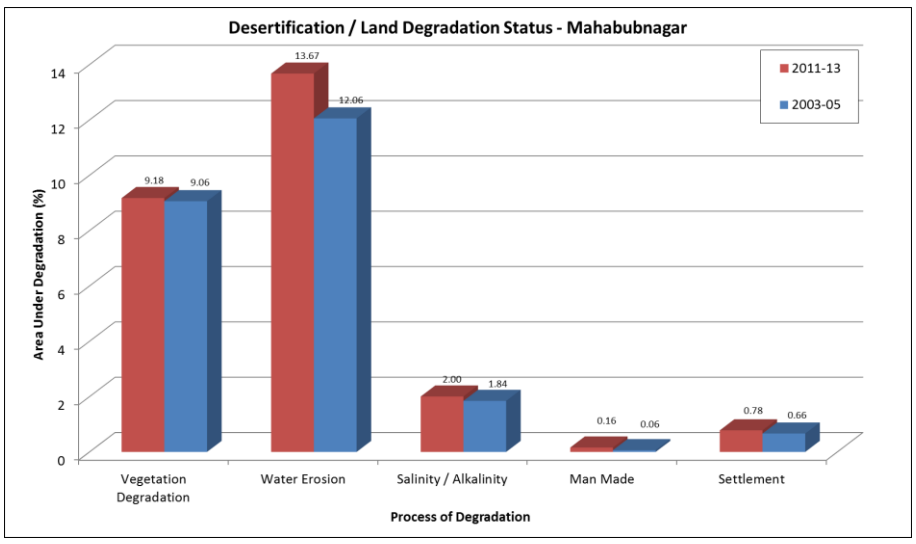
Mahabubnagar District, Telangana

Mahabubnagar district is located in the southern corner of Telangana state. The district is bounded in the north by Rangareddy district, east by Nalgonda, Guntur and Prakasam districts, south by Kurnool district and west by Karnataka state. It covers an area of 18,432 sq. km. The district has a population of 40,53,028 with 220 population density, 977 sex ratio and a literacy rate of 55.04%. (Census 2011)

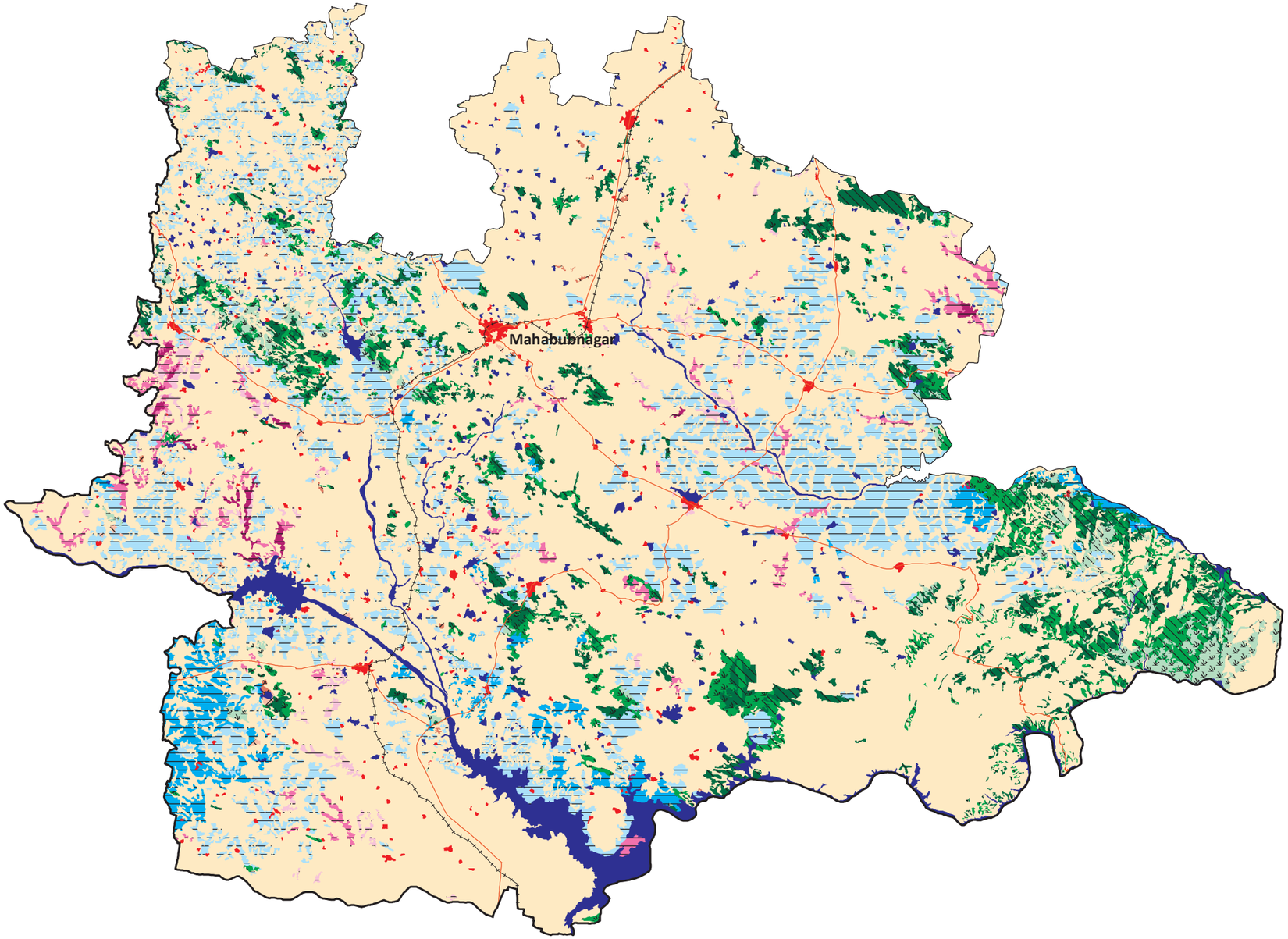
Physiographically, the district is higher in altitude in the north and north-western parts showing a rugged topography with an elevation ranging between 300 and 600 meters. The predominant soil is Chalka Dubba which covers about 70% of the total district area and has the low water holding capacity. The district, with a general slope towards the South-east is drained by the rivers Krishna and its tributary Tungabhadra.

Mahabubnagar is observed with 25.79% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 2.10% since 2003-05. The most significant process of land degradation/ desertification in the district is Water Erosion (13.67% during 2011-13 and 12.06% during 2003-05) followed by Vegetation Degradation (9.18% during 2011-13 and 9.06% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	169128.67	9.18	167026.61	9.06	2102.07
Water Erosion	252054.99	13.67	222199.93	12.06	29855.07
Salinity / Alkalinity	36921.20	2.00	34003.86	1.84	2917.34
Man Made	2936.52	0.16	1177.00	0.06	1759.53
Settlement	14388.61	0.78	12245.12	0.66	2143.48
Total Area under Desertification	**475430.00**	**25.79**	**436652.51**	**23.69**	**38777.49**
No Apparent Degradation	**1301792.48**	**70.63**	**1343600.99**	**72.90**	**-41808.51**
Total Geographical Area (ha)	**1843200.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	46145.10	2.50	45231.64	2.45	913.46
2	Fv2	Forest, vegetation degradation, Moderate	32672.42	1.77	32099.09	1.74	573.33
3	Fv3	Forest, vegetation degradation, Severe	5951.76	0.32	5931.13	0.32	20.63
4	Sv1	Land with scrub, vegetation degradation, Slight	28354.57	1.54	27638.59	1.50	715.98
5	Sv2	Land with scrub, vegetation degradation, Moderate	32605.52	1.77	32672.94	1.77	-67.42
6	Sv3	Land with scrub, vegetation degradation, Severe	23399.31	1.27	23453.22	1.27	-53.91
7	Dw1	Agriculture unirrigated, water erosion, Slight	217478.65	11.80	188198.78	10.21	29279.87
8	Dw2	Agriculture unirrigated, water erosion, Moderate	34576.34	1.88	34001.15	1.84	575.20
9	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight	12773.33	0.69	11723.24	0.64	1050.10
10	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate	19703.16	1.07	17801.59	0.97	1901.57
11	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe	4444.71	0.24	4479.03	0.24	-34.32
12	Tm1	Others, man made, Slight	1610.87	0.09	907.00	0.05	703.87
13	Tm2	Others, man made, Moderate	1057.41	0.06	245.78	0.01	811.63
14	Tm3	Others, man made, Severe	268.25	0.01	24.21	0.00	244.03
15	S	Settlement	14388.61	0.78	12245.12	0.66	2143.48
Total Area Under Desertification/ Land Degradation			**475430.00**	**25.79**	**436652.51**	**23.69**	**36634.01**
16	W	Water body/ Drainage	65977.51	3.58	62946.50	3.42	3031.02
17	NAD	No Apparent Degradation	1301792.48	70.63	1343600.99	72.90	-41808.51
Total Geographical Area (ha)			**1843200.00**	**100.00**	**1843200.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Mahabubnagar District, Telangana
Timeframe - 2011-13

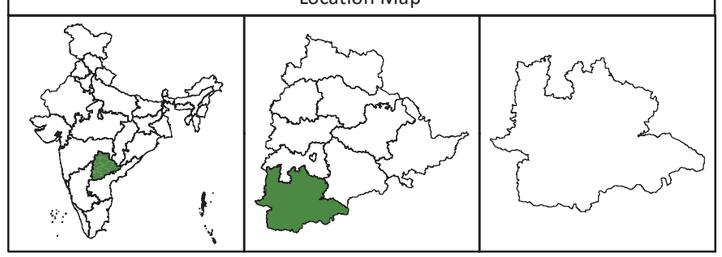
Legend		
Symbol	**Code**	**Description**
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight
	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate
	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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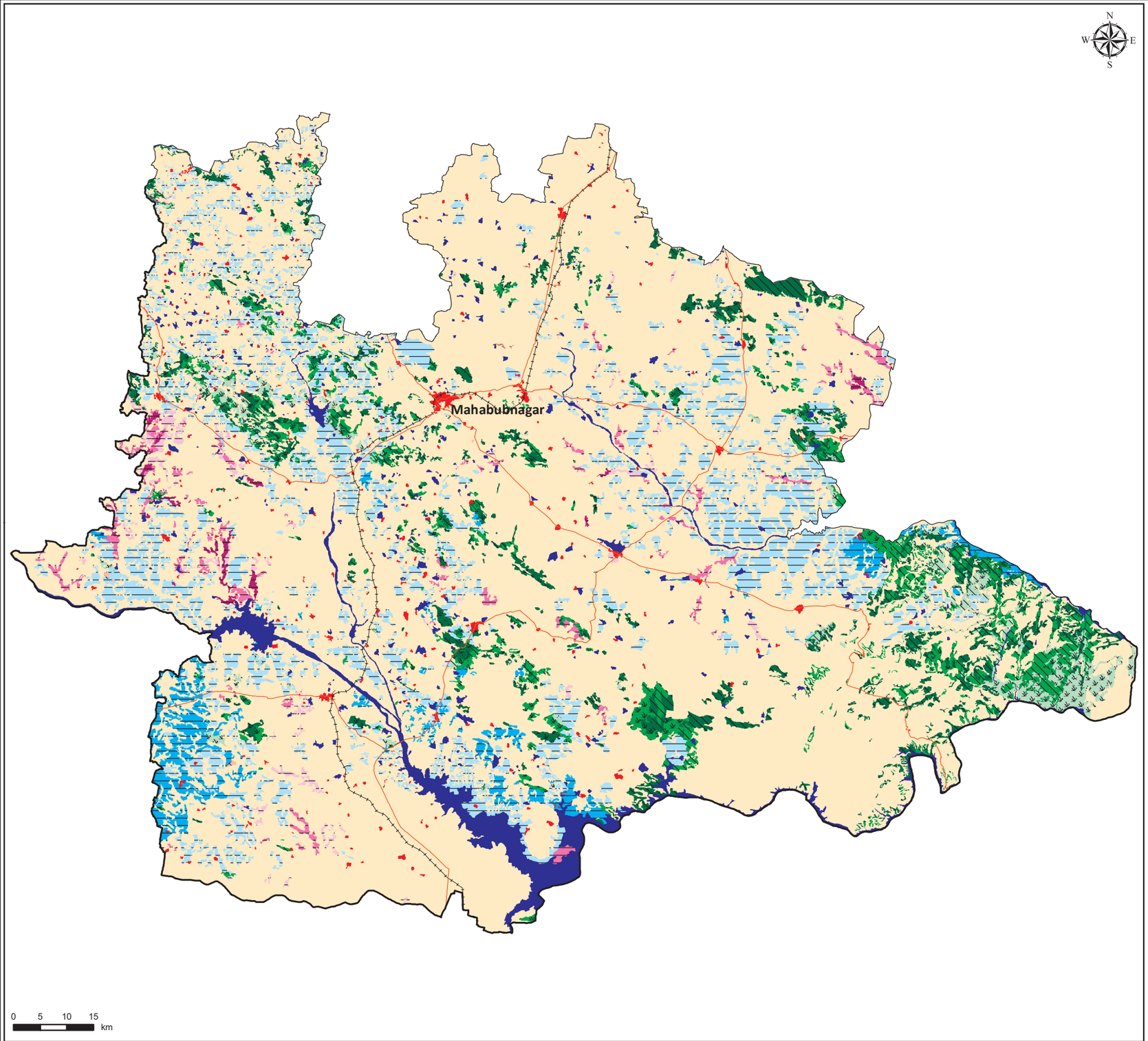
&
Space Applications Centre, ISRO, Ahmedabad



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Mahabubnagar District, Telangana
Timeframe - 2003-05

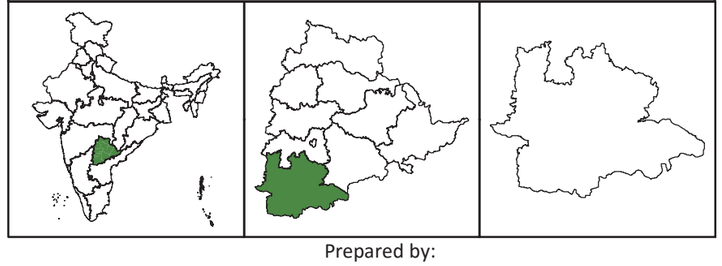
Legend		
Symbol	**Code**	**Description**
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight
	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate
	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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Space Applications Centre, ISRO, Ahmedabad

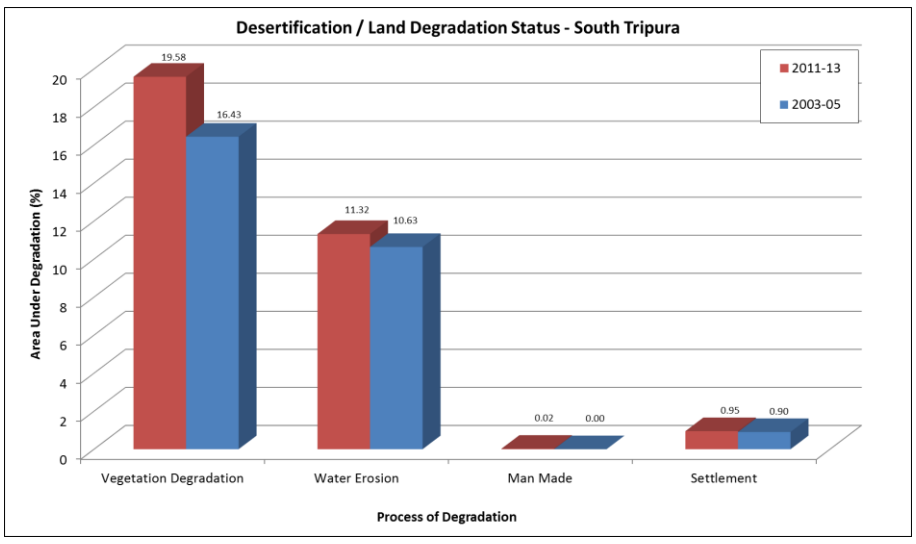
South Tripura, Tripura

South Tripura district is located in the southern part of Tripura state. It shares international border with Bangladesh on west, south and east sides. While, it is bounded by West Tripura district on the west and north sides and Dhalai district on the east side. It covers an area of 3,057 sq. km. The district has a population of 8,76,001 with 224 population density, 957 sex ratio and a literacy rate of 84.66%. (Census 2011)

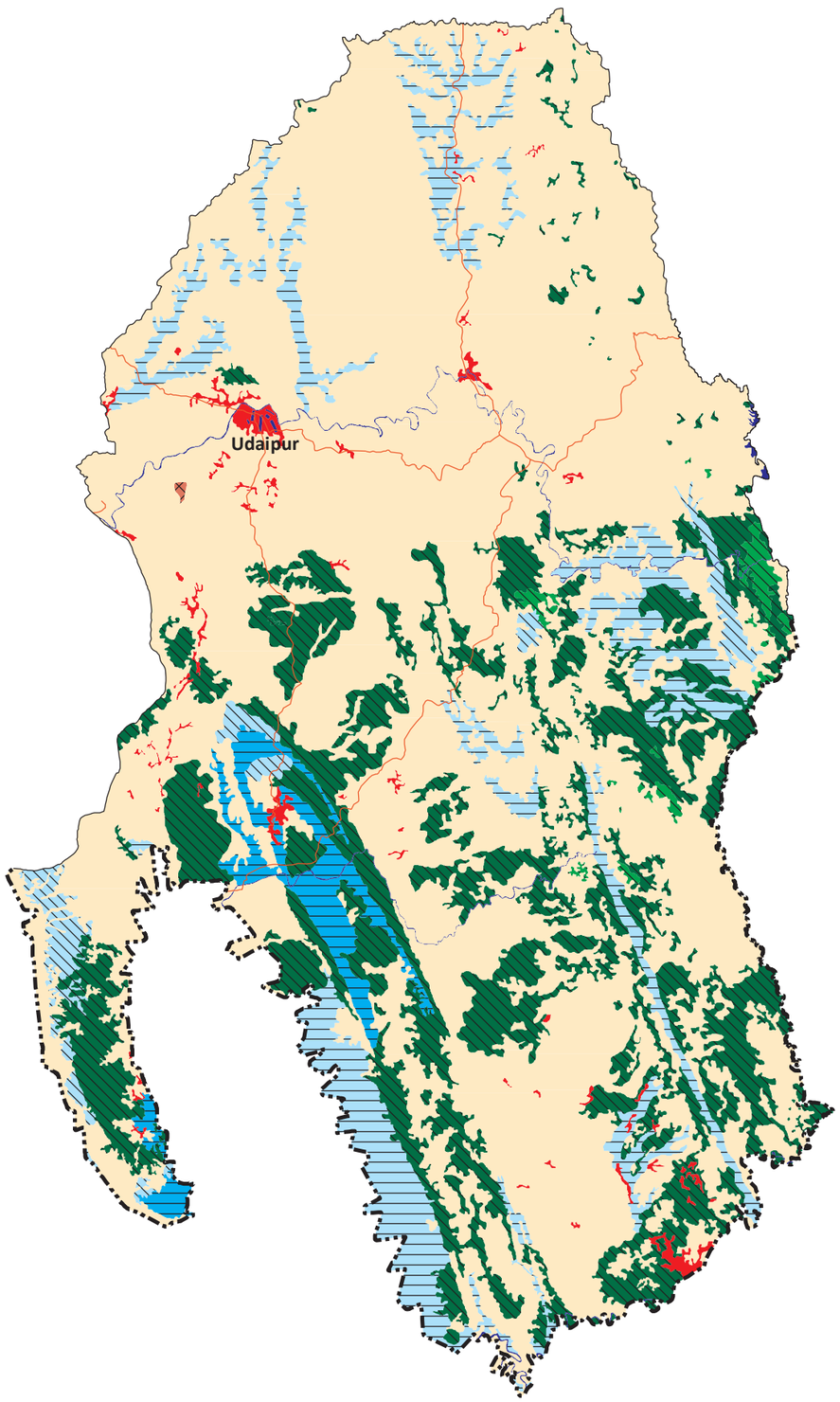
There are six principal hill ranges in Tripura state gradually increasing height from west to east. Out of the six principal hill ranges, Sardong and Deotamura ranges fall fully in this district. A part of this Athramura hill range is also fallen in South Tripura district. A series of hill ranges runs from north to South and divides the territory into broad parallel valleys, consisting of undulating tillas covered with forest and tortuous streams. The whole system of drainage and river system of the district ultimately finds its way into the neighboring country Bangladesh. Gomati, Muhuri and Fenney are the major rivers flow through the South Tripura district.

South Tripura is observed with 31.88% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 3.91 % since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (19.58% during 2011-13 and 16.43% during 2003-05) followed by Water Erosion (11.32% during 2011-13 and 10.63% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	59867.30	19.58	50233.25	16.43	9634.05
Water Erosion	34595.19	11.32	32507.18	10.63	2088.01
Man Made	75.01	0.02	0.00	0.00	75.01
Settlement	2905.14	0.95	2765.84	0.90	139.30
Total Area under Desertification	**97442.65**	**31.88**	**85506.27**	**27.97**	**11936.38**
No Apparent Degradation	**207149.11**	**67.76**	**219044.11**	**71.65**	**-11895.00**
Total Geographical Area (ha)	**305700.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	58091.74	19.00	49677.54	16.25	8414.20
2	Fv2	Forest, vegetation degradation, Moderate	1775.56	0.58	555.72	0.18	1219.85
3	Dw1	Agriculture unirrigated, water erosion, Slight	23579.04	7.71	23208.06	7.59	370.99
4	Dw2	Agriculture unirrigated, water erosion, Moderate	6490.12	2.12	5348.31	1.75	1141.81
5	Fw1	Forest, water erosion, Slight	4526.03	1.48	3950.81	1.29	575.22
6	Tm2	Others, man made, Moderate	75.01	0.02	0.00	0.00	75.01
7	S	Settlement	2905.14	0.95	2765.84	0.90	139.30
Total Area Under Desertification/ Land Degradation			**97442.65**	**31.88**	**85506.27**	**27.97**	**11936.38**
8	W	Water body/ Drainage	1108.24	0.36	1149.61	0.38	-41.37
9	NAD	No Apparent Degradation	207149.11	67.76	219044.11	71.65	-11895.00
Total Geographical Area (ha)			**305700.00**	**100.00**	**305700.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
South Tripura District, Tripura
Timeframe - 2011-13

Legend

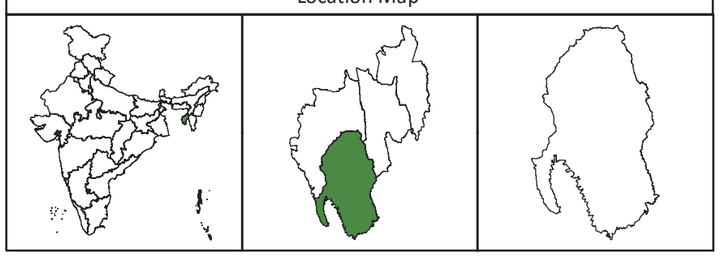
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Fw1	Forest, water erosion, Slight
	Tm2	Others, man made, Moderate
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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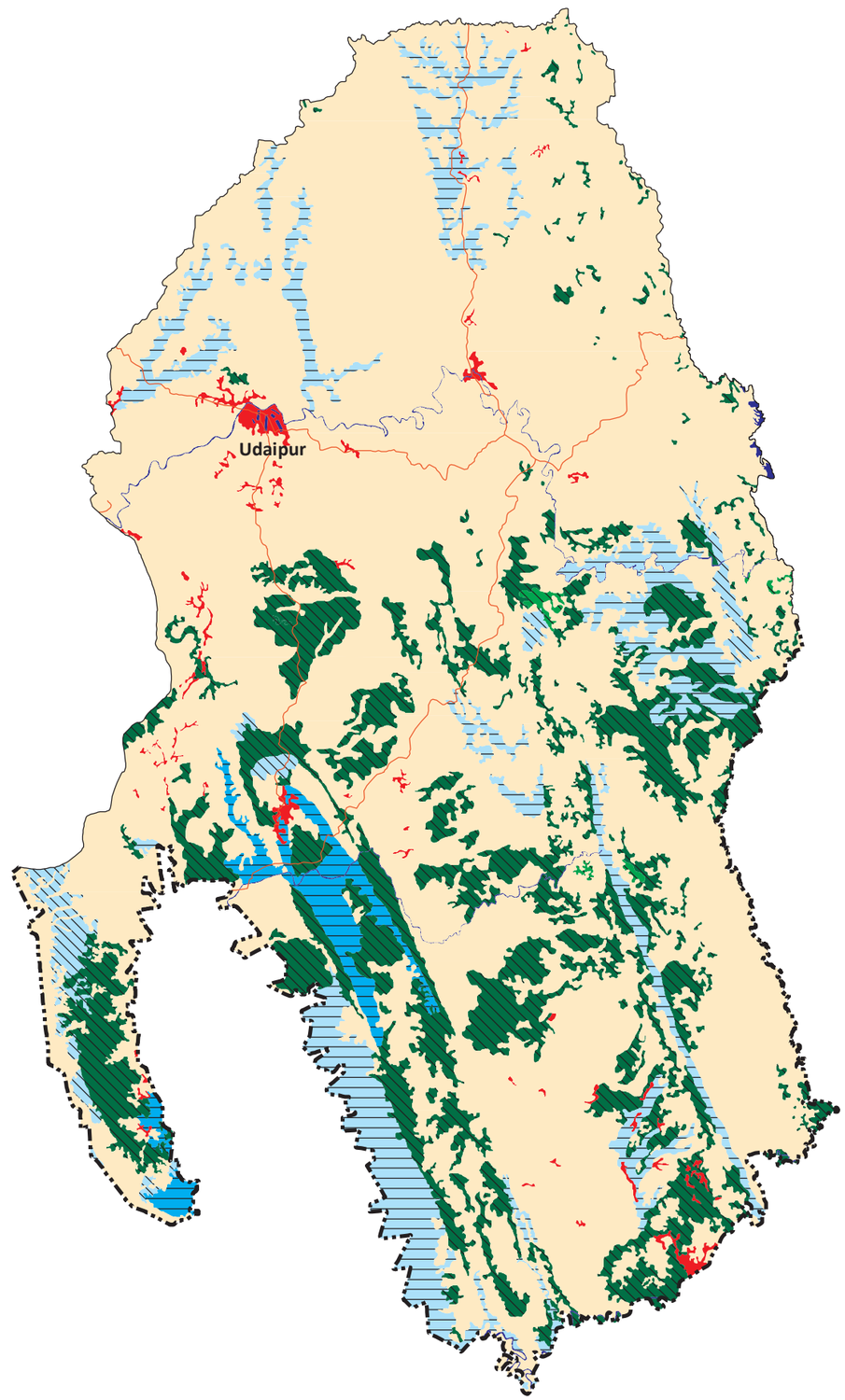
Space Applications Centre, ISRO, Ahmedabad



DESERTIFICATION / LAND DEGRADATION STATUS MAP
South Tripura District, Tripura
Timeframe - 2003-05

Legend

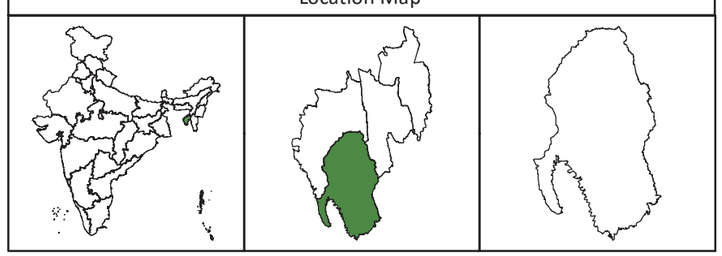
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Fw1	Forest, water erosion, Slight
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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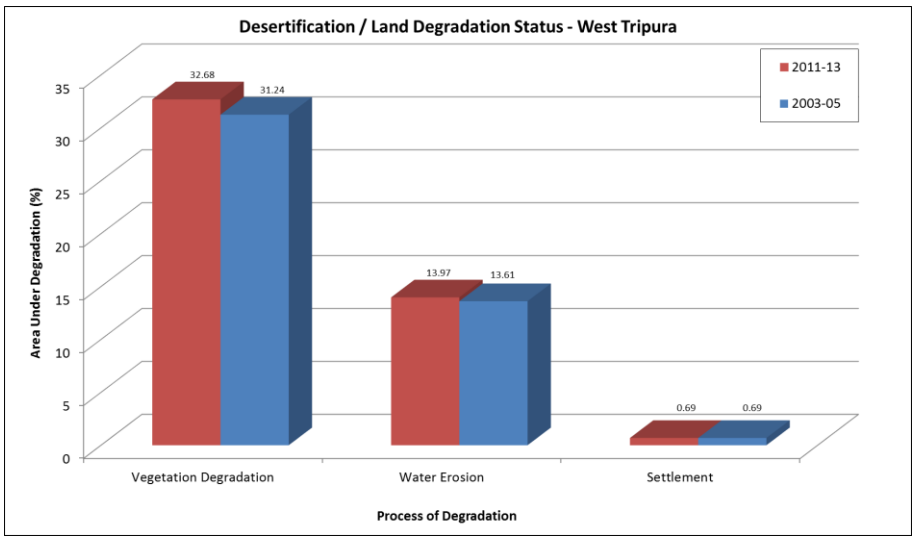
West Tripura District, Tripura

West Tripura district is located in the western part of Tripura state. It shares international border with Bangladesh on north and west sides. While, it is bounded by South Tripura district on the south side and Dhalai district on the east side. It covers an area of 2,993 sq. km. The district has a population of 17,25,739 with 576 population density, 962 sex ratio and a literacy rate of 85.69%. (Census 2011)

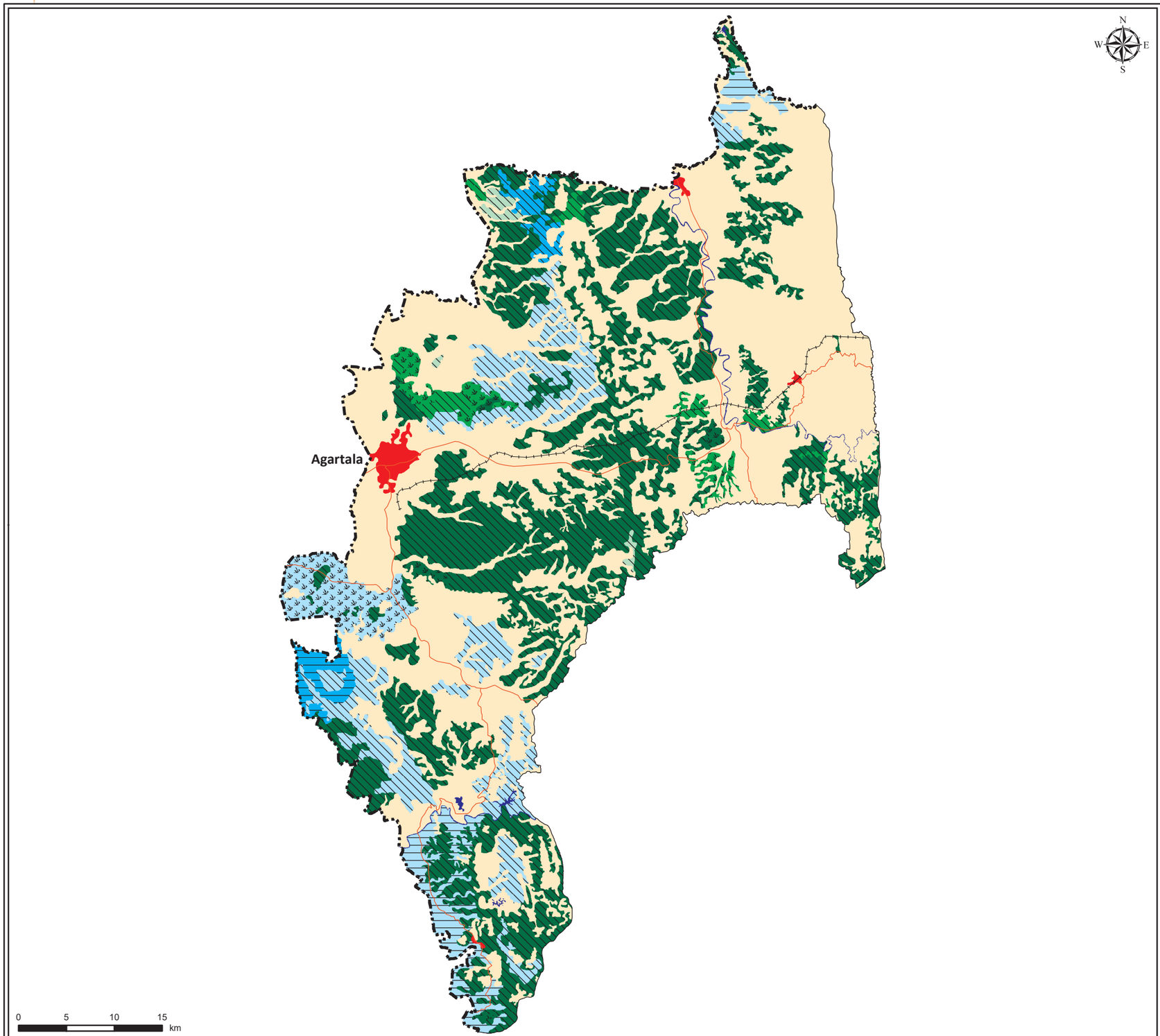
There are six principal hill ranges increasing in height as one moves from West to East. Out of the six principal ranges Baramura, Deotamura, Deotamura ranges fall fully in this district and Atharamura ranges partly fall in the district. The surface is undulating and made uneven by low hills. There are long river valleys extending over a vast area in different sub-division formed mostly of deep alluvial deposits with rich fertility excellently suited for the cultivation of paddy, Jute, oil seeds, spices, fruits and vegetables. Gomati, Khowai Howarh, and its tributaries are the main drainage system of this district.

West Tripura is observed with 47.34% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 1.8% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (32.68% during 2011-13 and 31.24% during 2003-05) followed by Water Erosion (13.97% during 2011-13 and 13.61% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	97825.68	32.68	93492.05	31.24	4333.63
Water Erosion	41817.09	13.97	40738.04	13.61	1079.05
Settlement	2056.19	0.69	2056.19	0.69	0.00
Total Area under Desertification	**141698.95**	**47.34**	**136286.27**	**45.54**	**5412.68**
No Apparent Degradation	**156571.98**	**52.31**	**161984.66**	**54.12**	**-5412.68**
Total Geographical Area (ha)	**299300.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	88407.20	29.54	84395.08	28.20	4012.11
2	Fv2	Forest, vegetation degradation, Moderate	3554.65	1.19	3361.03	1.12	193.62
3	Fv3	Forest, vegetation degradation, Severe	1110.27	0.37	1110.27	0.37	0.00
4	Sv1	Land with scrub, vegetation degradation, Slight	1586.09	0.53	1458.19	0.49	127.90
5	Sv2	Land with scrub, vegetation degradation, Moderate	3167.48	1.06	3167.48	1.06	0.00
6	Dw1	Agriculture unirrigated, water erosion, Slight	7680.49	2.57	7680.49	2.57	0.00
7	Dw2	Agriculture unirrigated, water erosion, Moderate	2611.25	0.87	2611.25	0.87	0.00
8	Fw1	Forest, water erosion, Slight	22690.44	7.58	22053.61	7.37	636.84
9	Fw2	Forest, water erosion, Moderate	2183.65	0.73	2183.65	0.73	0.00
10	Sw1	Land with scrub, water erosion, Slight	6651.26	2.22	6209.04	2.07	442.21
11	S	Settlement	2056.19	0.69	2056.19	0.69	0.00
Total Area Under Desertification/ Land Degradation			**141698.95**	**47.34**	**136286.27**	**45.54**	**5412.68**
12	W	Water body/ Drainage	1029.07	0.34	1029.07	0.34	0.00
13	NAD	No Apparent Degradation	156571.98	52.31	161984.66	54.12	-5412.68
Total Geographical Area (ha)			**299300.00**	**100.00**	**299300.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
West Tripura District, Tripura
Timeframe - 2011-13

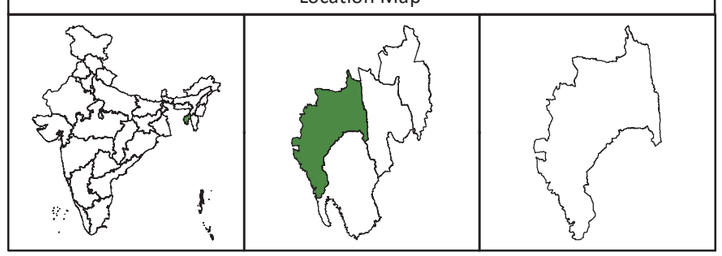
Legend

Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Fw1	Forest, water erosion, Slight
	Fw2	Forest, water erosion, Moderate
	Sw1	Land with scrub, water erosion, Slight
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary
Major Road
Major Rail

Location Map



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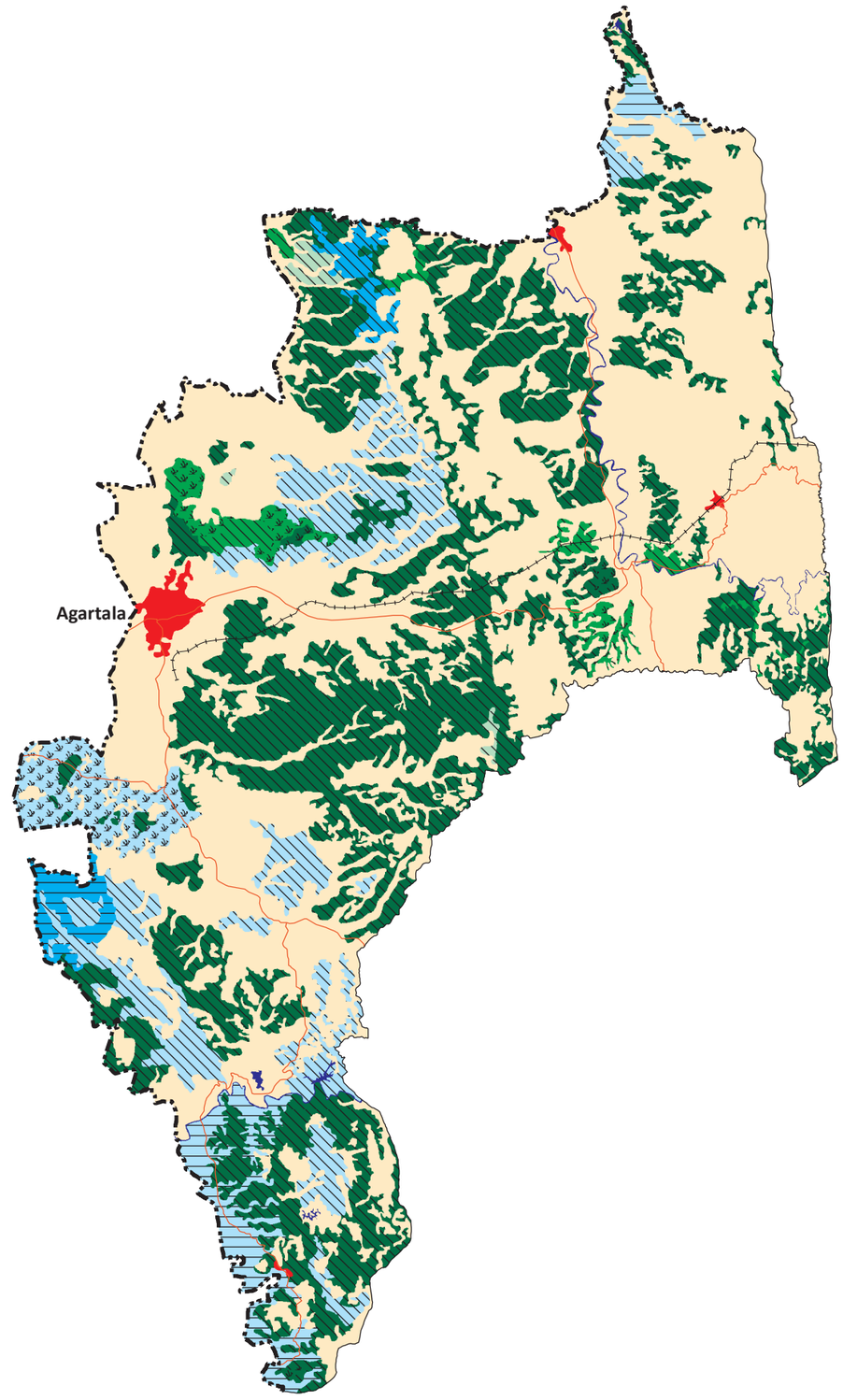
&
Space Applications Centre, ISRO, Ahmedabad



DESERTIFICATION / LAND DEGRADATION STATUS MAP
West Tripura District, Tripura
Timeframe - 2003-05

Legend

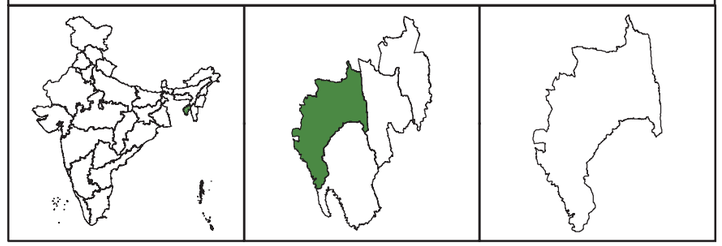
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Fw1	Forest, water erosion, Slight
	Fw2	Forest, water erosion, Moderate
	Sw1	Land with scrub, water erosion, Slight
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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Space Applications Centre, ISRO, Ahmedabad

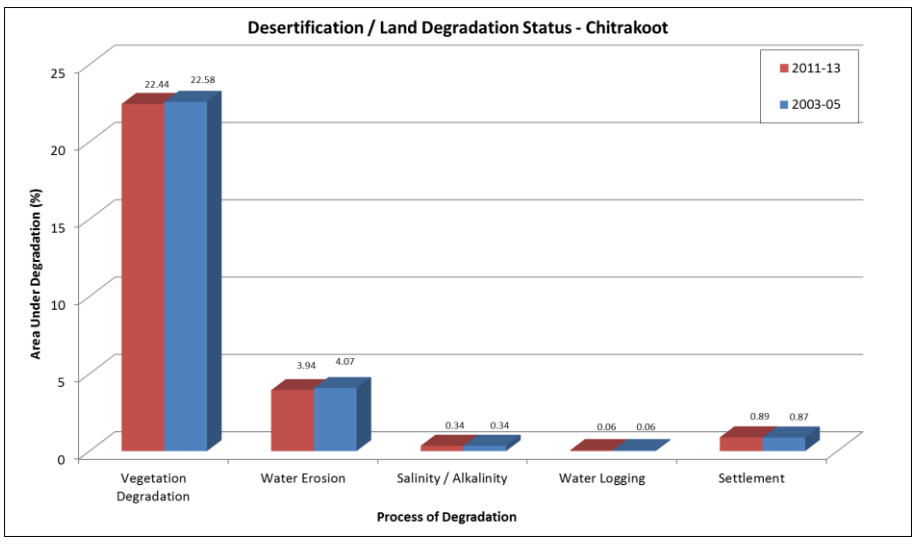
Chitrakoot District, Uttar Pradesh

Chitrakoot district lies in the southern part of Uttar Pradesh state. It is bounded by river Yamuna on north side, across which Fatehpur and Kaushambi districts. It is bounded on east side by Allahabad district and Madhya Pradesh state, on west side by Banda district and on the south side by Madhya Pradesh state. It covers an area of 3216 sq. km. The district has a population of 9,91,730 with 308 population density, 879 sex ratio and a literacy rate of 65.00%. (Census 2011)

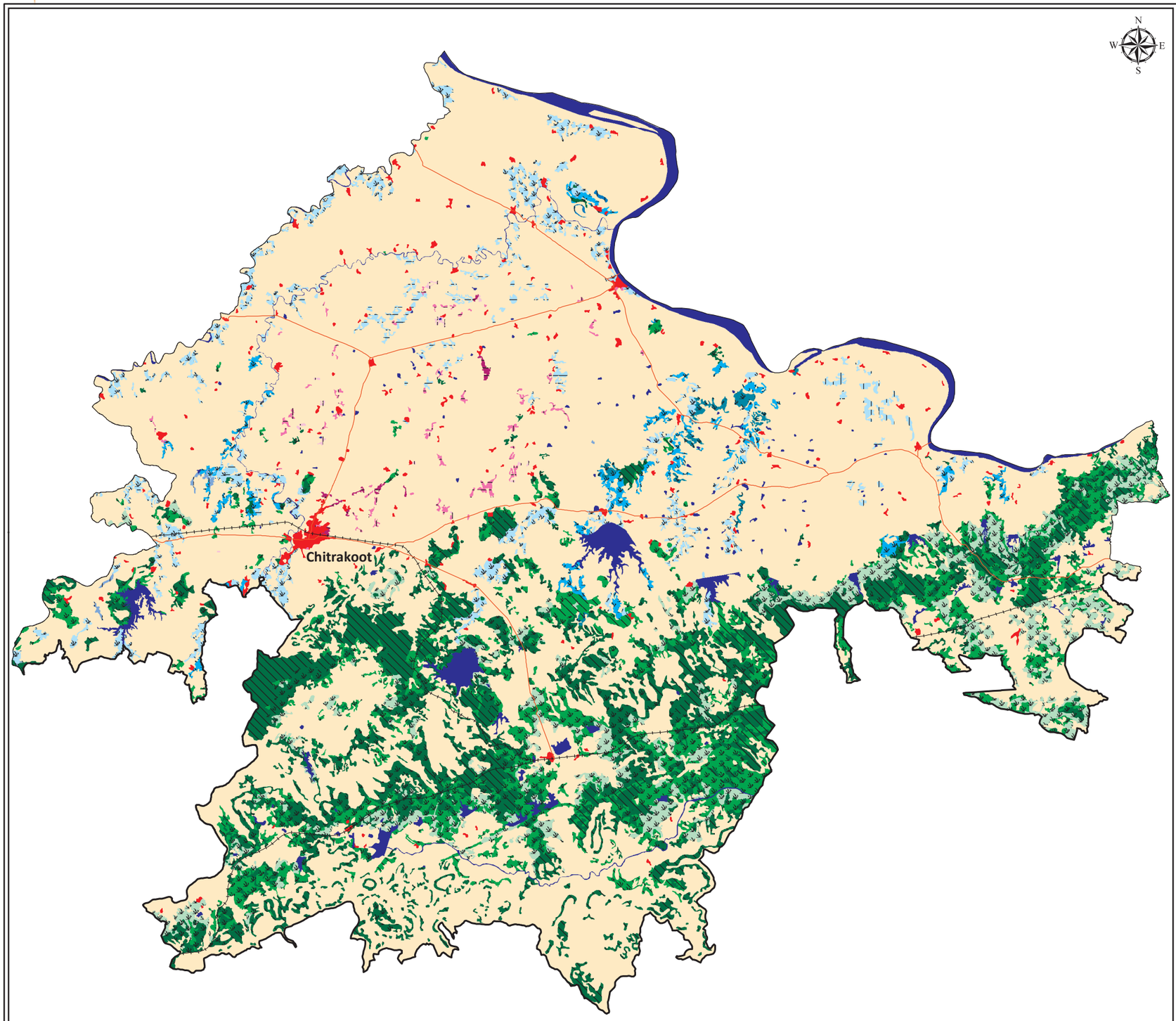
Chitrakoot district can be divided into three regions, viz. Chitrakoot plain, Naraini- Karwi Pene plain and Manikpur. Northern part of the district (Chitrakoot plain) is a flat expanse. The plain lowland in the district is made of alluvium deposited by many streams coming down from southern hills and flowing into Yamuna. Whereas, the southern part (Naraini- Karwi Pene plain and Manikpur uplands) is mainly the Vindhyan plateau, which is full of hills and forest cover. The topography of the regions is rugged because of river erosion, with very steep slope at places and highly dissected surface. Yamuna is the main river in the district.

Chitrakoot district is observed with 27.67% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has decreased about 0.26% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (22.44% during 2011-13 and 22.58% during 2003-05) followed by Water Erosion (3.94% during 2011-13 and 4.07% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	72182.54	22.44	72615.53	22.58	-432.99
Water Erosion	12660.36	3.94	13101.94	4.07	-441.58
Salinity / Alkalinity	1095.62	0.34	1095.36	0.34	0.26
Water Logging	192.13	0.06	192.13	0.06	0.00
Settlement	2851.78	0.89	2812.06	0.87	39.72
Total Area under Desertification	**88982.43**	**27.67**	**89817.02**	**27.93**	**-834.59**
No Apparent Degradation	**224061.03**	**69.67**	**222667.41**	**69.24**	**1393.61**
Total Geographical Area (ha)	**321600.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	19786.98	6.15	19786.98	6.15	0.00
2	Fv2	Forest, vegetation degradation, Moderate	2440.22	0.76	2440.22	0.76	0.00
3	Fv3	Forest, vegetation degradation, Severe	33.87	0.01	33.87	0.01	0.00
4	Sv1	Land with scrub, vegetation degradation, Slight	16176.97	5.03	15727.23	4.89	449.74
5	Sv2	Land with scrub, vegetation degradation, Moderate	20629.13	6.41	21253.86	6.61	-624.72
6	Sv3	Land with scrub, vegetation degradation, Severe	13115.36	4.08	13373.37	4.16	-258.01
7	Iw1	Agriculture irrigated, water erosion, Slight	480.58	0.15	354.72	0.11	125.86
8	Dw1	Agriculture unirrigated, water erosion, Slight	1249.82	0.39	1429.83	0.44	-180.01
9	Sw1	Land with scrub, water erosion, Slight	7300.77	2.27	7443.25	2.31	-142.48
10	Sw2	Land with scrub, water erosion, Moderate	2942.57	0.91	3187.53	0.99	-244.96
11	Sw3	Land with scrub, water erosion, Severe	686.61	0.21	686.61	0.21	0.00
12	Is1	Agriculture irrigated, salinity / alkalinity, Slight	135.31	0.04	120.28	0.04	15.03
13	Is2	Agriculture irrigated, salinity / alkalinity, Moderate	228.43	0.07	231.87	0.07	-3.44
14	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate	537.78	0.17	623.83	0.19	-86.05
15	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe	194.10	0.06	119.38	0.04	74.72
16	Il1	Agriculture irrigated, water logging, Slight	137.40	0.04	137.40	0.04	0.00
17	Il2	Agriculture irrigated, water logging, Moderate	54.73	0.02	54.73	0.02	0.00
18	S	Settlement	2851.78	0.89	2812.06	0.87	39.72
Total Area Under Desertification/ Land Degradation			**88982.43**	**27.67**	**89817.02**	**27.93**	**-834.59**
19	W	Water body/ Drainage	8556.55	2.66	9115.57	2.83	-559.02
20	NAD	No Apparent Degradation	224061.03	69.67	222667.41	69.24	1393.61
Total Geographical Area (ha)			**321600.00**	**100.00**	**321600.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Chitrakoot District, Uttar Pradesh
Timeframe - 2011-13

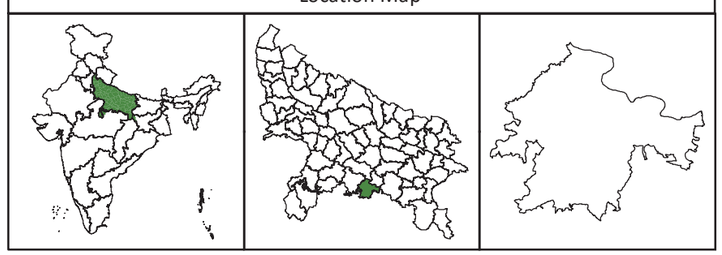
Legend		
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Sw1	Land with scrub, water erosion, Slight
	Sw2	Land with scrub, water erosion, Moderate
	Sw3	Land with scrub, water erosion, Severe
	Is1	Agriculture irrigated, salinity / alkalinity, Slight
	Is2	Agriculture irrigated, salinity / alkalinity, Moderate
	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate
	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe
	Il1	Agriculture irrigated, water logging, Slight
	Il2	Agriculture irrigated, water logging, Moderate
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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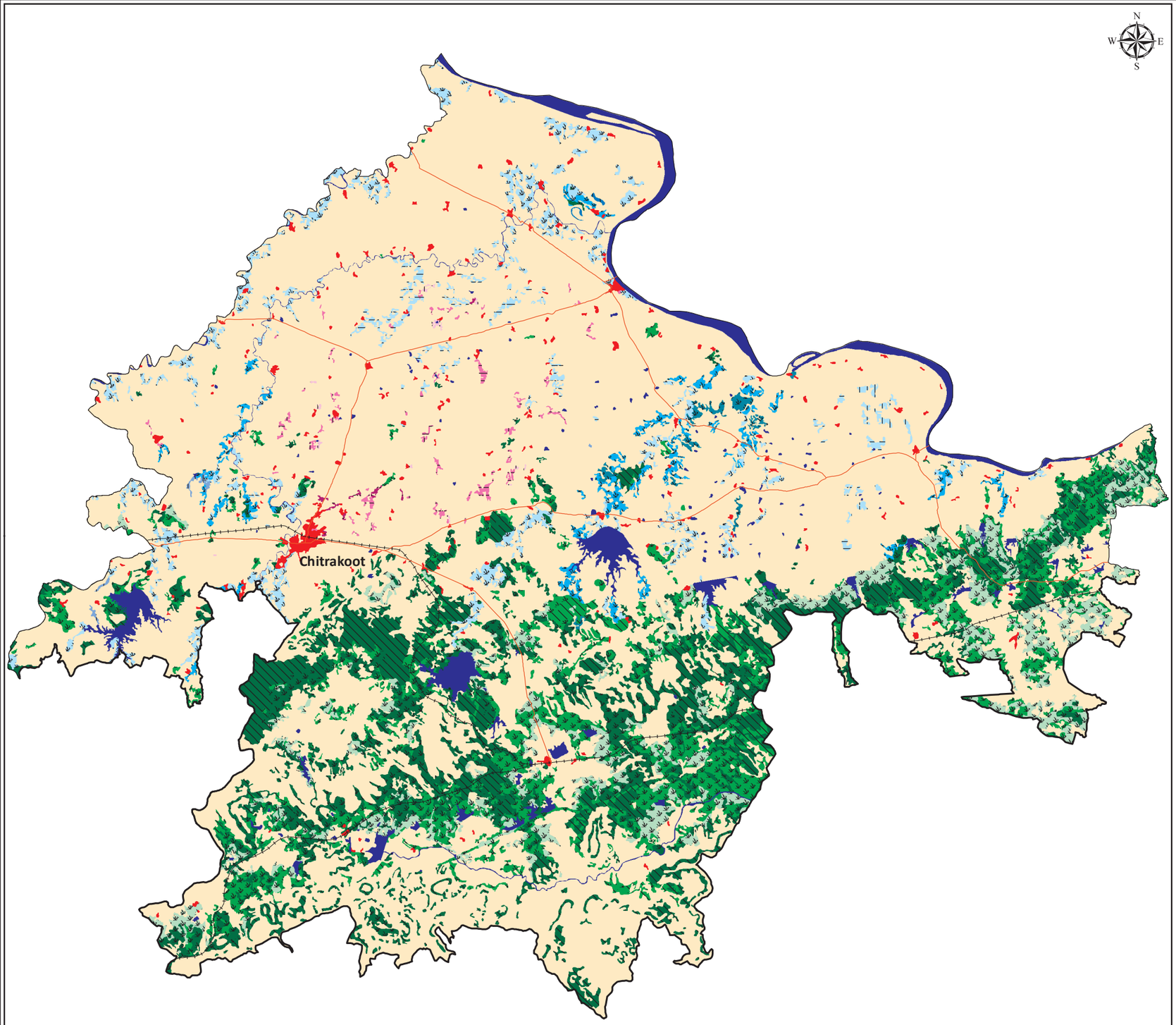


DESERTIFICATION / LAND DEGRADATION STATUS MAP
Chitrakoot District, Uttar Pradesh
Timeframe - 2003-05

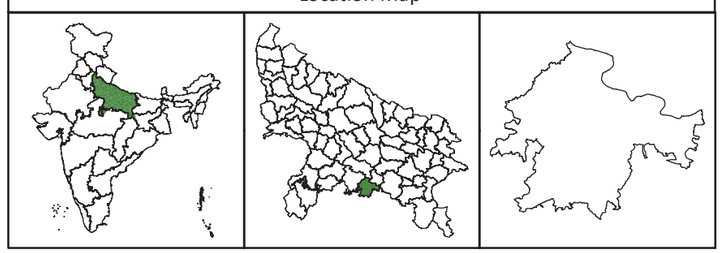
Legend		
Symbol	**Code**	**Description**
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Sw1	Land with scrub, water erosion, Slight
	Sw2	Land with scrub, water erosion, Moderate
	Sw3	Land with scrub, water erosion, Severe
	Is1	Agriculture irrigated, salinity / alkalinity, Slight
	Is2	Agriculture irrigated, salinity / alkalinity, Moderate
	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate
	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe
	Il1	Agriculture irrigated, water logging, Slight
	Il2	Agriculture irrigated, water logging, Moderate
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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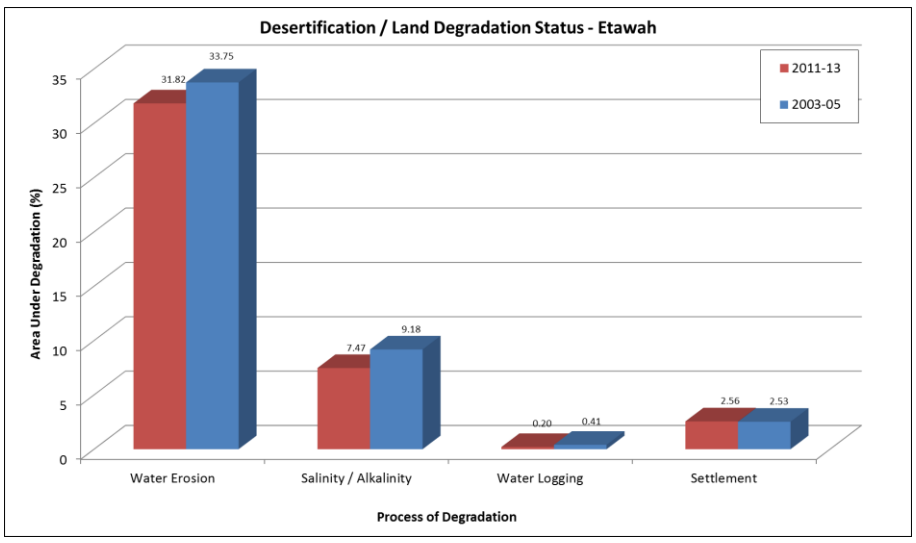
Etawah District, Uttar Pradesh

Etawah district lies in the south-west part of Uttar Pradesh state. It is bounded by Mainpuri and Firozabad districts on north side, Auraiya district on the east side, Jalaun district on the south, Madhya Pradesh on south-west side and Agra district on west side. It covers an area of 2311 sq. km. The district has a population of 15,81,810 with 685 population density, 870 sex ratio and a literacy rate of 78.40%. (Census 2011)

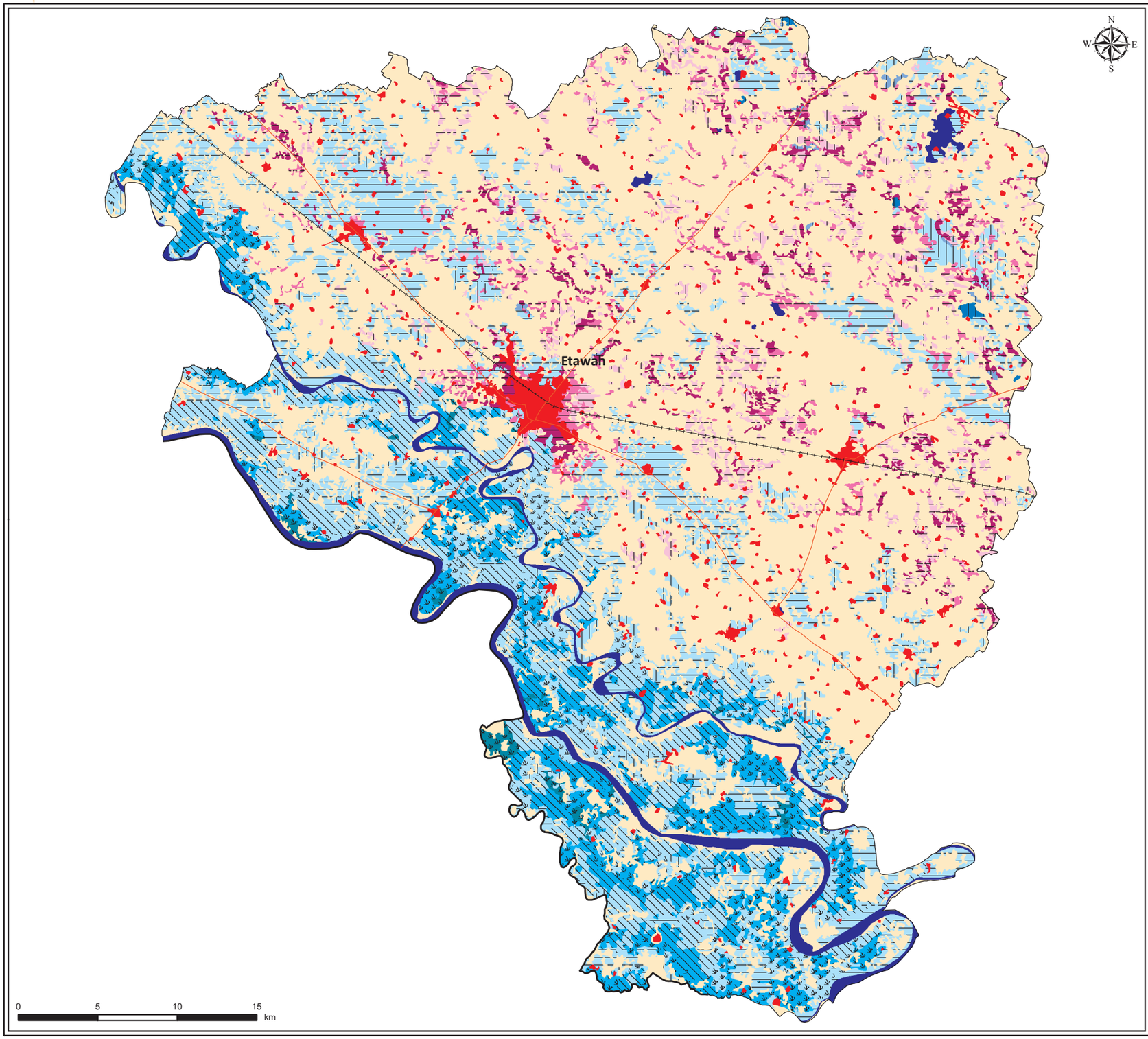
The Etawah district is a south eastern part of the southern upper Ganga plain. The district physical features vary considerably and are determined by the rivers. Southern part of the district is dissected by Yamuna and Chambal ravines. The Yamuna and the Chambal rivers, which after entering on the west from Agra flow towards south east bisecting the district into unequal segments. On the north of this belt the district depicts leveled plain and drained by several streams namely, Sengar, Ahneya, Rind and Pandu etc. The flow of these streams are towards south east which indicates that the general slope of the district is in the same direction.

Etawah is observed with 42.06% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has decreased about 3.80% since 2003-05. The most significant process of land degradation/ desertification in the district is Water Erosion (31.82% during 2011-13 and 33.75% during 2003-05) followed by Salinity/ Alkalinity (7.47% during 2011-13 and 9.18% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Water Erosion	73544.16	31.82	77999.78	33.75	-4455.61
Salinity / Alkalinity	17266.94	7.47	21209.81	9.18	-3942.86
Water Logging	473.49	0.20	937.02	0.41	-463.53
Settlement	5917.08	2.56	5841.64	2.53	75.44
Total Area under Desertification	**97201.67**	**42.06**	**105988.24**	**45.86**	**-8786.57**
No Apparent Degradation	**127961.44**	**55.37**	**119330.43**	**51.64**	**8631.00**
Total Geographical Area (ha)	**231100.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Iw1	Agriculture irrigated, water erosion, Slight	4760.74	2.06	7017.67	3.04	-2256.93
2	Dw1	Agriculture unirrigated, water erosion, Slight	26951.33	11.66	29000.90	12.55	-2049.57
3	Fw1	Forest, water erosion, Slight	16127.77	6.98	16127.77	6.98	0.00
4	Fw2	Forest, water erosion, Moderate	8050.96	3.48	8050.96	3.48	0.00
5	Fw3	Forest, water erosion, Severe	235.27	0.10	235.27	0.10	0.00
6	Sw1	Land with scrub, water erosion, Slight	7106.34	3.08	7236.02	3.13	-129.68
7	Sw2	Land with scrub, water erosion, Moderate	9497.75	4.11	9525.37	4.12	-27.62
8	Sw3	Land with scrub, water erosion, Severe	814.01	0.35	805.83	0.35	8.18
9	Is1	Agriculture irrigated, salinity / alkalinity, Slight	1893.18	0.82	780.61	0.34	1112.57
10	Is2	Agriculture irrigated, salinity / alkalinity, Moderate	131.46	0.06	75.52	0.03	55.94
11	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight	5474.08	2.37	8811.06	3.81	-3336.98
12	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate	5126.40	2.22	7262.74	3.14	-2136.35
13	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe	4641.83	2.01	4279.88	1.85	361.95
14	Il1	Agriculture irrigated, water logging, Slight	294.52	0.13	811.82	0.35	-517.31
15	Il2	Agriculture irrigated, water logging, Moderate	178.97	0.08	125.19	0.05	53.78
16	S	Settlement	5917.08	2.56	5841.64	2.53	75.44
Total Area Under Desertification/ Land Degradation			**97201.67**	**42.06**	**105988.24**	**45.86**	**-8786.57**
17	W	Water body/ Drainage	5936.89	2.57	5781.32	2.50	155.57
18	NAD	No Apparent Degradation	127961.44	55.37	119330.43	51.64	8631.00
Total Geographical Area (ha)			**231100.00**	**100.00**	**231100.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Etawah District, Uttar Pradesh
Timeframe - 2011-13

Legend

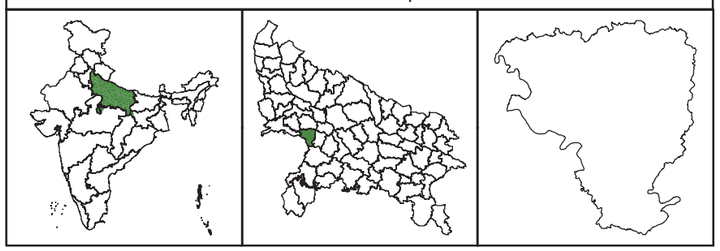
Symbol	Code	Description
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Fw1	Forest, water erosion, Slight
	Fw2	Forest, water erosion, Moderate
	Fw3	Forest, water erosion, Severe
	Sw1	Land with scrub, water erosion, Slight
	Sw2	Land with scrub, water erosion, Moderate
	Sw3	Land with scrub, water erosion, Severe
	Is1	Agriculture irrigated, salinity / alkalinity, Slight
	Is2	Agriculture irrigated, salinity / alkalinity, Moderate
	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight
	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate
	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe
	Il1	Agriculture irrigated, water logging, Slight
	Il2	Agriculture irrigated, water logging, Moderate
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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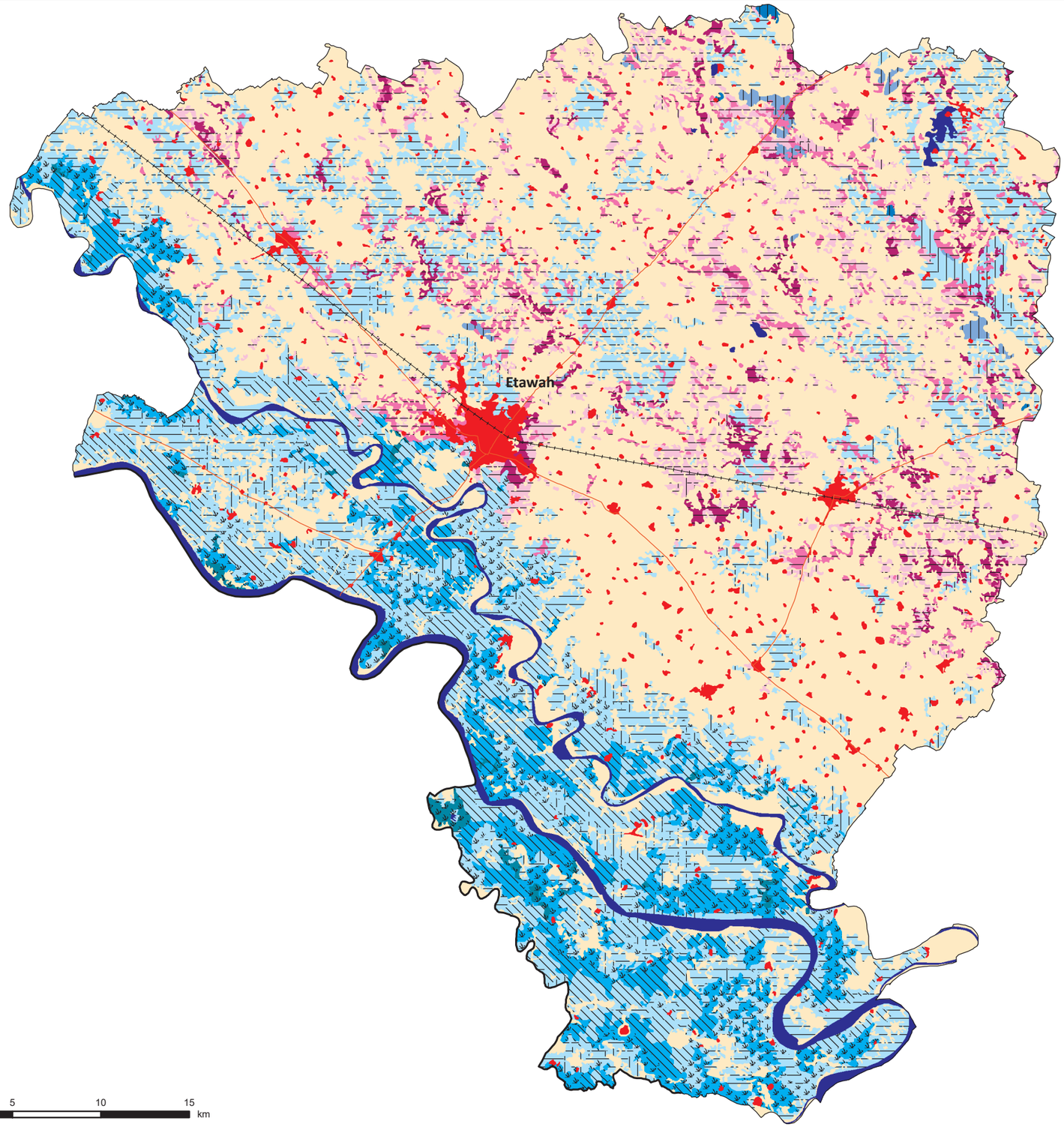


DESERTIFICATION / LAND DEGRADATION STATUS MAP
Etawah District, Uttar Pradesh
Timeframe - 2003-05

Legend

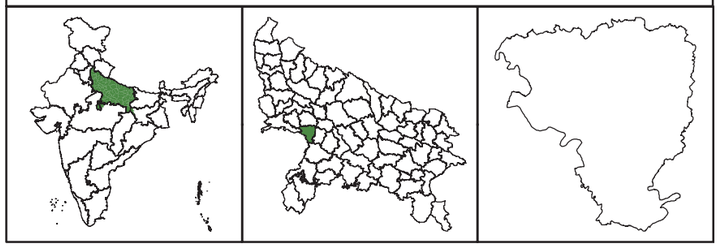
Symbol	Code	Description
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Fw1	Forest, water erosion, Slight
	Fw2	Forest, water erosion, Moderate
	Fw3	Forest, water erosion, Severe
	Sw1	Land with scrub, water erosion, Slight
	Sw2	Land with scrub, water erosion, Moderate
	Sw3	Land with scrub, water erosion, Severe
	Is1	Agriculture irrigated, salinity / alkalinity, Slight
	Is2	Agriculture irrigated, salinity / alkalinity, Moderate
	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight
	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate
	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe
	Il1	Agriculture irrigated, water logging, Slight
	Il2	Agriculture irrigated, water logging, Moderate
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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Space Applications Centre, ISRO, Ahmedabad

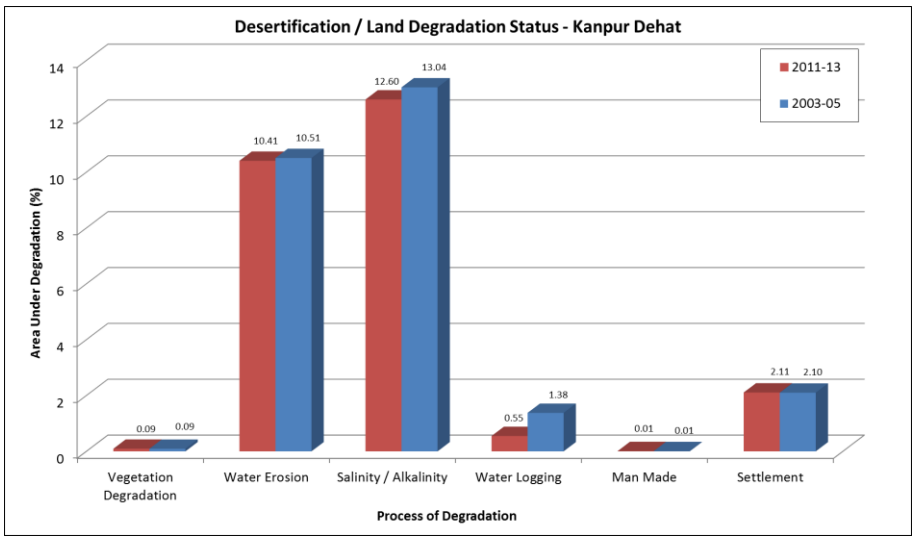
Kanpur Dehat District, Uttar Pradesh

Kanpur Dehat lies in the south-west part of Uttar Pradesh state. It is bounded by Kannauj district in north, Kanpur Nagar district in East, Jalaun district in south and Auraiya district in the west. It covers an area of 3021 sq. km. The district has a population of 17,96,184 with 595 population density, 865 sex ratio and a literacy rate of 75.78%. (Census 2011)

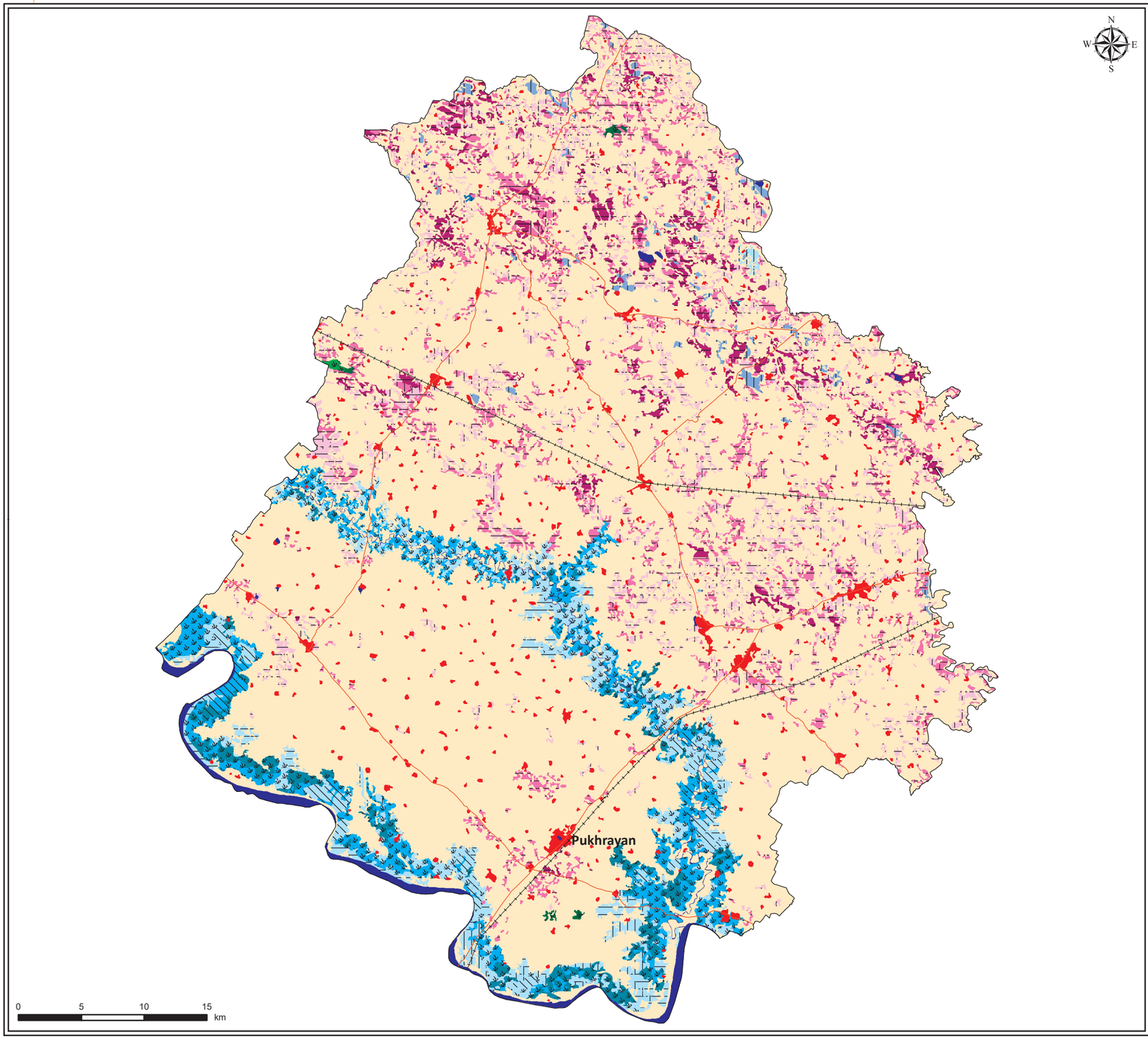
The district lies in the lower doab of Ganga and Yamuna rivers. Topographically, the district has slope from north to southeast direction. The district can be divided into Ganga Khadar, Bilhaur Plain and Rind Plain. Ganga Khadar region is situated along the Ganga river it is a narrow strip. Bilhaur Plain is situated parallel to the Ganga khadar and is an elongated shape. It is relatively a higher tract, which slopes from northwest to southeast direction. The Rind Plain region is situated in the central part of the district this region runs parallel to Bilhaur plain region and slopes from northwest to southeast direction. Apart from Ganga and Yamuna four other small rivers Rind, Sengar, Lon and Pondu Nadi also flank through the district.

Kanpur Dehat is observed with 25.78% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has decreased about 1.35% since 2003-05. The most significant process of land degradation/ desertification in the district is Salinity/Alkalinity (12.60% during 2011-13 and 13.04% during 2003-05) followed by Water Erosion (10.41% during 2011-13 and 10.51% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	286.86	0.09	282.28	0.09	4.58
Water Erosion	31439.36	10.41	31739.93	10.51	-300.57
Salinity / Alkalinity	38073.25	12.60	39383.78	13.04	-1310.53
Water Logging	1664.84	0.55	4166.60	1.38	-2501.76
Man Made	31.86	0.01	24.83	0.01	7.02
Settlement	6370.87	2.11	6350.91	2.10	19.96
Total Area under Desertification	**77867.04**	**25.78**	**81948.33**	**27.13**	**-4081.30**
No Apparent Degradation	**221052.26**	**73.17**	**217024.71**	**71.84**	**4027.56**
Total Geographical Area (ha)	**302100.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Sv1	Land with scrub, vegetation degradation, Slight	204.48	0.07	166.28	0.06	38.20
2	Sv2	Land with scrub, vegetation degradation, Moderate	82.38	0.03	116.00	0.04	-33.62
3	Iw1	Agriculture irrigated, water erosion, Slight	1747.25	0.58	1583.73	0.52	163.52
4	Dw1	Agriculture unirrigated, water erosion, Slight	2815.08	0.93	3003.66	0.99	-188.58
5	Fw1	Forest, water erosion, Slight	2280.27	0.75	2280.27	0.75	0.00
6	Fw2	Forest, water erosion, Moderate	1034.89	0.34	1034.89	0.34	0.00
7	Fw3	Forest, water erosion, Severe	204.22	0.07	204.22	0.07	0.00
8	Sw1	Land with scrub, water erosion, Slight	7654.68	2.53	7631.02	2.53	23.66
9	Sw2	Land with scrub, water erosion, Moderate	11359.48	3.76	11837.63	3.92	-478.15
10	Sw3	Land with scrub, water erosion, Severe	4343.50	1.44	4164.51	1.38	178.99
11	Is1	Agriculture irrigated, salinity / alkalinity, Slight	6684.12	2.21	5662.21	1.87	1021.91
12	Is2	Agriculture irrigated, salinity / alkalinity, Moderate	1901.40	0.63	1720.88	0.57	180.52
13	Is3	Agriculture irrigated, salinity / alkalinity, Severe	49.28	0.02	49.28	0.02	0.00
14	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight	9576.89	3.17	10783.41	3.57	-1206.51
15	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate	13848.67	4.58	14790.36	4.90	-941.69
16	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe	6012.89	1.99	6377.65	2.11	-364.75
17	Il1	Agriculture irrigated, water logging, Slight	1631.88	0.54	4133.64	1.37	-2501.76
18	Il2	Agriculture irrigated, water logging, Moderate	32.96	0.01	32.96	0.01	0.00
19	Tm1	Others, man made, Slight	31.86	0.01	24.83	0.01	7.02
20	S	Settlement	6370.87	2.11	6350.91	2.10	19.96
Total Area Under Desertification/ Land Degradation			**77867.04**	**25.78**	**81948.33**	**27.13**	**-4081.30**
21	W	Water body/ Drainage	3180.70	1.05	3126.96	1.04	53.74
22	NAD	No Apparent Degradation	221052.26	73.17	217024.71	71.84	4027.56
Total Geographical Area (ha)			**302100.00**	**100.00**	**302100.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Kanpur Dehat District, Uttar Pradesh
Timeframe - 2011-13

Legend

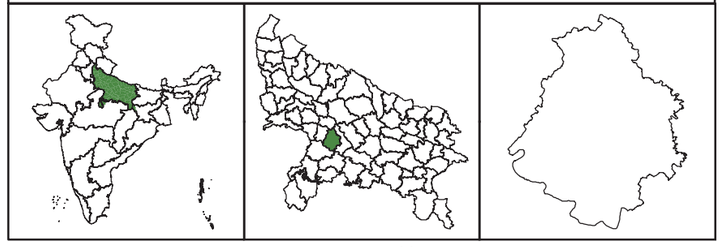
Symbol	Code	Description
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Fw1	Forest, water erosion, Slight
	Fw2	Forest, water erosion, Moderate
	Fw3	Forest, water erosion, Severe
	Sw1	Land with scrub, water erosion, Slight
	Sw2	Land with scrub, water erosion, Moderate
	Sw3	Land with scrub, water erosion, Severe
	Is1	Agriculture irrigated, salinity / alkalinity, Slight
	Is2	Agriculture irrigated, salinity / alkalinity, Moderate
	Is3	Agriculture irrigated, salinity / alkalinity, Severe
	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight
	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate
	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe
	Il1	Agriculture irrigated, water logging, Slight
	Il2	Agriculture irrigated, water logging, Moderate
	Tm1	Others, man made, Slight
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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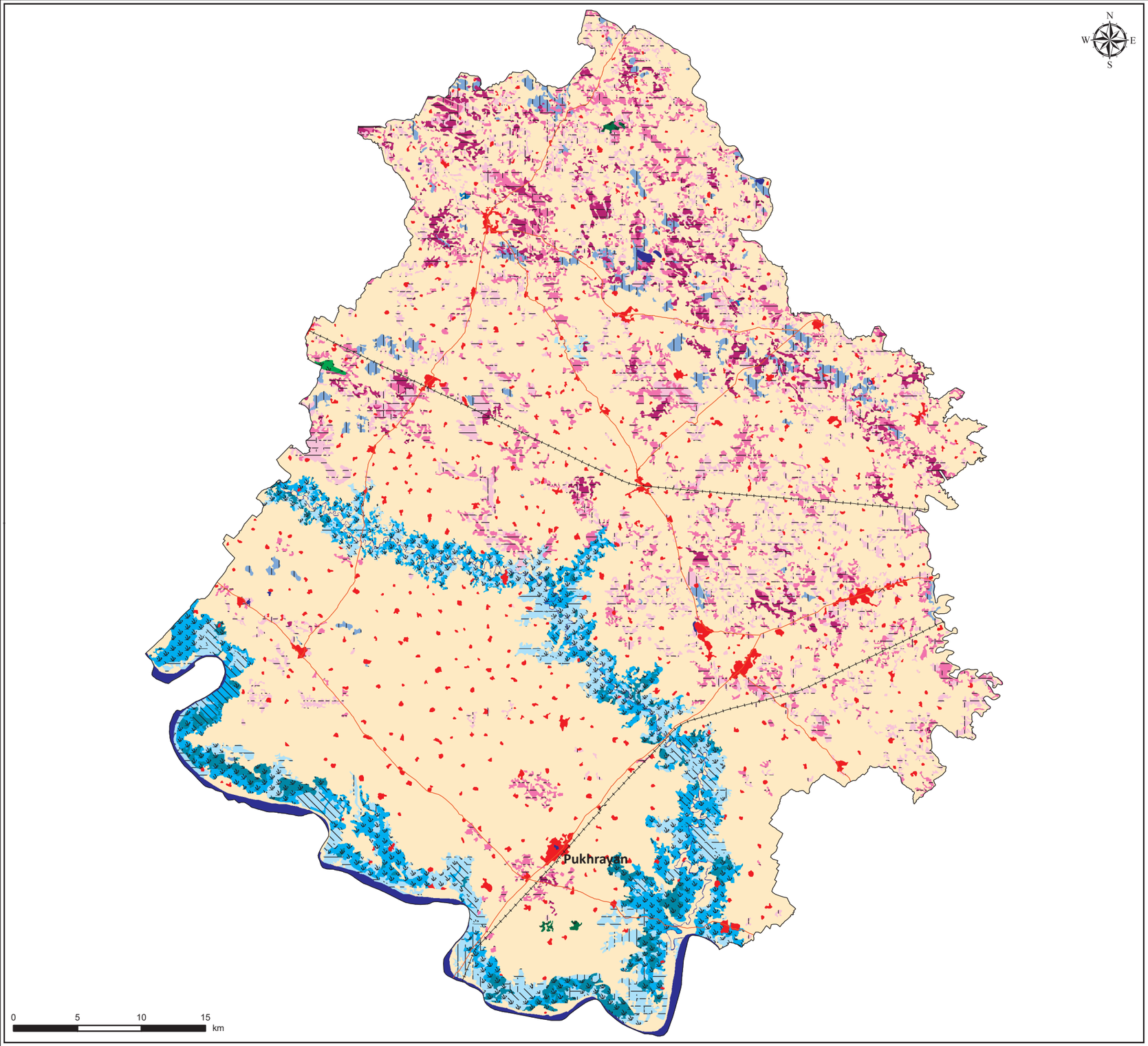


DESERTIFICATION / LAND DEGRADATION STATUS MAP
Kanpur Dehat District, Uttar Pradesh
Timeframe - 2003-05

Legend

Symbol	Code	Description
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Iw1	Agriculture irrigated, water erosion, Slight
	Dw1	Agriculture unirrigated, water erosion, Slight
	Fw1	Forest, water erosion, Slight
	Fw2	Forest, water erosion, Moderate
	Fw3	Forest, water erosion, Severe
	Sw1	Land with scrub, water erosion, Slight
	Sw2	Land with scrub, water erosion, Moderate
	Sw3	Land with scrub, water erosion, Severe
	Is1	Agriculture irrigated, salinity / alkalinity, Slight
	Is2	Agriculture irrigated, salinity / alkalinity, Moderate
	Is3	Agriculture irrigated, salinity / alkalinity, Severe
	Ds1	Agriculture unirrigated, salinity / alkalinity, Slight
	Ds2	Agriculture unirrigated, salinity / alkalinity, Moderate
	Ds3	Agriculture unirrigated, salinity / alkalinity, Severe
	Il1	Agriculture irrigated, water logging, Slight
	Il2	Agriculture irrigated, water logging, Moderate
	Tm1	Others, man made, Slight
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map

Prepared by:
Remote Sensing Applications Centre, Uttar Pradesh, Lucknow
&
Space Applications Centre, ISRO, Ahmedabad

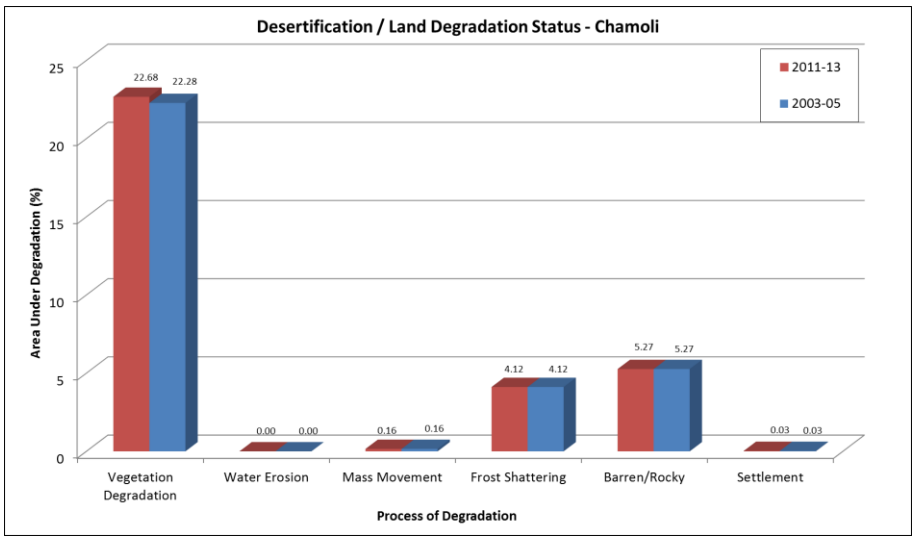
Chamoli District, Uttarakhand

Chamoli district lies in the northern portion of Uttarakhand state. It shares international border with Tibet on northern side. It is bounded by Pithoragarh, Bageshwar districts on east side, Bageshwar and Almora on south side, Pouri Garhwal district on south-west side and Rudraprayag & Uttarkashi districts on west side. It covers an area of 8,030 sq. km. The district has a population of 3,91,605 with 49 population density, 1,019 sex ratio and a literacy rate of 83.00%. (Census 2011)

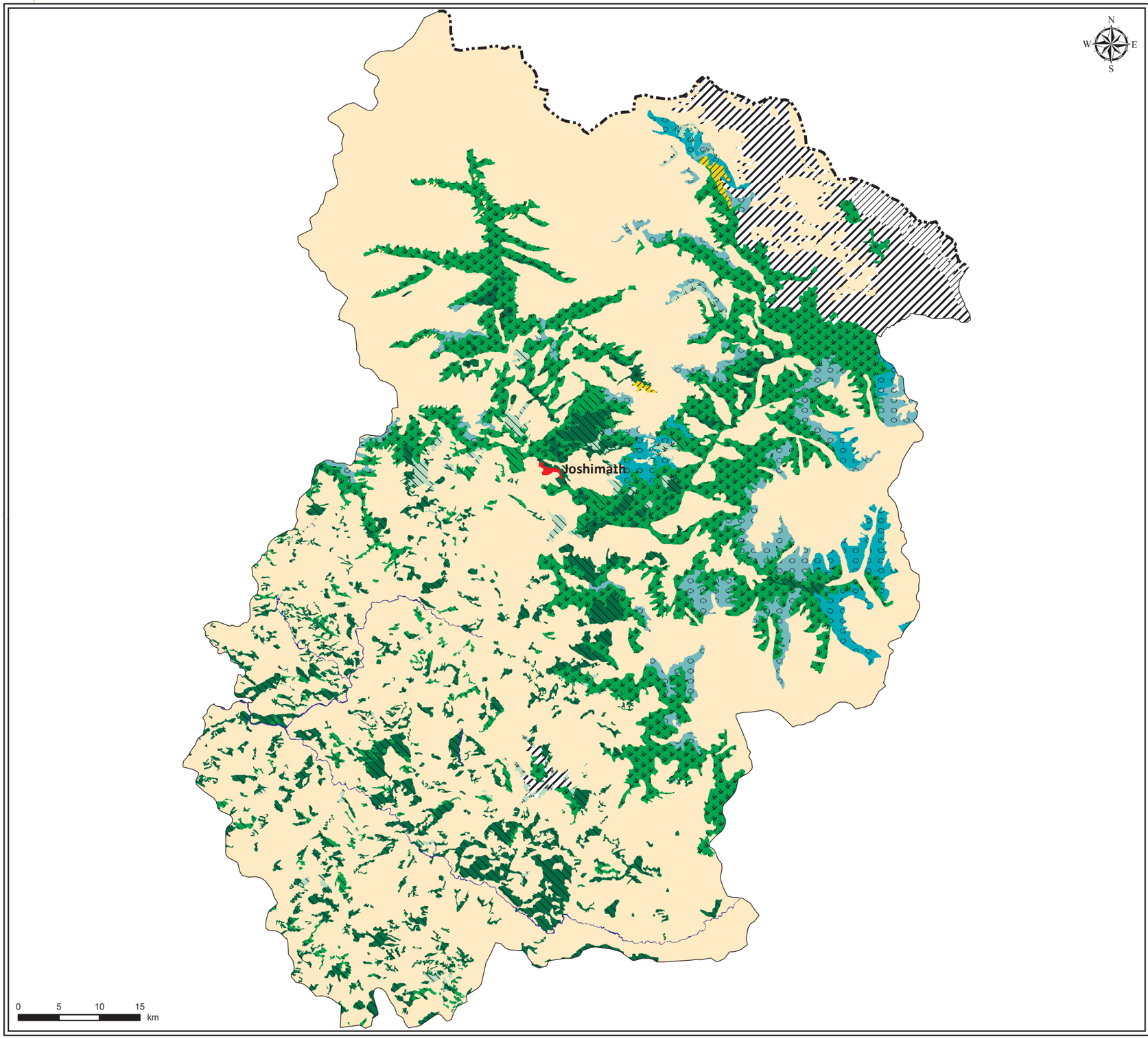
The physiography of the district is undulating. The district falls under the crests of the Himalayas. The district also stretches across the snow free valleys to the sky scraping peaks with perpetual snow and glaciers. The terrain consists of the Ridges of Nanda Devi & Badrinath which are dominating features and leave only the narrow and precipitous valleys. The adjacent ridges of the valleys are covered with dense forests. Between the dense fringes of the forest occurs the scarcely populated tract, the inhabitants of which subsist on terrace cultivation. Alaknanda, Mandakini and Pindar are the main rivers of the district.

Chamoli is observed with 32.25% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.4% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (22.68% during 2011-13 and 22.28% during 2003-05) followed by Frost Shattering (4.12% during 2011-13 and 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	182094.29	22.68	178916.25	22.28	3178.04
Water Erosion	15.89	0.00	15.89	0.00	0.00
Mass Movement	1263.48	0.16	1263.48	0.16	0.00
Frost Shattering	33058.35	4.12	33058.35	4.12	0.00
Barren/Rocky	42279.43	5.27	42279.43	5.27	0.00
Settlement	223.99	0.03	223.99	0.03	0.00
Total Area under Desertification	**258935.43**	**32.25**	**255757.39**	**31.85**	**3178.04**
No Apparent Degradation	**542540.64**	**67.56**	**545718.69**	**67.96**	**-3178.04**
Total Geographical Area (ha)	**803000.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	49716.56	6.19	47675.29	5.94	2041.26
2	Fv2	Forest, vegetation degradation, Moderate	9688.71	1.21	8930.42	1.11	758.29
3	Fv3	Forest, vegetation degradation, Severe	4717.67	0.59	4508.82	0.56	208.85
4	Sv1	Land with scrub, vegetation degradation, Slight	4866.57	0.61	4696.93	0.58	169.64
5	Sv2	Land with scrub, vegetation degradation, Moderate	110936.72	13.82	110936.72	13.82	0.00
6	Sv3	Land with scrub, vegetation degradation, Severe	2168.07	0.27	2168.07	0.27	0.00
7	Fw3	Forest, water erosion, Severe	15.89	0.00	15.89	0.00	0.00
8	Bg1	Barren, mass movement, Slight	368.71	0.05	368.71	0.05	0.00
9	Bg2	Barren, mass movement, Moderate	894.77	0.11	894.77	0.11	0.00
10	Lf1	Periglacial, frost shattering, Slight	21081.15	2.63	21081.15	2.63	0.00
11	Lf2	Periglacial, frost shattering, Moderate	11977.20	1.49	11977.20	1.49	0.00
12	B	Barren	4873.61	0.61	4873.61	0.61	0.00
13	R	Rocky	37405.82	4.66	37405.82	4.66	0.00
14	S	Settlement	223.99	0.03	223.99	0.03	0.00
Total Area Under Desertification/ Land Degradation			**258935.43**	**32.25**	**255757.39**	**31.85**	**3178.04**
15	W	Water body/ Drainage	1523.93	0.19	1523.93	0.19	0.00
16	NAD	No Apparent Degradation	542540.64	67.56	545718.69	67.96	-3178.04
Total Geographical Area (ha)			**803000.00**	**100.00**	**803000.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Chamoli District, Uttarakhand
Timeframe - 2011-13

Legend

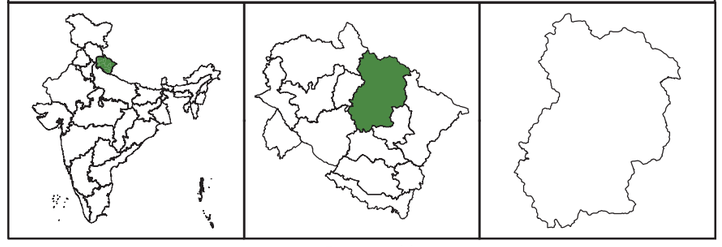
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Fw3	Forest, water erosion, Severe
	Bg1	Barren, mass movement, Slight
	Bg2	Barren, mass movement, Moderate
	Lf1	Periglacial, frost shattering, Slight
	Lf2	Periglacial, frost shattering, Moderate
	B	Barren
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

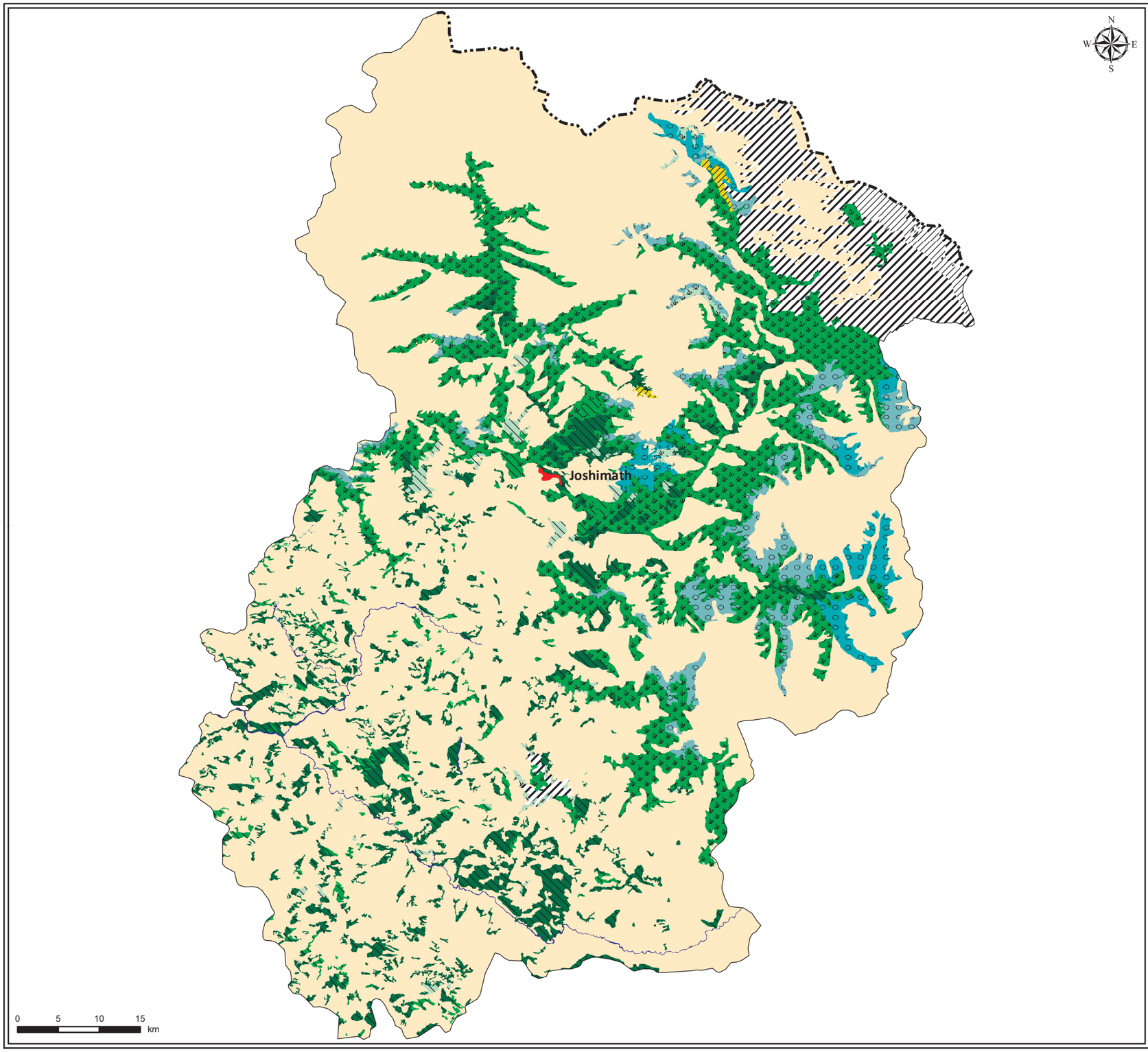
International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



Prepared by:
Soil and Land Use Survey of India, Delhi
&
Space Applications Centre, ISRO, Ahmedabad



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Chamoli District, Uttarakhand
Timeframe - 2003-05

Legend

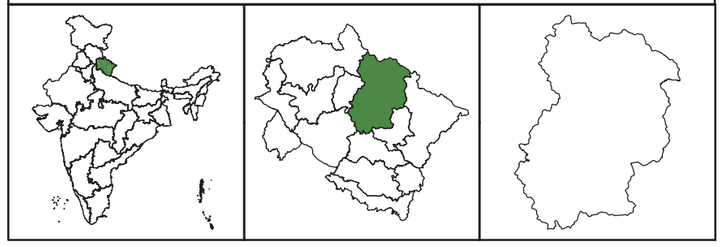
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Fw3	Forest, water erosion, Severe
	Bg1	Barren, mass movement, Slight
	Bg2	Barren, mass movement, Moderate
	Lf1	Periglacial, frost shattering, Slight
	Lf2	Periglacial, frost shattering, Moderate
	B	Barren
	R	Rocky
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



Prepared by:
Soil and Land Use Survey of India, Delhi
&
Space Applications Centre, ISRO, Ahmedabad

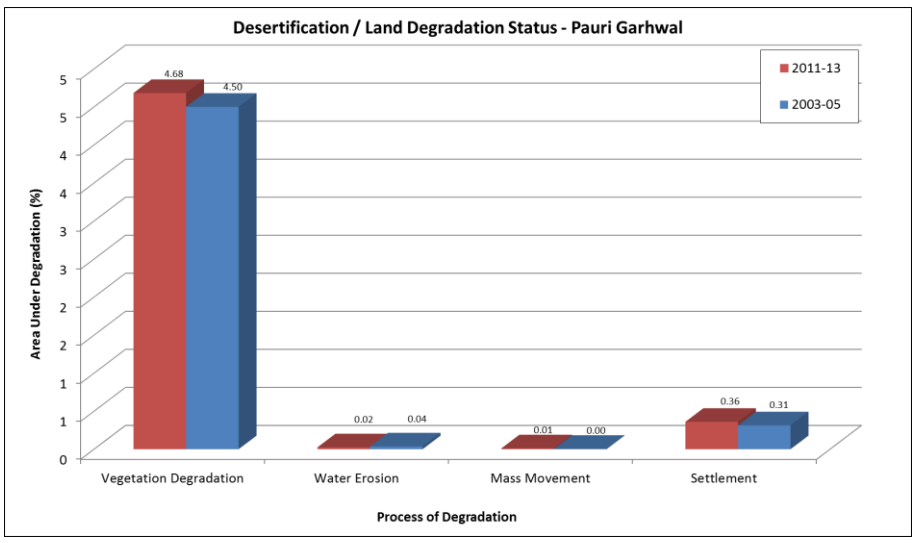
Pauri Garhwal District, Uttarakhand

Pauri Garhwal district lies in the south-west part of Uttarakhand state. It is bounded by Dehradun and Haridwar districts on the west, Tehri Garhwal and Rudraprayag districts on the north, Chamoli and Almora districts on east, Nainital district on south-east and Uttar Pradesh on south-west side. It covers an area of 5,329 sq. km. The district has a population of 6,97,078 with 131 population density, 1,106 sex ratio and a literacy rate of 77.50%. (Census 2011)

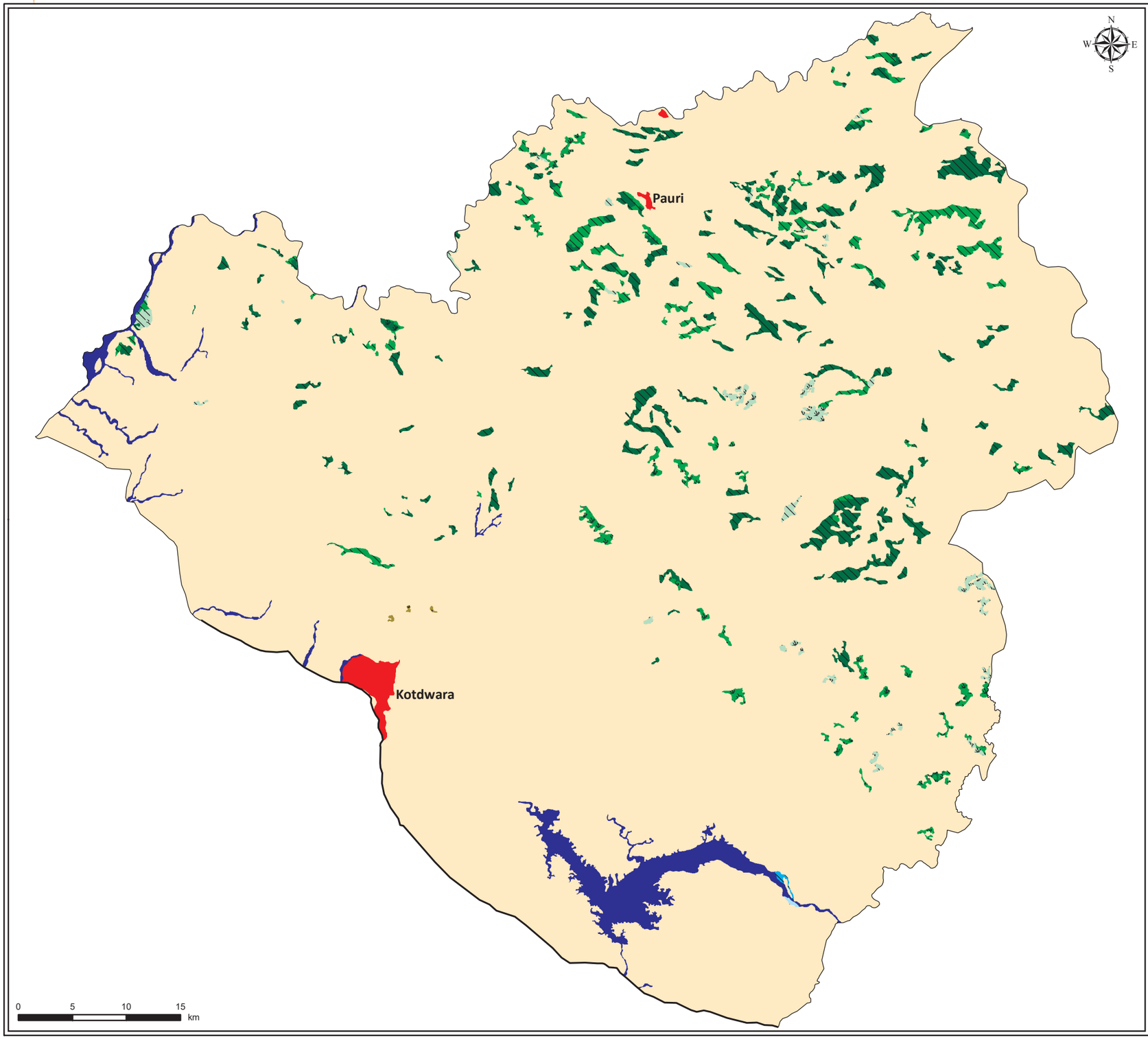
The region extends towards the south of the Ganga river in the northern part of the district and is bounded by Alaknanda basin in the north-east and Lesser Himalaya and Siwalik in the south. It is mountainous region consisting of ridges, slopes, falls and valleys. The average height ranges between 450 and 2,000 meters from the mean sea level. It consists of a succession of steep mountain ridges separated from each other by deep glens. The sub-mountain tract in the southern part of the district is known as Bhabar.

Pauri Garhwal is observed with 5.08% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.22% since 2003-05. The most significant process of land degradation/ desertification in the district is Vegetation Degradation (4.68% during 2011-13 and 4.50% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	24952.72	4.68	23984.52	4.50	968.19
Water Erosion	132.98	0.02	194.23	0.04	-61.25
Mass Movement	63.14	0.01	24.62	0.00	38.52
Settlement	1918.43	0.36	1669.54	0.31	248.89
Total Area under Desertification	**27067.27**	**5.08**	**25872.92**	**4.86**	**1194.35**
No Apparent Degradation	**495994.89**	**93.07**	**497197.54**	**93.30**	**-1202.65**
Total Geographical Area (ha)	**532900.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	13660.01	2.56	13057.62	2.45	602.39
2	Fv2	Forest, vegetation degradation, Moderate	5495.42	1.03	5322.71	1.00	172.71
3	Fv3	Forest, vegetation degradation, Severe	717.20	0.13	578.35	0.11	138.85
4	Sv1	Land with scrub, vegetation degradation, Slight	527.63	0.10	690.76	0.13	-163.13
5	Sv2	Land with scrub, vegetation degradation, Moderate	3007.05	0.56	2905.60	0.55	101.45
6	Sv3	Land with scrub, vegetation degradation, Severe	1545.40	0.29	1429.48	0.27	115.92
7	Fw1	Forest, water erosion, Slight	0.00	0.00	194.23	0.04	-194.23
8	Fw2	Forest, water erosion, Severe	132.98	0.02	0.00	0.00	132.98
9	Sg3	Land with scrub, mass movement, Severe	63.14	0.01	24.62	0.00	38.52
10	S	Settlement	1918.43	0.36	1669.54	0.31	248.89
Total Area Under Desertification/ Land Degradation			**27067.27**	**5.08**	**25872.92**	**4.86**	**1194.35**
11	W	Water body/ Drainage	9837.84	1.85	9829.54	1.84	8.30
12	NAD	No Apparent Degradation	495994.89	93.07	497197.54	93.30	-1202.65
Total Geographical Area (ha)			**532900.00**	**100.00**	**532900.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Pauri Garhwal District, Uttarakhand
Timeframe - 2011-13

Legend

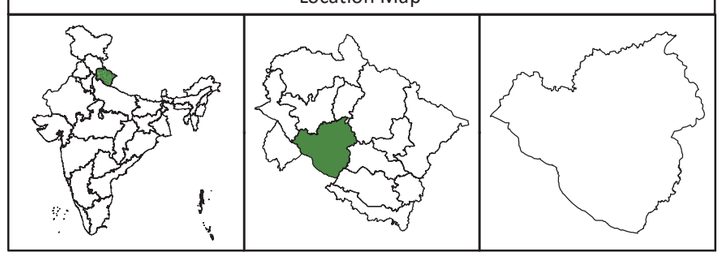
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Fw2	Forest, water erosion, Severe
	Sg3	Land with scrub, mass movement, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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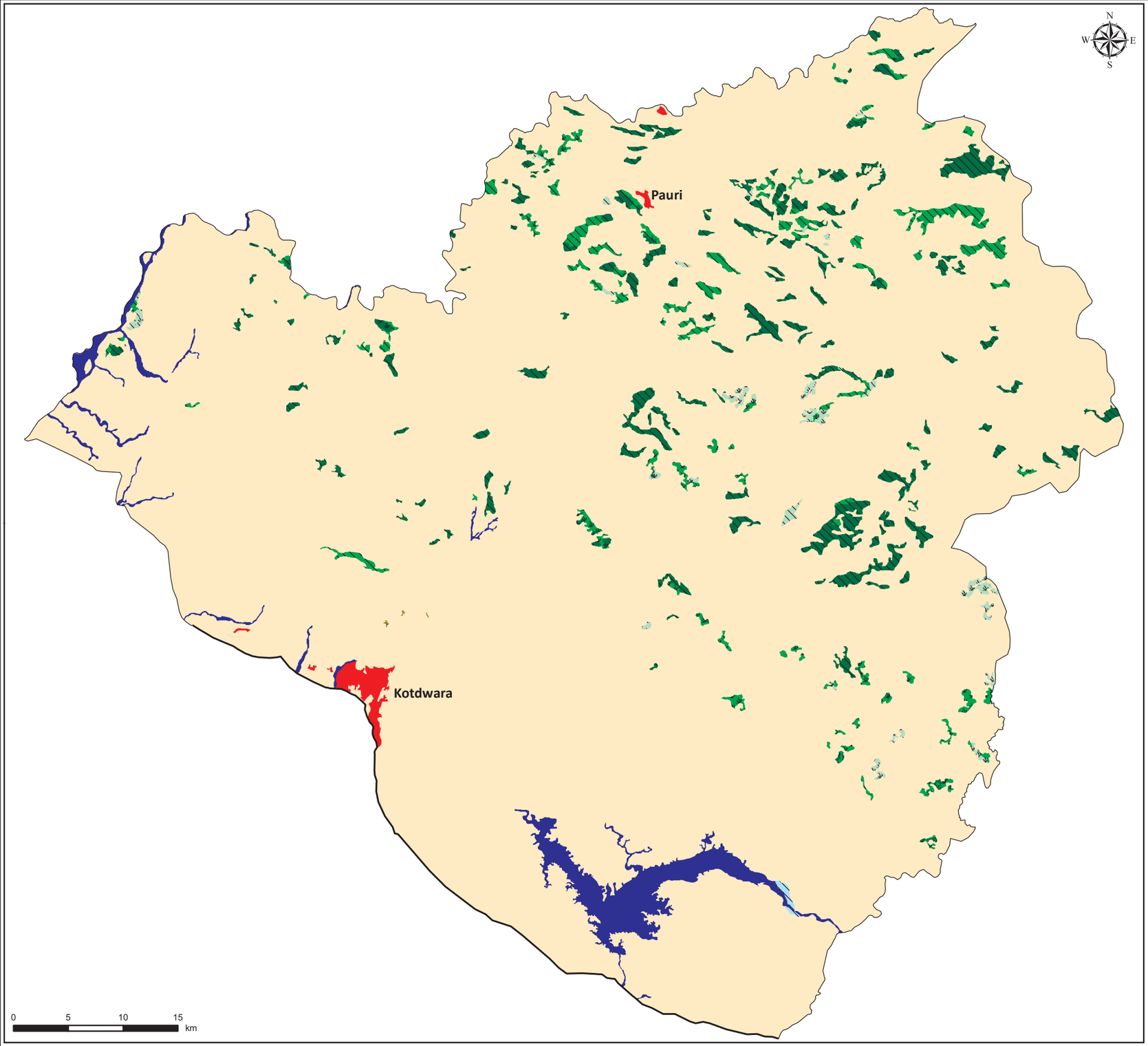
Soil and Land Use Survey of India, Delhi
&
Space Applications Centre, ISRO, Ahmedabad



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Pauri Garhwal District, Uttarakhand
Timeframe - 2003-05

Legend

Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Fw1	Forest, water erosion, Slight
	Sg3	Land with scrub, mass movement, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
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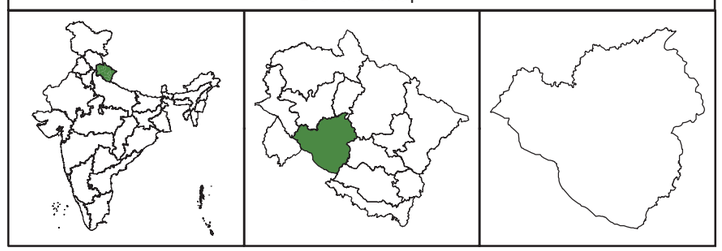
Major Road
Major Rail

Location Map



Prepared by:
Soil and Land Use Survey of India, Delhi
&
Space Applications Centre, ISRO, Ahmedabad

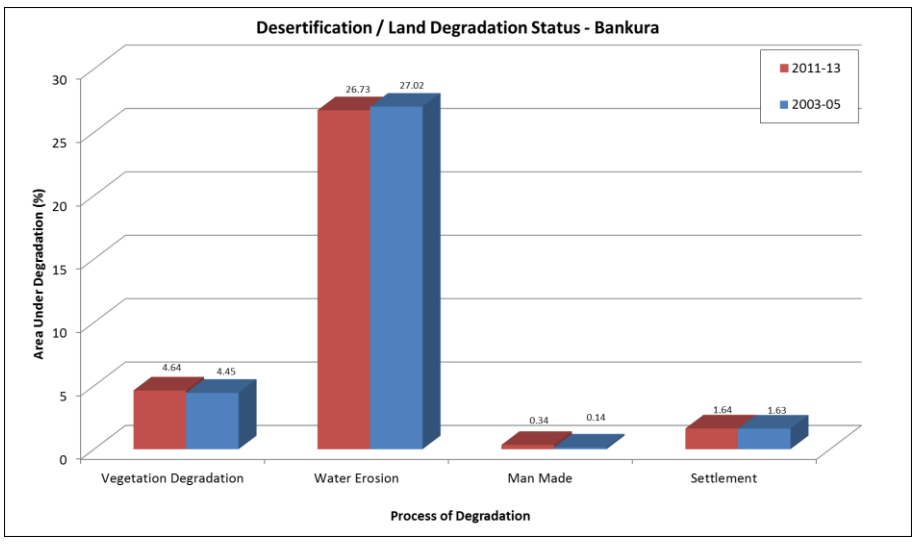
Bankura District, West Bengal

Bankura district lies in western part of West Bengal state. It is bounded by Barddhaman district in north and east sides, Hugli district in east, West Medinipur district to the south side and Purulia district to the west side. It covers an area of 6,882 sq. km. The district has a population of 35,96,674 with 523 population density, 957 sex ratio and a literacy rate of 70.30%. (Census 2011)

The district forms a link between the plains of Bengal on the east and Chota Nagpur plateau on the west. The areas to the east and north-east are low lying alluvial plains, similar to predominating rice lands of Bengal. To the west the surface gradually rises which gives way to undulating country, interspersed with rocky hillocks. The regions of the district could be divided into broad three parts 1) the hilly areas to the west, 2) the connecting undulating tract in the middle, and 3) the level alluvial plains to the east. The drainage system of the district is mainly controlled by rivers like Damodar, Dwarakeswar and Kangsabati along with their network of tributaries.

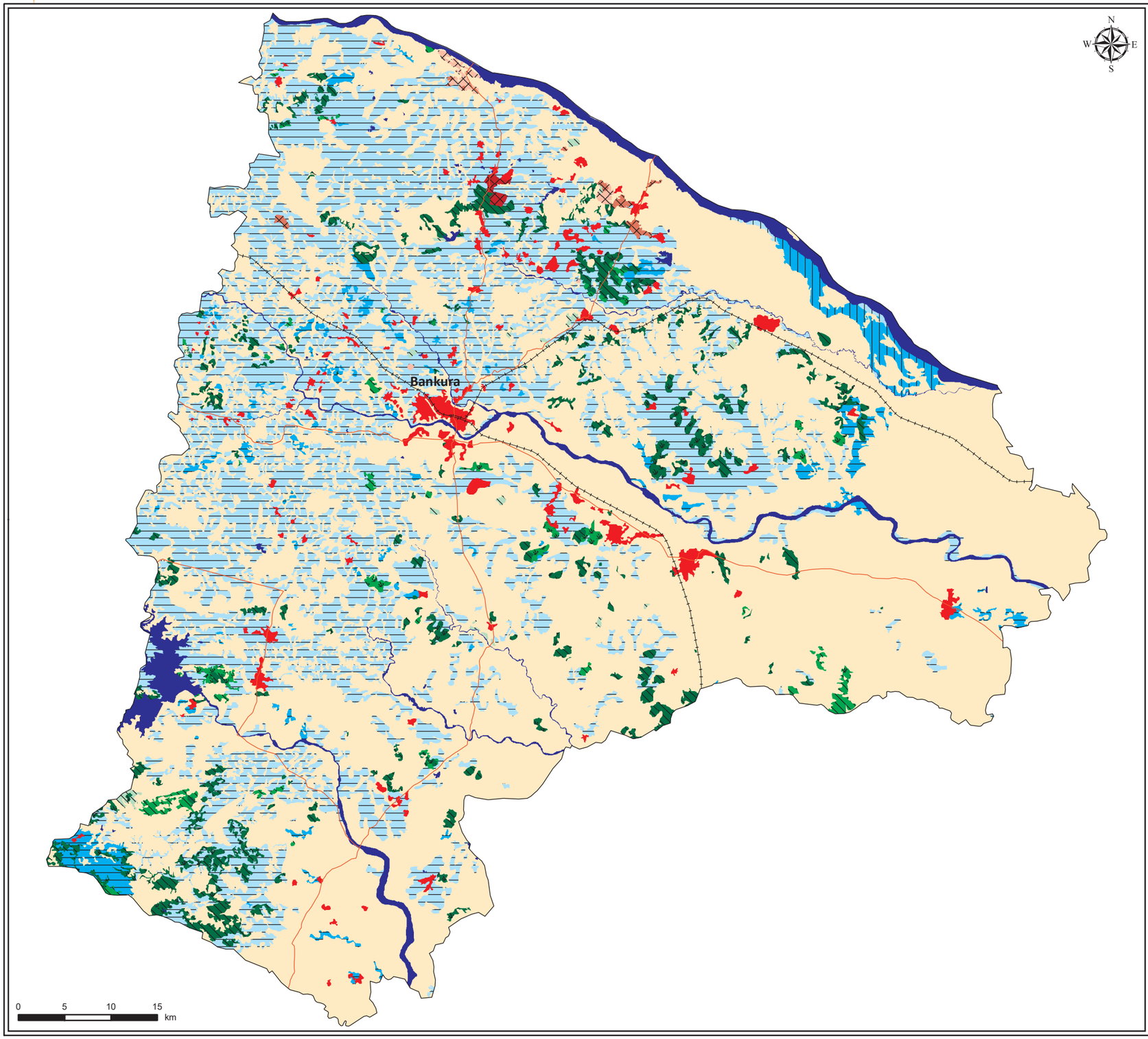
Bankura is observed with 33.35% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.13% since 2003-05. The most significant process of land degradation/ desertification in the district is Water Erosion (26.73% during 2011-13 and 27.02% during 2003-05) followed by Vegetation Degradation (4.64% during 2011-13 and 4.45% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	31907.13	4.64	30610.35	4.45	1296.78
Water Erosion	183990.16	26.73	185925.08	27.02	-1934.92
Man Made	2322.91	0.34	929.28	0.14	1393.63
Settlement	11270.26	1.64	11188.59	1.63	81.68
Total Area under Desertification	**229490.47**	**33.35**	**228653.30**	**33.22**	**837.17**
No Apparent Degradation	**438376.22**	**63.70**	**439213.39**	**63.82**	**-837.17**
Total Geographical Area (ha)	**688200.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	18711.03	2.72	17481.91	2.54	1229.12
2	Fv2	Forest, vegetation degradation, Moderate	3043.35	0.44	3043.35	0.44	0.00
3	Fv3	Forest, vegetation degradation, Severe	1131.60	0.16	1063.95	0.15	67.66
4	Sv1	Land with scrub, vegetation degradation, Slight	6718.12	0.98	6489.55	0.94	228.57
5	Sv2	Land with scrub, vegetation degradation, Moderate	2303.02	0.33	2531.60	0.37	-228.57
6	Iw1	Agriculture irrigated, water erosion, Slight	458.84	0.07	458.84	0.07	0.00
7	Iw2	Agriculture irrigated, water erosion, Moderate	4188.80	0.61	4188.80	0.61	0.00
8	Dw1	Agriculture unirrigated, water erosion, Slight	168486.29	24.48	170624.10	24.79	-2137.81
9	Dw2	Agriculture unirrigated, water erosion, Moderate	10856.23	1.58	10653.34	1.55	202.89
10	Tm1	Others, man made, Slight	941.92	0.14	55.81	0.01	886.11
11	Tm2	Others, man made, Moderate	847.19	0.12	873.47	0.13	-26.27
12	Tm3	Others, man made, Severe	533.79	0.08	0.00	0.00	533.79
13	S	Settlement	11270.26	1.64	11188.59	1.63	81.68
Total Area Under Desertification/ Land Degradation			**229490.47**	**33.35**	**228653.30**	**33.22**	**837.17**
14	W	Water body/ Drainage	20333.32	2.95	20333.32	2.95	0.00
15	NAD	No Apparent Degradation	438376.22	63.70	439213.39	63.82	-837.17
Total Geographical Area (ha)			**688200.00**	**100.00**	**688200.00**	**100.00**	

DESERTIFICATION / LAND DEGRADATION STATUS MAP
Bankura District, West Bengal
Timeframe - 2011-13



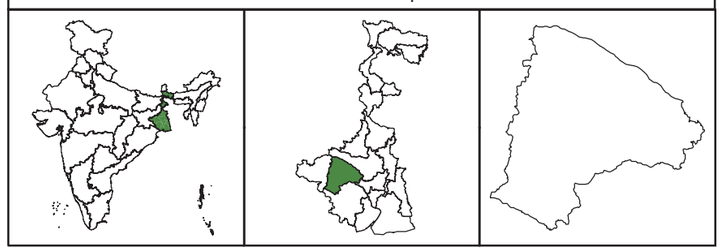
Legend		
Symbol	**Code**	**Description**
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Iw1	Agriculture irrigated, water erosion, Slight
	Iw2	Agriculture irrigated, water erosion, Moderate
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

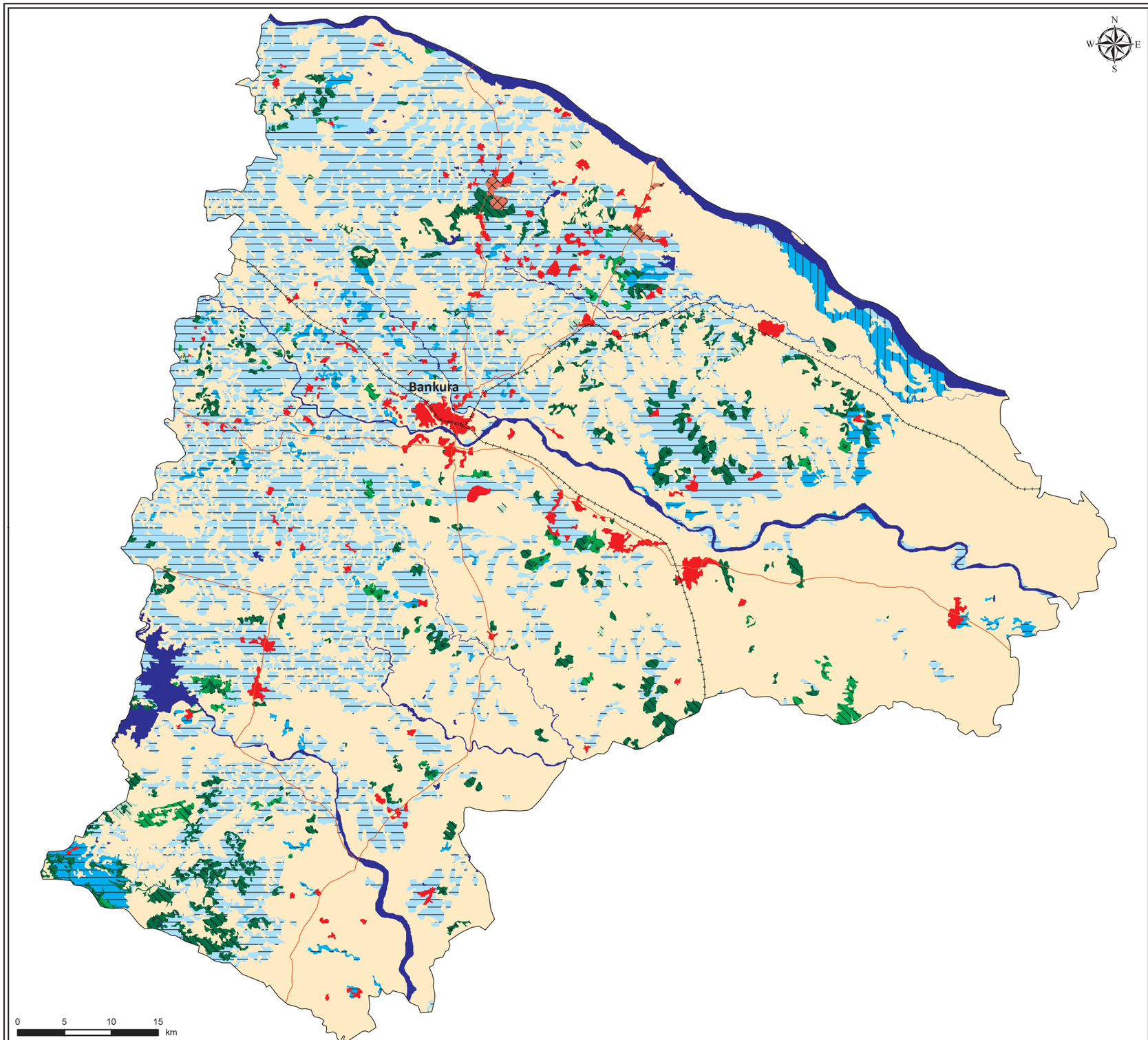
International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



Prepared by:
University of Calcutta, Kolkata
&
Space Applications Centre, ISRO, Ahmedabad



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Bankura District, West Bengal
Timeframe - 2003-05

Legend

Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Iw1	Agriculture irrigated, water erosion, Slight
	Iw2	Agriculture irrigated, water erosion, Moderate
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
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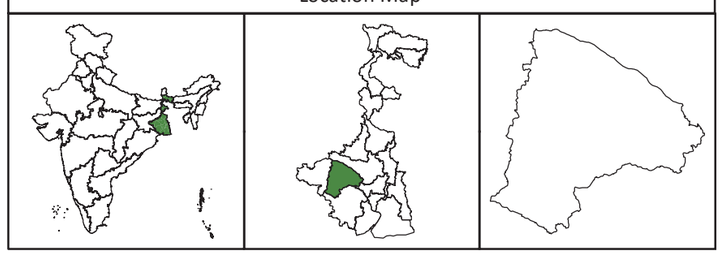
Major Rail

Location Map



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Space Applications Centre, ISRO, Ahmedabad

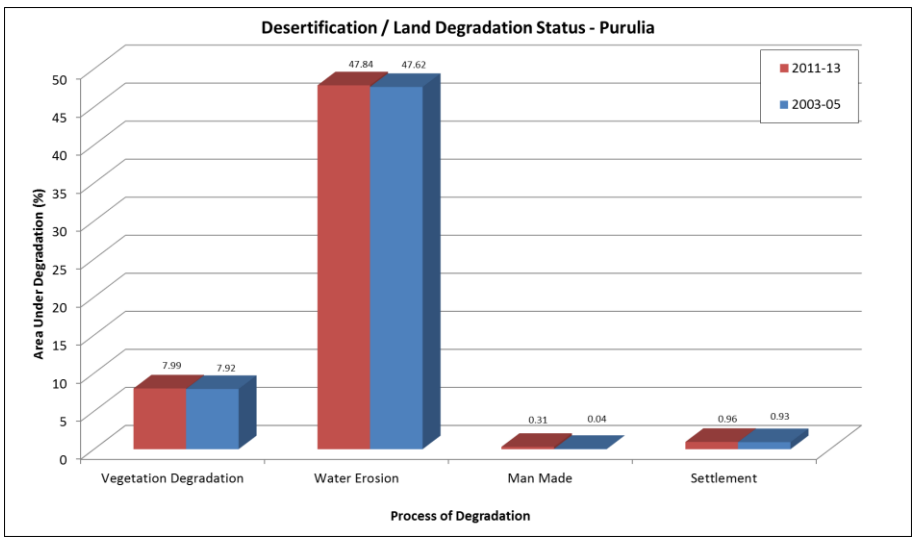
Purulia District, West Bengal

Purulia district lies in the west most part of West Bengal state. It is bounded by Jharkhand state on three sides, south, west and north. The eastern part is bounded by Barddhaman, Bankura and west Medinipur districts. It covers an area of with 6,259 sq. km. The district has a population of 29,30,115 with 468 population density, 957 sex ratio and a literacy rate of 64.50%. (Census 2011)

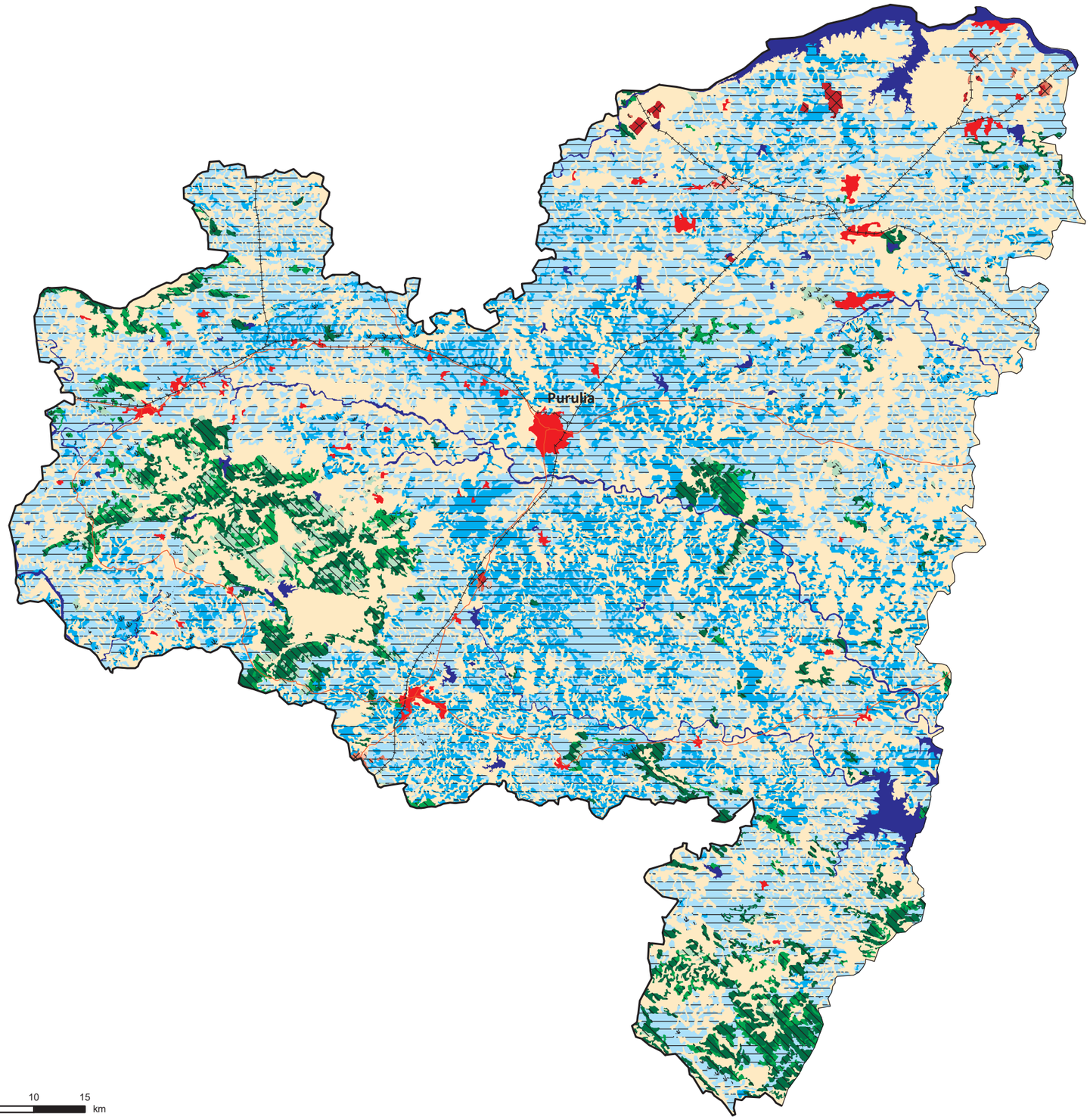
The topographical feature shows gradual decent from the uneven Chhota Nagpur plateau to the plain land of the state in the east. The district of Purulia is divided into three sub-micro regions on the basis of elevation and the nature of topography, viz Damodar–Darkeshwar Upland (north-east part), Upper Kasai Basin (central part), and Bagmundi–Bundwan Upland (north-west part). The main drainage of the district is controlled by river Kasai which drains more than three-fifth of the district's water.

Purulia is observed with 57.09% of total geographical area under land degradation/ desertification for the period 2011-13. The area under land degradation/ desertification in the district has increased about 0.59% since 2003-05. The most significant process of land degradation/ desertification in the district is Water Erosion (47.84% during 2011-13 and 47.62% during 2003-05) followed by Vegetation Degradation (7.99% during 2011-13 and 7.92% during 2003-05).

Process of Desertification / Land Degradation	2011-13		2003-05		Change (ha)
	Area(ha)	Area(%)	Area(ha)	Area(%)	(2011-13) - (2003-05)
Vegetation Degradation	49987.48	7.99	49548.80	7.92	438.67
Water Erosion	299402.89	47.84	298064.08	47.62	1338.81
Man Made	1935.31	0.31	236.34	0.04	1698.97
Settlement	6004.14	0.96	5789.61	0.93	214.52
Total Area under Desertification	**357329.82**	**57.09**	**353638.85**	**56.50**	**3690.97**
No Apparent Degradation	**254092.11**	**40.60**	**258062.77**	**41.23**	**-3970.66**
Total Geographical Area (ha)	**625900.00**				



SN	Desertification / Land degradation Classes		2011-13		2003-05		Change (ha)
	Code	Description (Land Cover, Process, Severity)	Area (ha)	Area (%)	Area (ha)	Area (%)	(2011-13) - (2003-05)
1	Fv1	Forest, vegetation degradation, Slight	27740.09	4.43	27471.55	4.39	268.55
2	Fv2	Forest, vegetation degradation, Moderate	10577.50	1.69	10559.42	1.69	18.08
3	Fv3	Forest, vegetation degradation, Severe	6308.61	1.01	6176.05	0.99	132.56
4	Sv1	Land with scrub, vegetation degradation, Slight	1128.69	0.18	1109.21	0.18	19.48
5	Sv2	Land with scrub, vegetation degradation, Moderate	2648.91	0.42	2648.91	0.42	0.00
6	Sv3	Land with scrub, vegetation degradation, Severe	1583.67	0.25	1583.67	0.25	0.00
7	Dw1	Agriculture unirrigated, water erosion, Slight	206860.56	33.05	206808.16	33.04	52.40
8	Dw2	Agriculture unirrigated, water erosion, Moderate	84576.68	13.51	83290.27	13.31	1286.41
9	Sw1	Land with scrub, water erosion, Slight	1646.78	0.26	1646.78	0.26	0.00
10	Sw2	Land with scrub, water erosion, Moderate	6318.87	1.01	6318.87	1.01	0.00
11	Tm1	Others, man made, Slight	428.55	0.07	99.69	0.02	328.85
12	Tm2	Others, man made, Moderate	390.09	0.06	20.94	0.00	369.15
13	Tm3	Others, man made, Severe	1116.67	0.18	115.70	0.02	1000.97
14	S	Settlement	6004.14	0.96	5789.61	0.93	214.52
Total Area Under Desertification/ Land Degradation			**357329.82**	**57.09**	**353638.85**	**56.50**	**3690.97**
15	W	Water body/ Drainage	14478.08	2.31	14198.39	2.27	279.69
16	NAD	No Apparent Degradation	254092.11	40.60	258062.77	41.23	-3970.66
Total Geographical Area (ha)			**625900.00**	**100.00**	**625900.00**	**100.00**	



DESERTIFICATION / LAND DEGRADATION STATUS MAP
Purulia District, West Bengal
Timeframe - 2011-13

Legend

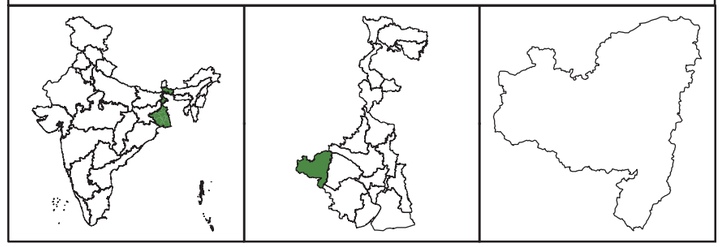
Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Sw1	Land with scrub, water erosion, Slight
	Sw2	Land with scrub, water erosion, Moderate
	Tm1	Others, man made, Slight
	Tm2	Others, man made, Moderate
	Tm3	Others, man made, Severe
	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2011-2013)
- Ancillary Information
- Ground Truth Data

International Boundary
State Boundary
District Bundary

Major Road
Major Rail

Location Map



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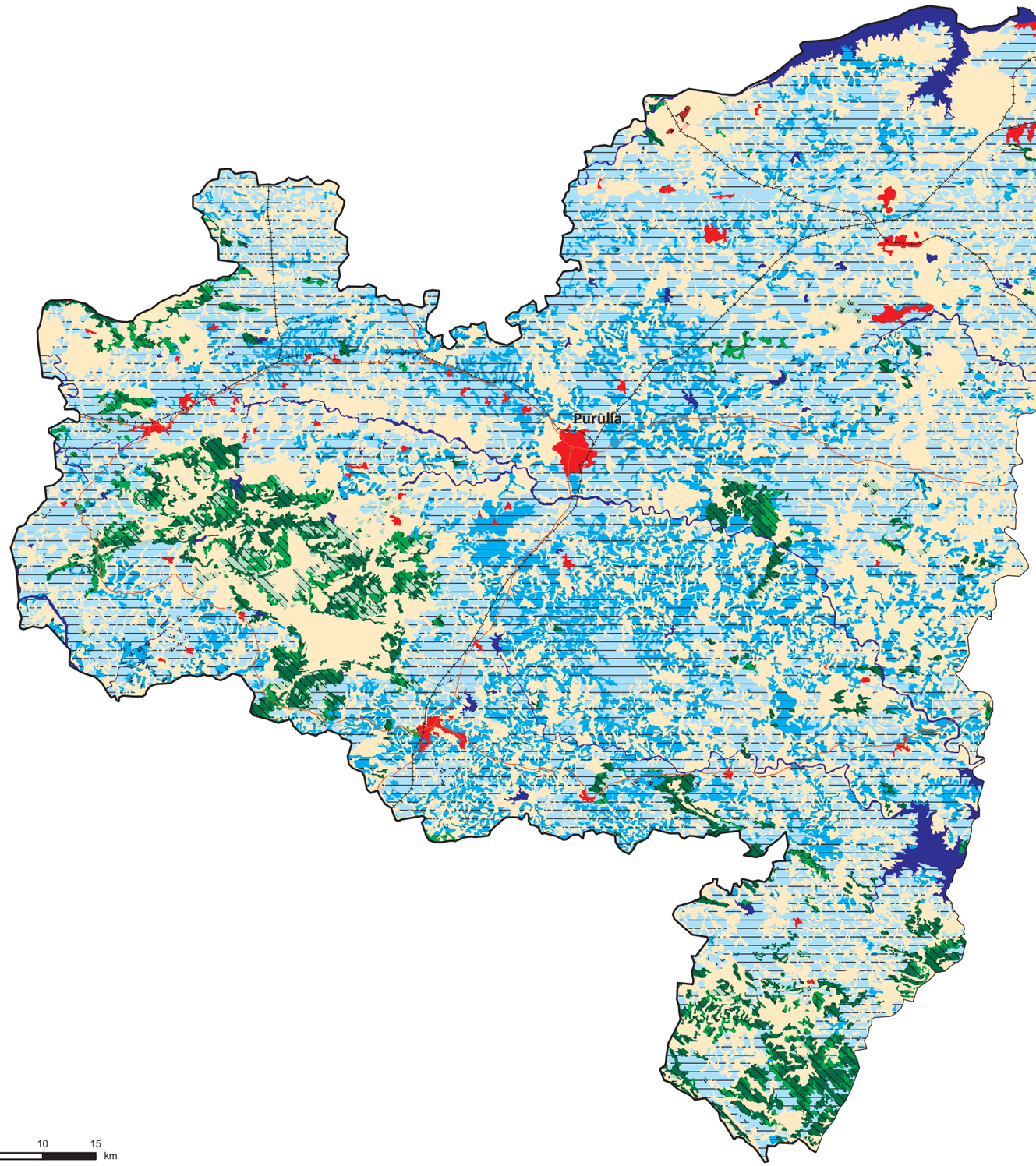

DESERTIFICATION / LAND DEGRADATION STATUS MAP
Purulia District, West Bengal
Timeframe - 2003-05

Legend

Symbol	Code	Description
	Fv1	Forest, vegetation degradation, Slight
	Fv2	Forest, vegetation degradation, Moderate
	Fv3	Forest, vegetation degradation, Severe
	Sv1	Land with scrub, vegetation degradation, Slight
	Sv2	Land with scrub, vegetation degradation, Moderate
	Sv3	Land with scrub, vegetation degradation, Severe
	Dw1	Agriculture unirrigated, water erosion, Slight
	Dw2	Agriculture unirrigated, water erosion, Moderate
	Sw1	Land with scrub, water erosion, Slight
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	S	Settlement
	W	Water body/ Drainage
	NAD	No Apparent Degradation

Data Source:
- IRS LISS3 (2003-2005)
- Ancillary Information
- Ground Truth Data

International Boundary
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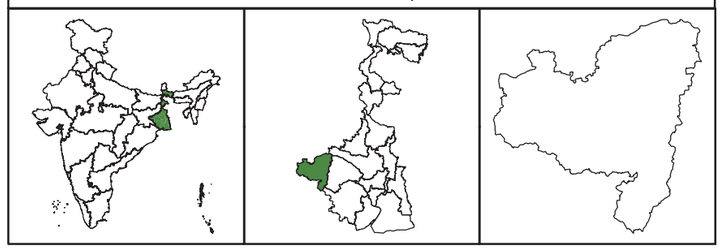
Major Road
Major Rail

Location Map



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Field Photos

Vegetation Degradation in forest area, Tirap district, Arunachal Pradesh

Vegetation Degradation, Bellary district, Karnataka

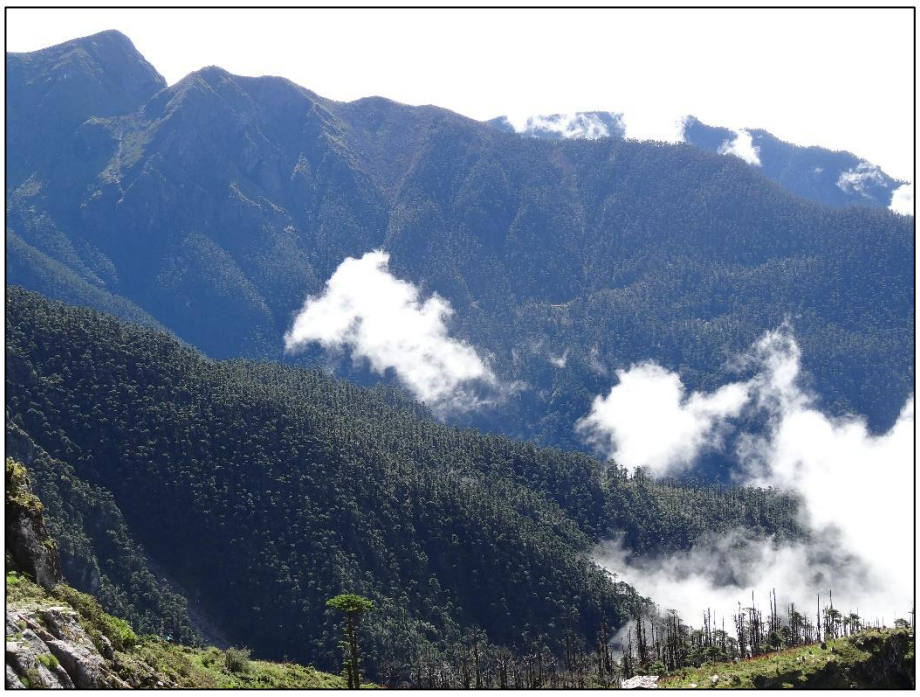
Vegetation degradation due to Jhum Cultivation, Lunglei district, Mizoram

Land without scrub, Anantapur district, Andhra Pradesh

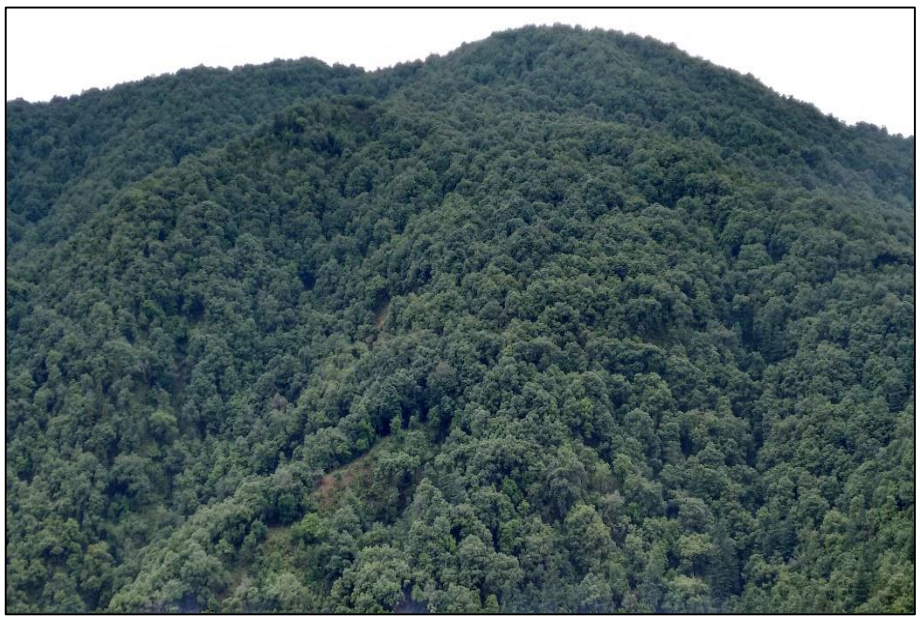
Vegetation degradation in Scrub land area, Anantapur district, AP

Land with scrub, North Sikkim district, Sikkim

Land with scrub, Jaisalmer district, Rajasthan



Dense forest area, Twang district, Arunachal Pradesh



Dense forest area, Chamoli district, Uttarakhand

Water erosion (Gulleys), Nubra valley, Leh district, Jammu & Kashmir

Water erosion (Sheet), Anantapur district, Andhra Pradesh

Water erosion (Gulleys), Bellary district, Karnataka

Agro plantation, Anantapur district, Andhra Pradesh

Afforestation, Anantapur district, Andhra Pradesh

Wind erosion, Pali district, Rajasthan

Wind erosion (sheet), Jaisalmer district, Rajasthan

Sand dune stabilisation, Jaisalmer district, Rajasthan

Sand in agriculture field, Bhiwani district, Haryana

Sand dunes in cold desert, Nubra valley, Ladakh region

Wind erosion, Nubra Valley, Ladakh region

Salinity, Kanpur Dehat district, Uttar Pradesh

Salinity, Surendranagar district, Gujarat

Salinity, Pali district, Rajasthan

Salinity, Surendranagar district, Gujarat

Salinity, Mahabubnagar district, Telangana

Water logging, Anantapur district, Andhra Pradesh

Water logging, Surendranagar district, Gujarat

Agriculture practice in valley area, Kargil district, Jammu & Kashmir

Frost Shattering, North Sikkim district, Sikkim

Frost shattering, Kargil district, Kashmir

Mining, Bokaro district, Jharkhand

Mining, Kendujhar district, Odisha

Mass movement (alluvial fans), Kargil district, Jammu & Kashmir

Land slide (mass movement), Pauri Garhwal district, Uttarakhand

Rocky area, Surendranagar district, Gujarat

Rocky area, Pali district, Rajasthan

Front and back cover shows land degradation in parts of Anantapur district of Andhra Pradesh and Chitradurga district of Karnataka, as seen on IRS LISS III FCC image of 21 January 2013. Front cover also shows the map highlighting districts selected for Desertification/ Land Degradation mapping on 1:50,000 scale.

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