



# APPLICATIONS OF **REMOTE SENSING** AND **GIS IN SERICULTURE** DEVELOPMENT



Central Silk Board  
Ministry of Textiles, Government of India,  
Bangalore-560068



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## Message of Chairman, ISRO

Sericulture is one of the important sectors of the Indian Economy and it significantly contributes to the rural employment generation. The Central Silk Board (CSB), Ministry of Textiles, has been pursuing the application of satellite, IRS-1A in 1988. ISRO along with CSB has effectively applied Remote Sensing and Geographical Information System (RS & GIS) technology for mulberry acreage estimation, garden condition assessment and for finding suitable areas for introducing sericulture in the non-traditional states, collaborating with the concerned State Sericulture/Textiles departments as well as demonstrated 'SPAARS' project for large-scale national applications. The project is a good example of applications of geospatial technologies in identifying suitable areas for sericulture activities in the country.

The North-Eastern Space Applications Centre (NESAC) has taken the responsibility to lead and execute this national level project on RS & GIS for sericulture development funded by CSB covering 108 districts in 24 states. Space-based inputs on physiography, soil and climate have effectively been evaluated for delineating potential areas for all the four types of sericulture viz., mulberry, eri, muga and tasar. The project has hosted a public domain geoportal developed on Open Source GIS platform namely, Sericulture Information Linkages and Knowledge System (SILKS) giving important and helpful information to sericulturists, planners and administrators in sericulture related activities and decision-making.

Outcome of the project in terms of maps and statistics has been compiled by the project team and brought out in the form of an Atlas. I am sure, this compilation will be of immense value to the users as a reference volume.

I compliment the entire project team comprising of Scientists from NESAC, State Remote Sensing Centres, State Directorates of Sericulture and a large number of CSB institutes for this commendable effort.

Bangalore  
April 27, 2015

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## North Eastern Space Applications Centre in collaboration with State Remote Sensing Applications Centre



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### Preamble

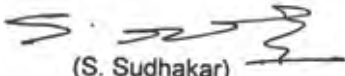
It is a matter of great satisfaction that the project titled "Applications of Remote Sensing and GIS in Sericulture Development" is taken up by NESAC, Department of Space, Government of India at the specific request of Central Silk Board (CSB), Ministry of Textiles has been completed achieving more than what was envisaged in the original proposal.

The project demonstrated the use of geospatial technology in delineating the potential areas for sericulture development considering a number of physiographic and climatic parameters. The assessment of suitability of land for sericulture involves matching these parameters with the requirements of the silkworm host plants. It needs interpretation and integration of soils, climatic parameters, vegetation and other aspects of land, like wastelands and slope using GIS. The project output from National Land Use Land Cover Mapping (LULC 50K), National Wastelands Inventory Project (NWIP) and National Wastelands Updation Project (NWUP) has provided the significant inputs in terms of delineating the culturable wastelands as the major inputs for the identification of suitable areas for sericulture development. Soil characteristics (soil depth, pH, texture, etc.) are obtained as project outputs from a number of projects by National Bureau of Soil Survey and Land Use Planning (NBSS & LUP) and Soil and Land Use Survey of India (SLUSI). Information on ground water availability is obtained from ground water prospect map already prepared under NRDB project and under Rajiv Gandhi National Drinking Water Mission. Application of geospatial techniques for mapping of potential areas for non-mulberry sericulture comprising of Eri, Muga and Tasar has been attempted for the first time in the country. Suitable methodology has been developed by the project team for non-mulberry sericulture and the project output will provide valuable information for various users particularly for NE region.

The webportal titled Sericulture Information Linkages and Knowledge System (SILKS) developed as a part of the project is unique in terms of information contents in both spatial and non-spatial domain for all the selected 108 districts. This portal is currently made available in 12 languages, including 6 local languages of NER. Open Source GIS based platform helps the users to use the GIS functionalities of the portal with an ease.

Implementation of the project of such magnitude would not have been possible for NESAC alone without the collaboration and support from State Remote Sensing Application Centres and a large number of CSB regional Centres and R&D Institutes. Periodic monitoring and evaluation of the progress of the project by Project Monitoring Committee (PMC) has also helped in successful completion of the project. This Atlas contains the maps and statistics generated as the project output along with the description of methodology adopted, results and recommendations. I am sure the Atlas will serve as a useful document for planning and expansion of sericulture activities in the selected districts by various stakeholders of the sericulture industry.

April 24, 2015

  
(S. Sudhakar)

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Initiatives taken by Dr. P.P. Nageswara Rao, Former Director, NESAC and the Project Director in conceptualizing and implementing the project in association with a large number of collaborating institutes deserves high appreciation. Sincere appreciation extended to Dr S. Sudhakar, Director, NESAC and the Project Director for his support and guidance thorough out the project period.

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Finally the project team would like to thank all the Scientists/Engineers of NESAC and other staff members for their support and help in successful completion of the project.

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## EXECUTIVE SUMMARY

Sericulture is a source of livelihood and provides gainful employment in the rural areas, especially for the women. The Central Silk Board (CSB), Ministry of Textiles has placed greater emphasis on improving the productivity at all stages of silk production to ensure higher returns to the stakeholders. Realizing that the space technology in the past has provided valuable inputs to the sericulture development, CSB has requested the Department of Space (DOS) to suggest appropriate inputs expansion of sericulture activities particularly in the non-traditional sericulture states with a special emphasis on NE states.

North Eastern Space Applications Centre (NESAC) took the lead on behalf of DOS and came up with the project proposal titled Applications of Remote Sensing and GIS in Sericulture Development, which has three major components: i) Identification of potential areas on 1: 50,000 scale of mapping for development of silkworm host plants covering selected districts in all 8 North Eastern States in addition to Andhra Pradesh, Bihar, Chhattisgarh, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal. ii) Appraisal survey of a few selected areas / districts (as per the choice of CSB), and iii) development of a network of Sericulture Information Linkage and Knowledge Systems (SILKS) in about 50 intensive sericulture-practicing districts in the country. 108 districts were selected in consultation with CSB and State Sericulture Departments covering the all 24 states. For appraisal survey 8 talukas/Blocks were selected from the states on Andhra Pradesh, Karnataka, Maharashtra and Tamil Nadu as per suggestions of CSB, Bangalore. In the due course of Project implementation it was decided to develop SILKS web portal for all the selected 108 districts instead of only 50 selected districts.

The project has been carried out in collaboration with State Remote Sensing Centres, a few other Central government Institutes and a large number CSB regional Centres and R& D Institutes. A Committee was formulated to prepare the project Manual and finalise the local specific parameters for considering in the process of site suitability analysis. A Project Monitoring Committee (PMC) under the Chairmanship of Member Secretary, CSB guided the project team for successful completion of the project.

Out of 108 districts, 41 districts were selected from 8 NE states including Sikkim covering a total geographical area of 9,35,195 sq km. Among the NE states, Nagaland is found to have maximum suitable areas (21.9% of total geographical area) that can be brought under Mulberry Sericulture. This is followed by Meghalaya (15.8%) and Sikkim (15.7%). Due to limitation of physiographic conditions and climate, Arunachal Pradesh is having very limited areas (17242 Ha in selected 7 districts) that can be brought under sericulture activities.



Among non-mulberry sericulture, Manipur and Meghalaya is having highest % of suitable areas in terms Muga rearing in the selected districts (28.6% and 28.4% respectively). Assam, which is traditionally well-known for Muga is having 19.8% of total geographical areas suitable for Muga in the selected 9 districts. Manipur has also come with highest areas suitable for Eri (26.2% of TGA). Assam occupies the second position with 14.2% of total geographical areas in the selected 9 districts have been found to be suitable for moriculture. Manipur, which is known for traditional oak tasar rearing has been found to have additional 3905 sq Km areas suitable for expansion of oak tasar.

Among non-traditional sericulture states, Bihar has been found to have the highest % of areas suitable for mulberry sericulture, which is about 11% of total geographical areas in the selected 3 districts, followed by Madhya Pradesh (10.2%) and Himachal Pradesh (9.7%). Among Traditional Sericulture states, Karnataka is found to have as high as 51% of total geographical areas suitable for mulberry sericulture. The reason for getting a very higher percent of suitable areas is that for the state of Karnataka suitable areas include land use categories like crop and fallow areas in addition to culturable wastelands as suggested by the State Sericulture Department. Similarly for the state of Andhra Pradesh, suitable areas include fallow land areas in addition to culturable wasteland areas, which has resulted in relatively higher percent of areas (16%) suitable for mulberry sericulture. The state of Punjab has been found to be least suitable for Mulberry sericulture with only 521 Ha of areas delineated as marginally suitable in the selected two districts. Other two states which have been found to be less suitable for Mulberry sericulture are Uttarakhand (0.05%) and Chhattisgarh (0.6%), but Uttarakhand has about 595 ha of area under highly suitable categories in the selected 5 districts. For non-mulberry sericulture, Bihar and West Bengal have significant suitable areas for Eri and West Bengal and Uttarakhand have significant suitable areas for Muga. For tropical tasar, Orissa has the highest percent of suitable areas (25% of TGA) in the selected 4 districts followed by Jharkhand (21.2% of TGA) in the selected district.

With regards to appraisal surveys, two Talukas in each of the selected four districts were selected. For the state of Karnataka, it was estimated that Kudligi taluka has an area of 928.6 ha, while Hagaribommanahalli has an area of 1135.86 ha under Mulberry plantations. In Andhra Pradesh Pathikonda and Atamkur talukas in Karnool district in the state of Maharashtra Wai Taluka in Satara district and Jalna Taluka in Jalna district were selected for the appraisal survey. The study shows that drought conditions in two taluks of Maharashtra have resulted in significant reductions in area under mulberry plantations. In Tamil Nadu, two Talukas viz., Udumalpet and Gudimangalam Talukas under Coimbatore district showed reduction in mulberry acreage during the period of 2007-08 and 2011-12.



SILKS (Sericulture Information Linkages and Knowledge System) webportal developed as a part of the project has been put in the public domain under the domain name <http://silks.csb.gov.in>. SILKS is a single window, ICT-based information and advisory services system for the farmers, sericulture extension workers, administrators and planners working in the field of sericulture development. The portal is now made available in 12 languages. It has 13 major non-spatial modules and 4 spatial modules, which are grouped into three categories, namely Planning Services, Other Services and Natural Resources Management. The available modules under Planning Services are Silkworm Food Plants Production Technologies, Techniques of Rearing Silkworm, Diseases and Pest Management of Silkworm Food Plants, Improved Varieties of Silkworm Food Plants, Species of Silkworm, Processing of Cocoons, Infrastructure and Equipments and Allied Sectors and Occupations. Within a short span of about one year, the portal has been able to make significant impact particularly in North Eastern region and a number of sericulture expansion activities have been initiated based on the outcome of the study.

# 1. INTRODUCTION

## 1.1 Background


Sericulture is one of the important sectors of economy in India and plays an important role in programmes of poverty alleviation. Compared to agricultural crops, sericulture provides more employment all round the year and fetches higher income for rural farm families. Sericulture allows commercialization and diversification of farm enterprises. It is also an environmental friendly farm activity because the silkworm food plants like mulberry, som, etc are perennial crops protecting the soil from erosion.

Indian sericulture is an age old practice, producing all four types of natural silk namely Mulberry, Tasar, Eri and Muga. Our country is the second largest producer of mulberry silk accounting for about 15 percent of the of the global raw silk production. Mulberry sericulture is practiced in almost all states in the country but Karnataka, Andhra Pradesh, West Bengal and Tamil Nadu together account for about 98 percent of the total mulberry silk production in the country.

Non-mulberry sericulture, also known as forest sericulture, mainly consists of tropical and temperate Tasar, Eri and Muga. Nearly 95 percent of the global production of non-mulberry silks is Tasar. This sericulture provides livelihood for large number of indigenous and tribal communities.

Sericulture production is still limited to a few pockets in our country and there was sharp decline in mulberry area in some states (Andhra Pradesh, Tamil Nadu) during mid 1990s. The current production (about 17 thousands tones) is not adequate to meet the demand for silk in the country. There is tremendous scope for improving the production and quality of silk through improved method of information collection, processing and dissemination, in addition to use of biotechnology.

Central Silk Board (CSB) and Indian Space Research Organization (ISRO) in collaboration with the concerned States Sericulture/Textiles Departments applied the technology of remote sensing (RS) and geographical information system (GIS) for mulberry acreage estimation, garden condition assessment and for finding suitable areas for introducing sericulture in the non-traditional States. Two approaches for mulberry acreage estimation have been developed, viz., (i) complete enumeration and (ii) stratified random sampling. These two approaches were tried in many parts of the country and found that the mulberry area estimates could be made within 8 percent error (i.e. 92% accuracy). ISRO and CSB had carried out another large area project, called National Survey of Potential and Actual Area under Sericulture through Remote Sensing (SPAARS), in which large scale application of the RS and GIS technologies were tried. Satellite based estimates of area under mulberry and a comparison of these estimates with that of the State Sericulture Department showed drastic reduction in the acreage under mulberry in some districts like Mysore and Bangalore rural districts of Karnataka State. SPAARS also had carried out district wise assessment of area suitable for sericulture development albeit on 1:250,000-scale mapping.



The database generated under this project is available at the five Regional Remote Sensing Service Centres (RRSSCs). SPAARS in some way served as a mechanism of evaluating the National Sericulture Project funded by World Bank.

The technology of remote sensing has further improved with launch of RESOURCESAT-1 (October 17, 2003) and CARTOSAT 1 (May 05, 2005) and CARTOSAT-2 on January 10, 2007 with improved spatial and temporal resolutions. The sensors on board these satellites allow us to detect and map sericulture activities over areas of size 50 to 300 sq. metres. Dhyani et al (1996) have reported that the sericulture-based agro-forestry systems (AFS) have great potential for higher returns in the north-eastern region with sloping and valley-land conditions. Based on a field investigation, initiated in November, 1992 at Research Farm, Barapani (980 m above msl, 26°N and 92°E and average rainfall 2428 mm/year) on acid Alfisol, they had evaluated seven mulberry (*Morus alba* L.) varieties, seven silkworm breeds and rearing performance of a bivoltine breed, NB-18. They tried three sericulture-based AFS viz. i) sericulture with fruit trees and fodder grasses, ii) field (upland) crops, and iii) lowland rice. Mulberry varieties TR-4, S-1635 and TR-10, and NB-18 a bivoltine silkworm breed were found better suited for this region. Sericulture with field crops (French bean-groundnut-mustard/vegetables) for valley land, with fruit plants (guava, pineapple) and grasses for mid-hill situations, and with rice for low lands were found suitable at the farm and for possible adoption in the north-eastern hill region of India.

Although many organizations are involved at various stages of silk production in different NER States, reliable information on the potential area suitable for silkworm food plants is not available at the district level and the extension machinery is not able to reach the far-flung places in the region. In the non-traditional States like Punjab, Haryana, Madhya Pradesh, etc. there is urgent need for diversification of agriculture, to protect the soils from degradation, to raise surplus income in the hands of farmers and to attain ecological/economic security of the traditionally wheat-rice ecosystem of our country. It is in this context, sericulture has to be seen as an alternative to agriculture.

Developments in the geospatial technologies have allowed us in the past to mount many applications of relevance to sericulture development at grass-root level. Hence, a project on Applications of Remote Sensing and GIS in Sericulture Development has been taken up for implementation during the XI Five Year Plan period.

Adoption of sericulture as an alternative to agriculture is possible under suitable agro-climatic conditions all over India and especially NER. But the potential varies from place to place and needs scientific evaluation of an area before venturing into the practice. It is here that the satellite technology has an important role to play. The CSB has a mandate for evolving a convergence strategy with the programmes of Ministry of Rural Development (MRD) for development of sericulture as a sustainable livelihood especially in the North Eastern Region (NER) of the country (the seven sisters and Sikkim) as well as in other states.

## 1.2 Space Technology inputs in sericulture related studies

Central Silk Board (CSB), Ministry of Textiles, Government of India has been pursuing the application of satellite remote sensing for sericulture development ever since the launch of the first operational remote sensing satellite, IRS-1A in 1988. CSB and ISRO in collaboration with the concerned States Sericulture/Textiles Departments applied the technology of remote sensing (RS) and geographical information system (GIS) for mulberry acreage estimation, garden condition assessment and for finding suitable areas for introducing sericulture in the non-traditional States. The "Manual of Satellite Remote Sensing Applications for Sericulture Development" brought out by CSB and ISRO (1994) gives more details. ISRO and CSB had carried out another large area project, called SPAARS, in which large scale application of the RS and GIS technologies were tried. Following are few nationwide projects carried out by Department of Space, which provided inputs to this project namely, Integrated Mission for Sustainable Development (IMSD), National Wastelands Updating Mission (NWUM), Land use land cover on 1:50,000 scale project(LULC 50K),NRIS NRDB project.

## 1.3 Objectives of the present project

This project is funded by Central Silk Board (CSB), Ministry of Textiles, Govt of India, for implementation during the XI Five Year Plan period, spread over most part of the country covering all types of sericulture (Mulberry, Eri, Muga and Tasar). The project work is being carried out in collaboration with State Remote Sensing Application Centres (SRSACs) and other partner Institutes with two major objectives

- i) To map and identify the potential areas for development of silkworm food plants for mulberry and non mulberry sericulture in the non-traditional States on 1: 50,000 scale,
- ii) To conduct appraisal survey in selected blocks
- iii) To develop and implement a network of Sericulture Information Linkage & Knowledge Systems (SILKS).

## 1.4 User Perspective

The beneficiaries include sericulture extension officials, farmers / sericulturists at the grass-root level Self-Help Groups, financial institutions like Banks and Co-operative Societies, State Sericulture Directorates, Regional Development Offices and Central Research Laboratories / Institutes of Central Silk Board (CSB).

## 1.5 States / areas covered

The study areas covered under three major components of the project are as given below.

- i) The following districts in non-traditional sericulture states and traditional sericulture states are covered under the component- Identification of additional potential areas for development of silkworm food plants. (figure 1).

Phase I : 41 districts covering all 8 states in north eastern region NER including Sikkim.

Phase II : 43 districts covering 11 other non-traditional states viz., Bihar, Chhattisgarh, Himachal Pradesh, Jharkhand, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Uttarakhand, and Uttar Pradesh.

Phase III : 22 districts in 5 traditional states viz. Andhra Pradesh, Jammu and Kashmir, Karnataka, Tamil Nadu and west Bengal.

- ii) Sericulture Information Linkages and Knowledge System (SILKS) for 106 districts where potential area mapping has been done, were covered under the component.

### 1.6 Outcome of the Project

- Block/Taluka and district-wise estimates of areas suitable for developing silkworm food plants with spatial location and extent of areas. Reports/ Atlas summarizing the area estimates and names of group of villages (Panchayats), blocks taluks suitable for sericulture in each district.
- Appraisal survey report in selected Talukas/blocks as identified by CSB.
- A network of 107 SILKS covering all the study area of 24 states to provide sericulture knowledge to the farmers and value addition to the advisory services.

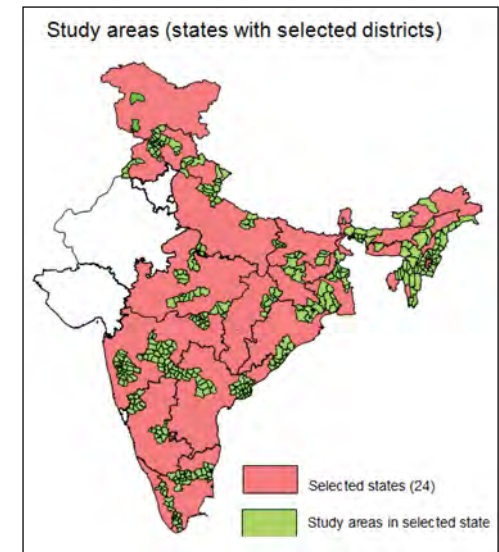


Figure 1. Study areas (states with selected districts)

## 2. MATERIALS AND METHODS

### 2.1 Identification of Potential Areas for Silkworm Food Plants

The methodology for identification of potential areas for sericulture development involves evaluation of land and water resources requirements for growing silkworm food plants as well as rearing of silk worms. Mulberry (*Morus spp.*) is the only food plant for silk worm *Bombyxmori*. Silk produced by *Philosamia ricini* is called Eri silk. The food plants of Eri silkworm mainly consist of castor (*Ricinus communis*) and other alternatives like *Heteropanax fragans*, *Manihot utilissima*, *Earica papaya*, *Ailanthus sp.*, *Plumeria acutifolia*. For the extraction of tasar silk three species of *Antherea* are used in India. They are *Antherea mylitta*, *A. perniyi* and *A. roylei*. This silkworm is reared on trees of *Terminalia tomentosa*, *Terminalia arjuna*. Requirements of food plants of Tasar and Muga silkworms. Tropical tasar silk worm (*Anthracea mylitta*) feeds on the leaves of *Terminalia tomentosa* (Asan), *T. arjuna*, *Shorea robusta* (Sal), *Lagerstromia parviflora* (Senna), *Zizyphus martiana*, etc. The silk produced by *Antherea assamensis* is called Muga. This silkworm prefers feeding on Som (*Machilus bombycina*) and Soalu (*Litsaea polyantha*). The temperate tasar (*A. proylei*) feeds on *Quercus serrata*, *Q. incana*, *Q. Semicarpifolia*.

The assessment of suitability of land for sericulture involves matching the land qualities with the requirements of the silkworm food plants (FAO, 1976; Sys, 1985, Sys et al, 1993) and silkworm rearing. It needs interpretation and integration of soils, climatic parameters, vegetation and other aspects of land, like wastelands and slope using GIS. An inventory of area under wastelands (degraded lands that can be brought under vegetative cover) was made for the entire country under the National Wastelands Inventory Project (NWIP) and National Wastelands Updation Project (NWUP). The mapping was done on 1:50,000 scale adopting a 28 fold classification system. This was done under the technical guidance of National Remote Sensing Centre (NRSC) for the Ministry of Rural Development, Govt. of India. The satellite based estimates show that there is an area of 55.27 million ha (17.45%) of the country's geographical area under wastelands. Out of which, areas under culturable wastelands are used as the major inputs for the identification of suitable areas for sericulture development. The cultivatable wasteland categories have to be evaluated for introducing sericulture in the new areas. The evaluation procedure consists of three phases, as described below.

#### 2.1.1 Identification of Potential areas for Mulberry

Following sections describes the methodology followed in case of identification and mapping of potential areas for mulberry cultivation.

##### 2.1.1.1. Evaluation of site suitability based on landscape and soil characteristics

Soil characteristics (soil depth, pH, texture, etc.) are integrated while assessing the soil site suitability. Soil characteristics



are obtained from the soil map prepared under the ongoing project and from other sources like National Bureau of Soil Survey and Land Use Planning (NBSS & LUP), Soil and Land Use Survey of India (SLUSI) and also from Natural Resources Data Base (NRDB), IMSD project, etc. Slope map is derived from SRTM DEM (Shuttle Radar Topographic Mission- Digital Elevation Model). Information on ground water availability is obtained from ground water prospect map already prepared under NRDB project and under Rajiv Gandhi National Drinking Water Mission. The slope map is reclassified based on plant requirements. Different thematic layers are generated in GIS environment for each of the land characteristics (Table 1) and compared with the requirements of silkworm food plants (Table 2). Degree of limitation ranging from 1 (suggesting no or slight limitation) to 4 (suggesting very severe limitation) is assigned and final maps are generated.

### 2.1.1.2. Evaluation of site suitability based on climatic parameters for mulberry food plants

Climate is an important parameter, which determines the growth of plant species, as the extreme climatic conditions are detrimental for plant growth. The suitability of climate for a given crop can be described in terms of: (i) minimal length of growing period, (ii) temperature, (iii) water supply (rainfall). The weather data are collected from the class-I observatories of India Meteorological Department (IMD) and available automatic weather stations (AWS) of ISRO and IMD network.

Table 1: Soil site parameters considered for land evaluation

| Soil site characteristics   | Related land quality   |
|---|--|
| Climate (C) during crop growing period<br>- Total rainfall (mm)<br>- Mean temperature ( C)<br>- Length of growing period (days) | - Available moisture   |
| Topography and landscape (t)<br>- Slope<br>- Erosion  | - Landscape position<br>- Resistance to erosion  |
| Wetness (w) conditions<br>- Drainage<br>- Ground water availability   | - Available moisture/ soil aeration<br>- Landscape position<br>- Deficiency and toxicity of nutrients  |
| Physical condition(s) of soil<br>- Texture<br>- Depth   | - Water availability/ soil aeration/ soil structure<br>- Foot hold availability for root development<br>- Available space for root development |
| Soil fertility (f)<br>- pH  | - Availability of plant nutrients  |

Table 2 : Criteria or limitation rating for evaluation of soil site suitability for Mulberry

| Soil-site characteristics |              | Degree of limitation & Suitability class |                             |                             |                     |
|---------------------------|--------------|--|-----------------------------|-----------------------------|---------------------|
|                           | Unit         | 0-1<br>None to slight                    | 2<br>Moderate               | 3<br>Severe                 | 4<br>Very severe    |
|                           |              | S1<br>(Highly suitable)                  | S2<br>(Moderately suitable) | S3<br>(Marginally suitable) | N<br>(Not suitable) |
| Topography and landscape  |              |  |                             |                             |                     |
| Slope                     | (%)          | 0-3<br>(level to very gentle)            | 3-5<br>(gentle)             | 5-10<br>(moderate)          | >10<br>(steep)      |
| Erosion                   |              | e <sub>1</sub>                           | e <sub>2</sub>              | e <sub>3</sub>              | e <sub>4</sub>      |
| Soil characteristics      |              |  |                             |                             |                     |
| Drainage                  | Class        | Well                                     | Well                        | Well                        | Excessive           |
| Ground water              | Availability | Good                                     | Fair                        | Fair to moderate            | Poor                |
| Texture                   | Class        | Clay loam gravelly clay                  | Fine loamy                  | Coarse loamy                | Sandy fragmental    |
| Depth                     | Cm           | Deep                                     | Mod. shallow mod. deep      | Shallow                     | Very shallow        |
| pH                        |              | 6.5-7.5                                  | 5.5-6.5<br>7.5-8.5          | 4.5-5.5<br>8.5-9.5          | >4.5<br>>9.5        |

Spatial layers are generated for rainfall, maximum and minimum temperature and computed length of growing period (LGP) for the silkworm food plants. Long term monthly and annual averages of mean temperatures of all the stations are regressed against corresponding elevation data (Patel, 2000).The empirical relation thus developed is used in GIS environment for depicting spatial variation of annual mean temperature or mean temperature for the growing season of silkworm food plants. The spatial distribution of annual rainfall is generated using Kriging interpolation technique in GIS environment. It is based on statistical models that include autocorrelation, where it assumes that the distance or direction between sample points reflects a spatial correlation that can be used to explain variation in the surface. Spatial surface is created based on the formula given below:

Length of growing period (LGP) or moisture availability period for crop growth is the period (in days) when precipitation (P) exceeds 50 percent of the PET. Shorter LGP (less than 120 days for mulberry and 90-120 days for castor, as examples) may not suitable for cultivation of silkworm food plants.

Monthly potential evapotranspiration (mm) are computed by Thornthwaite method(1948) as illustrated below:

$$Z(S_0) = \sum_{i=1}^N \lambda_i Z(S_i) \quad \dots\dots\dots \text{eq.1}$$

where:

$Z(S_0)$  = the value at the prediction location  $S_0$ .

$Z(S_i)$  = the measured value at the  $i^{\text{th}}$  location.

$\lambda_i$  = an unknown weight for the measured value at the  $i^{\text{th}}$  location.

$N$  = the number of measured values.

The computed LGP is presented in spatial domain by the interpolation technique, preferably kriging. Thus the spatial variation of LGP is generated in the GIS environment using geostatistical analyst tool (available with ArcGIS).

$$PET = 16 \times C \times (10 \times T / I)^a \quad \text{for } T \leq 26.50C$$

$$PET = C \times (-0.43253 \times T^2 + 32.244 - 415.85 \times T) \quad \text{for } T > 26.50C$$

Where,

PET = Potential evapotranspiration (mm/month)

$T$  = Mean monthly temperature ( $^{\circ}C$ )

$I$  = annual heat index for 12 months in a year ( $I = \sum i$ )

$i$  = Monthly heat index  $\{i = (T/5)^{1.514}\}$

$$a = 6.75 \times 10^{-7} \times I^3 - 7.71 \times 10^{-5} \times I^2 + 1.792 \times 10^{-2} \times I + 0.49239$$

$C$  = Correction factor for each month

$$C = (m/30) \times (d/12)$$

$m$  = No of days in a month,  $d$  = Monthly mean daily sunshine duration in hour

Based on climatic characteristics , limiting levels such as highly suitable, moderately suitable, marginally suitable and unsuitable have been decided by matching the requirements of silkworms food plants (Table 3) and assigned suitability class (limitation) to each polygons. Thus a climatic limitation map was generated. This map is superimposed on the soil constraints map, to finally arrive at a site suitability map.



Table 3: Evaluation of climatic site suitability for Mulberry

| Climatic characteristics               | Suitability classes  |                          |                          |                  |
|--|----------------------|--------------------------|--------------------------|------------------|
|  | Highly suitable (S1) | Moderately suitable (S2) | Marginally suitable (S3) | Not suitable (N) |
| Sericulture food plant :Mulberry       |                      |                          |                          |                  |
| Mean temperature in growing season(OC) | 20-30                | 30-37                    | 30-37                    | <15, >37         |
| Total rainfall (mm)                    | 500-750              | 750-2000                 | 2000-3400                | <500, >3400      |
| LGP(days)                              | >120                 |                          |                          |                  |

### 2.1.1.3 Evaluation of suitability for silkworm rearing (Mulberry and Non Mulberry)

Silkworms are delicate and very sensitive to environmental conditions. Among the various environmental factors, the most important are atmospheric temperature and humidity prevailing at the time of rearing. Temperature has indirect correlation to the growth of the silkworms and excessive fluctuations in temperature are harmful and should be avoided. The combined effect of both temperature and humidity largely determines the satisfactory growth of the silkworms. The growth of the worm is better under higher temperature and higher humidity condition followed by lower temperature and lower humidity condition during their life cycle. Humidity also influences directly the physiological functions of the silkworm. But limiting conditions vary depending on the rearing seasons and species of both mulberry and non-mulberry silkworms. Local knowledge on climatic requirements is taken into consideration while evaluating the site suitability.

In case of Mulberry, generally the optimum temperature and relative humidity ranges between 20-28°C and 70-85%. The temperature above 30°C directly affects the health of the worm. The temperature below 20°C, worm becomes too weak and susceptible to disease. But in hilly region the minimum temperature and relative humidity it can withstand up to 15°C and 55% respectively. For Muga silkworm, the optimum temperature and relative humidity ranges are 24-25°C and 75-80%. For commercial crop, minimum temperature requirement is 16-20°C. The above given requirements are the range of temperature and humidity up to which they can sustain. For winter crop (Jarua) minimum temperature should not go below 7°C. In case of temperate Tasar , *A. proylei* needs optimum temperature 25-26°C and become restless above 28°C and inactive below 15°C. For *A. pernyi*, optimum temperature is 18-22°C. Temperature above 28-30°C and below 8-10°C are not suitable. The early stages require higher relative humidity (80-90%) than the advanced stages (70-80%). Eri silkworms are reared throughout the year in both the plains and the hills at temperatures ranging from 15°C in winter to 35°C in summer and from 50% to 100% relative humidity. However, the optimum range of temperature and relative humidity is 24-26°C and 75-85%. The larval span varies from 20 days in summer to 50 days in winter.

Table 4 : Criteria for determination of land suitability classes

| Land classes               | Criteria  |
|----------------------------|---|
| S1: Highly suitable        | Land units with no or only 4 slight limitations   |
| S2: Moderately suitable    | Land units with more than 4 slight limitations and/or no more than 3 moderate limitations |
| S3: Marginally suitable    | Land units with more than 3 moderate limitations and/ or one or more severe limitation    |
| NI: Temporarily unsuitable | Land units with very severe limitation which can be corrected.                            |

#### 2.1.1.4 Integrated evaluation of soil and climatic suitability for silkworm food plants and sericulture development

The limitation maps generated for climate, landscape and soil characteristics have been spatially overlaid in GIS environment to produce a resultant polygon layer. Each polygon has 8 values (soil characteristics) of degree of limitation. Based on number and the intensity of limitations suitability classes have been decided and graded as highly suitable (S1), moderately suitable (S2), marginally suitable (S3) and not suitable (N) as given in Table 4. The entire sequence of steps in this method is illustrated in Figure 2.

The partner institutions - State Remote Sensing Applications Centres, has closely interacted with the State Directorate of Sericulture and / or CSB for selecting the food plants and information on soil, climate and socio-economic requirements for the selected food plants and rearing of silkworm. Accordingly, the partner institutions have fine-tuned the methodology of finding the suitable sites.

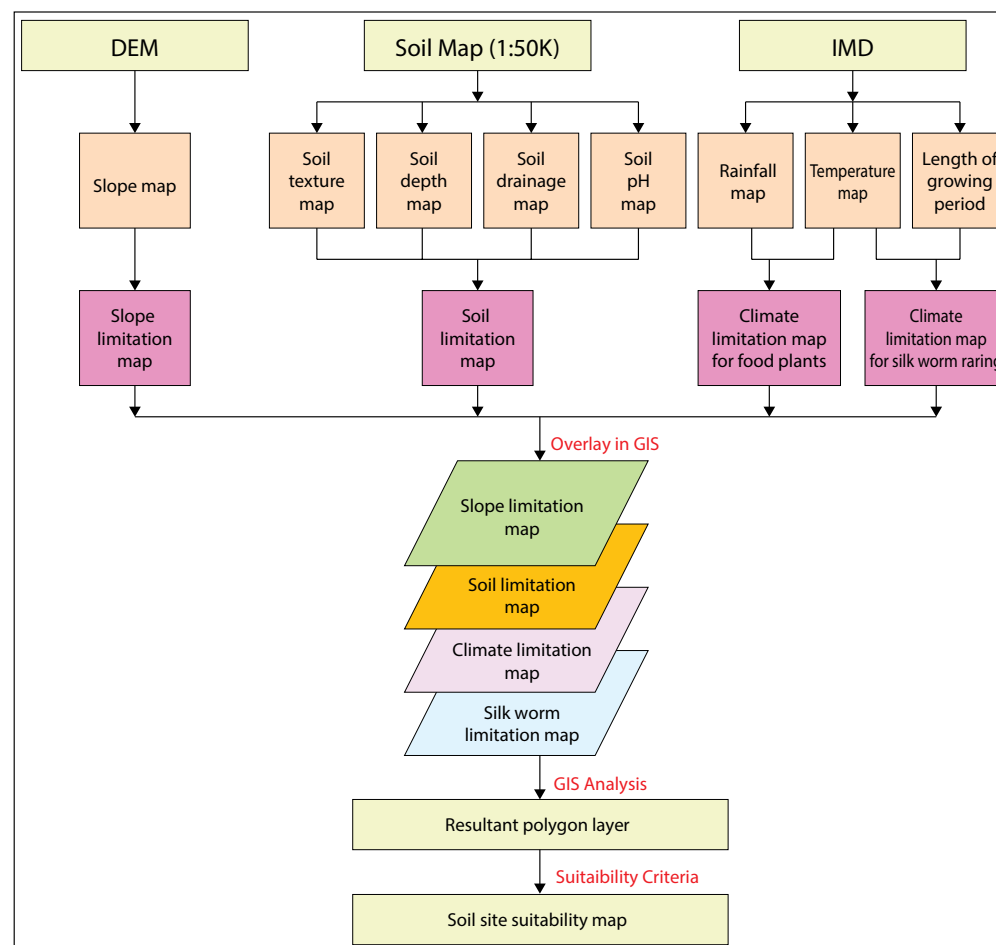


Fig. 2 Integrated methodology of finding out suitable areas for sericulture food plants

### 2.1.2 Methodology for identifying existing areas under non-mulberry food plants and their conservation

There are varieties of non mulberry food plants, which are mostly associated with forest ecosystems. Mostly the forest fringe areas are used for rearing these silkworms. As such, non mulberry food plants need to be protected from deforestation. Table 5 gives an overview of Vanya silks of India.

Most of these plant species come under the moist deciduous or semi-evergreen forest type. Experience shows that identification of individual trees of these plants may be difficult but as a plant community they can be delineated from the forest types. Areas suitable for sericulture development in these forest ecosystems are those which are up to 3 Kms from periphery of forest areas (accessible zones). Steps involved in delineating potential areas for expansion of non mulberry are described below. Figure 3 depicts the methodology flow chart for Identification of potential areas for Eri, Muga and Tasar food plants.

#### Suitability criteria for Non Mulberry food plants :

- Physical: Elevation 300-1500m above MSL and Slope<35% for Eri Food plants (Source: Manual, Soil site suitability for Major crops, NBSS & LUP, Nagpur)
- Physical: Elevation <1500m above MSL and Slope<35% for Muga food plants. Source: Hand book of Muga culture, CSB
- Physical: Elevation 700-1500m above MSL and Slope<35% for Temperate Tasar (Source: Manuals on Sericulture, FAO)
- Socio-economic: Dominance of silk rearing communities in the villages

#### Four categories of suitability made based on the following criteria :

- 1) Highly suitable: within 1km buffer of villages growing Tasar silkworm food plants and satisfying the physical criteria
- 2) Moderately suitable: within 1-2 km buffer of villages growing Tasar silkworm food plants and satisfying the physical criteria
- 3) Marginally suitable: within 2-3 km buffer of villages growing Tasar silkworm food plants and satisfying the physical criteria
- 4) Less suitable: beyond 3kms of villages growing Tasar silkworm food plants satisfying physical criteria

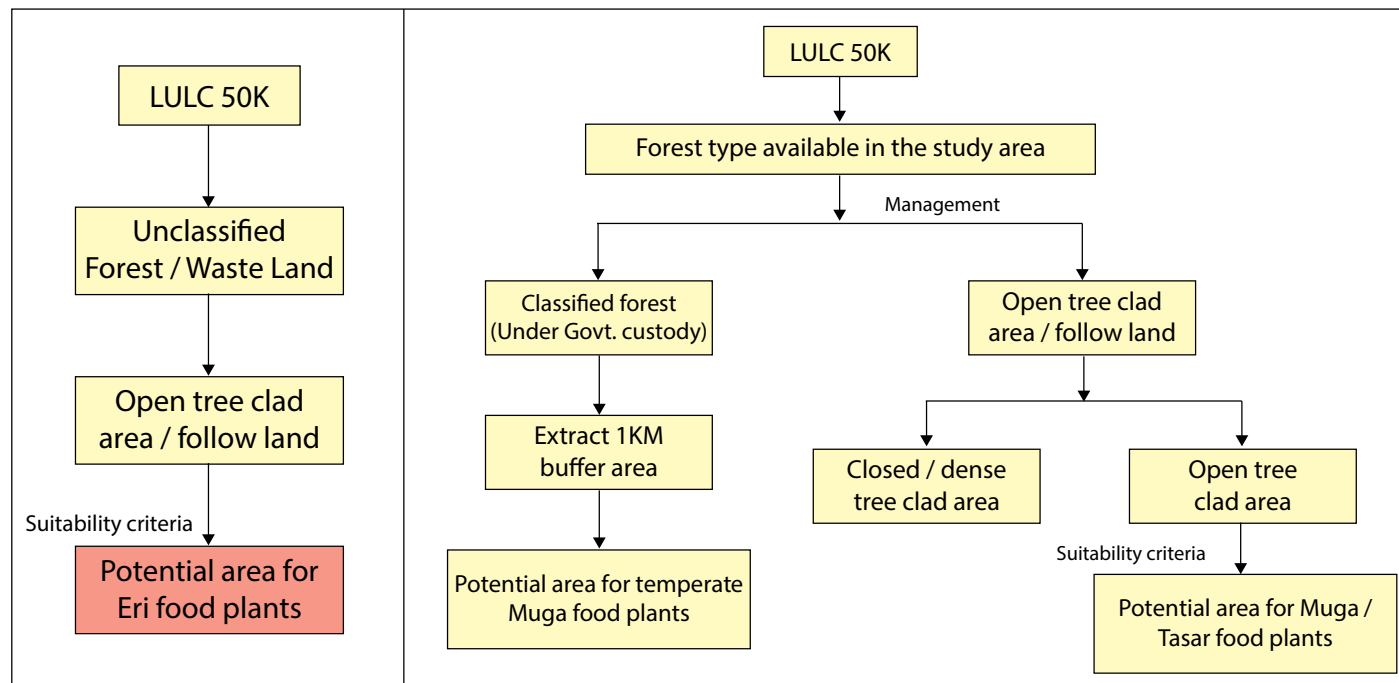


Fig.3 Methodology flow chart for Identification of Potential areas for Eri, Muga and Tasar food plants

## 2.2 Output and Statistics Generation

Area statistics on potential sites for silkworm food plants are generated in GIS environment for all the suitability classes. The statistics tabulated as per the administrative boundaries (Mandals, Blocks, Taluks, District), the choice of which has to be ascertained from the concerned State Directorate of Sericulture.

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### 3. GROUND TRUTH COLLECTION AND QUALITY ASSURANCE

The project envisages mapping of potential sites for silkworm food plants on 1:50,000 scale. Since the project is being carried out at national level, seamless data generation play an important role for effective utilization of output. So, for quality of the output, quality check is required at various stages of project. Quality Assurance of the project has been done in the line LULC 50K Project of NRSC/Dept. of Space.

The preliminary interpretation was checked for the quality and before collecting ground truth. The idea is to improve the quality of ground truth in light of the knowledge of interpreter about sericulture. The ground truth points were collected for all the classes dominantly for the mulberry and other sericulture food plant growing areas.



## 4.DEVELOPMENTOF SERICULTUREINFORMATIONLINKAGESANDKNOWLEDGESYSTEMS(SILKS)

SILKS is a single window, ICT-based information and advisory services system for the farmers practicing sericulture. The objectives of SILKS are to i) provide computerized information storage, value addition, and supply sericulture knowledge to the farmers, ii) Provide planning and advisory services in formats and language appropriate for the local sericulturists, and iii) supply the information and advisory services through Internet and satellite based communication.

Each SILKS has modules of information on the natural resources potential of a group of villages, their suitability for sericulture, agro-climatic conditions, package of best practices of sericulture, cocoon and silk marketing information, etc. The meteorological data collected by the network of Automatic Weather Stations (AWS) established all over India and a few in the R&D laboratories of CSB served as an important source of data for value added services from SILKS.

### 4.1 Information modules

The SILKS has been developed for all the 107 districts covered under the project. It has 13 major non-spatial modules and 4 spatial modules, which are grouped into three categories, namely Planning Services, Other Services and Natural Resources Management. The available modules under Planning Services are Silkworm Food Plants Production Technologies, Techniques of Rearing Silkworm, Diseases and Pest Management of Silkworm Food Plants, Improved Varieties of Silkworm Food Plants, Species of Silkworm, Processing of Cocoons, Infrastructure and Equipments and Allied Sectors and Occupations. The Other Service has modules like Micro Credit and Self Help Group, Seri Marketing, Seed Distribution Centres, Weaving Reeling Centres and Schemes & Grants for Farmers (Figure 4).

### 4.2 Database Development and Structure

Database has been generated, organized, stored and processed to meet the information and decision support needs of various users. SILKS functions in a multi-user

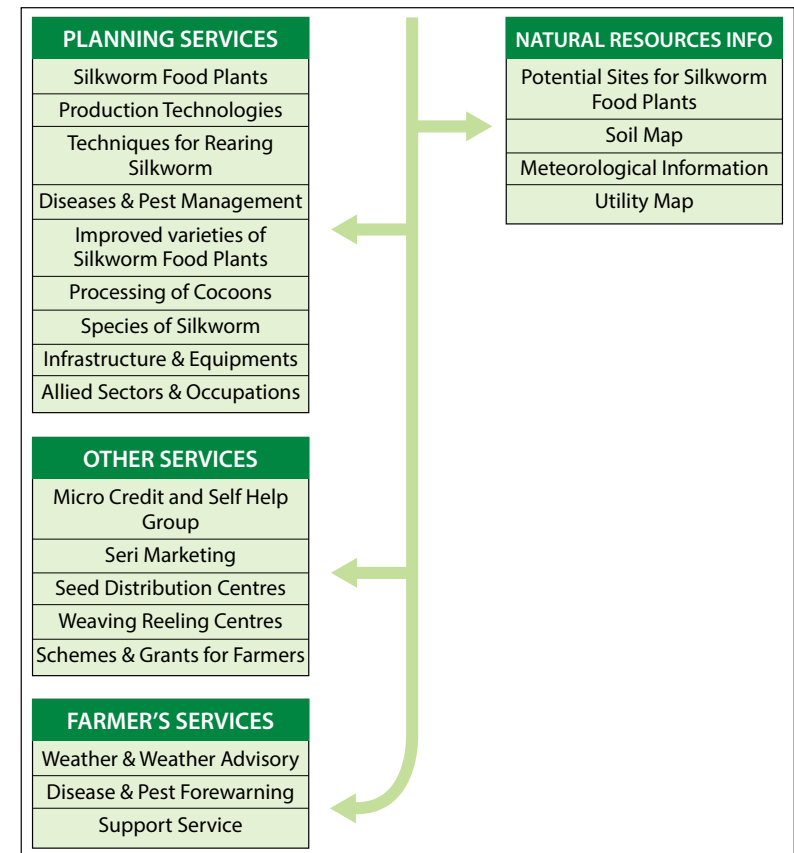


Fig. 4 : Modules in SILKS

environment. Client-Server architecture has been adopted, because it is a repository of multiple heterogeneous data sources (various spatial and non-spatial data), organized under a unified schema at a single site (single window access) in order to facilitate management decision at many places by many people.

The concept of Client-Server architecture assumes an underlying framework that consists of many computer systems and workstations as well as server systems or mainframe machines, connected via a local area network (LAN) and other types of computer networks. A client in this framework is typically a user machine that provides user interface capabilities and local processing. When a client requires access to additional functionalities- such as database access-that does not exist at that machine, it connects to a server that provides the needed functionality. A server machine provides services to the client machines and allows printing, archiving, database access, etc.



Fig. 5. Home Page of SILKS

render over 20 different vector data formats, including shape files, PostGIS and ArcSDE geometries, OPeNDAP, Arc/Info coverage files.

#### 4.3 Development of SILKS system

The development of WebGIS can be categorized into fat-client and thin-client. In fat-client systems, a significant proportion of data processing happens at the client, whereas the server is primarily responsible for data storage. The thin-client system on the other hand strives to minimize processing on the client; except for presentation and user interaction, most of the data processing occurs at the server. Here, in our current implementation, the thin-client approach was adopted. Some of the criteria's like software portability, optimization of user network traffic, scalability and ease of server administration have been considered before adopting and implementing the WebGIS.

The MapServer, an Open Source platform for publishing spatial data and interactive mapping applications to the web have been used as spatial data server. It creates map images from spatial information stored in digital format. It can handle both vector and raster data. MapServer can

The original ESRI shape files were converted into All the spatial data are stored as PostgreSQL tables; in this way PostgreSQL becomes an indispensable system component from which the web GIS loads data to be displayed in the maps; these tables are called by MapServer using the map file PostGIS connection. Each PostgreSQL table has been previously provided with a Geometry Column, in which every record has its spatial description. In this way the tables become "spatial tables". The Geometry Column provided spatial information has been done by PostGIS: using the special Add Geometry Column function for the spatial layer table and automatically with PostGIS Data Loader for paths and highlights tables.

Table 5 : Vanya silkworm varieties and their food plants

| Silkworm Variety | Entomological Name                                  | Primary Food Plants  |  | Distribution                                |
|------------------|---|----------------------|--|---|
|                  |   | Local Name           | Botanical Name   |   |
| Tropical Tasar   | <i>Antheraea mylitta</i> D.                         | Arjun<br>Asan<br>Sal | <i>Terminalia arjuna</i><br><i>T. tomentosa</i><br><i>Shorea robusta</i> | Central India and Southern Plateau Region   |
| Oak Tasar        | <i>Antheraea proylei</i> J.<br><i>A. roylei</i> Mr. | Uyung                | <i>Quercus serrata</i><br><i>Q. incana</i><br><i>Q. semicarpifolia</i>   | Sub Himalaya Region and North Eastern India |
| Muga             | <i>Antheraea assamensis</i> Ww.                     | Som<br>Sualu         | <i>Machilus bombycina</i><br><i>Litsea polyantha</i>                     | North Eastern Region                        |

#### 4.4 Sources of Data

Creation of single window access to information needs of all users of sericulture implies collecting data from all relevant sources. Because of the multi-disciplinary nature of the activity and various types of stakeholders, from individuals to government and private organizations, the sources of data are quite numerous. SILKS database has not only the conventional non-spatial data but also the latest, scientific spatial data on suitable areas of sericulture development, existing areas under seri food plants, etc. The database will have two main heads i.e. spatial and non spatial data to meet the information requirements of sericulturists and other players in the sericulture industry. Two types of information contents have been prepared as shown in the figure below (Figure 6):

Apart from collecting data from existing sources, relevant data have been obtained from various journals, literatures, text books and internet.

| Sl. No.                              | Information Category |  | Sources  |
|--------------------------------------|----------------------|--|--|
| 1                                    | Spatial contents     | Area under silkworm food plants                        | Generated using RS & GIS   |
|                                      |                      | Potential sites for silkworm food plants               |  |
|                                      |                      | Soil map   |  |
|                                      |                      | Rainfall/temperature/Length of growing period(LGP) map |  |
|                                      |                      | Utility map  |  |
| 2                                    | Non-spatial contents | Silkworm food plants production technology             | <ul style="list-style-type: none"> <li>• CSB</li> <li>• Department of Sericulture, Horticulture</li> <li>• District sericulture office</li> <li>• ICAR</li> <li>• Public/private sector banks</li> </ul> |
|                                      |                      | Techniques of rearing silkworm                         |  |
|                                      |                      | Disease and pest management of silkworm/food plants    |  |
|                                      |                      | Variety of silkworm food plants                        |  |
|                                      |                      | Species of silkworm                                    |  |
|                                      |                      | Processing of cocoons                                  |  |
|                                      |                      | Infrastructure and equipments                          |  |
|                                      |                      | Allied sectors & occupations                           |  |
|                                      |                      | Micro Credit and Self Help Groups                      |  |
|                                      |                      | Seri marketing   |  |
|                                      |                      | Seed distribution centres                              |  |
|                                      |                      | Weaving reeling centres                                |  |
| Govt. schemes and grants for farmers |                      |  |  |

Fig. 6 : Sources of Data

#### 4.5 Dissemination of Services

An important component of SILKS is that it should provide long term planning inputs as well as day-to-day advice on market and weather using the terminology that sericulturists use and understand. It has been realised that no single system of communication, however strong it may be, can reach the entire sericulture community in the country. The telecommunications infrastructure is not very widespread, and difficult to reach into the countryside. Satellites are being used for data collection and also for communication, thereby providing wide reach and access. While Internet is the primary mode of communication, we may utilise large network of satellite communication planned under EDUSAT-I utilization programme, which can be appropriately tuned towards sericulture extension education. The premier research institutions

under CSB can serve as teaching-end where as the SILKS can be receiving-end. Dissemination of sericulture development-related services to the village communities may also be realized through the modern ICT based approach, utilizing the VRCs of ISRO, CSCs of Ministry of IT and VKCs of Mission 2007, and similar other initiatives.



## 5. Results

This section summarizes the state-wise observations on mapping of potential areas of Sericulture development in 24 selected states.

### **Andhra Pradesh & Telangana**

Four districts covering the state of Andhra Pradesh and Telangana were included in this study viz. Medak, Nalgonda, Srikakulam and West Godavari. Suitable areas for mulberry cultivation were studied in all the four districts. Suitable areas for rearing of eri were studied in Medak & Nalgonda and rearing of tasar were studied in Srikakulam and West Godavari districts. Nalgonda district was found to have highest suitable area for mulberry cultivation (Table 7.3), however, Medak district had more highly suitable areas (16933.70 ha). Similarly, suitable areas for eri rearing have been found to be more in Medak district (87412.54 ha).

### **Arunachal Pradesh**

Suitable areas for cultivation mulberry and rearing of eri, muga and tasar were studied in Anjaw, Changlang, Kurungkumey, Tawang, Tirap, Upper Subansiri and West Kameng district. This has been observed that suitable areas for mulberry cultivation were highest in Anjaw district (2663.93 ha). However, most of the areas were marginally suitable for mulberry cultivation. On the other hand, suitable areas for rearing of eri and muga have been found to be highest in Tirap district (Table 8.18 & 8.19). Upper Subansiri district have been found to have highest suitable areas for rearing of tasar (21896.01). This has been observed that Tawang district was having negligible areas suitable for rearing of all the four types of silkworms due to the limitation of Physiographic and climatic conditions.

### **Assam**

Identification of suitable areas for mulberry cultivation and rearing of eri, muga and tasar were carried out in Cachar, Dhubri, Dima Hasao (erstwhile North Cachar Hills), Golaghat, Hailakandi, Karbianglong, Karimganj, Lakhimpur and Udalguri district. As per the suggestions from the State Directorate of Sericulture, Govt. of Assam, in addition to culturable wastelands, areas under tree clad and homestead gardens were also taken for evaluation of potential areas. This has resulted in higher proportion of areas under various suitable categories. Karbianglong district was found to have highest suitable area for mulberry cultivation and rearing of eri (Table 9.1 & 9.2). However, most of the areas were moderate to marginally suitable for mulberry cultivation. Hailakandi and Karimganj district were found to have no suitable areas for rearing of eri. Again, suitable areas for rearing of muga have been found to be highest in Dima Hasao district (96906.82 ha), although, highly suitable areas were highest in Karbianglong district (44995.39 ha). Similarly, Golaghat district was found to have more suitable areas for rearing of tasar (Table 9.8), however, highly suitable areas were found in Lakhimpur district (Table 9.15). Three districts of Barak Valley (Cachar, Hailakandi and Karimganj) were found to have no suitable areas for rearing of tasar.



### **Bihar**

Three districts were included for identification of suitable areas for mulberry cultivation and rearing of eri viz. Bhaglpur, Gaya and Munger. Gaya district was found to have more suitable areas for mulberry cultivation and rearing of eri (57014.09 & 123463.77 ha, respectively). However, none of the district was found to have highly suitable areas rather they were moderately to marginally suitable for mulberry cultivation (Table 10.1, 10.3 & 10.5).

### **Chhattisgarh**

Suitable areas for mulberry cultivation were studied in two districts viz. Baster and Raigarh and this has been observed that Bastar district has more suitable areas compared to Raigarh (10681.48 ha). However, most of the areas were moderately to marginally suitable and none of the districts were found to have highly suitable areas (Table 11.1 & 11.2).

### **Himachal Pradesh**

Four districts were selected for identification of suitable areas for mulberry cultivation viz. Kangra, Kullu, Sirmour and Una. Kangra district have been found to have highest suitable areas (51533.76 ha), however, most of the areas in the selected districts are in the category of moderate to marginally suitable (Table 12.1 to 12.4).

### **Jammu & Kashmir**

Identification of suitable areas for mulberry cultivation was attempted in Bandipore and Reasi district. This has been observed that Reasi district had more suitable areas (Table 13.2), although Bandipore district was found to have more highly suitable areas for cultivation of mulberry (1784.48 ha).

### **Jharkhand**

Pakur and Ranchi districts were selected for identification of suitable areas for mulberry cultivation and Ranchi was found to have more suitable areas compared to Pakur district (17267.30 ha). However, most of the areas were marginally to moderately suitable and none of the districts were found to have highly suitable areas (Table 14.1 & 14.3). Again, suitable areas for rearing of tasar were studied in Saraikela district and most of the areas were found to be highly to moderately suitable for rearing of tasar (Table 14.2).

### **Karnataka**

Suitable areas for mulberry cultivation were studied in Bagalkote, Bidar, Chitradurga and Belgaum district. As per the suggestions from the State Directorate of Sericulture, Govt. of Karnataka, in addition to culturable wastelands, areas under fallow land and homestead gardens were also taken for evaluation of potential areas. This has resulted in higher proportion of areas under various suitable categories. It has been observed that Belgaum district has the highest suitable areas (551344.22 ha). However, most of the areas are in the category of moderate to marginally suitable for further

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expansion of sericulture activities.(Table 15.1 to 15.4).

### **Kerala**

Two districts were selected for identification of suitable areas for mulberry cultivation viz. Idukki and Palghat and Idukki district was found to have more suitable areas (30323.34 ha). However, most of the suitable areas of Idukki were moderately to marginally suitable for mulberry cultivation (Table 16.1). On the contrary, highly suitable areas were found to be more in Palghat district (8381.61 ha).

### **Madhya Pradesh**

An attempt was made to identify suitable areas for mulberry cultivation in six districts viz. Datia, Dewas, Hoshangabad, Gwalior, Jhabua and Vidisha. This has been observed that Datia district has more suitable areas (table 17.1), However, highly suitable areas were more in Gwalior district (662.20 ha). In general, most of the areas were marginally to moderately suitable for mulberry cultivation for all the districts.

### **Maharashtra**

Seven districts were selected for identification of suitable areas for mulberry cultivation viz. Beed, Jalna, Latur, Parbhani, Nagpur, Pune and Satara and Nagpur district was found to have highest suitable areas for mulberry cultivation (32476.88 ha). Most of suitable areas were marginally suitable and none of the districts were found to have highly suitable areas for mulberry cultivation (table 18.1 to 18.7).

### **Manipur**

All the nine districts were studied for identification of suitable areas for mulberry, eri, muga & tasar. Chandel district was found to have highest area suitable for mulberry cultivation (Table 19.4). Bishnupur and Imphal East were not found to have suitable areas for mulberry cultivation. On the other hand, Ukhrul district have been found to have highest suitable areas for rearing of eri, muga and tasar (Tables 19.32-19.34). However, most of the suitable areas were marginally to moderately suitable for mulberry cultivation and rearing of eri, muga & tasar.

### **Meghalaya**

Suitable areas for mulberry, eri & muga were studied in two districts viz. East Garo Hills (covering both East Garo Hills and North Garo Hills district) and Ri bhoi. This has been observed that East Garo Hills district had more suitable areas for mulberry, eri & muga (Tables 20.1- 20.3). However, highly suitable areas were found only in Ri bhoi district (13927.51 ha). Most of the areas of East Garo Hills district were found to be in the category of moderately suitable and marginally suitable. On the other hand, suitable areas for rearing of tasar was studied only in East Garo Hills district and 9969.70 ha area were found to be suitable. Most of the suitable areas were found in two blocks viz., Samanda and Dambo Rongjeng (Table 20.4).

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### **Mizoram**

Six districts viz. Aizawl, Champai, Langtlai, Lunglei, Mamit and Saiha were covered for identification of suitable areas for mulberry eri, muga and tasar. Suitable areas for mulberry cultivation were found to be highest in Champhai district (Table 21.5), however, highly suitable areas were found in Lunglei (Table 21.13). Similarly, Lunglei district was found to have highest areas suitable for rearing of eri, muga and tasar. Mamit district has more areas which are highly suitable for rearing of eri and muga (Tables 21.18 & 21.19). Most of the areas were found to be highly suitable for mulberry cultivation but marginally suitable for rearing of eri, muga and tasar irrespective of districts.

### **Nagaland**

Suitable areas for mulberry cultivation and rearing of eri, muga & tasar were studied in five districts viz. Kiphire, Mokokchung, Phek, Tuensang, Zuneheboto. Mokokchung district was found to have highest suitable areas for mulberry cultivation (Table 22.5), however, highly suitable areas were found highest in Zuneheboto district (Table 22.15). Again, Suitable areas for rearing of eri were found to be highest in Zuneheboto district (Table 22.15), however, highly suitable areas were found highest in Mokokchung district (Table 22.5). Similarly, suitable areas for rearing of muga were also found to be highest in Mokokchung district (40089.72 ha) On the other hand, suitable areas for rearing of tasar were found to be highest in Tuensang district (18301.66 ha), however, Zuneheboto district was found to have more highly suitable areas (3617.71 ha). Most of the areas were found to be moderately to marginally suitable for mulberry, eri, muga & tasar irrespective of districts.

### **Odisha**

Four districts were studied for identification of suitable areas for mulberry cultivation and rearing of tasar viz. Deogarh, Gajapati, Keonjhar and Mayurbhanj. This has been observed that Keonjhar district had highest area suitable for mulberry cultivation (58273.53 ha), however, most of the areas were marginally suitable. On the other hand, Mayurbhanj district was found to have more suitable areas for rearing of tasar (Table 23.8) and most of the areas were found to be highly to moderately suitable irrespective of districts.

### **Punjab**

Suitable areas for mulberry cultivation were studied in two districts viz. Hoshiarpur and Nawanshehar and this has been observed that suitable area were more in Hoshiarpur (Table 24.1). However, suitable areas were found to be in the category of moderately suitable and marginally suitable.

### **Sikkim**

An attempt was made to identify suitable areas for cultivation of mulberry, eri and muga in South Sikkim district and 5922.26, 64.54 & 465.89 ha were identified, respectively. This has been observed that most of the areas were moderately to marginally suitable for mulberry, eri and muga (Table 25).



## **Tamil Nadu**

Four districts were studied for identification of suitable areas for mulberry cultivation viz. Erode, Tirunelveli, Theni and Vellore. This has been observed that suitable areas were highest in Erode district (116846.84 ha) and most of the areas were found to be highly to moderately suitable for mulberry cultivation (Table 26.1-26.4).

## **Tripura**

Suitable areas for cultivation of mulberry and rearing of muga were studied in two districts viz. Dhalai and North Tripura. Suitable areas for mulberry cultivation were more in Dhalai district (18307.11 ha), however, most of the areas were moderately to marginally suitable for mulberry cultivation irrespective of districts. On the other hand, North Tripura district was found to have more areas for rearing of muga (Table 27.4).

## **Uttar Pradesh**


An attempt was made to identify suitable areas for mulberry cultivation in Balia, Gonda and Pilbhit district. Pilbhit district was found to have highest suitable area for mulberry cultivation (10215.01 ha), however, most of the areas were marginally to moderately suitable and highly suitable areas were identified only in Pilbhit district (Table 28.6). On the other hand, suitable areas for rearing of tasar were studied in Jhansi, Lalitpur and Mahoba and Lalitpur district was found to have highest suitable area for rearing of tasar (83256.08 ha).

## **Uttarakhand**

Five districts were studied for identification of suitable areas for cultivation of mulberry and rearing of eri, muga & tasar viz. Dehradun, Nainital, Pithoragarh, Uttarkashi and Udham Singh Nagar. Suitable areas for mulberry cultivation were found to be highest in Dehradun (Table 29.1) and most of the areas were found to be highly suitable. However, highly suitable areas for mulberry cultivation were not found in Pithoragarh and Udham Singh Nagar district. Again, suitable areas for rearing of muga & tasar were found to be highest in Pithoragarh (4117.83 ha) and Uttar Kashi (143516.67 ha), respectively. Most of the areas were found to be highly suitable for rearing of tasar.

## **West Bengal**

Suitable areas for cultivation of mulberry were studied in Bankura, Birbhum, Jalpaiguri, Koch Bihar, Maldah, Murshidabad, Pachim Medinipur, Purba Medinipur and Purulia. This has been observed that Bankura district has highest suitable areas for mulberry cultivation (36333.14 ha) and most of the areas were found to be moderately to marginally suitable. Study was made to identify suitable areas for rearing of eri in Jalpaiguri district and a total of 82461.84 ha areas were identified out of which most of the areas were marginally suitable (Table 30.6). Similarly, identification of areas suitable for rearing of muga were carried out in Jalpaiguri and Koch Bihar districts and this has been observed that Jalpaiguri district has more



suitable areas (82461.92 ha). Again, identification of areas suitable for rearing of tasar was attempted in Bankura, Birbhum, Paschim Medinipur and Purulia district and Paschim Medinipur district was found to have highest suitable areas (69416.89 ha). However, most of the areas were marginally suitable for rearing of eri, muga and tasar.

#### **Appraisal surveys in selected talukas**

With regards to appraisal surveys, two Talukas in each of the selected four districts were selected. For the state of Karnataka, Kudligi and Hagaribommanahalli in Bellary district of Karnataka were selected for the appraisal survey. It was estimated that Kudligi taluka has an area of 928.6 ha, while Hagaribommanahalli has an area of 1135.86 ha under Mulberry plantations. In Andhra Pradesh two Talukas viz., Pathikonda and Atamkur in Karnool district have been selected for the appraisal survey while for the state of Maharashtra two Talukas viz., Wai Taluka in Satara district and Jalna Taluka in Jalna district were selected for the appraisal survey. The study shows that drought conditions in these talukas have resulted in significant reductions in area under mulberry plantations. Similarly in Tamil Nadu, two Talukas viz., Udumalpet and Gudimangalam Talukas under Coimbatore district showed reduction in mulberry acreage during the period of 2007-08 and 2011-12.

#### **Sericulture Information Linkages and Knowledge System (SILKS)**

The webportal called Sericulture Information Linkages and Knowledge System (SILKS) developed as a part of the project has been put in the public domain under the domain name <http://silks.csb.gov.in>. SILKS is a single window, ICT-based information and advisory services system for the farmers, sericulture extension workers, administrators and planners working in the field of sericulture development. It provide computerized information storage, value addition, and supply sericulture knowledge to users and planning and advisory services in formats and language appropriate for the local sericulturists. The portal is now made available in 12 languages viz., English, Hindi, Telugu, Kanada, Assamese, Bengali, Manipuri, Mizo, Khasi, Garo, Ao Naga and Sumi Naga. It has 13 major non-spatial modules and 4 spatial modules, which are grouped into three categories, namely Planning Services, Other Services and Natural Resources Management. The available modules under Planning Services are Silkworm Food Plants Production Technologies, Techniques of Rearing Silkworm, Diseases and Pest Management of Silkworm Food Plants, Improved Varieties of Silkworm Food Plants, Species of Silkworm, Processing of Cocoons, Infrastructure and Equipments and Allied Sectors and Occupations. Within a short span of about one year, the portal has been able to make significant impact particularly in North Eastern region and a number of sericulture expansion activities have been initiated based on the outcome of the study. Publishing of bulletin with sericulture advisories has been initiated in collaboration India Meteorological Department and made it operational for the state of Andhra Pradesh.




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# DETAILS OF DISTRICT LEVEL INFORMATION WITH MAPS AND STATISTICS

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## ANDHRA PRADESH & TELANGANA



Andhra Pradesh situated on the country's southeastern coast is the eighth largest state in India covering an area of 160,205 km<sup>2</sup>. As per 2011 census of India, the state is tenth largest by population with 49,386,799 inhabitants. The new capital city of Andhra Pradesh is proposed in Guntur District. In accordance with the Andhra Pradesh Reorganisation Act, 2014, Hyderabad will remain the de jure capital of both Andhra Pradesh and Telangana states for a period of 10 years. The state has the second longest coastline of 972 km after Gujarat. It borders Telangana in the northwest, Chhattisgarh in the North, Odisha in the northeast, Karnataka in the west, Tamil Nadu in the south and the water body of Bay of Bengal in the east. There are two regions in the state namely Coastal Andhra and Rayalaseema and hence, the two regions are more often referred as Seemandhra. There are 13 districts with 9 in Coastal Andhra and 4 in Rayalaseema. Visakhapatnam is the largest city and a commercial hub of the state. Climate of the state is generally hot and humid.

On 2nd June, 2014, Telangana was separated from Andhra Pradesh as a new 29th state of India, with the city of Hyderabad as its capital. Telangana has an area of 114,840 km<sup>2</sup> and is the twelfth largest state in India. Telangana is bordered by the states of Maharashtra, Odisha, Chhattisgarh to the north, Karnataka to the west, and Andhra Pradesh to the south and east. Telangana has an area of 114,840 square kilometres and a population of 35,286,757 (2011 census).

Undivided Andhra Pradesh occupies 1st position in productivity and 2nd position in the country next to Karnataka in production of Silk. Andhra Pradesh produces all the four popular varieties of Silk worm cocoons namely Mulberry, Tasar, Eri and Muga and it has got very strong and traditional weaving base with more than one lakh number of hand looms mostly concentrated in weaving pockets like Dharmavaram, Pochampally, Gadval, Patur, Peddapuram, Narayanpet, etc., In the last decade, the number of cotton weavers have taken to silk weaving in centers like Rayadurg and Proddatur because of better income in silk weaving.

As per Sericulture Department, Govt. of A.P, the area under Mulberry cultivation is about 0.43 lakh hectares, under Tasar food plantation is about 0.10 lakh hectares and Eri is about 109.42 lakh hectares, of which the area under Castor is about 109.18 lakh hectares and Tapioca is about 0.24 lakh hectares respectively during the year 2006-07.

Two districts from Andhra Pradesh (West Godavari and Srikakulam) and two districts from Telangana (Medak and Nalgonda) were selected for mapping of potential areas for Mulberry, out of which two districts (Medak and Nalgonda) were selected for mapping of potential areas for Eri. A brief introduction of each of the selected districts is given below.

## **West Godavari**

West Godavari District is one of the 13 districts of Andhra Pradesh, with the district headquarters is the city of Eluru. The district is in the delta region of the Krishna and Godavari rivers. Khammam District lies to the north, East Godavari District to the east, the Bay of Bengal to the south, and Krishna District to the west. West Godavari district occupies an area of approximately 7,742 sq. km.

## **Srikakulam**

Srikakulam District is the extreme Northeastern District of Andhra Pradesh situated within the geographic co-ordinates of 18 20' and 19 10' of Northern latitude and 83 50' and 84 50' of Eastern longitude. Vizianagaram District flanks in the south and west while Orissa bounds it on the north and Bay of Bengal on the East. The total area of the District is 5837 Sq. Kms.

## **Medak**

Medak is located towards the north of the Hyderabad city some 60 kms away. Medak is a small district with the boundaries shared to the adjacent places of Warangal, Nalgonda, Hyderabad and Nizamabad. Sangareddi is the district headquarters of Medak. Medak district occupies an area of approximately 9,699 square kilometers. It has an average elevation of 442 metres (1450 feet).

## **Nalgonda**

The district is in the Southern part of the Telangana Region between 16 25' and 17 50' of the Northern Latitude and 78 40' and 80 05' of Eastern longitude covering an area of 14,240 Sq. Kms. The District is bounded by Medak and Warangal districts in the North, Guntur and Mahaboobnagar districts in the South, Khammam and Krishna districts in the East and Mahabubnagar and Rangareddy district in the West.

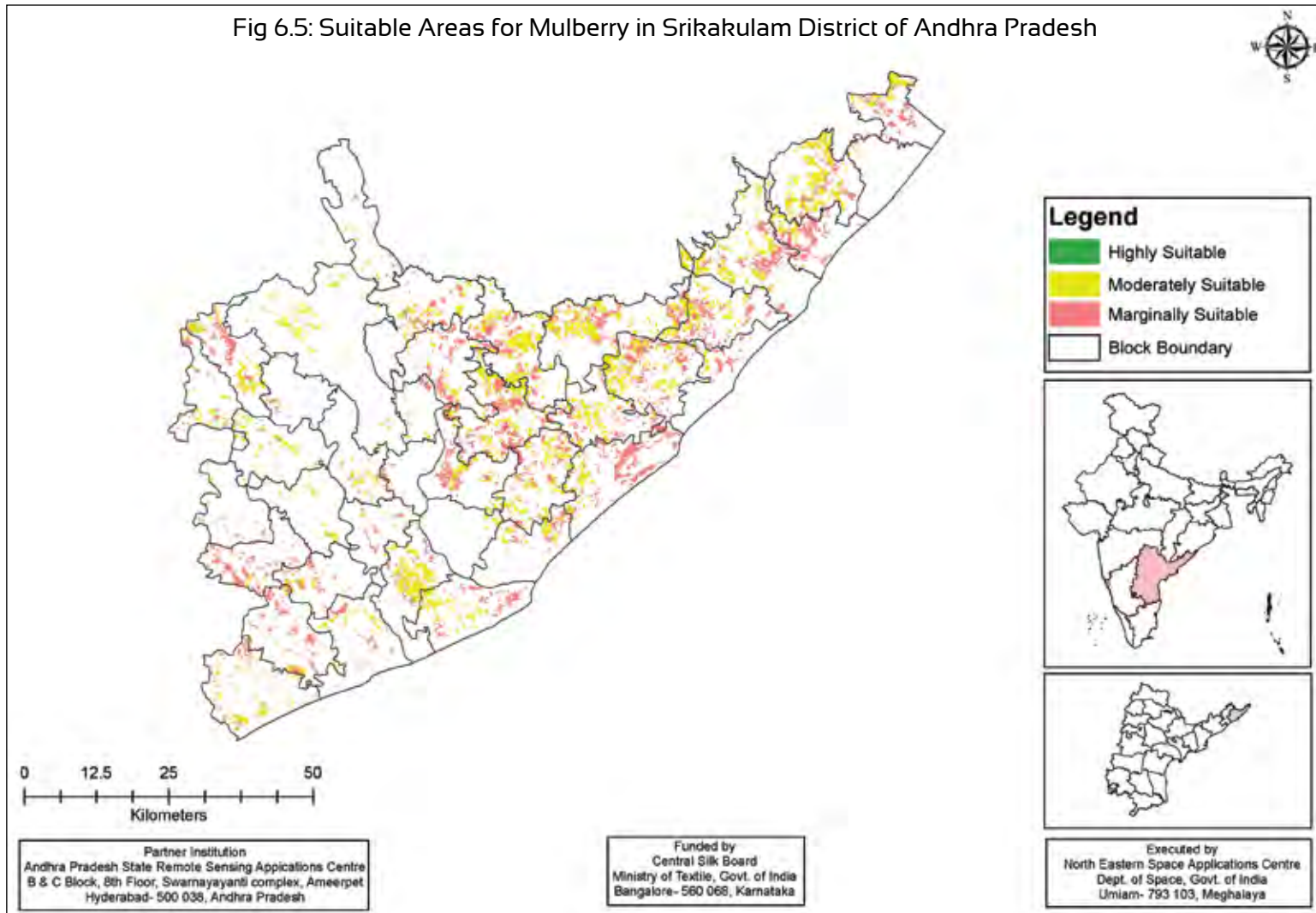
Table 7.5: Suitable Areas for Mulberry in Srikakulam District of Andhra Pradesh

| Block               | Suitable Areas For Mulberry (ha) |          |         |
|---------------------|----------------------------------|----------|---------|
|                     | Moderate                         | Marginal | Total   |
| Amadalavalasa       | 208.49                           | 374.60   | 583.09  |
| Bhamini             | 251.30                           | 191.62   | 442.92  |
| Burja               | 622.69                           | 257.99   | 880.68  |
| Etcherla            | 626.35                           | 607.50   | 1233.85 |
| Ganguvarisigadam    | 285.42                           | 1457.33  | 1742.76 |
| Gara                | 1345.23                          | 1172.60  | 2517.83 |
| Hiramandalam        | 791.48                           | 1600.51  | 2392.00 |
| Ichchapuram         | 994.67                           | 1235.70  | 2230.36 |
| Jalumuru            | 1041.61                          | 1501.16  | 2542.76 |
| Kanchili            | 3555.20                          | 1222.71  | 4777.91 |
| Kaviti              | 91.03                            | 173.01   | 264.04  |
| Kotabommali         | 2138.99                          | 1588.31  | 3727.30 |
| Kothuru             | 1102.14                          | 1023.66  | 2125.81 |
| Lakshminarsupeta    | 214.88                           | 261.48   | 476.36  |
| Laveru              | 560.18                           | 1539.79  | 2099.97 |
| Mandasa             | 2566.33                          | 2264.89  | 4831.22 |
| Meliaputti          | 3435.42                          | 1922.90  | 5358.33 |
| Nandigam            | 2822.18                          | 2398.85  | 5221.03 |
| Narasannapeta       | 211.34                           | 14.60    | 225.94  |
| Palakonda           | 140.86                           | 138.82   | 279.69  |
| Palasa              | 2160.53                          | 1886.07  | 4046.60 |
| Pathapatnam         | 3273.43                          | 1840.59  | 5114.02 |
| Polaki              | 796.88                           | 765.55   | 1562.43 |
| Ponduru             | 386.06                           | 663.22   | 1049.28 |
| Rajam               | 136.23                           | 269.37   | 405.60  |
| Ranastalam          | 1085.65                          | 819.35   | 1905.00 |
| Regidiamadalavalasa | 786.62                           | 157.95   | 944.57  |
| Santhabommali       | 907.43                           | 2969.24  | 3876.67 |
| Santhakaviti        | 475.71                           | 47.92    | 523.63  |
| Saravakota          | 2916.05                          | 2925.99  | 5842.04 |
| Sarubujjili         | 49.49                            | 241.68   | 291.17  |
| Seethampeta         | 1546.78                          | 0.16     | 1546.94 |



|                |          |          |          |
|----------------|----------|----------|----------|
| Sompeta        | 702.28   | 1944.39  | 2646.68  |
| Srikakulam     | 2490.18  | 712.88   | 3203.06  |
| Tekkali        | 1685.43  | 1283.96  | 2969.39  |
| Vajrapukothuru | 258.67   | 642.15   | 900.82   |
| Vangara        | 697.38   | 593.89   | 1291.28  |
| Veeraghattam   | 1420.72  | 1198.89  | 2619.61  |
| Total          | 44781.33 | 39911.30 | 84692.63 |

Fig 6.5: Suitable Areas for Mulberry in Srikakulam District of Andhra Pradesh



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Table 7.6: Suitable Areas for Mulberry in West Godavari District of Andhra Pradesh

| Block            | Suitable Areas For Mulberry (ha) |          |          |          |
|------------------|----------------------------------|----------|----------|----------|
|                  | High                             | Moderate | Marginal | Total    |
| Bhimadole        | 38.53                            | 50.63    | 79.01    | 168.17   |
| Bhimavaram       | -                                | 68.30    | -        | 68.30    |
| Buttayagudem     | -                                | 694.67   | 629.66   | 1324.33  |
| Chagallu         | 34.25                            | 1.60     | 77.35    | 113.19   |
| Chintalapudi     | 0.72                             | 491.58   | 292.46   | 784.75   |
| Denduluru        | 130.43                           | 51.10    | 5.50     | 187.03   |
| Devarapalle      | 99.79                            | 148.47   | 1392.45  | 1640.70  |
| Dwaraka Tirumala | -                                | 859.40   | 621.23   | 1480.63  |
| Eluru            | 114.42                           | 22.40    | 0.75     | 137.57   |
| Gopalapuram      | 476.67                           | 1109.24  | 1018.28  | 2604.19  |
| Jangareddigudem  | -                                | 248.71   | 534.61   | 783.32   |
| Jeelugu Milli    | -                                | 84.16    | 167.29   | 251.45   |
| Kamavarapukota   | -                                | 300.89   | 521.44   | 822.33   |
| Kovvur           | 396.32                           | 21.63    | 419.99   | 837.94   |
| Koyyalagudem     | -                                | 277.67   | 734.01   | 1011.68  |
| Lingapalem       | 83.47                            | 577.63   | 333.86   | 994.96   |
| Nallajerla       | -                                | 223.31   | 1187.78  | 1411.09  |
| Nidadavole       | 5.33                             | 32.00    | 229.51   | 266.84   |
| Pedapadu         | 61.86                            | -        | -        | 61.86    |
| Pedavegi         | 50.75                            | 105.67   | 90.41    | 246.83   |
| Peravali         | -                                | 22.58    | -        | 22.58    |
| Polavaram        | 79.58                            | 158.01   | 198.57   | 436.16   |
| T.Narasapuram    | -                                | 370.01   | 155.35   | 525.36   |
| Tadepalligudem   | -                                | 255.98   | 779.47   | 1035.45  |
| Tallapudi        | 794.02                           | 138.70   | 116.01   | 1048.72  |
| Undrajavaram     | -                                | 4.14     | -        | 4.14     |
| Ungutur          | -                                | 322.76   | 754.50   | 1077.26  |
| Total            | 2366.12                          | 6641.23  | 10339.48 | 19346.83 |



Table 7.1 : Suitable Areas for Mulberry in Medak District of Telangana

| Block            | Suitable Areas For Mulberry (Ha) |          |          |          |
|------------------|----------------------------------|----------|----------|----------|
|                  | High                             | Moderate | Marginal | Total    |
| Alladurg         | -                                | 1679.99  | 1993.02  | 3673.01  |
| Andole           | -                                | 4428.32  | 0.58     | 4428.89  |
| Chegunta         | -                                | 1358.53  | 628.46   | 1986.99  |
| Chinnakodur      | -                                | 3452.75  | 3442.81  | 6895.57  |
| Doultabad        | -                                | 3735.32  | 499.32   | 4234.64  |
| Dubbak           | -                                | 3681.14  | 319.70   | 4000.83  |
| Gajwel           | -                                | 5230.12  | 272.05   | 5502.18  |
| Hathnoora        | -                                | 4165.96  | 274.73   | 4440.69  |
| Jagdevpur        | -                                | 5848.50  | 890.75   | 6739.24  |
| Jharasangam      | 2977.97                          | 1962.16  | 419.51   | 5359.64  |
| Jinnaram         | -                                | 3597.56  | 422.47   | 4020.03  |
| Kalher           | -                                | 4216.94  | 966.71   | 5183.65  |
| Kangti           | -                                | 6099.34  | 10264.47 | 16363.81 |
| Kohir            | 3053.82                          | 2518.91  | 533.63   | 6106.37  |
| Kondapak         | -                                | 4379.14  | 276.27   | 4655.41  |
| Kondapur         | -                                | 3463.33  | 92.27    | 3555.60  |
| Kowdipalle       | -                                | 2170.95  | 93.85    | 2264.81  |
| Kulcharam        | -                                | 1430.85  | 3.89     | 1434.74  |
| Manoor           | -                                | 2917.89  | 4555.27  | 7473.16  |
| Medak            | -                                | 2594.89  | 541.01   | 3135.89  |
| Mirdoddi         | -                                | 3118.10  | 791.09   | 3909.19  |
| Mulug            | -                                | 2228.97  | 2874.83  | 5103.81  |
| Munpalle         | -                                | 1088.14  | 774.73   | 1862.87  |
| Nangnoor         | -                                | 2681.19  | 1473.22  | 4154.41  |
| Narayankhed      | -                                | 3905.58  | 2722.94  | 6628.52  |
| Narsapur         | -                                | 1728.99  | 133.97   | 1862.96  |
| Nyalkal          | 4348.67                          | 2896.35  | 1288.45  | 8533.47  |
| Papannapet       | -                                | 1867.37  | 180.42   | 2047.79  |
| Patancheru       | -                                | 7031.87  | 140.09   | 7171.96  |
| Pulkal           | -                                | 5683.28  | 13.73    | 5697.01  |
| Raikode          | -                                | 1440.63  | 424.39   | 1865.02  |
| Ramayampet       | -                                | 1688.07  | 1598.01  | 3286.09  |
| Ramchandrapuram  | -                                | 1339.24  | 86.30    | 1425.54  |
| Regode           | -                                | 902.12   | 1673.15  | 2575.27  |
| Sadasivpet       | -                                | 5210.75  | 1.25     | 5212.00  |
| Sangareddy       | -                                | 4733.88  | 159.13   | 4893.01  |
| Shankarampet (R) | -                                | 1667.95  | 145.13   | 1813.08  |
| Shankarampet[A]  | -                                | 4103.97  | 641.59   | 4745.56  |

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|           |          |           |          |           |
|-----------|----------|-----------|----------|-----------|
| Shivampet | -        | 1061.04   | 1024.01  | 2085.05   |
| Siddipet  | -        | 4012.10   | 1124.71  | 5136.81   |
| Tekmal    | -        | 3867.33   | 88.44    | 3955.77   |
| Thoguta   | -        | 4565.77   | 557.73   | 5123.49   |
| Tupran    | -        | 1726.37   | 677.71   | 2404.08   |
| Wargal    | -        | 2757.95   | 191.34   | 2949.29   |
| Yeldurthy | -        | 1734.68   | 634.99   | 2369.66   |
| Zahirabad | 6553.23  | 6844.12   | 2652.93  | 16050.29  |
| Total     | 16933.70 | 148818.40 | 48565.06 | 214317.16 |

Fig 6.1 : Suitable Areas for Mulberry in Medak District of Telangana

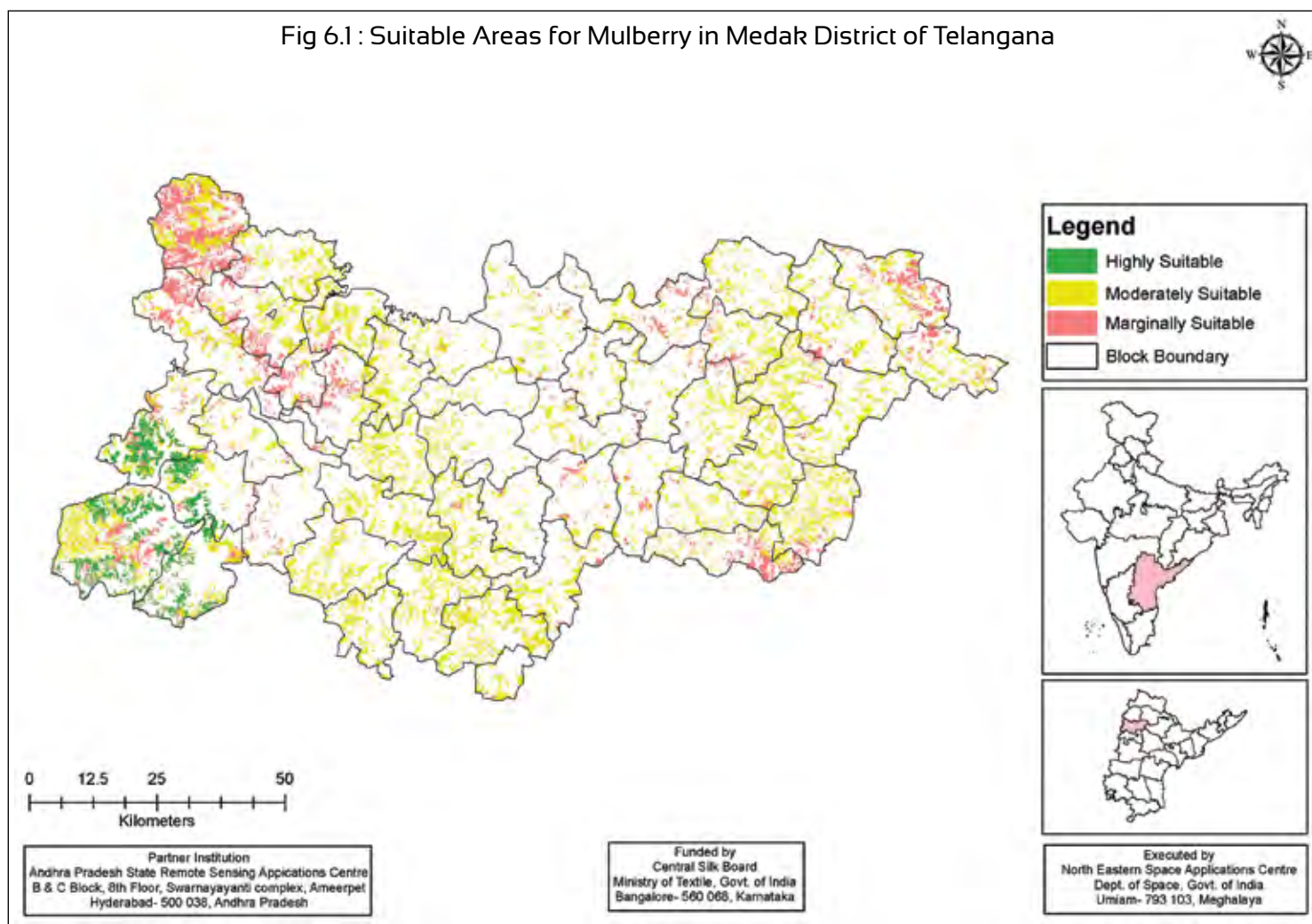


Table 7.2: Suitable Areas for Eri in Medak District of Telangana

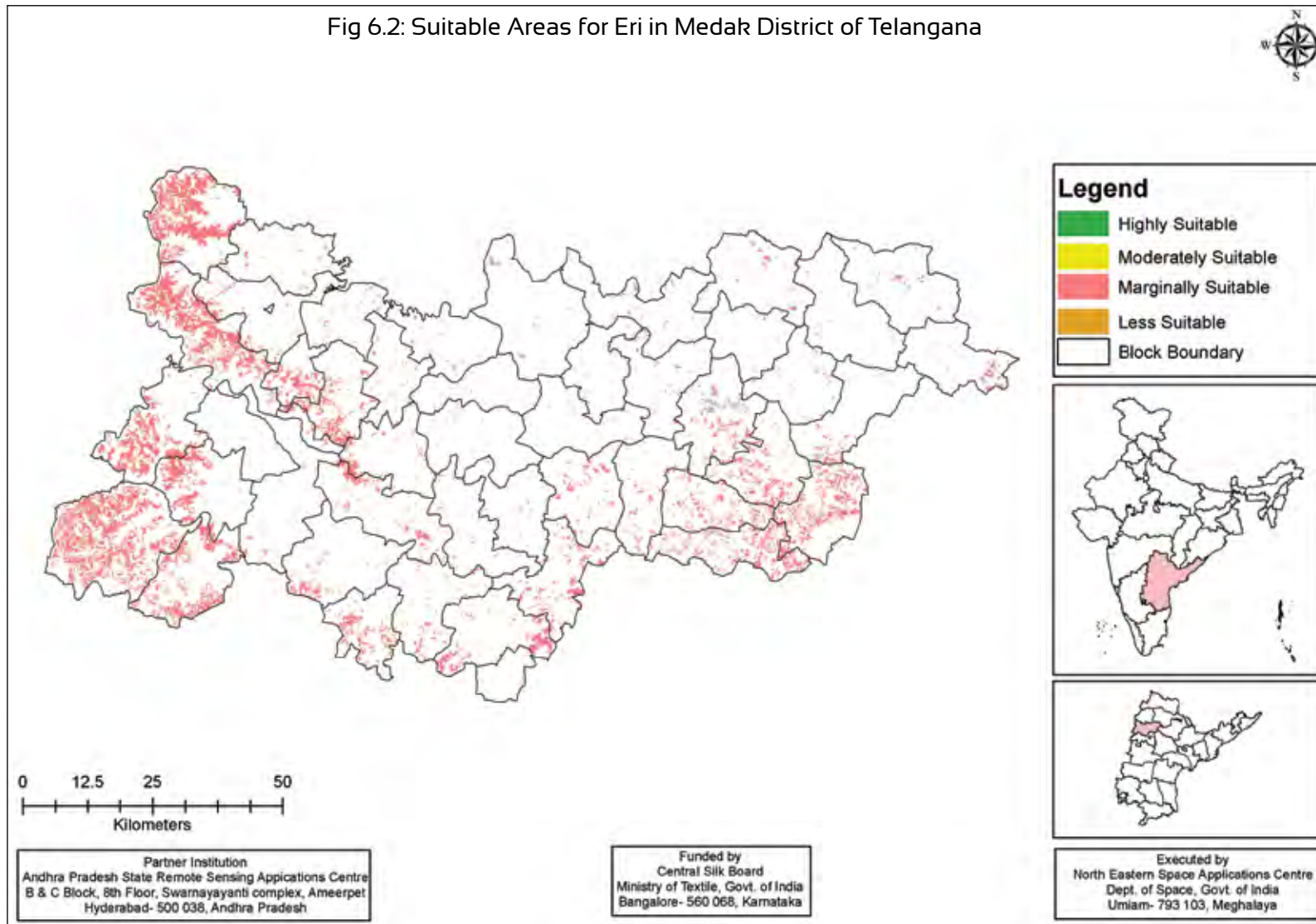
| Block       | Suitable Areas For Eri (Ha) |          |
|-------------|-----------------------------|----------|
|             | Suitable                    | Total    |
| Alladurg    | 2637.24                     | 2637.24  |
| Andole      | 1096.26                     | 1096.26  |
| Chegunta    | 383.39                      | 383.39   |
| Chinnakodur | 435.20                      | 435.20   |
| Doultabad   | 2013.50                     | 2013.50  |
| Dubbak      | 527.15                      | 527.15   |
| Gajwel      | 2340.63                     | 2340.63  |
| Hathnoora   | 335.15                      | 335.15   |
| Jagdevpur   | 4732.65                     | 4732.65  |
| Jharasangam | 3829.70                     | 3829.70  |
| Jinnaram    | 2022.44                     | 2022.44  |
| Kalher      | 421.16                      | 421.16   |
| Kangti      | 9234.24                     | 9234.24  |
| Kohir       | 5070.22                     | 5070.22  |
| Kondapak    | 803.81                      | 803.81   |
| Kondapur    | 1717.25                     | 1717.25  |
| Kowdipalle  | 88.83                       | 88.83    |
| Kulcharam   | 68.85                       | 68.85    |
| Manoor      | 10138.98                    | 10138.98 |
| Medak       | 273.46                      | 273.46   |
| Mirdoddi    | 93.32                       | 93.32    |
| Mulug       | 3693.66                     | 3693.66  |

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|                  |          |          |
|------------------|----------|----------|
| Munpalle         | 347.42   | 347.42   |
| Nangnoor         | 646.28   | 646.28   |
| Narayankhed      | 1286.96  | 1286.96  |
| Narsapur         | 196.69   | 196.69   |
| Nyalkal          | 5398.75  | 5398.75  |
| Papannapet       | 223.80   | 223.80   |
| Patancheru       | 2172.25  | 2172.25  |
| Pulkal           | 1628.36  | 1628.36  |
| Raikode          | 58.78    | 58.78    |
| Ramayampet       | 350.63   | 350.63   |
| Ramchandrapuram  | 47.28    | 47.28    |
| Regode           | 2308.86  | 2308.86  |
| Sadasivpet       | 1026.46  | 1026.46  |
| Sangareddy       | 876.69   | 876.69   |
| Shankarampet (R) | 123.88   | 123.88   |
| Shankarampet[A]  | 310.95   | 310.95   |
| Shivampet        | 1074.49  | 1074.49  |
| Siddipet         | 99.77    | 99.77    |
| Tekmal           | 352.65   | 352.65   |
| Thoguta          | 374.04   | 374.04   |
| Tupran           | 742.08   | 742.08   |
| Wargal           | 2176.76  | 2176.76  |
| Yeldurthy        | 116.82   | 116.82   |
| Zahirabad        | 13514.78 | 13514.78 |
| Total            | 87412.54 | 87412.54 |

Fig 6.2: Suitable Areas for Eri in Medak District of Telangana



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Table 7.3: Suitable Areas for Mulberry in Nalgonda District of Telangana

| Block           | Suitable Areas For Mulberry (ha) |          |          |          |
|-----------------|----------------------------------|----------|----------|----------|
|                 | High                             | Moderate | Marginal | Total    |
| Alair           | -                                | 3102.22  | 1331.08  | 4433.30  |
| Anumula         | 734.31                           | 2419.31  | 3307.37  | 6460.99  |
| Atmakur (M)     | -                                | 5014.85  | 2598.80  | 7613.65  |
| Atmakur (S)     | -                                | 1488.65  | 1985.71  | 3474.35  |
| Bhongir         | -                                | 6701.54  | 5309.86  | 12011.40 |
| Bibinagar       | 121.18                           | 3001.62  | 3745.13  | 6867.93  |
| Bommalaramaram  | -                                | 3476.00  | 2792.72  | 6268.73  |
| Chandam Pet     | -                                | 32.26    | 2740.82  | 2773.08  |
| Chandur         | -                                | 391.43   | 3546.31  | 3937.74  |
| Chilkur         | -                                | 537.94   | 14.19    | 552.13   |
| Chintha Palle   | -                                | 7189.46  | 389.81   | 7579.28  |
| Chityala        | -                                | 5684.16  | 2821.40  | 8505.56  |
| Chivvemla       | -                                | 2097.39  | 860.08   | 2957.47  |
| Choutuppal      | 1385.72                          | 7457.69  | 6998.11  | 15841.52 |
| Dameracherla    | -                                | 6843.63  | 341.49   | 7185.12  |
| Devarakonda     | -                                | 3048.65  | 2886.46  | 5935.11  |
| Garidepalle     | -                                | 1364.92  | 14.60    | 1379.52  |
| Gundala         | -                                | 2512.52  | 251.91   | 2764.44  |
| Gundla Palle    | -                                | 2351.42  | 2442.04  | 4793.46  |
| Gurrapode       | 44.51                            | 1651.79  | 1459.95  | 3156.25  |
| Huzurnagar      | -                                | 50.74    | 298.23   | 348.96   |
| Jajireddi Gudem | -                                | 81.02    | 7096.36  | 7177.38  |
| Kangal          | 3149.64                          | 2098.58  | 62.03    | 5310.25  |
| Kattangoor      | -                                | 1928.67  | 427.89   | 2356.56  |
| Kethepalle      | -                                | 7.36     | 865.24   | 872.60   |
| Kodad           | -                                | 1250.29  | 359.98   | 1610.27  |
| M.Turkapalle    | -                                | 723.80   | 3017.02  | 3740.82  |
| Marriguda       | -                                | 2497.24  | 2657.86  | 5155.10  |



|                      |          |           |           |           |
|----------------------|----------|-----------|-----------|-----------|
| Mattam Palle         | -        | 3209.87   | 52.57     | 3262.44   |
| Mella Cheruvu        | -        | 3915.03   | 2.10      | 3917.13   |
| Miryalaguda          | -        | 592.93    | 305.62    | 898.55    |
| Mothey               | -        | 3139.07   | 3017.31   | 6156.39   |
| Mothkur              | -        | 5538.90   | 6238.83   | 11777.72  |
| Munagala             | -        | 1792.95   | 920.75    | 2713.70   |
| Munugode             | -        | 706.68    | 3240.76   | 3947.44   |
| Nadigudem            | -        | 656.23    | 589.98    | 1246.21   |
| Nakrekal             | -        | 530.75    | 650.85    | 1181.60   |
| Nalgonda             | 2120.53  | 4169.68   | 947.33    | 7237.54   |
| Nampalle             | -        | 6580.40   | 1861.85   | 8442.25   |
| Narayanapur          | -        | 1972.72   | 5084.28   | 7057.01   |
| Narketpalle          | -        | 3997.93   | 399.10    | 4397.03   |
| Neredcherla          | -        | 1200.16   | 138.87    | 1339.03   |
| Nidamanur            | 1241.61  | 2969.95   | 575.52    | 4787.08   |
| Nuthankal            | -        | 719.11    | 598.39    | 1317.50   |
| Pedda Adiserla Palle | -        | 2721.49   | 0.00      | 2721.49   |
| Peddavoor            | -        | 5287.02   | 2835.11   | 8122.13   |
| Penpahad             | -        | 1738.25   | 0.00      | 1738.25   |
| Pochampalle          | 2093.18  | 5554.86   | 1141.44   | 8789.48   |
| Rajapet              | -        | 1980.46   | 2549.87   | 4530.33   |
| Ramannapeta          | -        | 3650.19   | 4022.53   | 7672.72   |
| Sali Gouraram        | -        | 0.00      | 880.00    | 880.00    |
| Suryapet             | -        | 934.45    | 2721.91   | 3656.36   |
| Thipparthi           | 1557.76  | 2560.53   | 827.79    | 4946.08   |
| Thirumalgiri         | -        | 1864.39   | 2345.43   | 4209.82   |
| Thripuraram          | 259.90   | 1972.29   | 291.60    | 2523.80   |
| Thungathurthi        | -        | 1489.30   | 1700.48   | 3189.77   |
| Valigonda            | -        | 4197.32   | 5343.46   | 9540.79   |
| Vemulapalle          | -        | 119.11    | 1426.99   | 1546.10   |
| Yadagirigutta        | -        | 4303.91   | 2478.05   | 6781.97   |
| Total                | 12708.35 | 155071.10 | 113811.20 | 281590.65 |

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Fig 6.3: Suitable Areas for Mulberry in Nalgonda District of Telangana

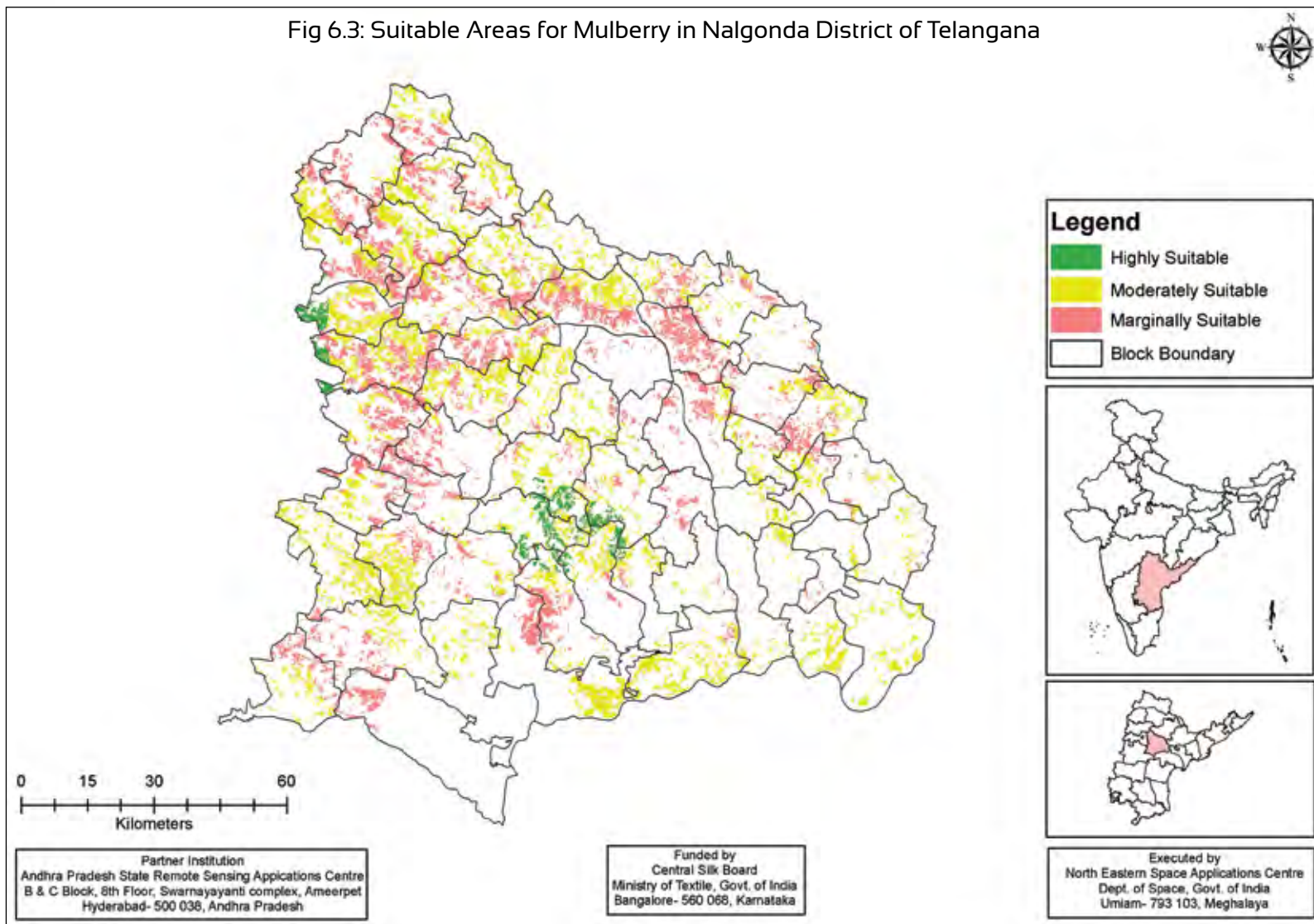


Table 7.4: Suitable Areas for Eri in Nalgonda District of Telangana

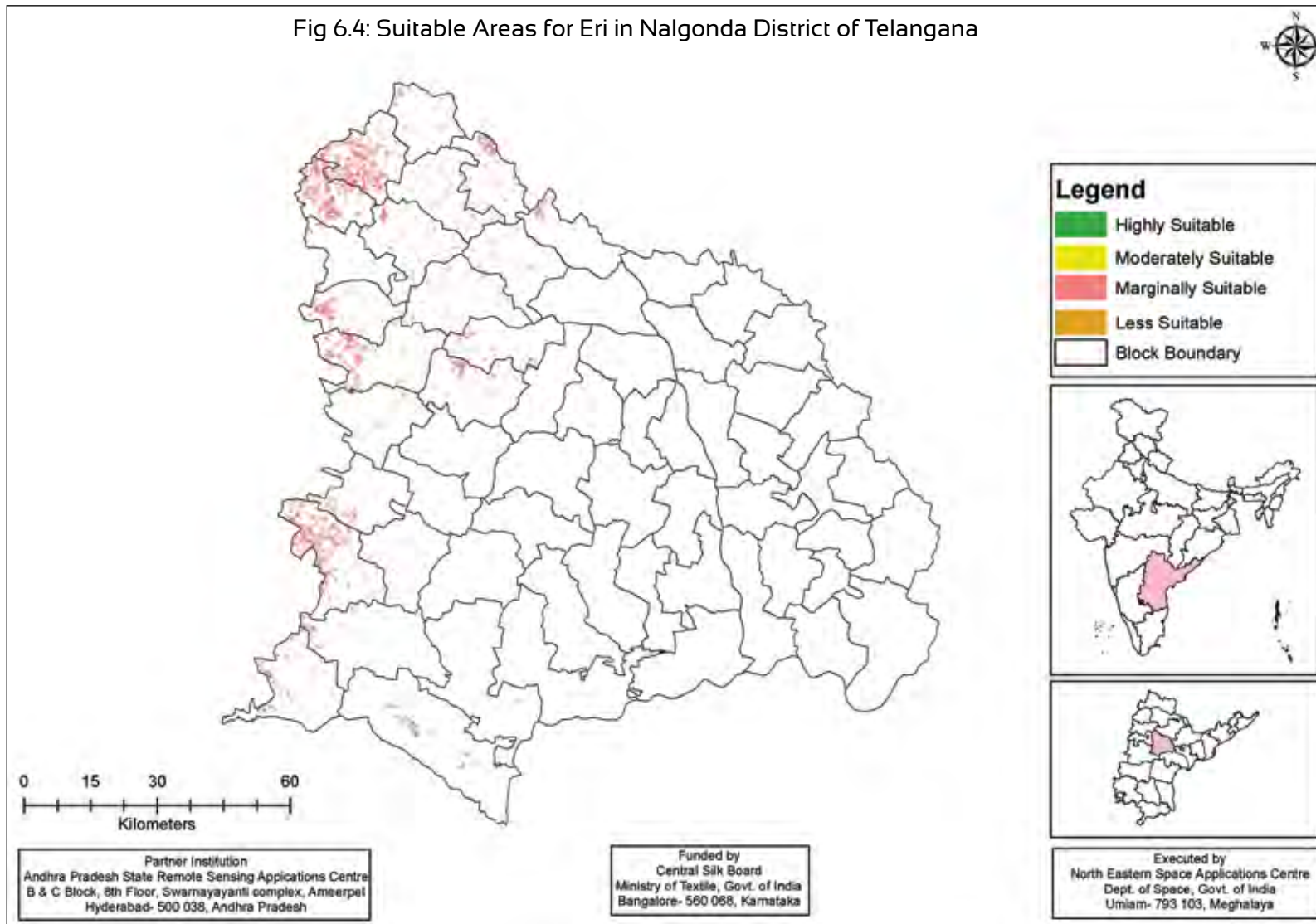
| Block           | Suitable Areas For Eri (Ha) |         |
|-----------------|-----------------------------|---------|
|                 | Suitable                    | Total   |
| Alair           | 1215.76                     | 1215.76 |
| Anumula         | -                           | -       |
| Atmakur (M)     | 462.53                      | 462.53  |
| Atmakur (S)     | -                           | -       |
| Bhongir         | 1083.97                     | 1083.97 |
| Bibinagar       | 313.58                      | 313.58  |
| Bommalaramaram  | 3516.47                     | 3516.47 |
| Chandam Pet     | 897.78                      | 897.78  |
| Chandur         | 39.66                       | 39.66   |
| Chilkur         | -                           | -       |
| Chintha Palle   | 4647.28                     | 4647.28 |
| Chityala        | 1007.97                     | 1007.97 |
| Chivvemla       | 6.57                        | 6.57    |
| Choutuppal      | 2419.44                     | 2419.44 |
| Dameracherla    | -                           | -       |
| Devarakonda     | 545.50                      | 545.50  |
| Garidepalle     | -                           | -       |
| Gundala         | 516.01                      | 516.01  |
| Gundla Palle    | 1310.32                     | 1310.32 |
| Gurrapode       | -                           | -       |
| Huzurnagar      | -                           | -       |
| Jajireddi Gudem | 3.97                        | 3.97    |
| Kangal          | -                           | -       |
| Kattangoor      | -                           | -       |
| Kethepalle      | -                           | -       |
| Kodad           | -                           | -       |
| M.Turkapalle    | 5115.20                     | 5115.20 |
| Marriguda       | 866.81                      | 866.81  |
| Mattam Palle    | -                           | -       |

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|                      |          |          |
|----------------------|----------|----------|
| Mella Cheruvu        | -        | -        |
| Miryalaguda          | -        | -        |
| Mothey               | -        | -        |
| Mothkur              | -        | -        |
| Munagala             | -        | -        |
| Munugode             | 5.11     | 5.11     |
| Nadigudem            | -        | -        |
| Nakrekal             | -        | -        |
| Nalgonda             | -        | -        |
| Nampalle             | 123.42   | 123.42   |
| Narayanapur          | 463.58   | 463.58   |
| Narketpalle          | 100.65   | 100.65   |
| Neredcherla          | -        | -        |
| Nidamanur            | -        | -        |
| Nuthankal            | -        | -        |
| Pedda Adiserla Palle | 41.84    | 41.84    |
| Peddavoora           | -        | -        |
| Penpahad             | -        | -        |
| Pochampalle          | 1467.76  | 1467.76  |
| Rajapet              | 536.23   | 536.23   |
| Ramannapeta          | 630.46   | 630.46   |
| Sali Gouraram        | -        | -        |
| Suryapet             | -        | -        |
| Thipparthi           | -        | -        |
| Thirumalgiri         | -        | -        |
| Thripuraram          | -        | -        |
| Thungathurthi        | -        | -        |
| Valigonda            | 714.56   | 714.56   |
| Vemulapalle          | -        | -        |
| Yadagirigutta        | 718.53   | 718.53   |
| Grand Total          | 28770.96 | 28770.96 |

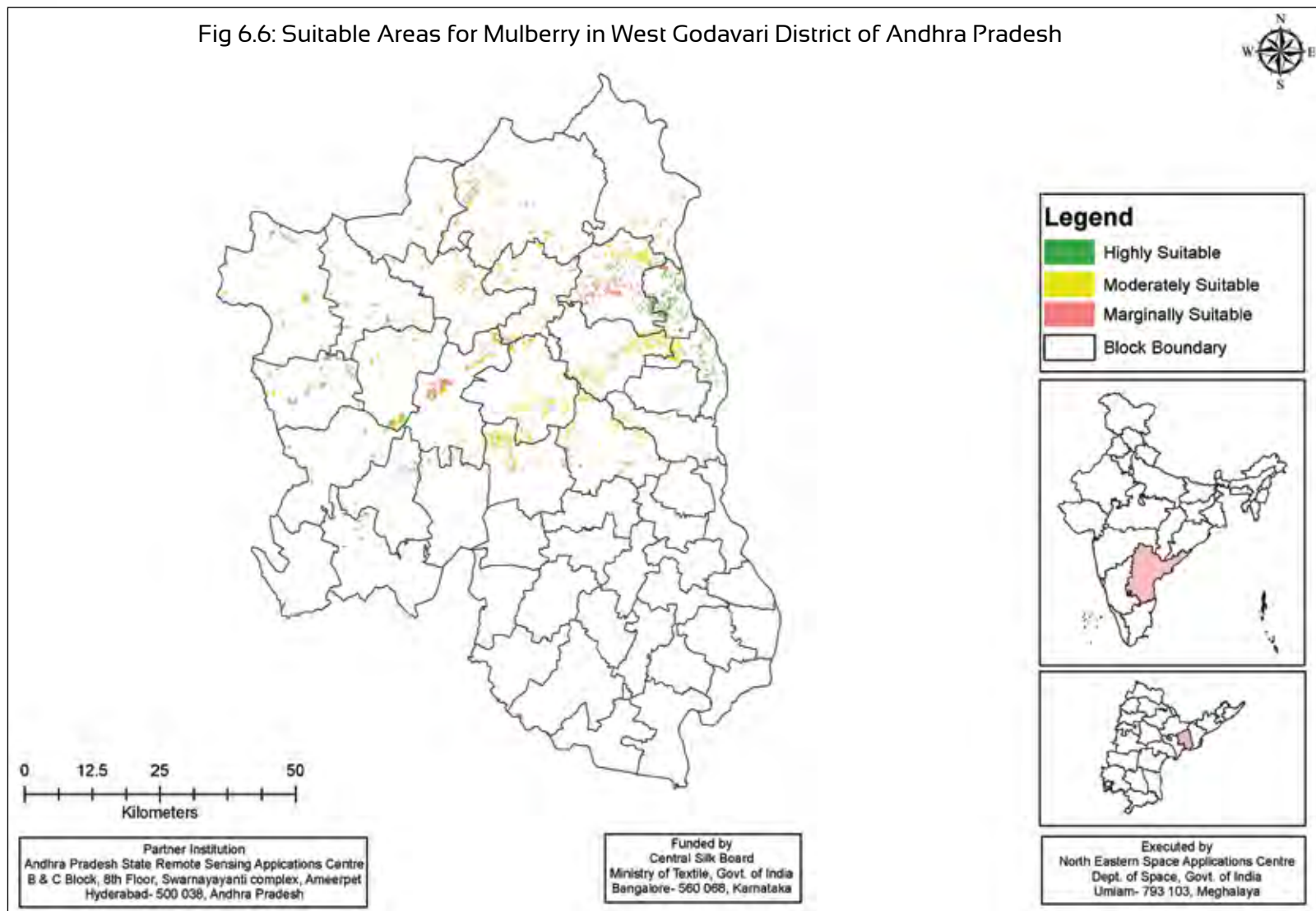
Fig 6.4: Suitable Areas for Eri in Nalgonda District of Telangana



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Fig 6.6: Suitable Areas for Mulberry in West Godavari District of Andhra Pradesh



## ARUNACHAL PRADESH

Arunachal Pradesh is the largest state in NER region with total geographical area of 83,743 Sq.km. Arunachal Pradesh has international boundary with China in the north, Bhutan in the west, and Myanmar in the south east. It is situated between latitude 26°30' N and 29°30' N and longitude 91°30' E and 97°30' E. Itanagar is the capital of Arunachal Pradesh and located at an altitude of 530 meters above MSL. The state is inhabited by 25 major tribes and 110 sub tribes. The department of Textiles and Handicrafts, Govt. of Arunachal Pradesh is encouraging sericulture activities in a big way in all the sericulture practicing area in the districts. Through various developmental schemes sponsored by state as well as centre, Arunachal Pradesh is promises to be a hub for various sericulture activities in near future in the context of Look East Policy (North East Vision document, 2020) unveiled by the Govt. of India on 2nd July, 2008.

Arunachal Pradesh is having good potential for Sericulture activities due to varying topography, abundance land area and high natural fertility of soil. The soil type varies from black clay to black loamy, lateritic to sandy soil and acidic in nature. The rainfall ranges from 164 mm to 5600 mm. The climatic condition of Arunachal Pradesh is such that higher altitude generally is of temperate type that is suitable for Oak Tasar and Bi-voltine rearing. In the foot hill, it is a sub-tropical type, which is very congenial for the propagation of all the four types of silkworms namely Mulberry, Muga, Eri and Temperate Tasar. Besides that the tribal attitude of the Arunachal State is quite nature loving by virtue of which there is no any social inhibition for adoption of this bio-technology in their way of daily life. Food plants for all variety of silk worms are naturally found in abundance in the natural vegetation of the state. Proper regeneration or afforestation of the non mulberry silkworm food plants is expected to prosper the sericulture farmers and growth of Textiles & Handicrafts Department and boost the economy of state in future.

### **Anjaw**

Anjaw District with its Headquarter at Hawaii was created on 16th February 2004 and came into force on 4th December, 2003 with seven Administrative Units, namely Hayuliang, Hawaii, Manchal, Goiliang, Walong, Kibithoo, Chaglogam. According to the 2011 census, Anjaw district has a population of 21,089 with population density of only 3 inhabitants per square kilometer.

### **Changlang**

Changlang district is located in the Indian state of Arunachal Pradesh, located south of Lohit district and north of Tirap district. It covers with picturesque hills lies in the southeastern corner of Arunachal Pradesh, northeast India. It has an area of 4,662 sq. Km. The District lies between the Latitudes 26°40'N and 27°40'N, and Longitudes 95°11'E and 97°11'E .It

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is bounded by Tinsukia District of Assam and Lohit District of Arunachal Pradesh in the north, by Tirap District in the west and by Myanmar in the south-east.

### **Kurung Kumey**

The Kurung Kumey district of Arunachal Pradesh is lying approximately between 91.20' to 55.40' East Longitude and 28.30' to 38.04' North Latitudes. The district is surrounded by China in the north, East Kameng District in the west, Upper Subansiri District and Lower Subansiri District and in the southern boundary boundary adjoins by Papum Pare District in the East of the Arunachal Pradesh.

### **Tawang**

Tawang is a thinly populated mountainous tract lying roughly between the latitude 27 45' N and the longitude 90 15' E on the Northwest extremity of the state. The district is surrounded by the Tibet in the North East, Bhutan in south West and West Kameng district in the south East. Total Geographical area 2085 Sq. Km

### **Tirap**

The Tirap district is located in the southeastern part of the state and lies between the latitudes 26 38' N and 27 47' N and the longitudes 96 16' E and 95 40' E. It is bounded by Myanmar towards South, by Changlang District of Arunachal Pradesh towards the East, by Dibrugarh District of Assam in the North and by Sivasagar (Assam) and Mon (Nagaland) district towards the West. It covers a total area of 2362 sq. km and is the second smallest district of Arunachal Pradesh.

### **Upper Subansiri**

Upper Subansiri district with headquarters located at Daporijo is a mountainous tract in Arunachal Pradesh, which covers approximately between 7032 sq. km. of area extending latitude between 27.45"N and 28.13"N and longitude 93.13"E and 94.36"E. It is bounded Tibet in the north, West Siang in the east, West Siang and Lower Subansiri district in the south and Lower Subansiri district in the west.

### **West Kameng**

West Kameng District lies approximately between 91° 30' to 92°40' East longitudes and 26° 54' to 28° 01' North latitudes. The District is surrounded by Tibet region of China in the North, Bhutan in the West, Tawang District and East Kameng District of Arunachal Pradesh are in the Northwest and East respectively and the Southern boundary adjoins Sonitpur District of Assam. It covers an area of approximately 7422 Sq. Km.



Table 8.1-8.4: Suitable Areas for Mulberry, Eri, Muga & Tasar in Anjaw District of Arunachal Pradesh

Table 8.1

| Block       | Suitable areas for Mulberry (ha) |          |          |         |
|-------------|----------------------------------|----------|----------|---------|
|             | High                             | Moderate | Marginal | Total   |
| Changlagaon | -                                | -        | 14.29    | 14.29   |
| Goiliang    | -                                | -        | 90.21    | 90.21   |
| Hawai       | -                                | -        | 638.80   | 638.80  |
| Hayuliang   | -                                | 2.52     | 307.78   | 310.29  |
| Kibithoo    | -                                | -        | 373.88   | 373.88  |
| Manchal     | -                                | -        | 248.83   | 248.83  |
| Walong      | -                                | -        | 987.61   | 987.61  |
| Total       | -                                | 2.52     | 2661.41  | 2663.93 |

Table 8.2

| Block       | Suitable areas for Eri (ha) |          |          |        |
|-------------|-----------------------------|----------|----------|--------|
|             | High                        | Moderate | Marginal | Total  |
| Changlagaon | -                           | -        | -        | -      |
| Goiliang    | 110.33                      | 8.15     | -        | 118.48 |
| Hawai       | 12.02                       | 16.57    | 1.25     | 29.85  |
| Hayuliang   | 29.67                       | 12.41    | -        | 42.08  |
| Kibithoo    | -                           | -        | -        | -      |
| Manchal     | 102.66                      | 33.68    | -        | 136.34 |
| Walong      | 84.28                       | 156.48   | 143.34   | 384.11 |
| Total       | 338.96                      | 227.30   | 144.59   | 710.86 |

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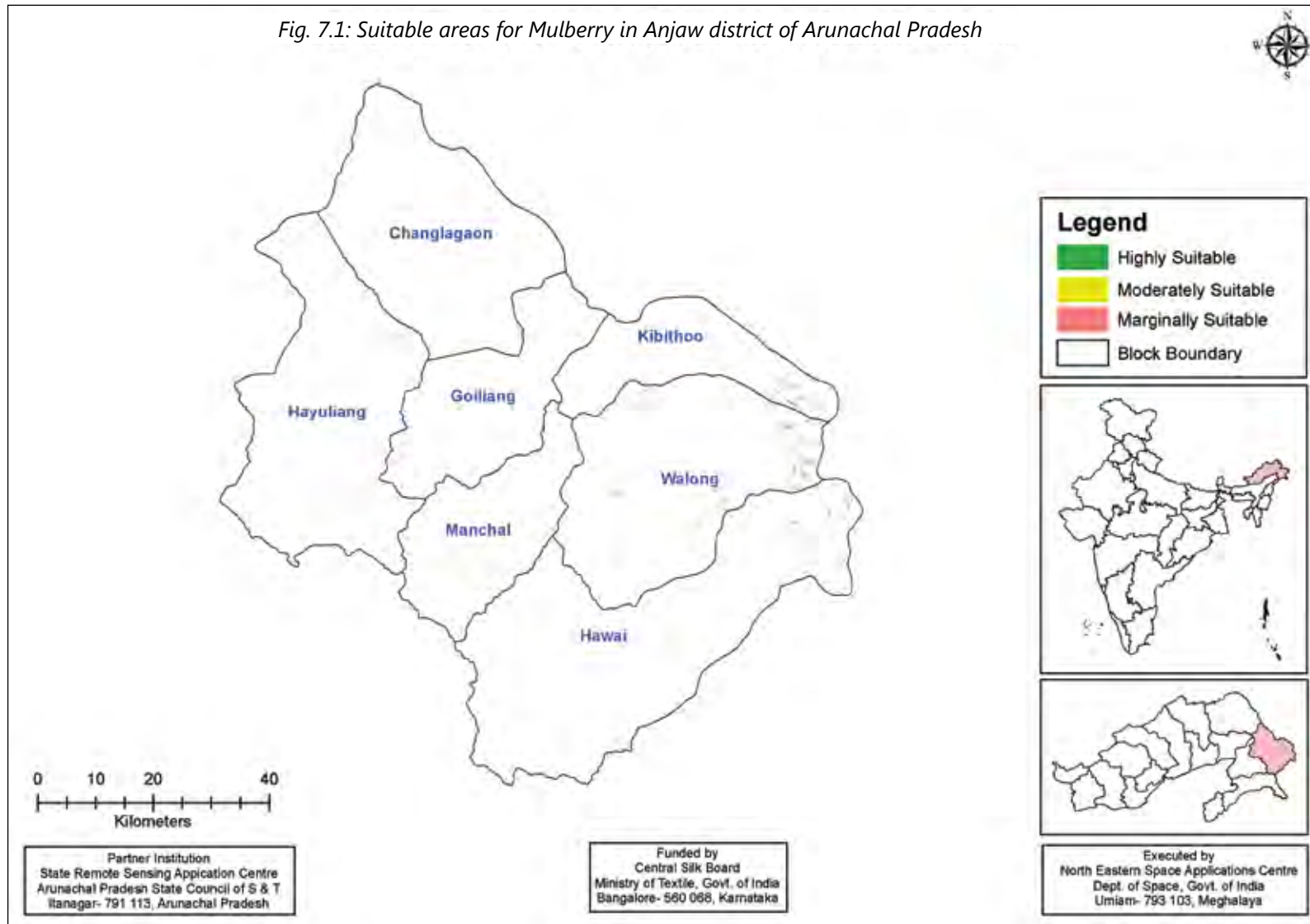
Table 8.3

| Block       | Suitable areas for Muga (ha) |          |          |        |
|-------------|------------------------------|----------|----------|--------|
|             | High                         | Moderate | Marginal | Total  |
| Changlagaon | -                            | -        | -        | 0.00   |
| Goiliang    | 110.33                       | 8.15     | -        | 118.48 |
| Hawai       | 12.02                        | 16.57    | 1.25     | 29.85  |
| Hayuliang   | 29.67                        | 12.41    | -        | 42.08  |
| Kibithoo    | -                            | -        | -        | 0.00   |
| Manchal     | 102.66                       | 33.68    | -        | 136.34 |
| Walong      | 84.28                        | 156.48   | 143.34   | 384.11 |
| Total       | 338.96                       | 227.30   | 144.59   | 710.86 |

Table 8.4

| Block       | Suitable areas for Tasar (ha) |          |          |        |
|-------------|-------------------------------|----------|----------|--------|
|             | High                          | Moderate | Marginal | Total  |
| Changlagaon | -                             | -        | -        | -      |
| Goiliang    | 110.33                        | 8.15     | -        | 118.48 |
| Hawai       | 12.02                         | 16.57    | 1.25     | 29.85  |
| Hayuliang   | 29.67                         | 12.41    | -        | 42.08  |
| Kibithoo    | -                             | -        | -        | -      |
| Manchal     | 102.66                        | 33.68    | -        | 136.34 |
| Walong      | 84.28                         | 156.48   | 143.34   | 384.11 |
| Total       | 338.96                        | 227.30   | 144.59   | 710.86 |

Fig. 7.1: Suitable areas for Mulberry in Anjaw district of Arunachal Pradesh



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Fig. 7.2: Suitable areas for Eri in Anjaw district of Arunachal Pradesh

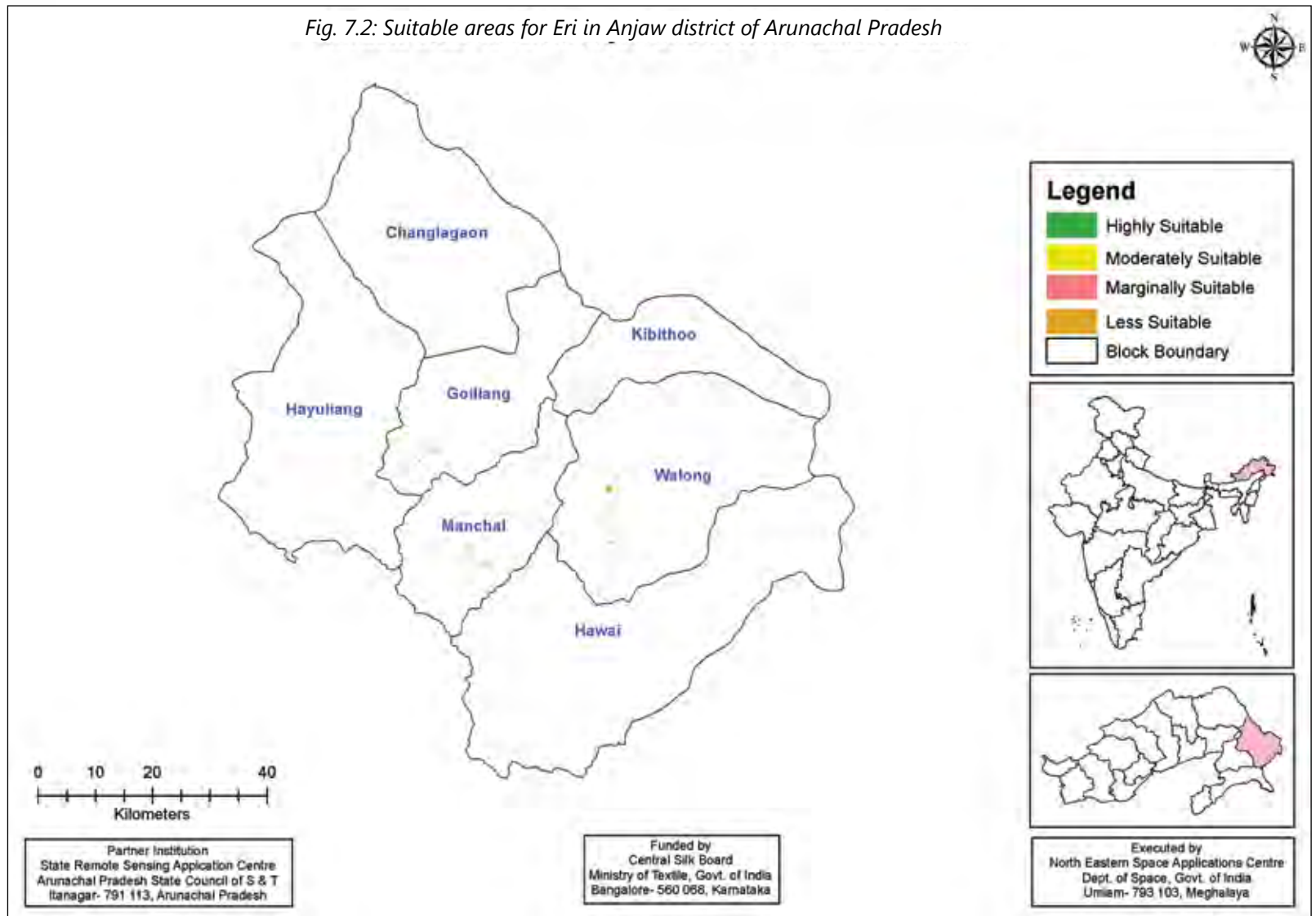
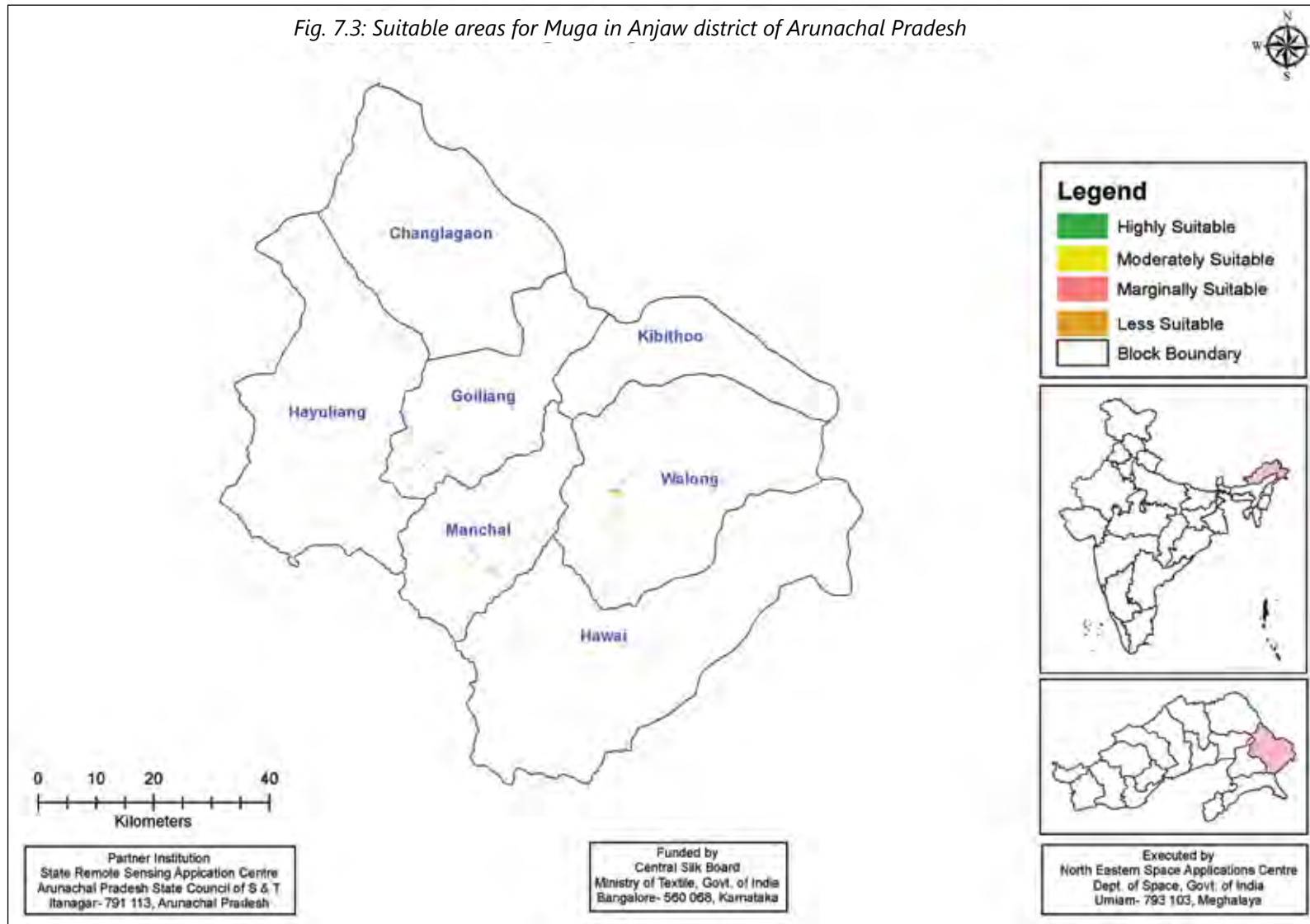


Fig. 7.3: Suitable areas for Muga in Anjaw district of Arunachal Pradesh



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Fig. 7.4: Suitable areas for Tasar in Anjaw district of Arunachal Pradesh

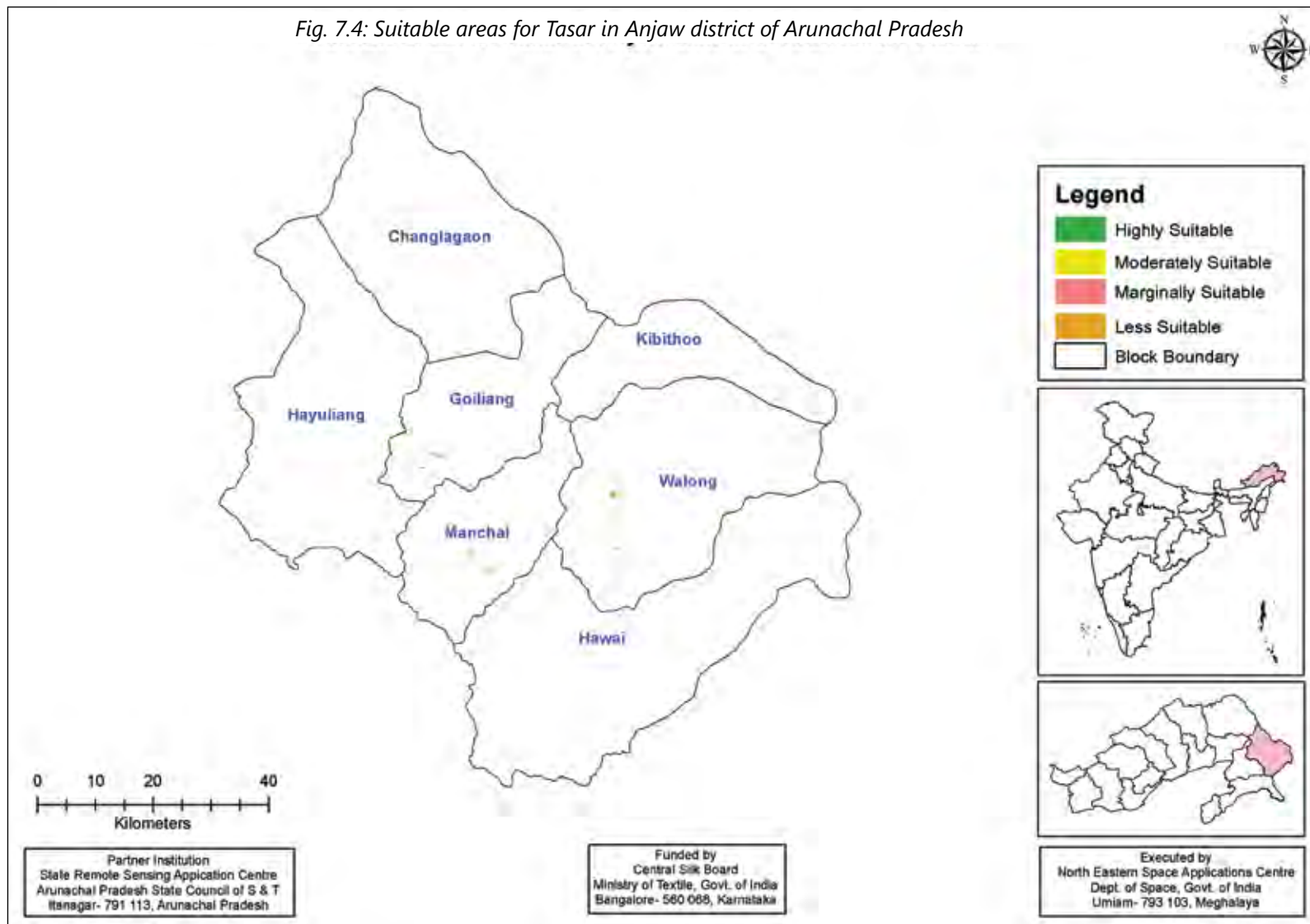


Table 8.5-8.8: Suitable Areas for Mulberry, Eri, Muga & Tasar in Changlang District of Arunachal Pradesh

Table 8.5

| Block       | Suitable areas for Mulberry (ha) |          |          |        |
|-------------|----------------------------------|----------|----------|--------|
|             | High                             | Moderate | Marginal | Total  |
| Bordumsa    | -                                | -        | 13.10    | 13.10  |
| Changlang   | 3.30                             | 141.78   | 218.79   | 363.87 |
| Diyun       | -                                | 24.09    | 6.98     | 31.08  |
| Jairampur   | -                                | 132.41   | 80.89    | 213.30 |
| Kharsang    | -                                | -        | -        | -      |
| Manmao      | 1.26                             | 63.18    | 72.28    | 136.71 |
| Miao        | 0.44                             | 32.45    | 13.11    | 46.00  |
| Nampong     | -                                | 91.77    | 25.35    | 117.12 |
| Namtak      | 1.15                             | 7.67     | 1.71     | 10.52  |
| Vijoy nagar | -                                | 3.92     | -        | 3.92   |
| Khimiyong   | 6.57                             | 7.98     | 28.25    | 42.80  |
| Total       | 12.71                            | 505.25   | 460.46   | 978.42 |

Table 8.6

| Block       | Suitable areas for Eri (ha) |          |          |         |
|-------------|-----------------------------|----------|----------|---------|
|             | High                        | Moderate | Marginal | Total   |
| Bordumsa    | -                           | -        | -        | -       |
| Changlang   | 12.19                       | 73.49    | 3.72     | 89.40   |
| Diyun       | 4.94                        | 231.66   | 1188.45  | 1425.05 |
| Jairampur   | -                           | -        | -        | -       |
| Kharsang    | -                           | -        | -        | -       |
| Manmao      | 11.05                       | 247.70   | 132.78   | 391.52  |
| Miao        | 1.04                        | 193.75   | 1044.64  | 1239.43 |
| Nampong     | 244.01                      | 151.61   | 7.08     | 402.70  |
| Namtak      | 1.00                        | 2.02     | 1.6      | 4.62    |
| Vijoy nagar | 172.55                      | 79.60    | -        | 252.14  |
| Khimiyong   | -                           | -        | -        | -       |
| Total       | 446.79                      | 979.82   | 2378.26  | 3804.86 |

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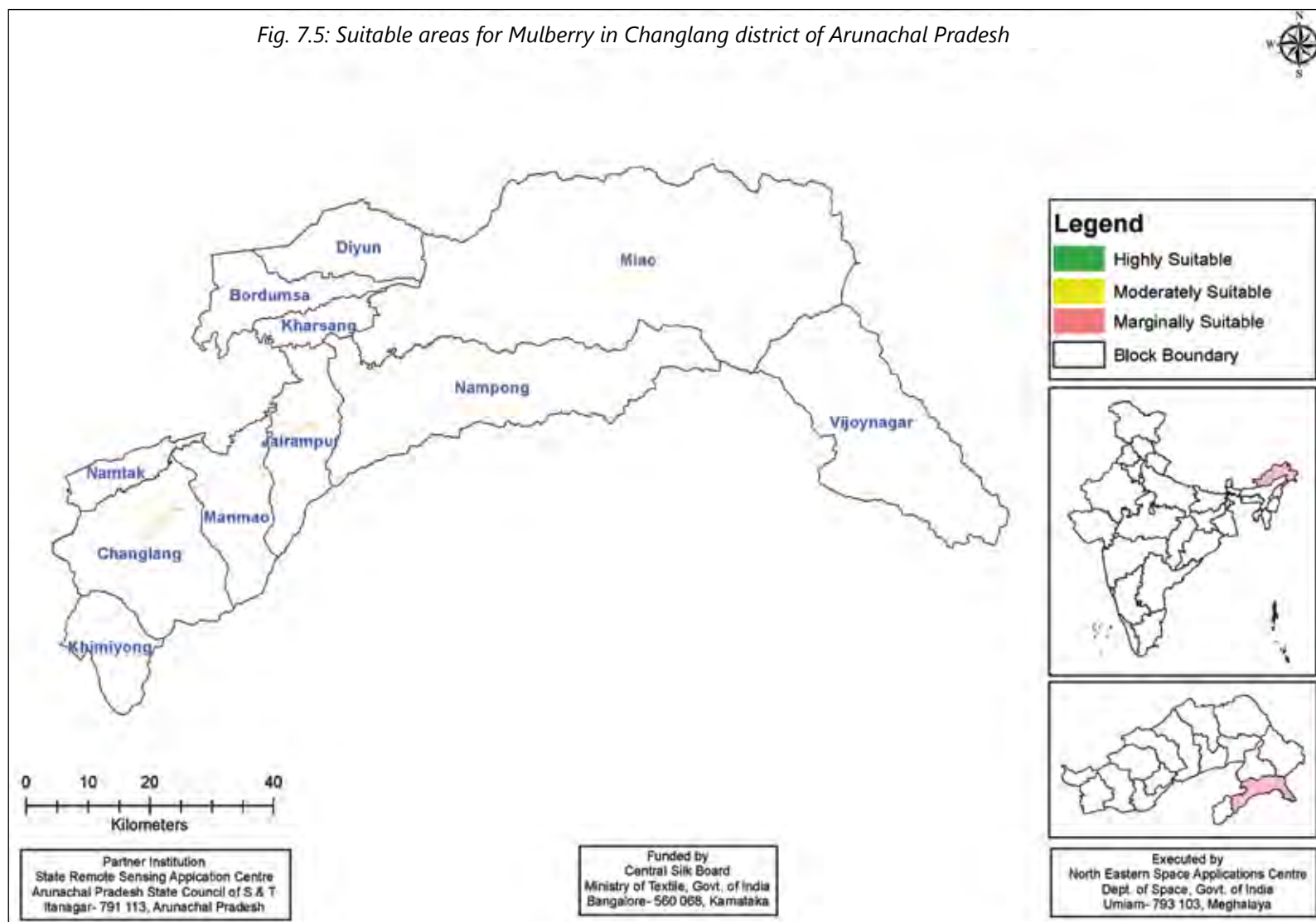
Table 8.7

| Block       | Suitable areas for Muga (ha) |          |          |          |
|-------------|------------------------------|----------|----------|----------|
|             | High                         | Moderate | Marginal | Total    |
| Bordumsa    | 261.16                       | 138.60   | 115.79   | 515.56   |
| Changlang   | 12.19                        | 73.49    | 3.72     | 89.40    |
| Diyun       | 13.12                        | 311.94   | 1258.71  | 1583.78  |
| Jairampur   | 175.93                       | 405.14   | 257.28   | 838.35   |
| Kharsang    | 1946.32                      | 1441.23  | 220.46   | 3608.02  |
| Manmao      | 11.05                        | 247.70   | 133.34   | 392.08   |
| Miao        | 1041.25                      | 1038.15  | 1242.94  | 3322.34  |
| Nampong     | 322.36                       | 222.34   | 17.75    | 562.45   |
| Namtak      | 1.00                         | 5.15     | 18.04    | 24.19    |
| Vijoy Nagar | 172.55                       | 79.60    | -        | 252.14   |
| Khimiyong   | -                            | -        | -        | -        |
| Total       | 3956.94                      | 3963.33  | 3268.04  | 11188.31 |

Table 8.8

| Block       | Suitable areas for Tasar (ha) |          |          |        |
|-------------|-------------------------------|----------|----------|--------|
|             | High                          | Moderate | Marginal | Total  |
| Bordumsa    | -                             | -        | -        | -      |
| Changlang   | 12.19                         | 46.29    | 0.28     | 58.76  |
| Diyun       | -                             | -        | -        | -      |
| Jairampur   | -                             | -        | -        | -      |
| Kharsang    | -                             | -        | -        | -      |
| Manmao      | -                             | -        | -        | -      |
| Miao        | -                             | -        | -        | -      |
| Nampong     | -                             | -        | -        | -      |
| Namtak      | -                             | -        | -        | -      |
| Vijoy Nagar | 172.55                        | 79.60    | -        | 252.14 |
| Khimiyong   | -                             | -        | -        | -      |
| Total       | 184.74                        | 125.88   | 0.28     | 310.90 |

Fig. 7.5: Suitable areas for Mulberry in Changlang district of Arunachal Pradesh



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Fig. 7.6: Suitable areas for Eri in Changlang district of Arunachal Pradesh

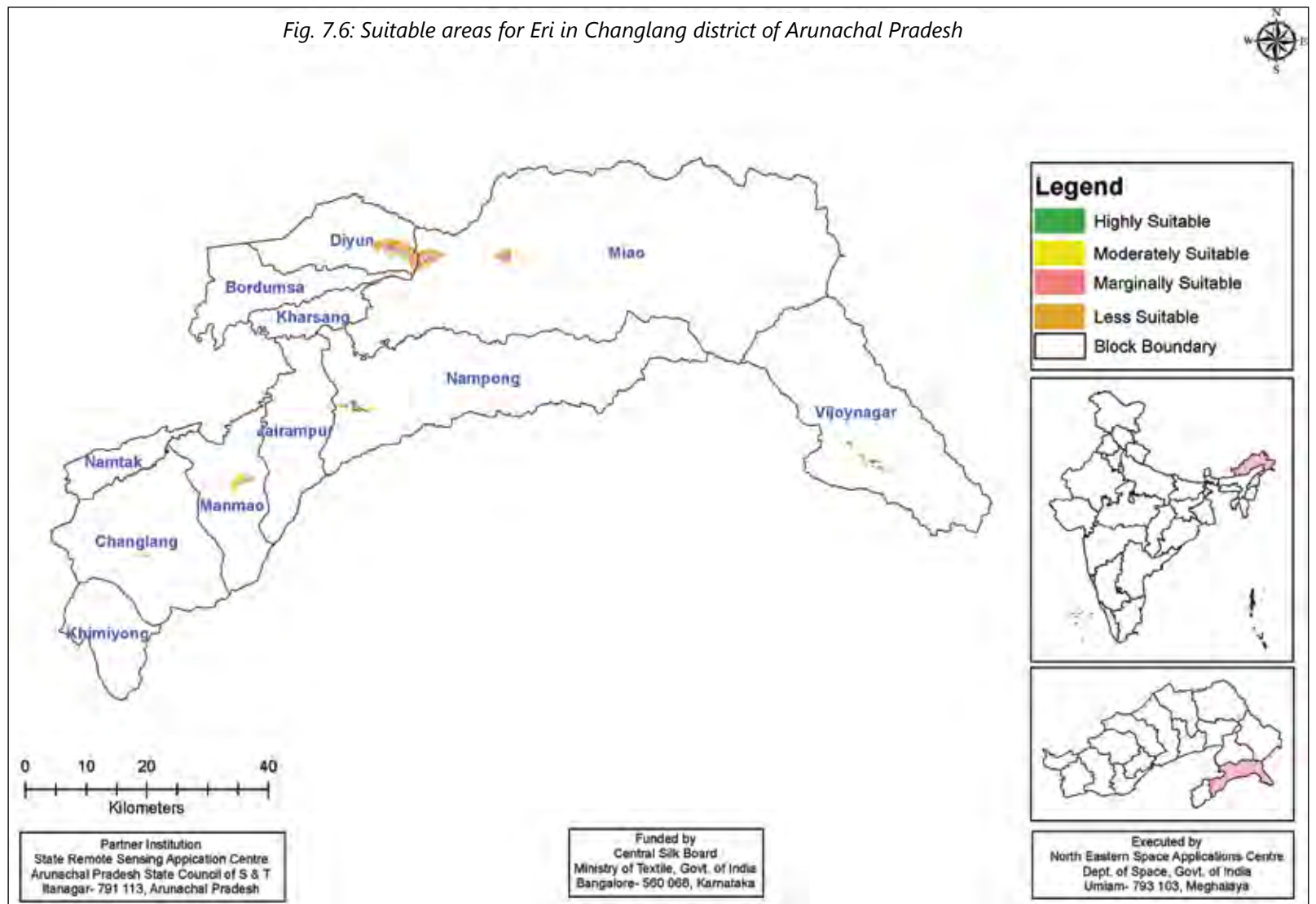
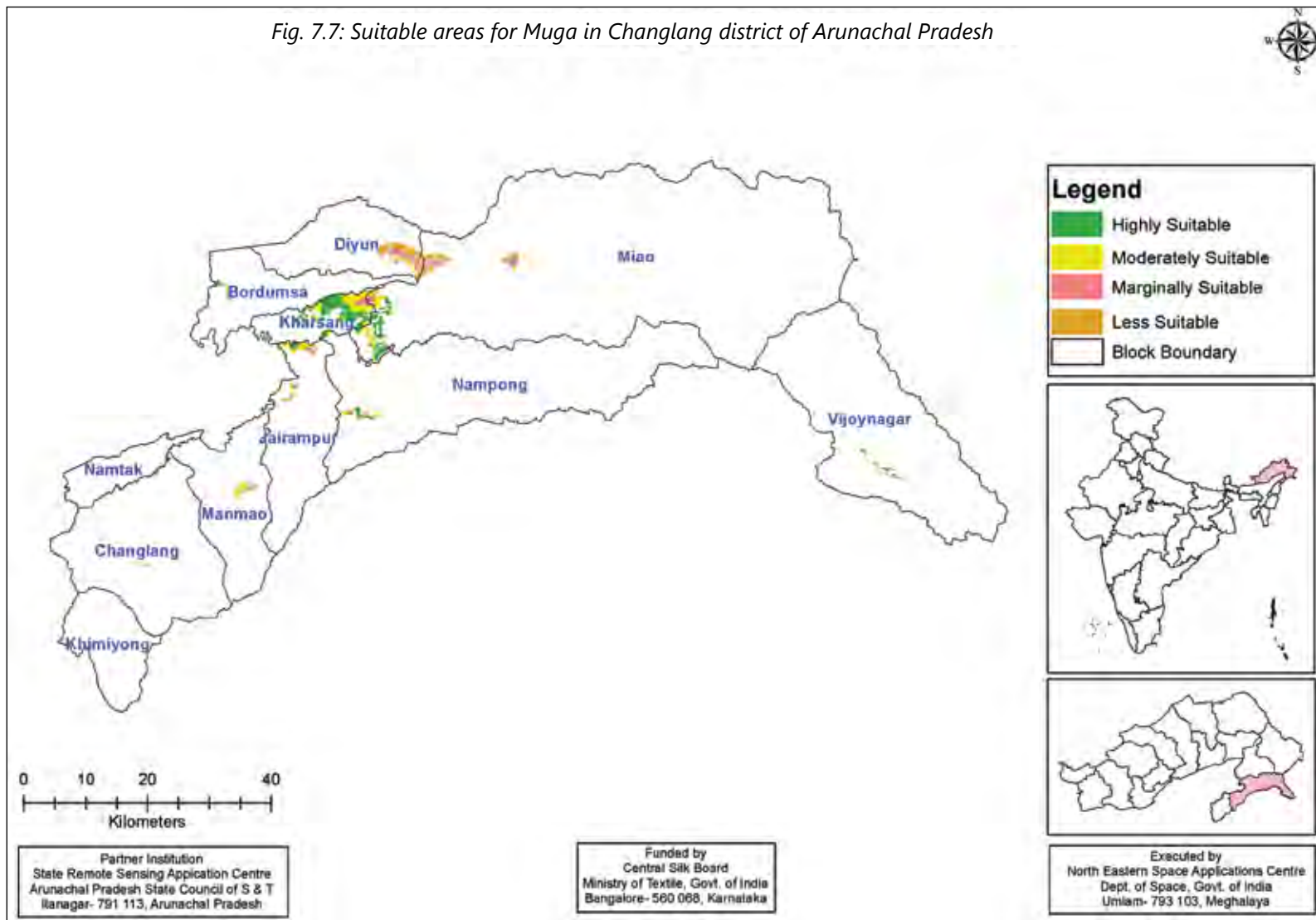


Fig. 7.7: Suitable areas for Muga in Changlang district of Arunachal Pradesh



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Fig. 7.8: Suitable areas for Tasar in Changlang district of Arunachal Pradesh

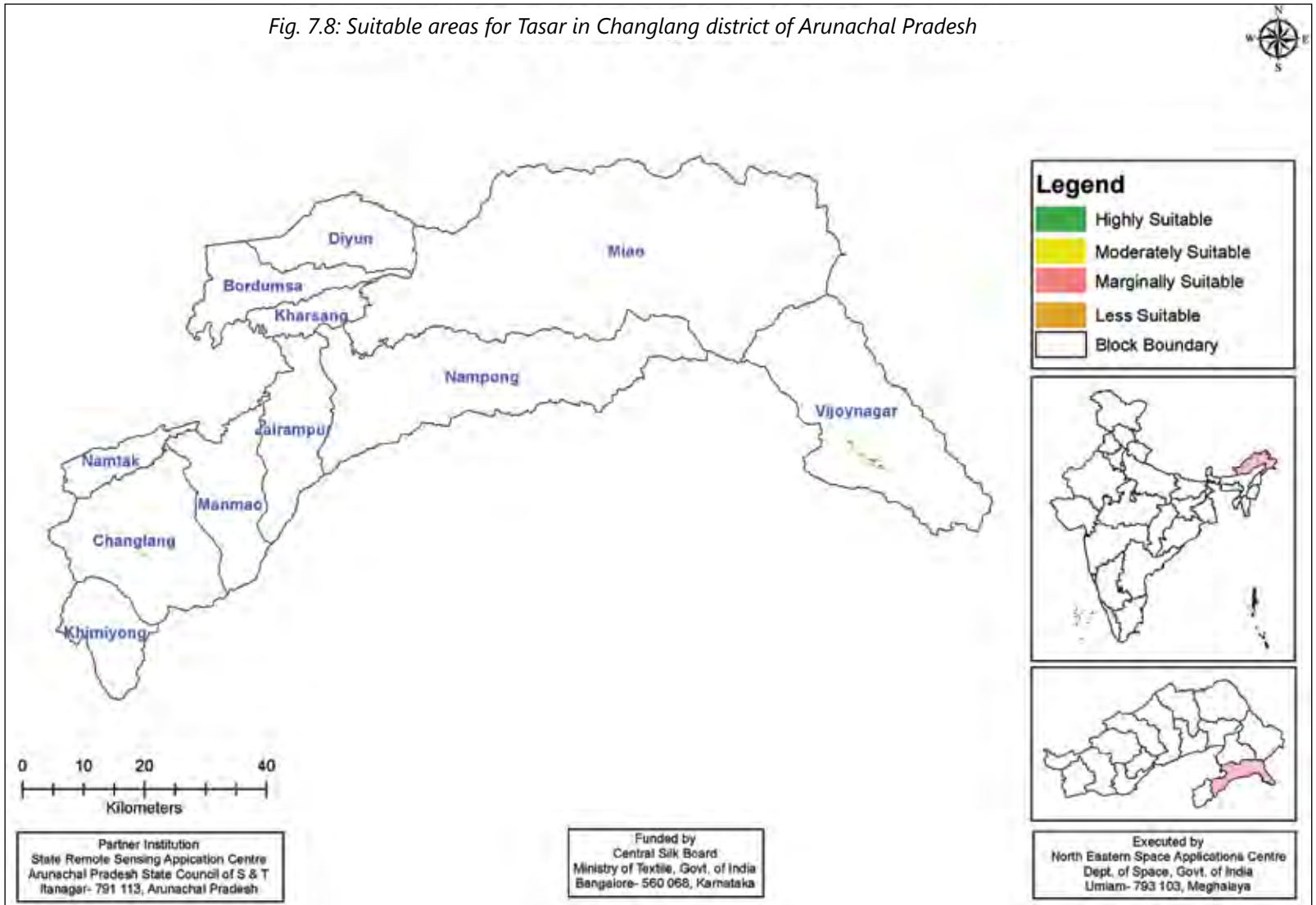


Table 8.9-8.12: Suitable Areas for Mulberry, Eri, Muga & Tasar in Kurung\_Kumey District of Arunachal Pradesh

Table 8.9

| Block           | Suitable areas for Mulberry (ha) |          |          |        |
|-----------------|----------------------------------|----------|----------|--------|
|                 | High                             | Moderate | Marginal | Total  |
| Chambang        | -                                | -        | 2.94     | 2.94   |
| Hurid (Damin)   | -                                | -        | -        | -      |
| Koloriang       | -                                | -        | 3.08     | 3.08   |
| Longding Koling | -                                | -        | -        | -      |
| Nyapin          | -                                | -        | 90.88    | 90.88  |
| Palin           | -                                | -        | 108.66   | 108.66 |
| Parsi Parlo     | -                                | -        | 8.25     | 8.25   |
| Sangram         | -                                | -        | 31.72    | 31.72  |
| Sarli           | -                                | -        | -        | -      |
| Tali            | -                                | -        | -        | -      |
| Total           | -                                | -        | 245.53   | 245.53 |

Table 8.10

| Block           | Suitable areas for Eri (ha) |          |          |         |
|-----------------|-----------------------------|----------|----------|---------|
|                 | High                        | Moderate | Marginal | Total   |
| Chambang        | 414.36                      | 261.96   | 12.03    | 688.36  |
| Hurid (Damin)   | 259.76                      | 49.19    | -        | 308.95  |
| Koloriang       | 5.22                        | 11.13    | -        | 16.34   |
| Longding Koling | 24.86                       | 1.98     | 0.09     | 26.93   |
| Nyapin          | 42.99                       | 12.80    | 2.53     | 58.32   |
| Palin           | 340.19                      | 289.60   | 91.78    | 721.58  |
| Parsi Parlo     | -                           | -        | 2.77     | 2.77    |
| Sangram         | 271.46                      | 279.71   | 57.33    | 608.50  |
| Sarli           | 53.92                       | 31.16    | 3.8      | 88.87   |
| Tali            | 32.15                       | 41.41    | 13.27    | 86.82   |
| Total           | 1444.91                     | 978.93   | 183.61   | 2607.45 |

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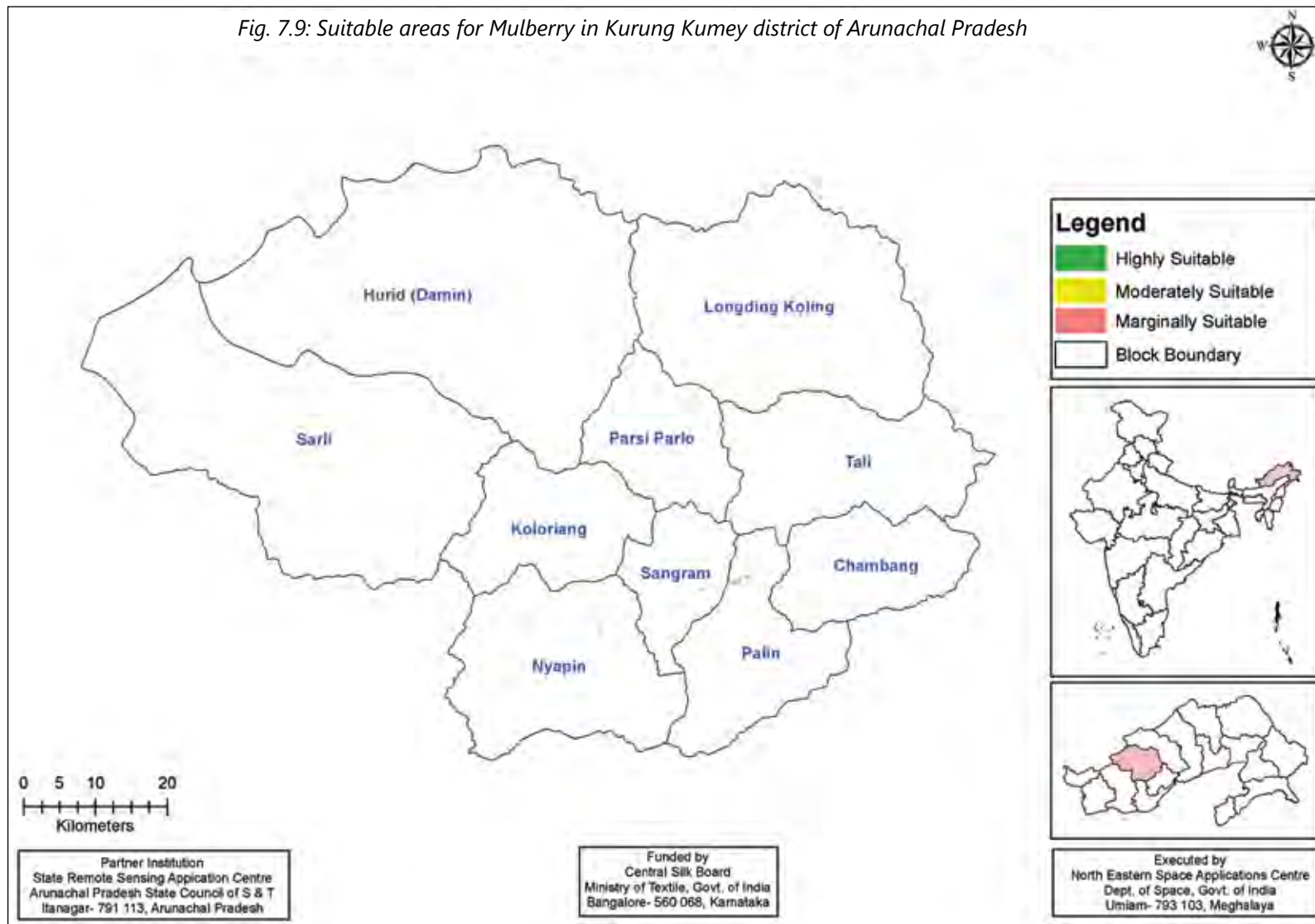
Table 8.11

| Block           | Suitable areas for Muga (ha) |          |          |         |
|-----------------|------------------------------|----------|----------|---------|
|                 | High                         | Moderate | Marginal | Total   |
| Chambang        | 414.36                       | 262.35   | 12.03    | 688.74  |
| Hurid (Damin)   | 259.76                       | 49.19    | -        | 308.95  |
| Koloriang       | 5.22                         | 11.13    | -        | 16.34   |
| Longding Koling | 24.86                        | 1.98     | 0.09     | 26.93   |
| Nyapin          | 42.99                        | 12.80    | 2.53     | 58.32   |
| Palin           | 340.19                       | 289.60   | 91.78    | 721.58  |
| Parsi Parlo     | -                            | -        | 2.77     | 2.77    |
| Sangram         | 271.46                       | 279.71   | 57.33    | 608.50  |
| Sarli           | 53.92                        | 31.16    | 3.8      | 88.87   |
| Tali            | 32.15                        | 41.41    | 13.27    | 86.82   |
| Total           | 1444.91                      | 979.32   | 183.61   | 2607.84 |

Table 8.12

| Block           | Suitable areas for Tasar (ha) |          |          |         |
|-----------------|-------------------------------|----------|----------|---------|
|                 | High                          | Moderate | Marginal | Total   |
| Chambang        | 395.47                        | 227.13   | 12.03    | 634.63  |
| Hurid (Damin)   | 259.76                        | 49.19    | -        | 308.95  |
| Koloriang       | 5.22                          | 11.13    | -        | 16.34   |
| Longding Koling | 24.61                         | 0.97     | -        | 25.58   |
| Nyapin          | 42.99                         | 12.80    | 2.53     | 58.32   |
| Palin           | 326.36                        | 272.87   | 91.78    | 691.01  |
| Parsi Parlo     | -                             | -        | 2.77     | 2.77    |
| Sangram         | 239.64                        | 247.12   | 57.33    | 544.10  |
| Sarli           | 53.92                         | 31.16    | 3.8      | 88.87   |
| Tali            | 22.48                         | 29.01    | 13.18    | 64.67   |
| Total           | 1370.44                       | 881.37   | 183.42   | 2435.24 |

Fig. 7.9: Suitable areas for Mulberry in Kurung Kumey district of Arunachal Pradesh



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Fig. 7.10: Suitable areas for Eri in Kurung Kumey district of Arunachal Pradesh

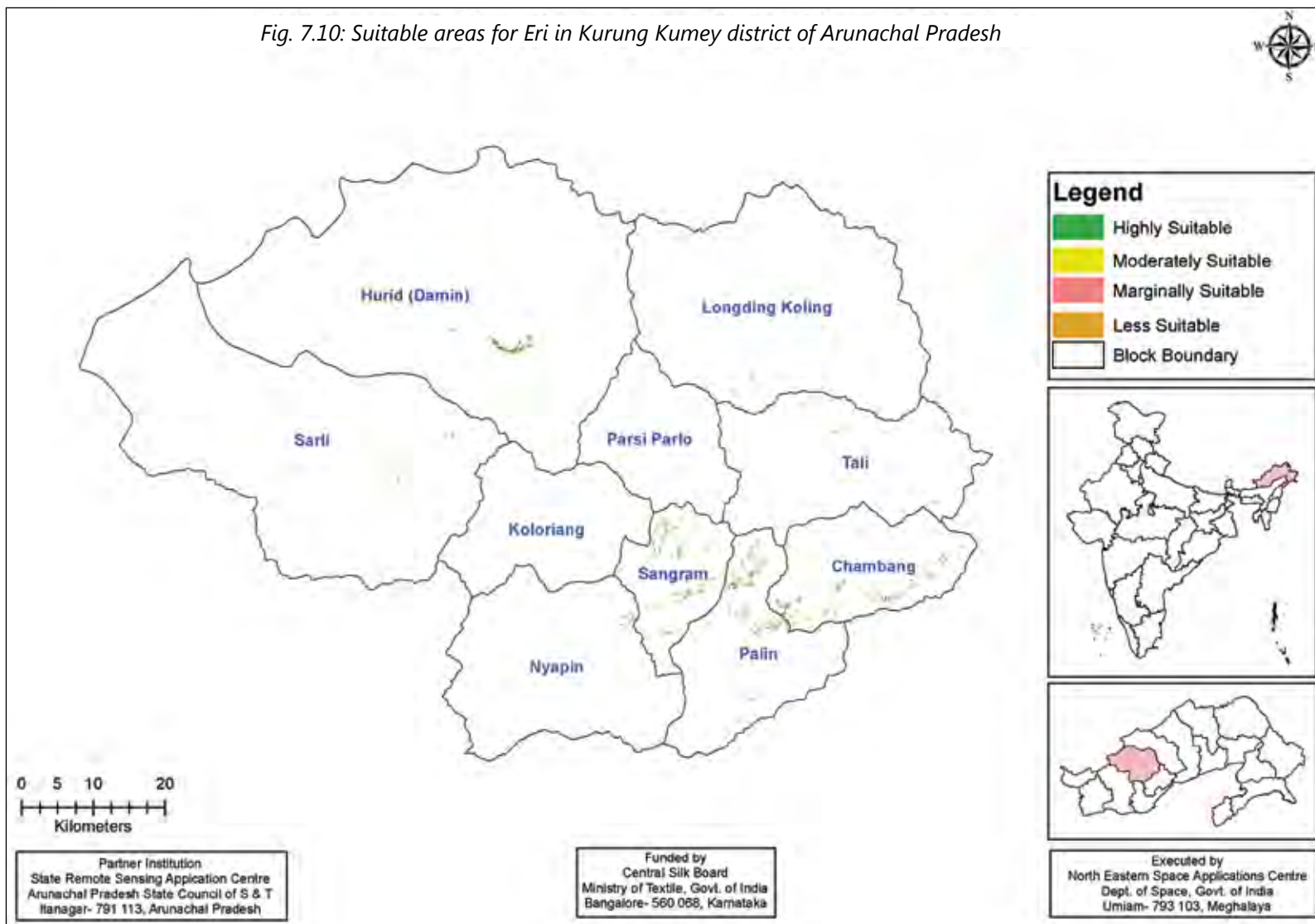
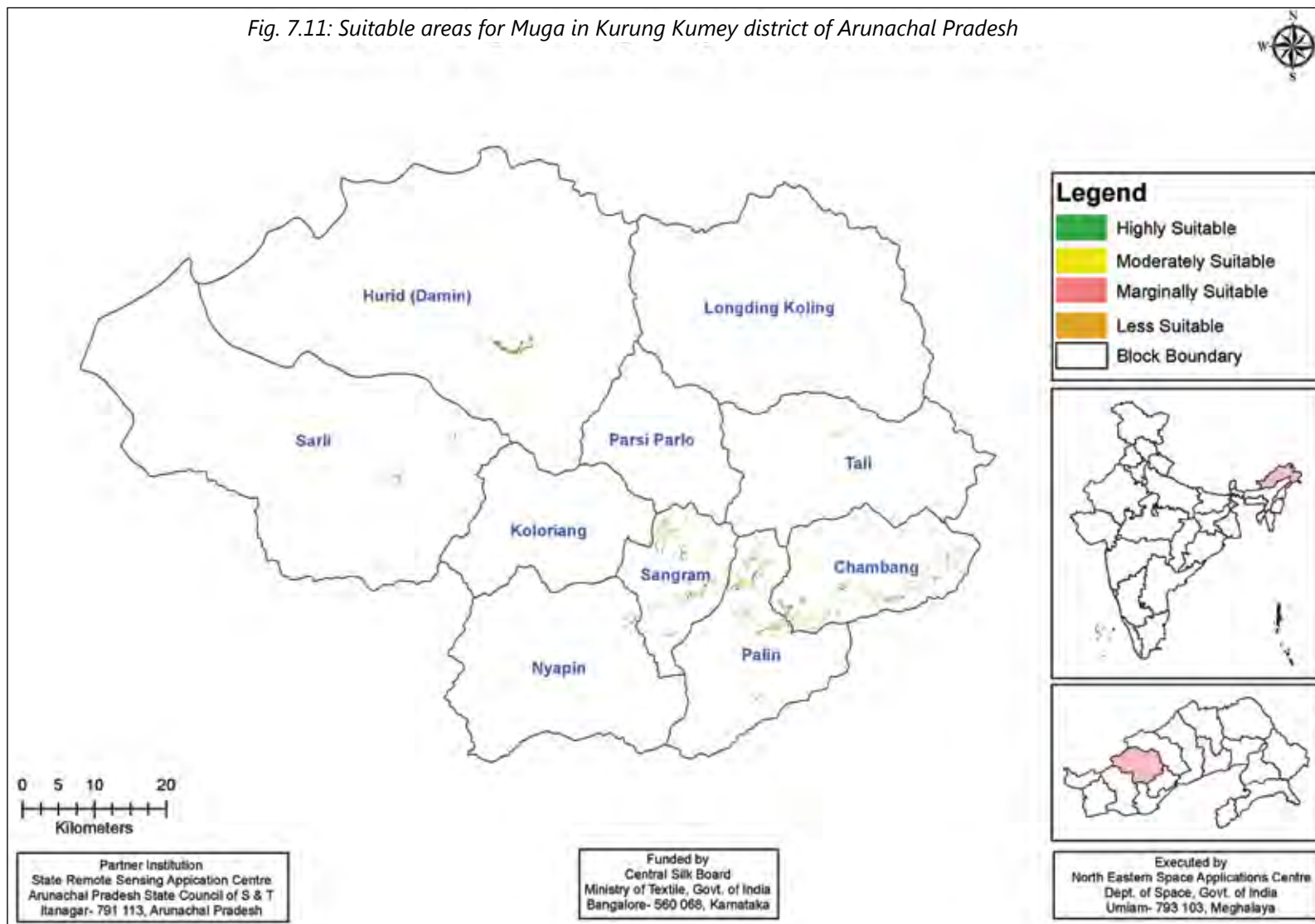


Fig. 7.11: Suitable areas for Muga in Kurung Kumey district of Arunachal Pradesh



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Fig. 7.12: Suitable areas for Tasar in Kurung Kumey district of Arunachal Pradesh

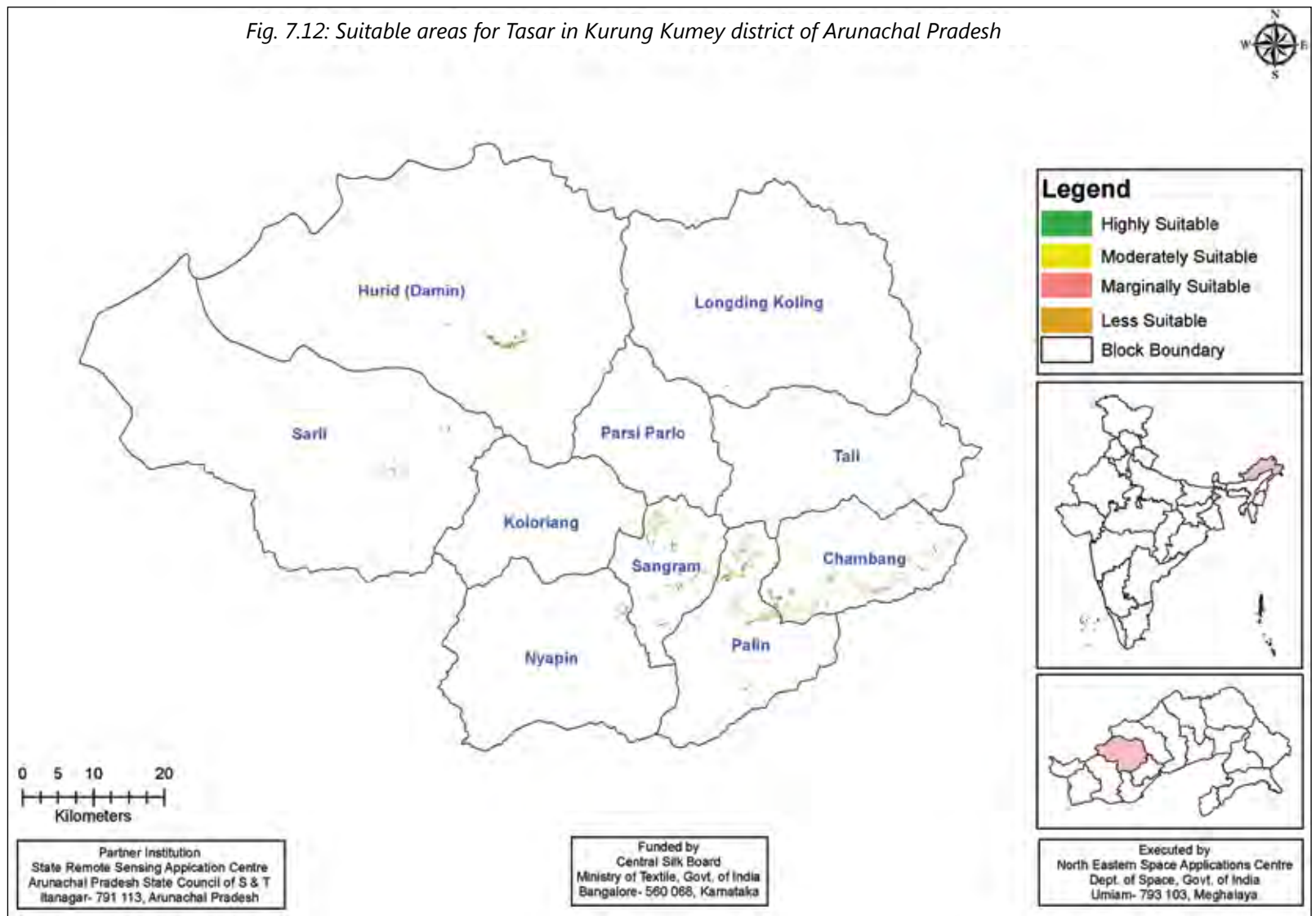


Table 8.13-8.16: Suitable Areas for Mulberry, Eri, Muga & Tasar in Tawang District of Arunachal Pradesh

Table 8.13

| Block     | Suitable areas for Mulberry (ha) |          |          |        |
|-----------|----------------------------------|----------|----------|--------|
|           | High                             | Moderate | Marginal | Total  |
| Jang      | -                                | -        | 1.86     | 1.86   |
| Lumla     | -                                | -        | 21.22    | 21.22  |
| Mukto     | -                                | -        | -        | -      |
| Tawang    | -                                | -        | 126.09   | 126.09 |
| Thingbu   | -                                | -        | -        | -      |
| Zemithang | -                                | -        | 10.06    | 10.06  |
| Total     | -                                | -        | 159.23   | 159.23 |

Table 8.14

| Block     | Suitable areas for Eri (ha) |          |          |       |
|-----------|-----------------------------|----------|----------|-------|
|           | High                        | Moderate | Marginal | Total |
| Jang      | -                           | -        | -        | -     |
| Lumla     | 9.78                        | 3.83     | 14.15    | 27.76 |
| Mukto     | -                           | -        | -        | -     |
| Tawang    | -                           | -        | -        | -     |
| Thingbu   | -                           | -        | -        | -     |
| Zemithang | 0.72                        | 17.43    | -        | 18.15 |
| Total     | 10.49                       | 21.26    | 14.15    | 45.91 |

Table 8.15

| Block     | Suitable areas for Muga (ha) |          |          |       |
|-----------|------------------------------|----------|----------|-------|
|           | High                         | Moderate | Marginal | Total |
| Jang      | -                            | -        | -        | -     |
| Lumla     | 9.78                         | 3.83     | 14.15    | 27.76 |
| Mukto     | -                            | -        | -        | -     |
| Tawang    | -                            | -        | -        | -     |
| Thingbu   | -                            | -        | -        | -     |
| Zemithang | 0.72                         | 17.43    | -        | 18.15 |
| Total     | 10.49                        | 21.26    | 14.15    | 45.91 |

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Table 8.16

| Block     | Suitable areas for Tasar (ha) |          |          |       |
|-----------|-------------------------------|----------|----------|-------|
|           | High                          | Moderate | Marginal | Total |
| Jang      | -                             | -        | -        | -     |
| Lumla     | 9.78                          | 3.83     | 14.15    | 27.76 |
| Mukto     | -                             | -        | -        | -     |
| Tawang    | -                             | -        | -        | -     |
| Thingbu   | -                             | -        | -        | -     |
| Zemithang | 0.72                          | 17.43    | -        | 18.15 |
| Total     | 10.49                         | 21.26    | 14.15    | 45.91 |

Fig. 7.13: Suitable areas for Mulberry in Tawang district of Arunachal Pradesh

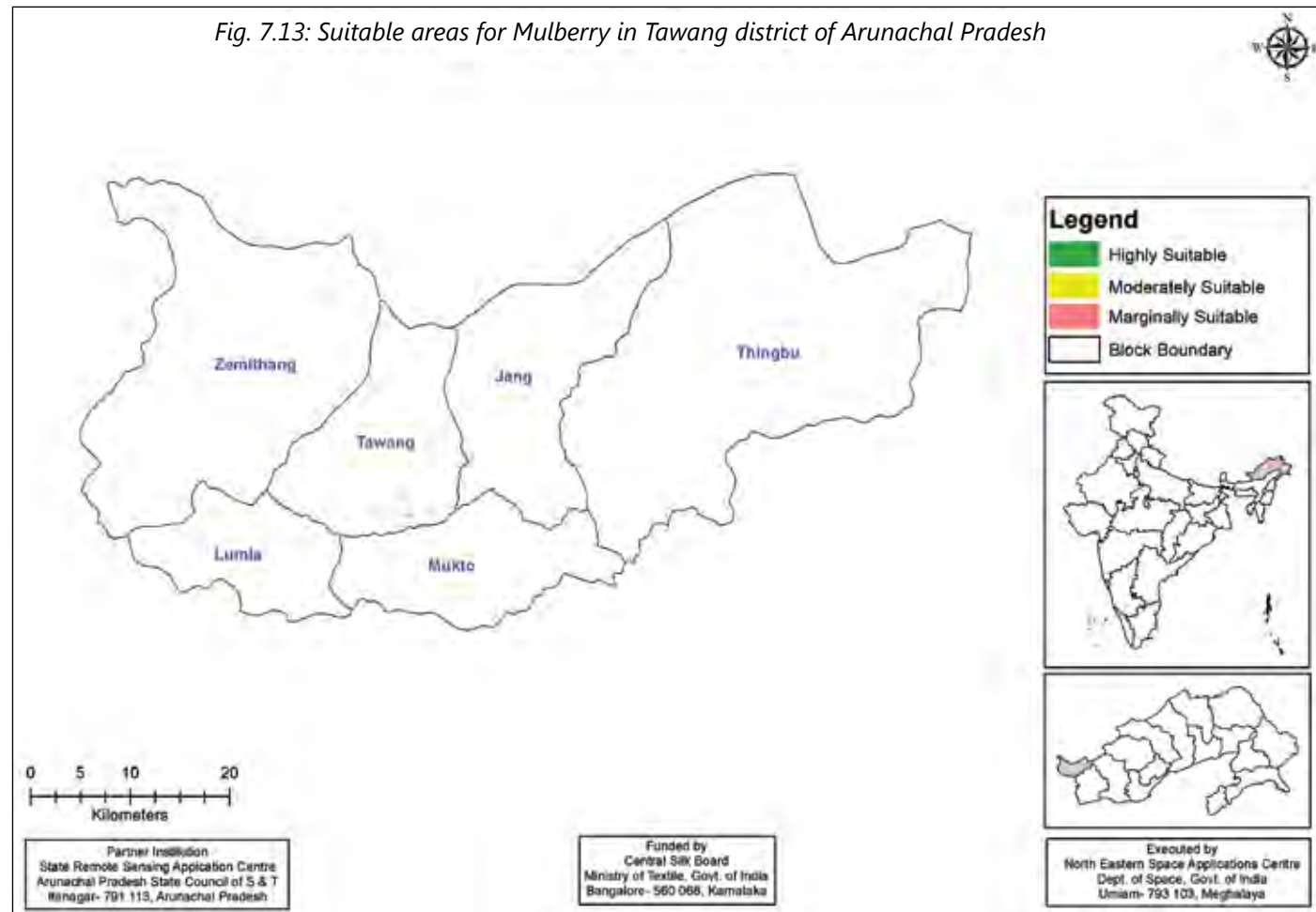
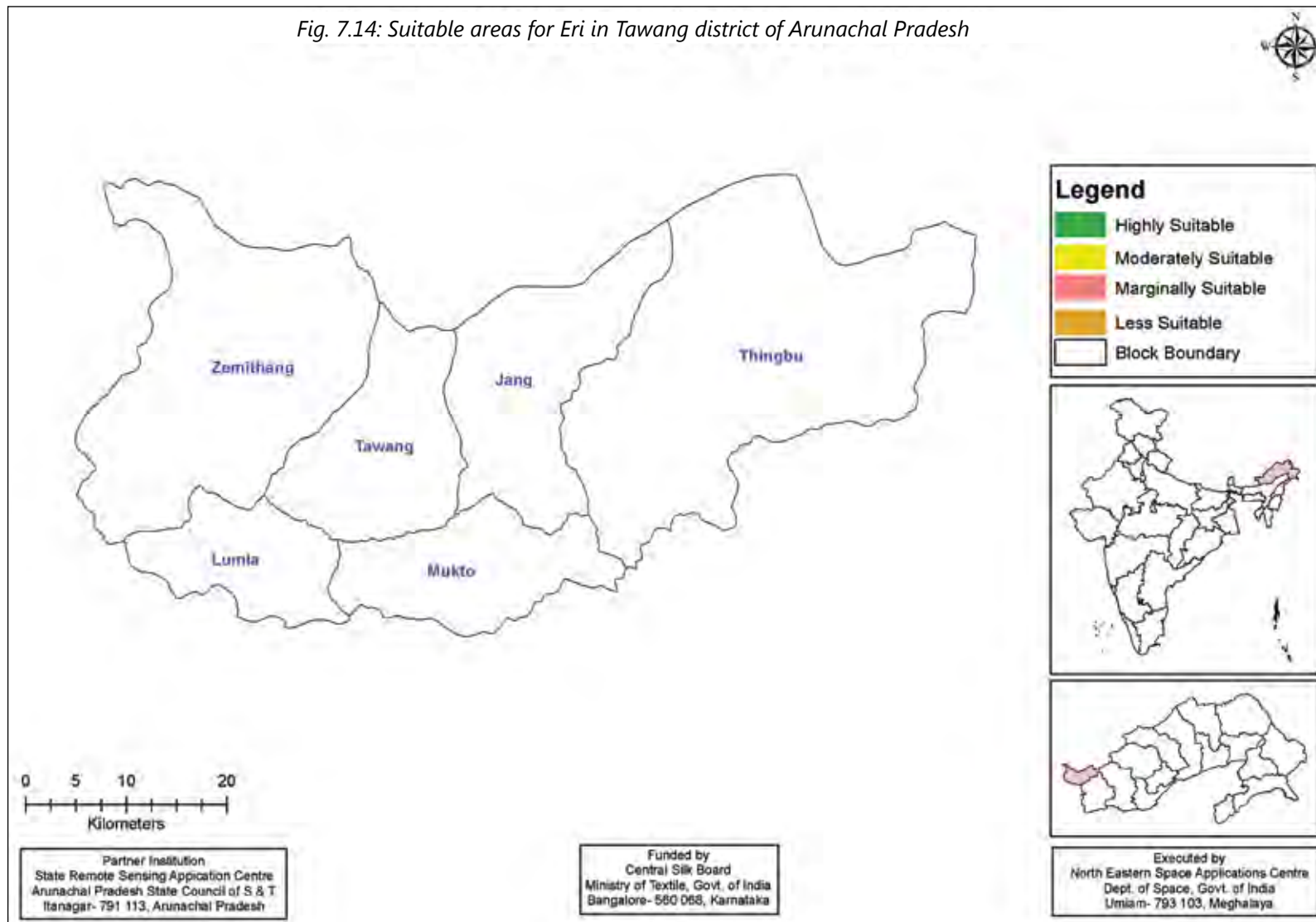


Fig. 7.14: Suitable areas for Eri in Tawang district of Arunachal Pradesh



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Fig. 7.15: Suitable areas for Muga in Tawang district of Arunachal Pradesh

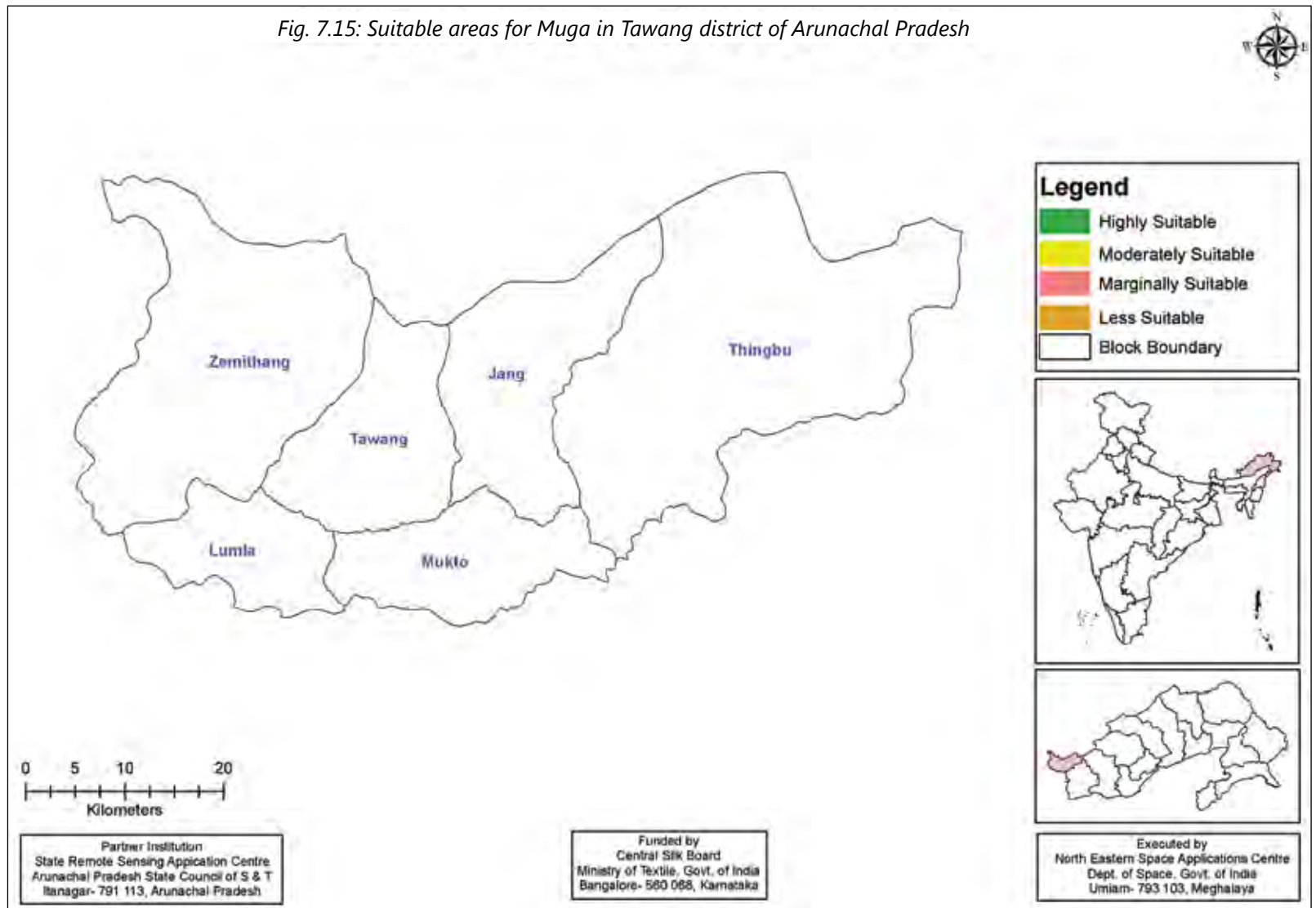
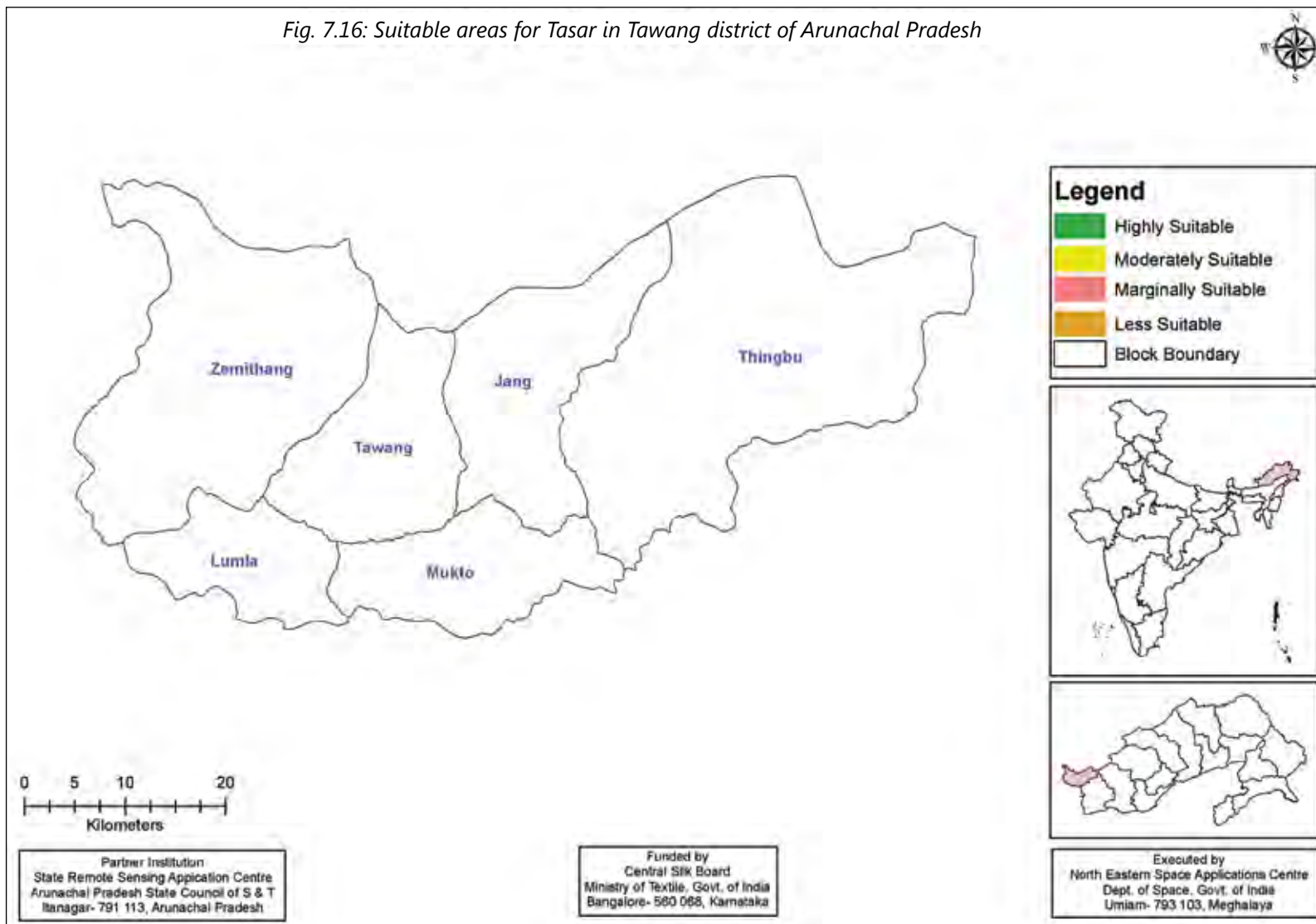


Fig. 7.16: Suitable areas for Tasar in Tawang district of Arunachal Pradesh



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Table 8.17-8.20: Suitable Areas for Mulberry, Eri, Muga & Tasar in Tirap District of Arunachal Pradesh

Table 8.17

| Block    | Suitable areas for Mulberry (ha) |          |          |       |
|----------|----------------------------------|----------|----------|-------|
|          | High                             | Moderate | Marginal | Total |
| Deomali  | -                                | -        | -        | -     |
| Kanubari | -                                | 2.27     | 19.47    | 21.74 |
| Khonsa   | -                                | -        | 3.31     | 3.31  |
| Laju     | -                                | -        | -        | -     |
| Longding | -                                | -        | 19.25    | 19.25 |
| Pangchao | -                                | -        | -        | -     |
| Pumao    | -                                | -        | 22.44    | 22.44 |
| Wakka    | -                                | -        | 3.66     | 3.66  |
| Total    | -                                | 2.27     | 68.13    | 70.40 |

Table 8.18

| Block    | Suitable areas for Eri (ha) |          |          |          |
|----------|-----------------------------|----------|----------|----------|
|          | High                        | Moderate | Marginal | Total    |
| Deomali  | 1936.94                     | 4837.11  | 5667.79  | 12441.84 |
| Kanubari | 281.64                      | 493.06   | 1969.25  | 2743.95  |
| Khonsa   | 2861.23                     | 6178.69  | 2772.61  | 11812.54 |
| Laju     | -                           | -        | -        | -        |
| Longding | 773.47                      | 1899.50  | 2354.14  | 5027.10  |
| Pangchao | 532.29                      | 1216.04  | 1592.24  | 3340.57  |
| Pumao    | 445.16                      | 1652.55  | 2277.81  | 4375.51  |
| Wakka    | 529.31                      | 1540.01  | 1008.69  | 3078.02  |
| Total    | 7360.05                     | 17816.97 | 17642.52 | 42819.53 |



Table 8.19

| Block    | Suitable areas for Muga (ha) |          |          |          |
|----------|------------------------------|----------|----------|----------|
|          | High                         | Moderate | Marginal | Total    |
| Deomali  | 2213.08                      | 5522.99  | 8148.49  | 15884.55 |
| Kanubari | 272.13                       | 807.45   | 2827.99  | 3907.57  |
| Khonsa   | 2808.51                      | 6273.35  | 3689.9   | 12771.76 |
| Laju     | -                            | -        | -        | -        |
| Longding | 760.33                       | 1952.18  | 2419.91  | 5132.43  |
| Pangchao | 483.13                       | 1120.80  | 1516.04  | 3119.97  |
| Pumao    | 407.28                       | 1642.32  | 2320     | 4369.60  |
| Wakka    | 500.19                       | 1451.50  | 937.21   | 2888.89  |
| Total    | 7444.64                      | 18770.59 | 21859.54 | 48074.77 |

Table 8.20

| Block    | Suitable areas for Tasar (ha) |          |          |          |
|----------|-------------------------------|----------|----------|----------|
|          | High                          | Moderate | Marginal | Total    |
| Deomali  | 939.12                        | 1020.20  | 993.45   | 2952.78  |
| Kanubari | -                             | -        | 8.09     | 8.09     |
| Khonsa   | 687.91                        | 1416.79  | 493.32   | 2598.02  |
| Laju     | -                             | -        | -        | -        |
| Longding | 495.52                        | 1352.33  | 901.43   | 2749.28  |
| Pangchao | 532.29                        | 1147.77  | 1271.75  | 2951.82  |
| Pumao    | 334.45                        | 753.70   | 1128.39  | 2216.54  |
| Wakka    | 455.15                        | 804.66   | 400.16   | 1659.97  |
| Total    | 3444.44                       | 6495.45  | 5196.6   | 15136.49 |





Fig. 7.17: Suitable areas for Mulberry in Tirap district of Arunachal Pradesh

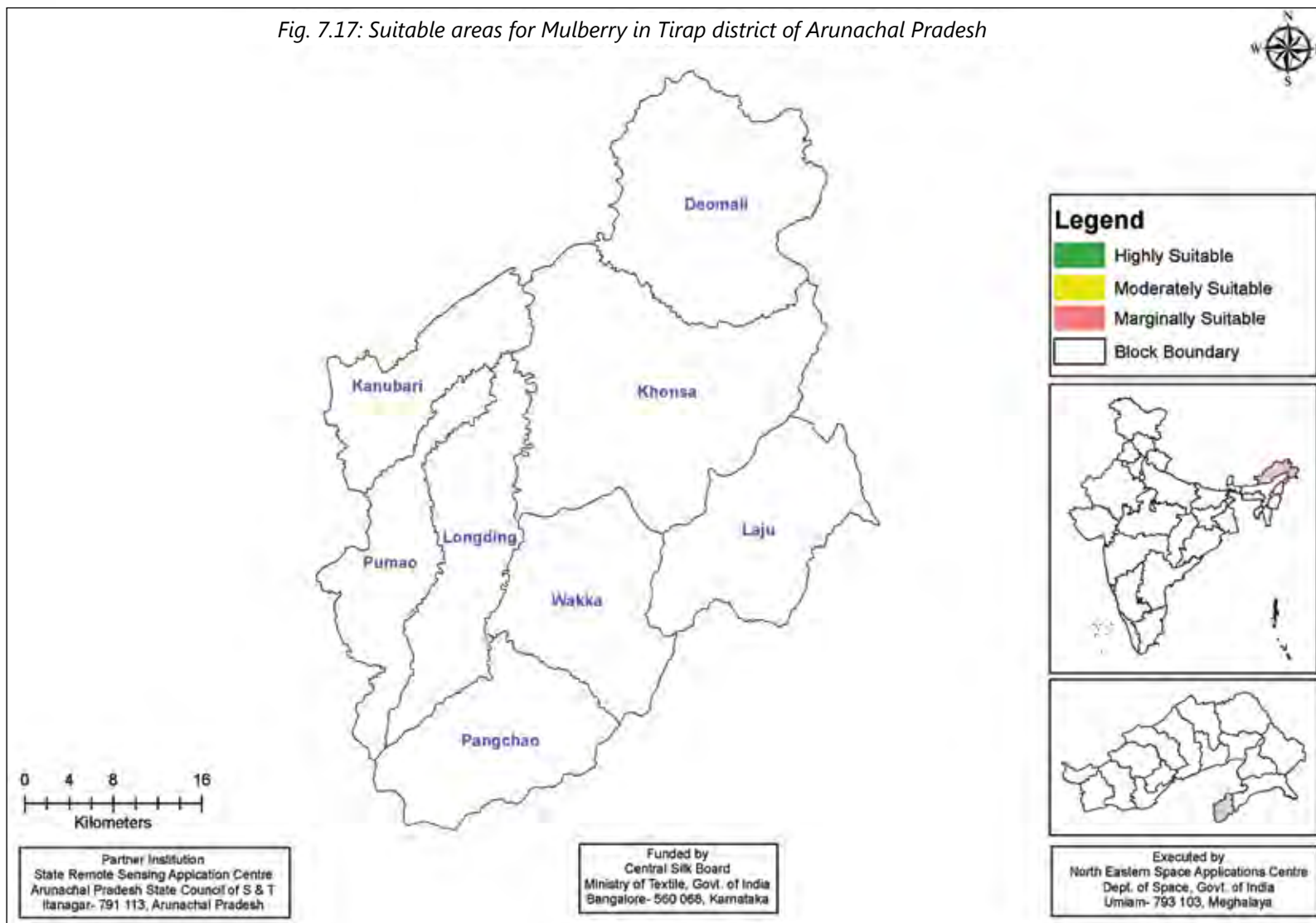
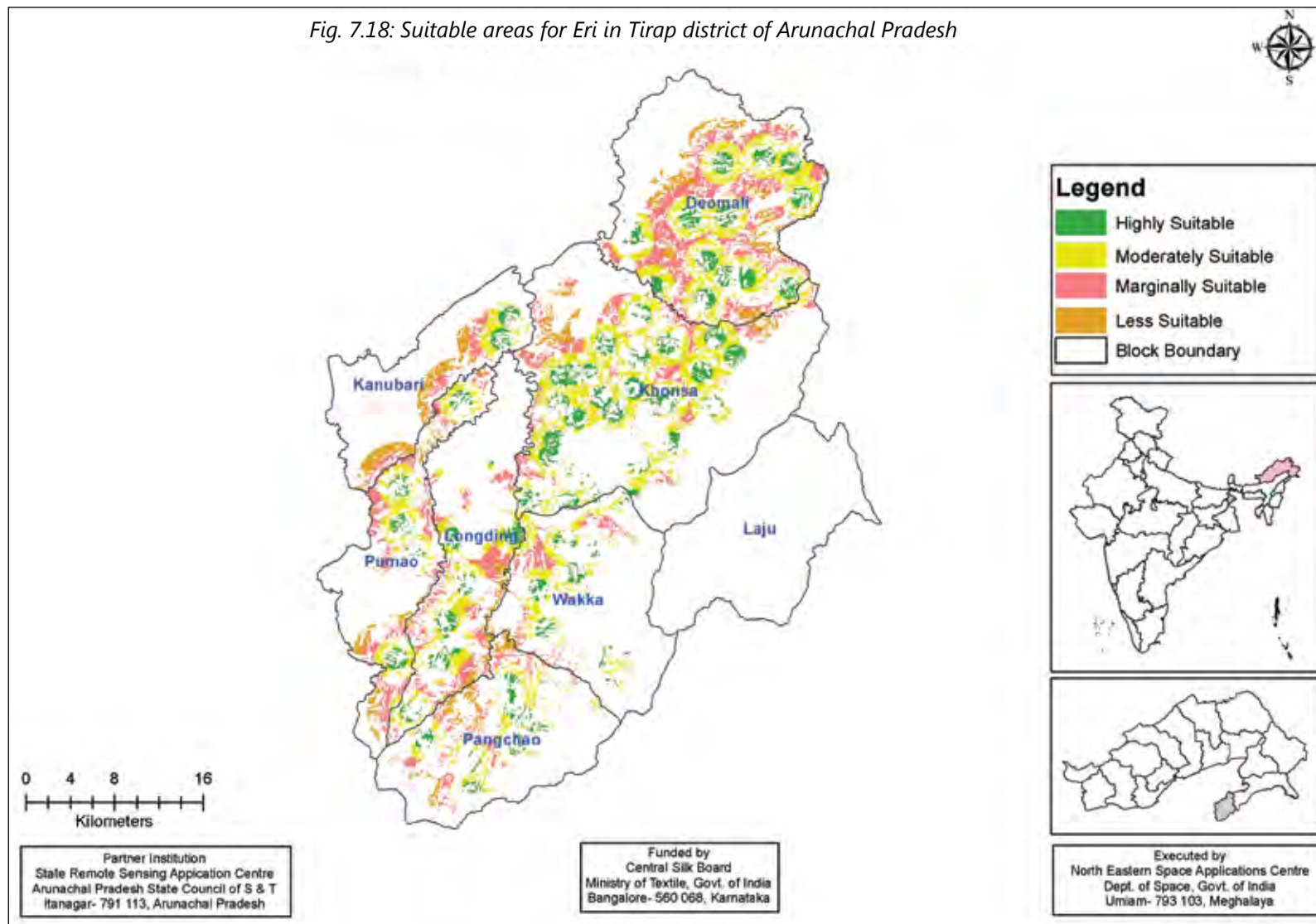


Fig. 7.18: Suitable areas for Eri in Tirap district of Arunachal Pradesh



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Fig. 7.19: Suitable areas for Muga in Tirap district of Arunachal Pradesh

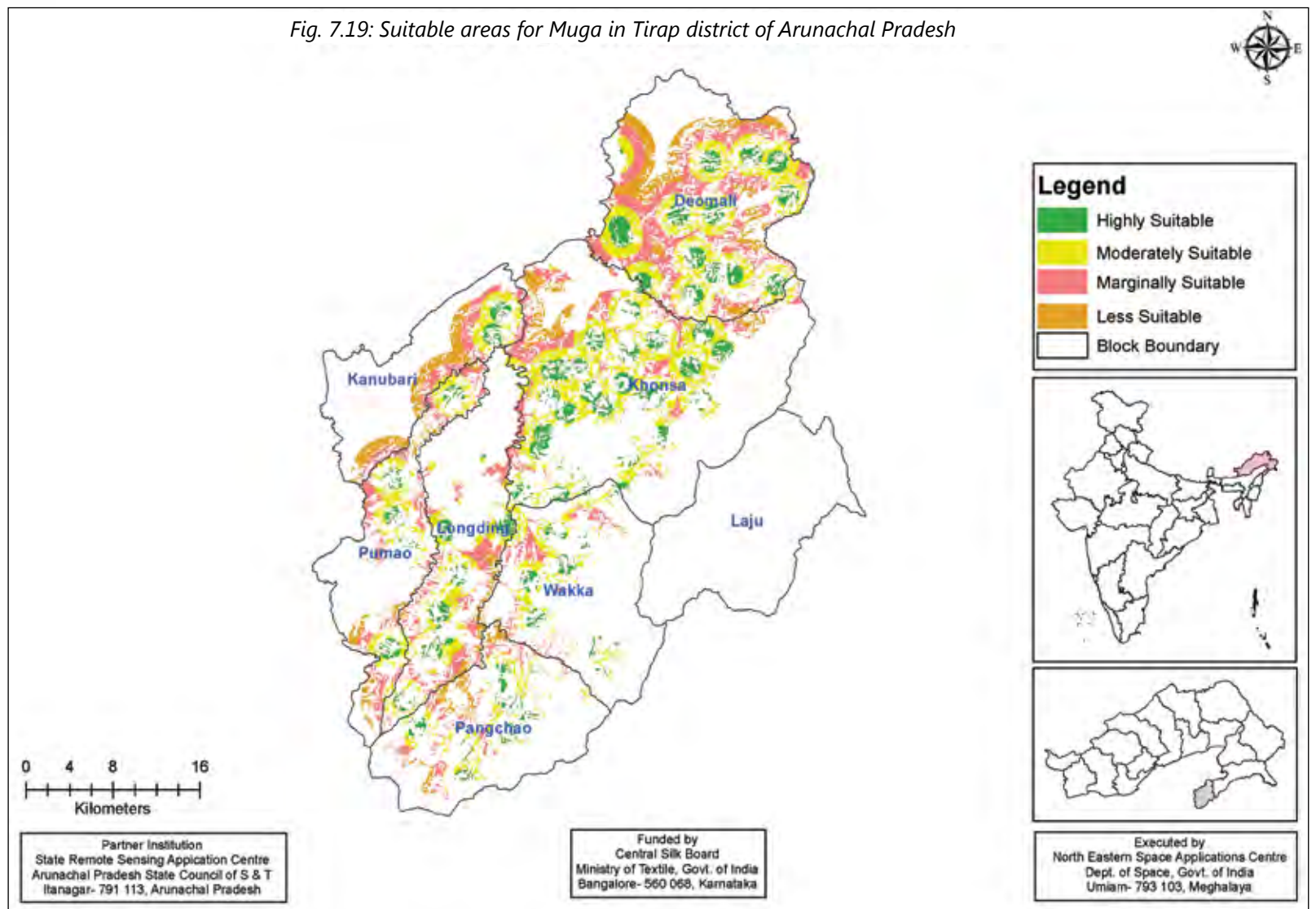
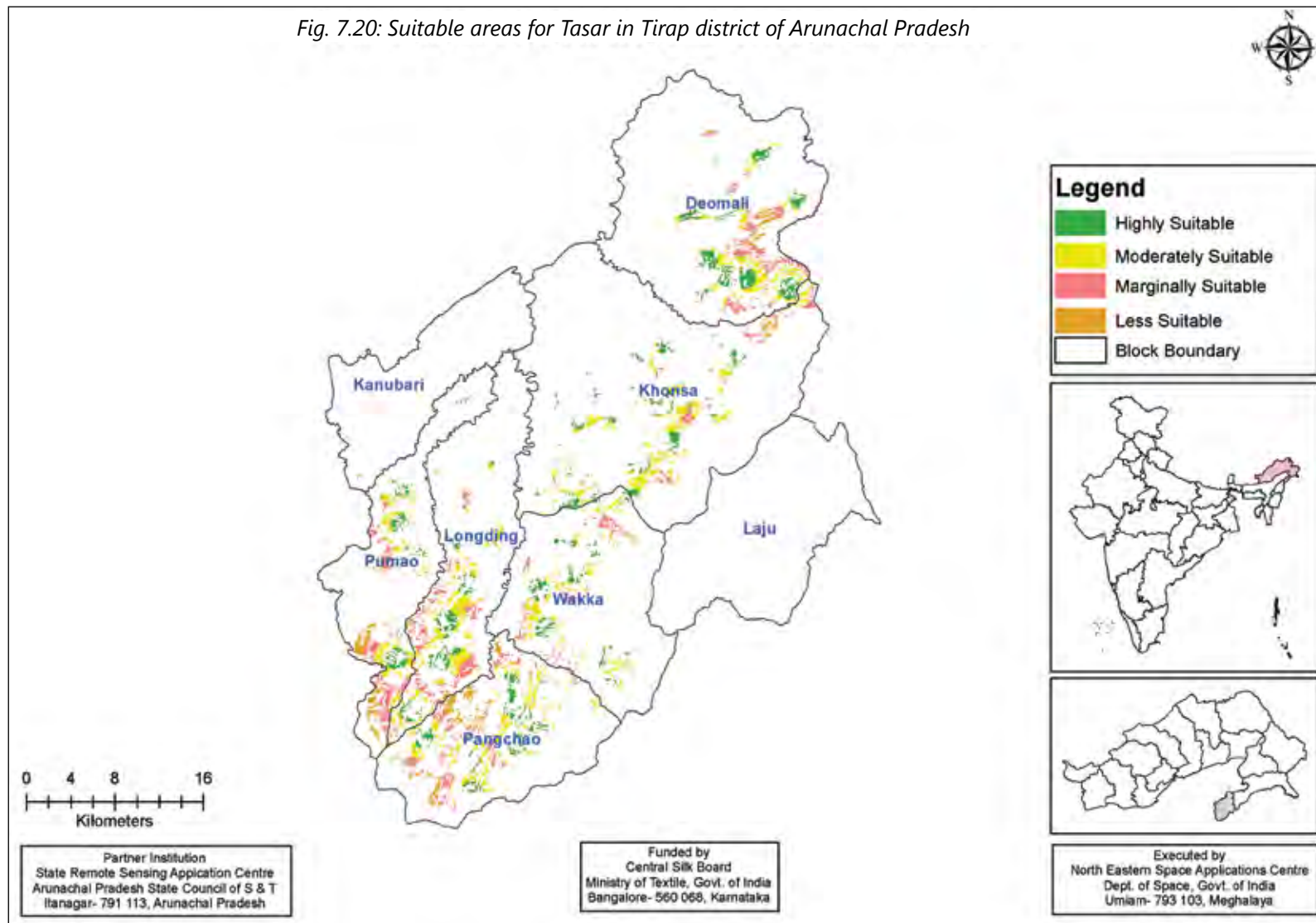


Fig. 7.20: Suitable areas for Tasar in Tirap district of Arunachal Pradesh



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Table 8.21-8.24: Suitable Areas for Mulberry, Eri, Muga & Tasar in Upper Subansiri District of Arunachal Pradesh

Table 8.21

| Block     | Suitable areas for Mulberry (ha) |          |          |        |
|-----------|----------------------------------|----------|----------|--------|
|           | High                             | Moderate | Marginal | Total  |
| Baririjo  | -                                | -        | 9.55     | 9.55   |
| Daporijo  | -                                | 6.53     | 5.74     | 12.28  |
| Dumporijo | -                                | 0.16     | 30.33    | 30.49  |
| Giba      | -                                | -        | 2.74     | 2.74   |
| Limeking  | -                                | -        | -        | -      |
| Nacho     | -                                | -        | -        | -      |
| Payeng    | -                                | -        | -        | -      |
| Puchigeku | -                                | -        | 75.02    | 75.02  |
| Siyum     | -                                | -        | -        | -      |
| Taksiang  | -                                | -        | -        | -      |
| Taliha    | -                                | -        | -        | -      |
| Total     | -                                | 6.69     | 123.38   | 130.08 |

Table 8.22

| Block     | Suitable areas for Eri (ha) |          |          |          |
|-----------|-----------------------------|----------|----------|----------|
|           | High                        | Moderate | Marginal | Total    |
| Baririjo  | 2089.02                     | 3764.97  | 2341.82  | 8195.81  |
| Daporijo  | 2429.04                     | 2189.85  | 650.16   | 5269.04  |
| Dumporijo | 4138.63                     | 3485.02  | 343      | 7966.64  |
| Giba      | 3165.09                     | 1724.30  | 244.95   | 5134.34  |
| Limeking  | 179.74                      | 413.35   | 327.22   | 920.31   |
| Nacho     | 553.30                      | 411.09   | 43.22    | 1007.61  |
| Payeng    | 1059.04                     | 299.49   | 57.22    | 1415.75  |
| Puchigeku | 1883.23                     | 1588.01  | 737.82   | 4209.06  |
| Siyum     | 551.62                      | 74.75    | 0.05     | 626.42   |
| Taksiang  | 18.46                       | 158.51   | 375.34   | 552.30   |
| Taliha    | 1610.81                     | 240.80   | 18.32    | 1869.93  |
| Total     | 17677.98                    | 14350.16 | 5139.1   | 37167.24 |



Table 8.23

| Block     | Suitable areas for Muga (ha) |          |          |          |
|-----------|------------------------------|----------|----------|----------|
|           | High                         | Moderate | Marginal | Total    |
| Baririjo  | 2112.78                      | 3792.58  | 2351.47  | 8256.82  |
| Daporijo  | 2673.91                      | 2407.65  | 650.16   | 5731.71  |
| Dumporijo | 4448.00                      | 3677.69  | 374.18   | 8499.86  |
| Giba      | 3260.12                      | 1739.13  | 244.95   | 5244.20  |
| Limeking  | 179.74                       | 413.35   | 327.22   | 920.31   |
| Nacho     | 553.30                       | 411.09   | 43.22    | 1007.61  |
| Payeng    | 1059.07                      | 299.82   | 57.22    | 1416.12  |
| Puchigeku | 2140.91                      | 1737.62  | 770.86   | 4649.39  |
| Siyum     | 551.62                       | 74.75    | 0.05     | 626.42   |
| Taksiang  | 18.46                        | 158.51   | 375.34   | 552.30   |
| Taliha    | 1668.91                      | 262.18   | 18.32    | 1949.40  |
| Total     | 18666.82                     | 14974.38 | 5212.96  | 38854.16 |

Table 8.24

| Block     | Suitable areas for Tasar (ha) |          |          |          |
|-----------|-------------------------------|----------|----------|----------|
|           | High                          | Moderate | Marginal | Total    |
| Baririjo  | 750.11                        | 1687.44  | 443.79   | 3963.78  |
| Daporijo  | 703.86                        | 1217.19  | 103.67   | 2557.01  |
| Dumporijo | 2189.14                       | 1915.06  | 29.03    | 4375.82  |
| Giba      | 2387.50                       | 1348.63  | 2.22     | 3972.40  |
| Limeking  | 179.74                        | 413.35   | 36.97    | 920.31   |
| Nacho     | 343.16                        | 294.39   | 13.02    | 680.10   |
| Payeng    | 605.65                        | 244.66   | 1.32     | 907.54   |
| Puchigeku | 908.61                        | 903.95   | 230.24   | 2425.30  |
| Siyum     | 384.80                        | 66.26    | -        | 451.11   |
| Taksiang  | 18.46                         | 158.51   | 151.64   | 552.30   |
| Taliha    | 865.27                        | 206.75   | 3.61     | 1090.34  |
| Total     | 9336.31                       | 8456.21  | 1015.49  | 21896.01 |



Fig. 7.21: Suitable areas for Mulberry in Upper Subansiri district of Arunachal Pradesh

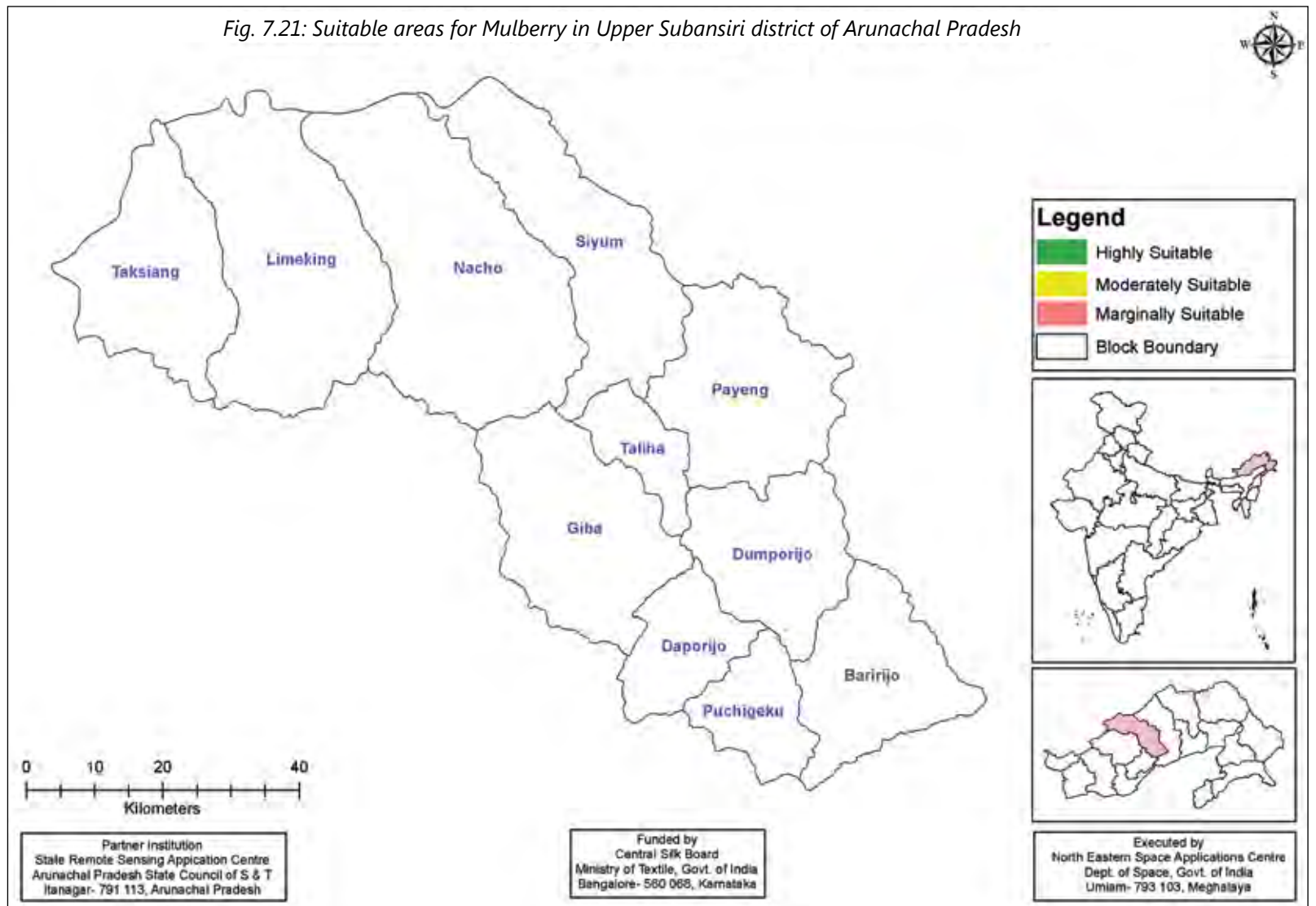
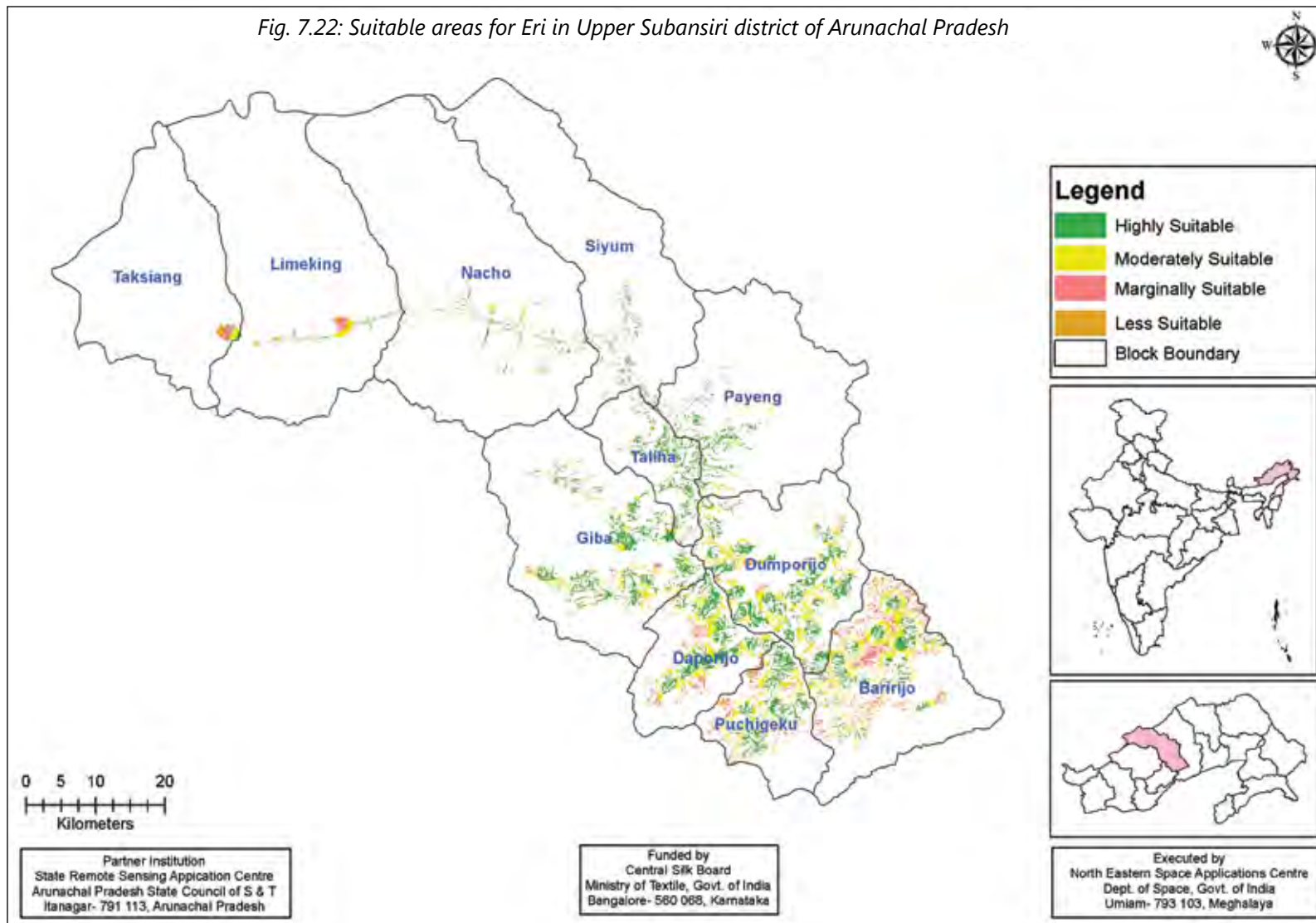


Fig. 7.22: Suitable areas for Eri in Upper Subansiri district of Arunachal Pradesh



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Fig. 7.23: Suitable areas for Muga in Upper Subansiri district of Arunachal Pradesh

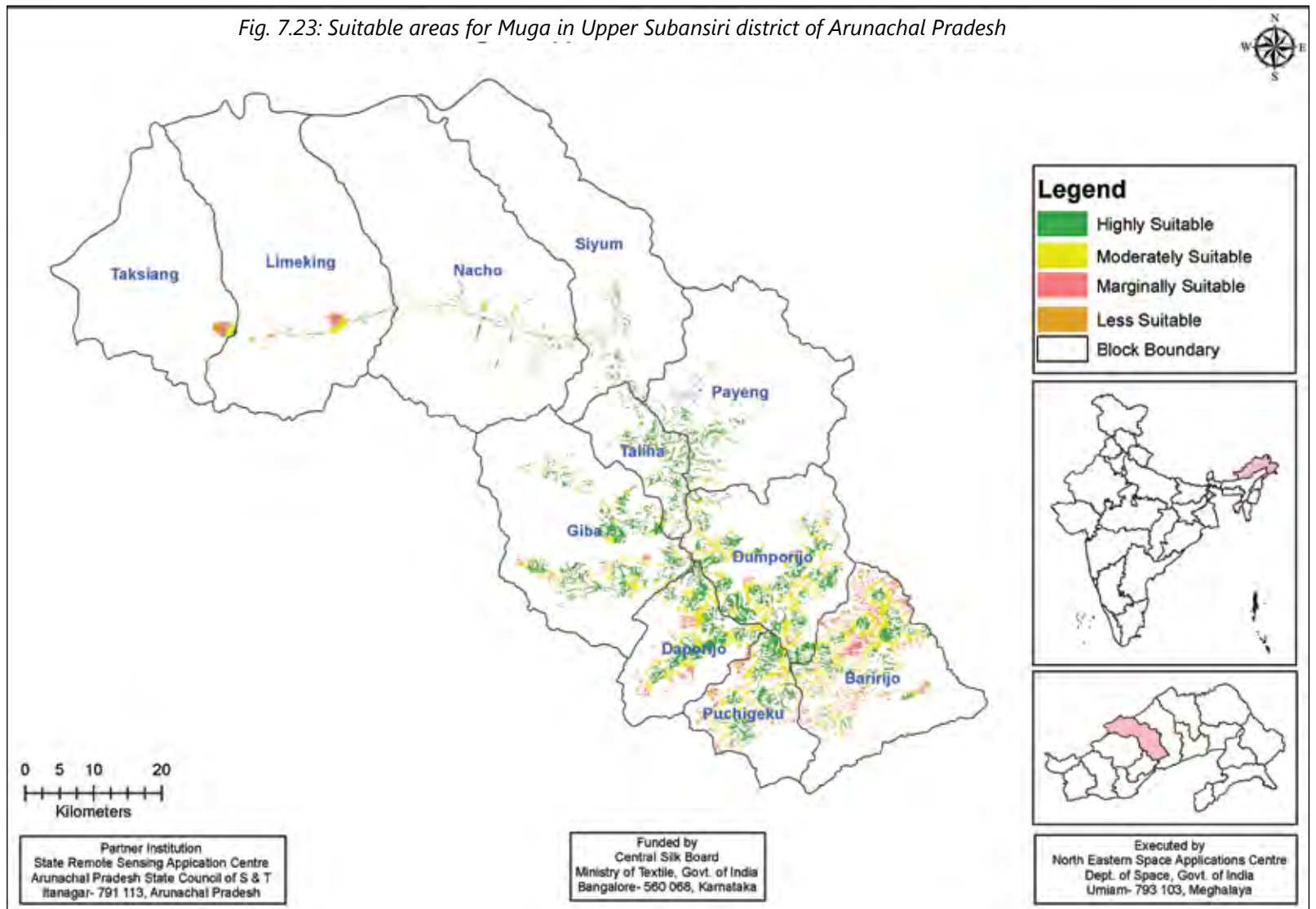
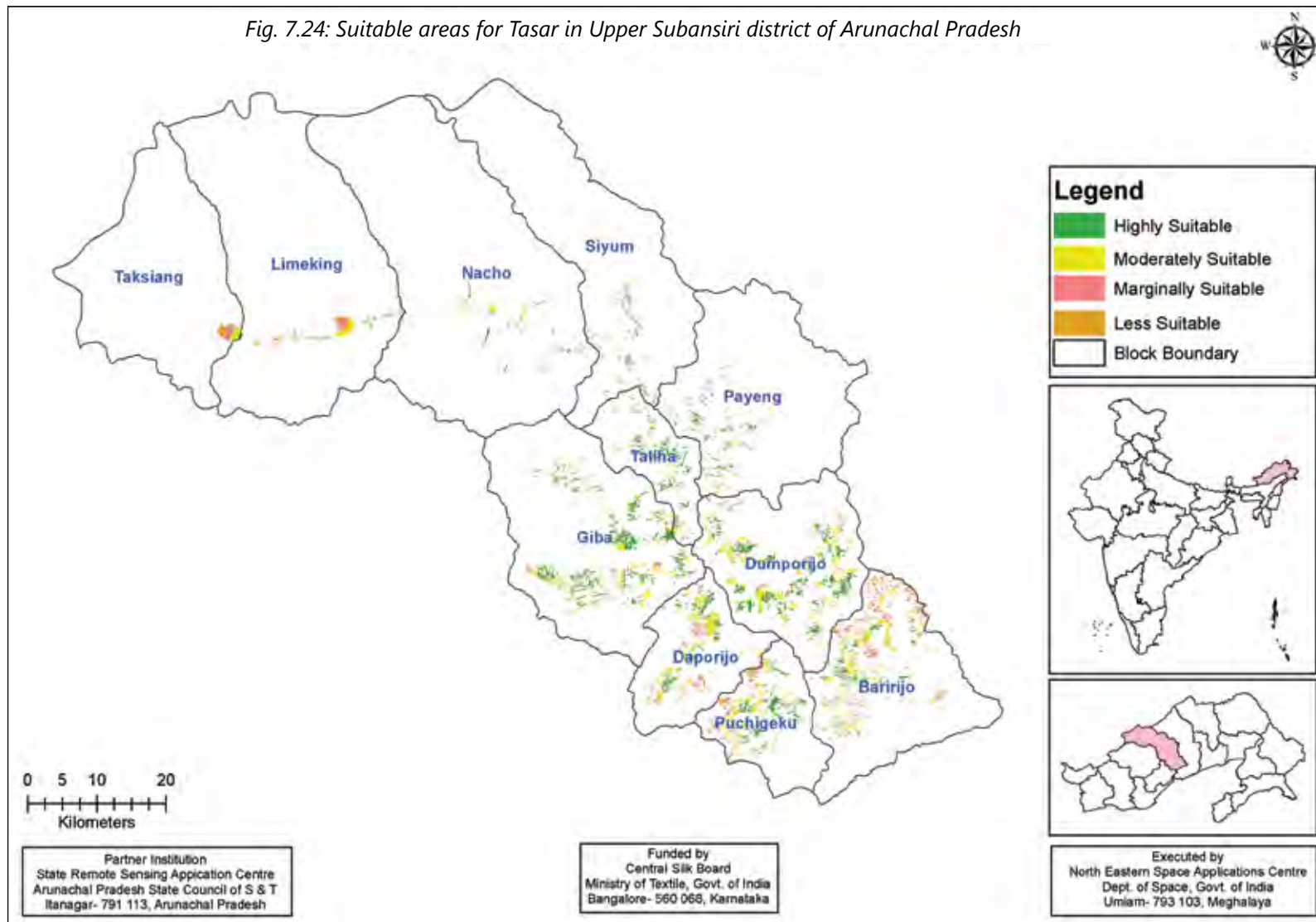


Fig. 7.24: Suitable areas for Tasar in Upper Subansiri district of Arunachal Pradesh



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Table 8.25-8.28 Suitable Areas for Mulberry, Eri, Muga & Tasar in West Kameng District of Arunachal Pradesh

Table 8.25

| Block      | Suitable areas for Mulberry (ha) |          |          |        |
|------------|----------------------------------|----------|----------|--------|
|            | High                             | Moderate | Marginal | Total  |
| Balimau    | -                                | -        | 0.90     | 0.90   |
| Bhalukpung | -                                | -        | 3.39     | 3.39   |
| Bomdila    | -                                | -        | -        | -      |
| Dirang     | -                                | -        | 198.36   | 198.36 |
| Jamiri     | -                                | 13.23    | 41.63    | 54.86  |
| Kalaktang  | -                                | -        | 16.02    | 16.02  |
| Nafra      | -                                | 19.14    | 37.53    | 56.66  |
| Rupa       | -                                | -        | 86.90    | 86.90  |
| Thrizino   | -                                | 0.92     | 91.02    | 91.93  |
| Total      | -                                | 33.28    | 475.74   | 509.02 |

Table 8.26

| Block      | Suitable areas for Eri (ha) |          |          |         |
|------------|-----------------------------|----------|----------|---------|
|            | High                        | Moderate | Marginal | Total   |
| Balimau    | 157.56                      | 245.09   | 581.7    | 984.35  |
| Bhalukpung | 47.20                       | 125.10   | 206.22   | 378.52  |
| Bomdila    | -                           | -        | -        | -       |
| Dirang     | 2.21                        | 63.82    | 36.64    | 102.66  |
| Jamiri     | 169.07                      | 127.20   | 172.43   | 468.70  |
| Kalaktang  | 73.97                       | 69.13    | 2.24     | 145.35  |
| Nafra      | 219.79                      | 258.66   | 68.96    | 547.41  |
| Rupa       | 0.30                        | 0.29     | 0.79     | 1.38    |
| Thrizino   | 991.95                      | 1007.91  | 865.58   | 2865.44 |
| Total      | 1662.05                     | 1897.19  | 1934.56  | 5493.81 |



Table 8.27

| Block      | Suitable areas for Muga (ha) |          |          |         |
|------------|------------------------------|----------|----------|---------|
|            | High                         | Moderate | Marginal | Total   |
| Balimau    | 163.33                       | 245.09   | 581.85   | 990.27  |
| Bhalukpung | 130.08                       | 350.72   | 339.82   | 820.63  |
| Bomdila    | -                            | -        | -        | -       |
| Dirang     | 2.21                         | 63.82    | 36.64    | 102.66  |
| Jamiri     | 177.61                       | 133.21   | 205.74   | 516.57  |
| Kalaktang  | 73.97                        | 69.13    | 2.24     | 145.35  |
| Nafra      | 219.79                       | 258.66   | 68.96    | 547.41  |
| Rupa       | 0.30                         | 0.29     | 0.79     | 1.38    |
| Thrizino   | 991.95                       | 1007.91  | 865.58   | 2865.44 |
| Total      | 1759.24                      | 2128.84  | 2101.62  | 5989.70 |

Table 8.28

| Block      | Suitable areas for Tasar (ha) |          |          |         |
|------------|-------------------------------|----------|----------|---------|
|            | High                          | Moderate | Marginal | Total   |
| Balimau    | 134.05                        | 134.71   | 378.05   | 646.81  |
| Bhalukpung | 1.84                          | 13.72    | 47.74    | 63.30   |
| Bomdila    | -                             | -        | -        | -       |
| Dirang     | 2.21                          | 63.82    | 36.64    | 102.66  |
| Jamiri     | 147.24                        | 116.92   | 134.37   | 398.53  |
| Kalaktang  | 73.97                         | 69.13    | 2.24     | 145.35  |
| Nafra      | 219.79                        | 258.66   | 68.96    | 547.41  |
| Rupa       | 0.30                          | 0.29     | 0.79     | 1.38    |
| Thrizino   | 866.02                        | 813.35   | 714.22   | 2393.60 |
| Total      | 1445.42                       | 1470.60  | 1383.01  | 4299.04 |

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Fig. 7.25: Suitable areas for Mulberry in West Kameng district of Arunachal Pradesh

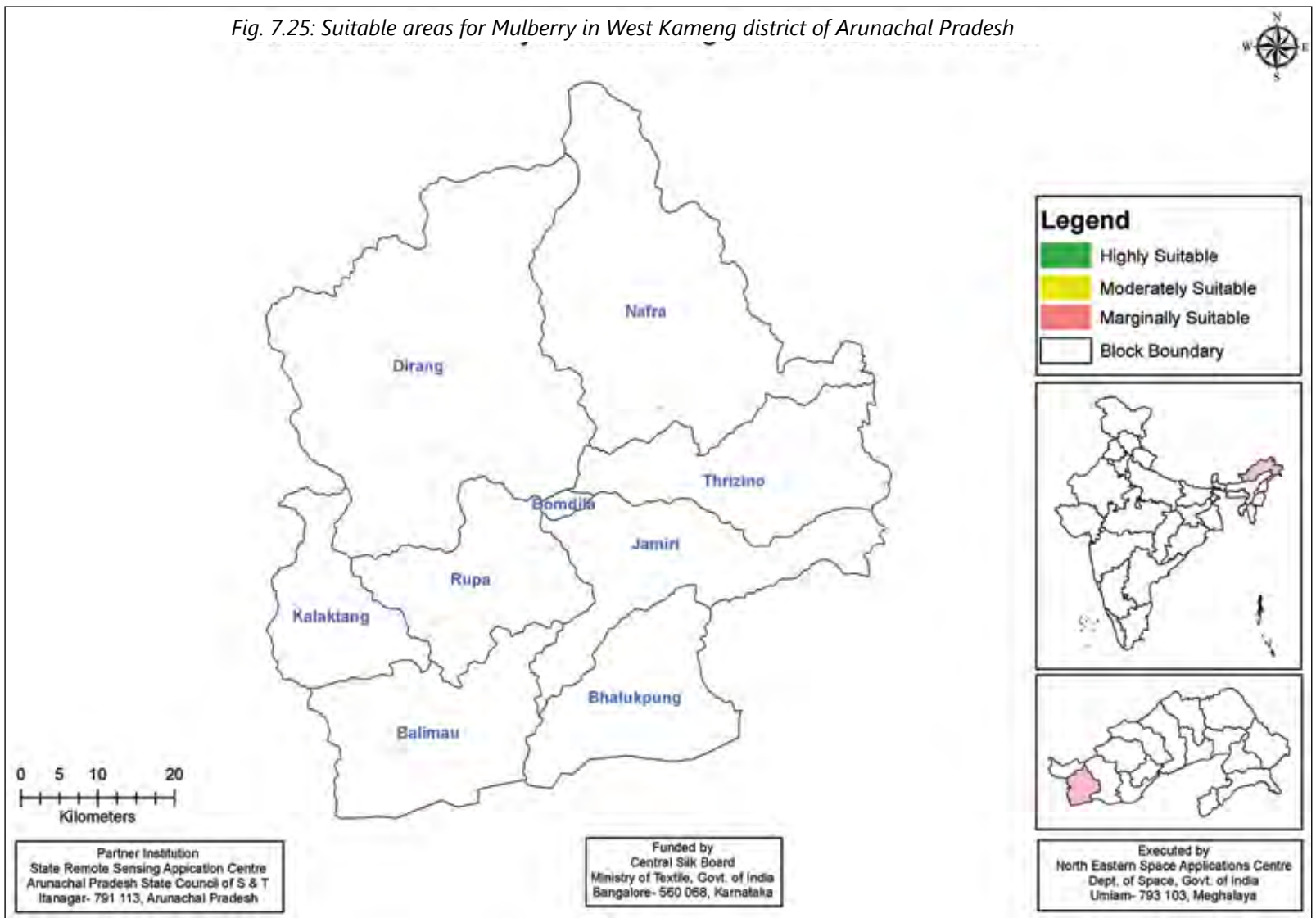
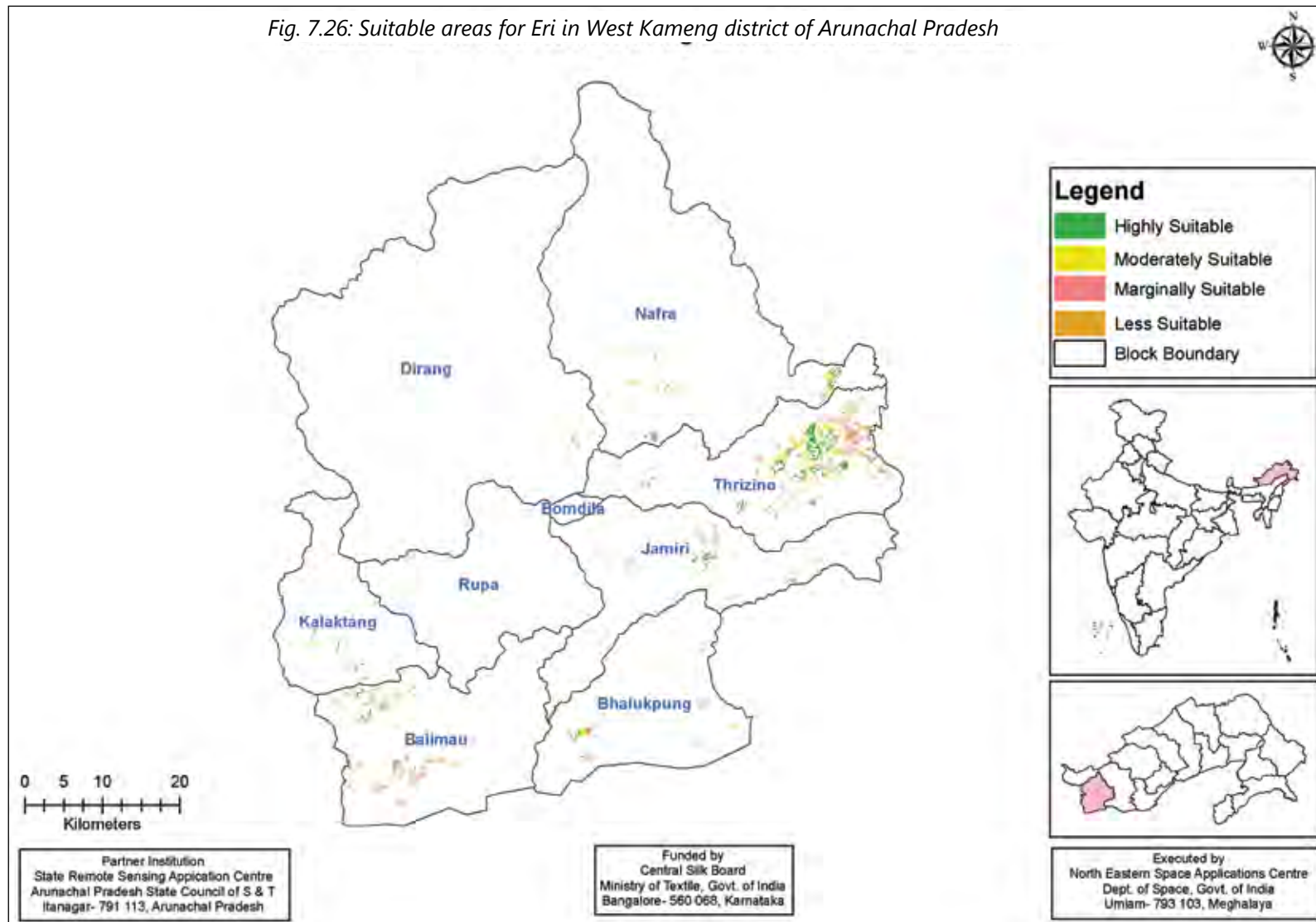


Fig. 7.26: Suitable areas for Eri in West Kameng district of Arunachal Pradesh



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Fig. 7.27: Suitable areas for Muga in West Kameng district of Arunachal Pradesh

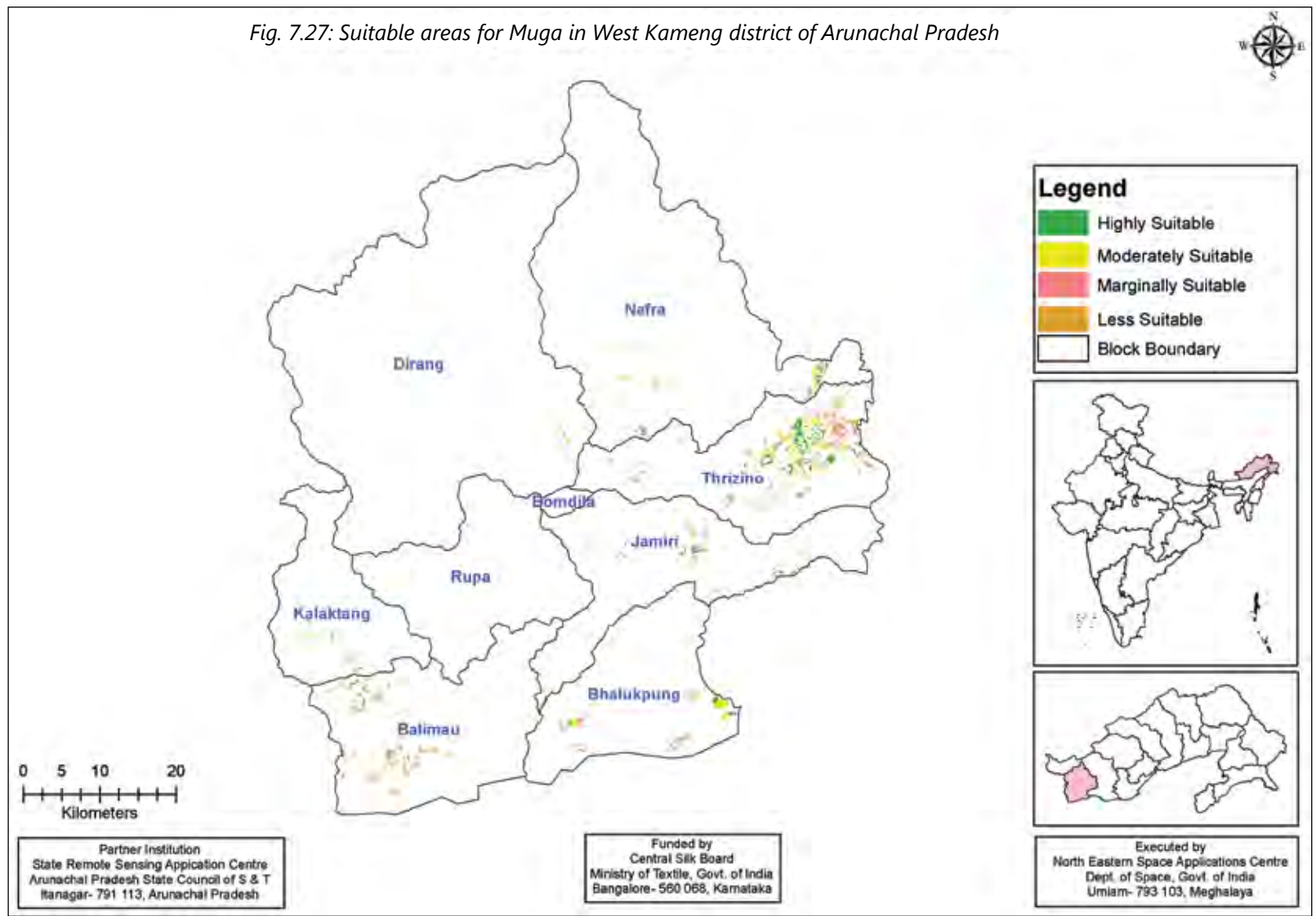
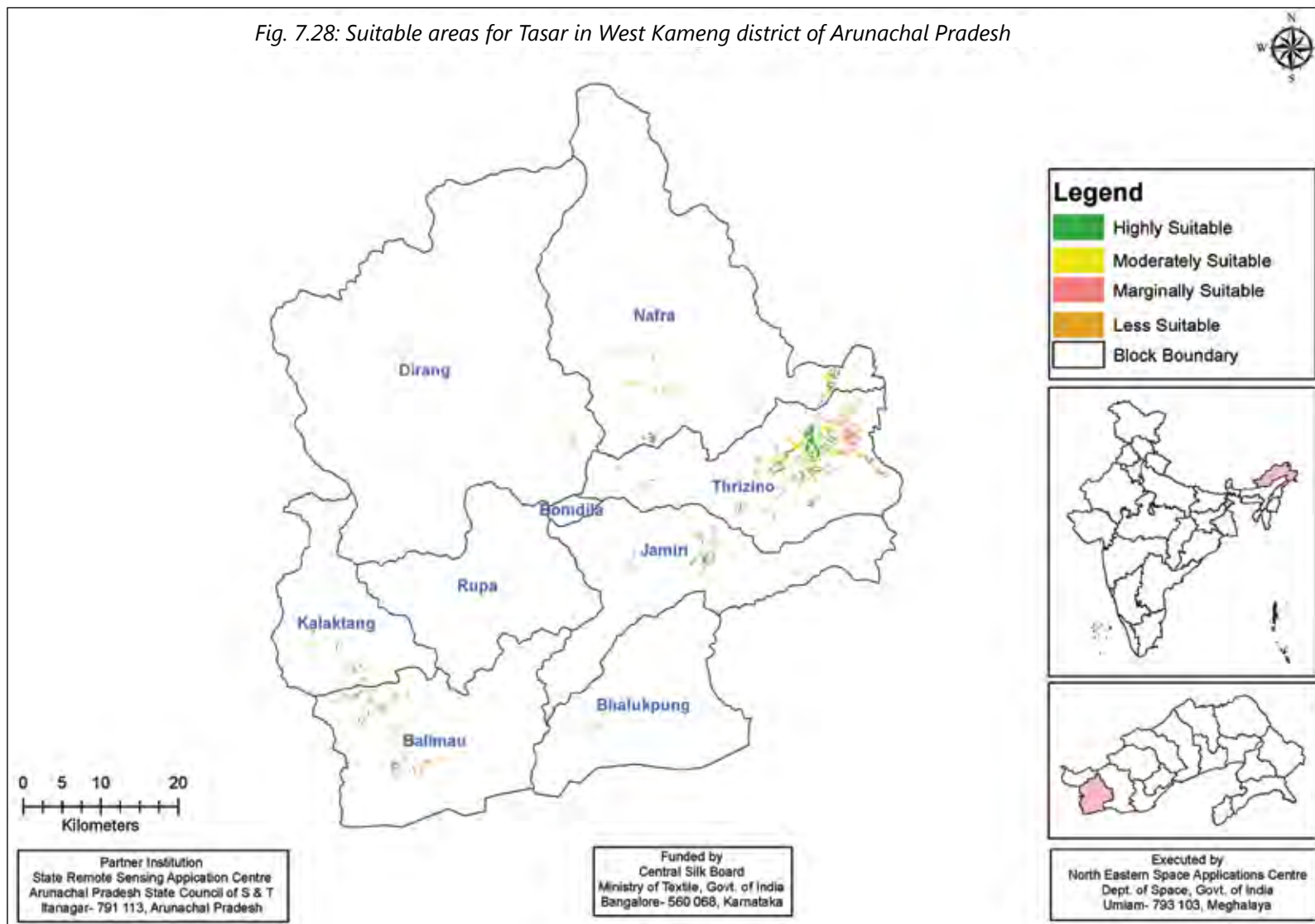


Fig. 7.28: Suitable areas for Tasar in West Kameng district of Arunachal Pradesh



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## ASSAM

Located south of the eastern Himalayas, Assam comprises the Brahmaputra and the Barak river valleys along with the Karbi Anglong and the North Cachar Hills with an area of 78,438 km<sup>2</sup>. Assam is surrounded by six of the other Seven Sister States: Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura and Meghalaya. It extending from 89° 42' E to 96° E longitude and 24° 8' N to 28° 2' N latitude and shares international borders with Bhutan and Bangladesh.

A land of high rainfall, Assam is endowed with lush greenery and the mighty river Brahmaputra, whose tributaries and oxbow lakes provide the region with a unique hydro-geomorphic and aesthetic environment. The forest lands occupy a major part of Assam's area. Brahmaputra river makes the agricultural area of the state more fertile and is known for its wide-spread tea plantations.

Sericulture of Assam is one of the ancient industries of the region. Assam is endowed by nature with the opportunity of culturing all the four varieties of silk. Silk culture traditionally however is confined more on Muga, Eri and Tasar. Rearing of mulberry silk is a relatively less. Among the four, Muga the golden silk is endemic to the state. Usually the cultivation of host plants of all the silk varieties is encircled around the homestead area. The other sources of host plants are government and private farms and the forest for the fringe dwellers. There is ample scope for expand the area under host plants in the culturable wastelands.

### Cachar

Cachar district is located in the southernmost part of Assam. It is bounded on the north by Barail and Jayantia hill ranges, on the south by the State of Mizoram and on the east by the districts of Hailakandi and Karimganj. The district lies between 92° 24' E and 93° 15' E longitude and 24° 22' N and 25° 8' N latitude. The total geographical area of the district is 3,786 Sq. Km. Silchar, the district headquarter town.

### Dhubri

Dhubri District is bounded both by inter-state and international border i.e. West Bengal and Bangladesh in the west, Goalpara and Bogaigoan district of Assam and Garo Hills district of Meghalaya in the east, Kokrajhar district in the north, Bangladesh and state of Meghalaya in the south. Covering an area of 2,838 Sq. Kms. including forests, riverines, hills etc. The district headquarters are located at Dhubri town which is situated at ~290 km from Guwahati, the state capital. Dhubri district is primarily dependent on agriculture and forest products.

### Dima Hasao/ Nc Hills

Dima Hasao district formerly North Cachar Hills district is extending between 92°37' 93°17' E Longitudes and 23°30' 25°47'



N Latitudes covering an area 4890 Sq. Km with district headquarters at Haflong. It is bounded by Nagaland and Manipur to the East, Meghalaya and Karbi Anglong to the West, Nagaon and Karbi Anglong to the North and Cachar to the South.

### **Golaghat**

The golaghat district is bounded by Brahmaputra river in the north, Karbi Anglong, Nagaland in the south, Jorhat, Nagaland in the East, Nagaon , Karbi Anglong in the west. It is located between 25°50' North to 26°47' North latitude; and 93°16' East to 94°10' East longitude.

### **Hailakandi**

The district has got inter-state border with Mizoram on its south having a length of 76 km besides inter district border on other sides with Karimganj district and Cachar district. It has a geographical area of 1327 Sq. km.

### **Karbianglong**

The Karbi Anglong District is situated in the central part of Assam. It is bounded by Golaghat district in the east, Meghalaya and Morigaon district in the west, Nagaon and Golaghat district in the north and N.C. Hills district and Nagaland in the south. The district with dense tropical forest covered hills and flat plains is situated between 25° 33' N to 26°35' N Latitude and 92°10' to 93°50' E Longitude. The total geographical area of the district is 10,434 Sq. Km.

### **Karimganj**

Karimganj District is located in the Southern tip of Assam - a state in the North-eastern corner of India. Together with two other neighbouring districts - Cachar and Hailakandi - it constitutes the Barak Valley zone in Southern Assam. Total area of the district is 1809 Sq. Kms. which comprises varied geographical features like agricultural plains, shallow wetlands, hilly terrains and forests.

The geographical location of Karimganj district is between longitudes 92°15' and 92°35' east and latitudes 24°15' and 25°55' North. The district is bounded on the North by Bangladesh and Cachar district; on the South by Mizoram and Tripura states, on the West by Bangladesh and Tripura and on the East by Hailakandi district.

### **Lakhimpur**

Lakhimpur District is situated on the North East corner of Assam. The district lies between 26°48' and 27°53' northern latitude and 93°42' and 94°20' east longitude (approx.) It is bounded on the north by Siang and Papumpare District of Arunachal Pradesh and on the east by Dhemaji District and Subansiri river. Majuli Sub Division of Jorhat District stands on the southern side and Gahpur sub division of Sonitpur District is on the West. The District covers an area of 2277 Sq km.

## Udalguri

This district is bounded by Bhutan and Arunachal Pradesh in the north, Sonitpur district in the east, Darrang district in the south and Baksa district in the west. The district of Udalguri lies between 26°46' and 26°77' North Latitude and 92°08' and 95°15' East Longitude at an altitude of about 345' above the mean sea level (MSL). Total geographical area of the district is about 1,985.68 sq. km.

Tables 9.1-9.3: Suitable Areas for Mulberry, Eri & Muga in Cachar District of Assam

Table 9.1

| Block    | Suitable areas for Mulberry (ha) |          |          |          |
|----------|----------------------------------|----------|----------|----------|
|          | High                             | Moderate | Marginal | Total    |
| Katigora | -                                | 2753.65  | 1320.45  | 4074.10  |
| Lakhipur | -                                | 548.95   | 1350.01  | 1898.96  |
| Silchar  | -                                | 2820.71  | 2315.97  | 5136.68  |
| Sonai    | -                                | 2400.22  | 3413.31  | 5813.53  |
| Udarbond | -                                | 396.30   | 786.34   | 1182.64  |
| Total    | -                                | 8919.83  | 9186.07  | 18105.91 |

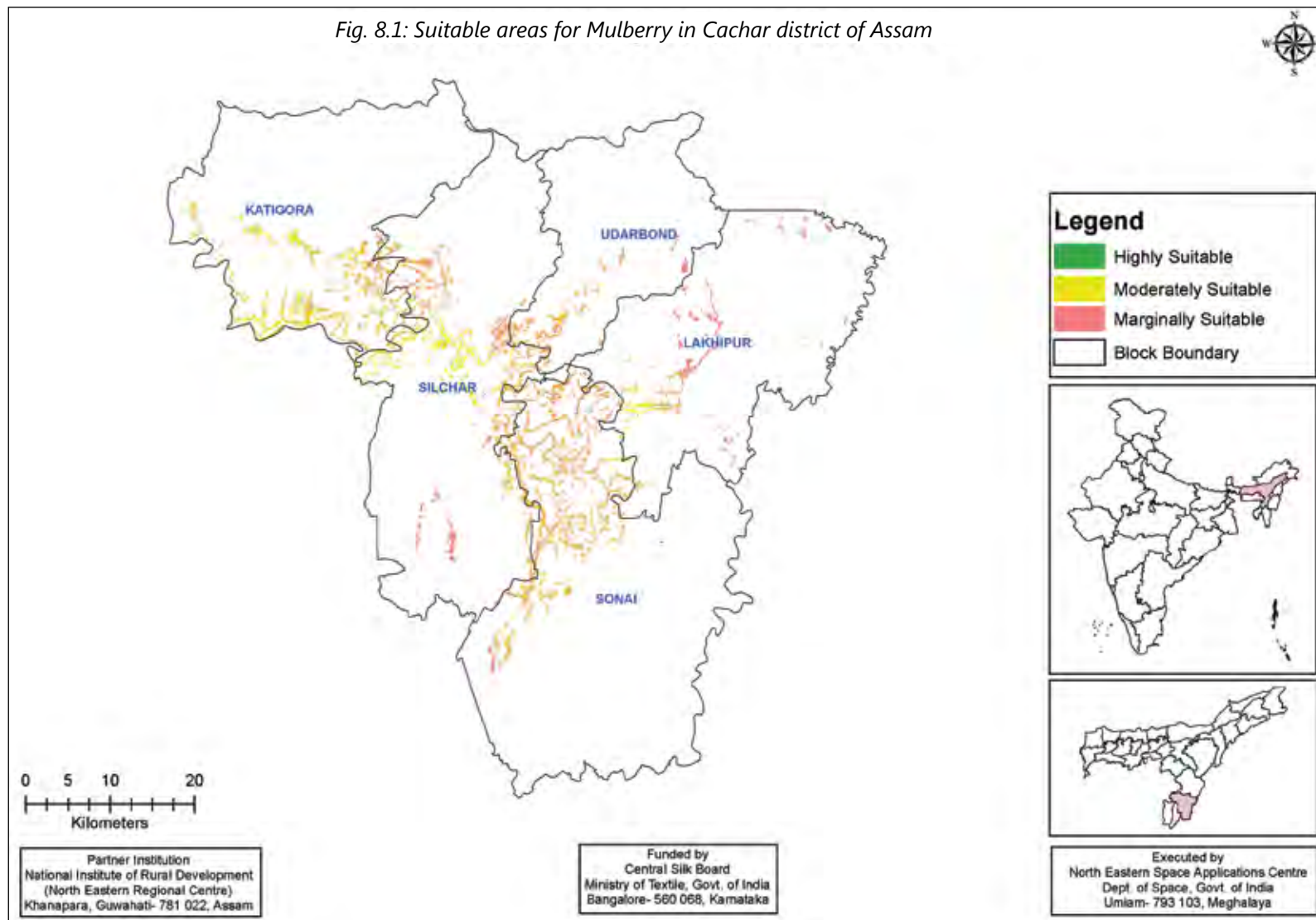
Table 9.2

| Block    | Suitable areas for Eri(ha) |          |          |        |
|----------|----------------------------|----------|----------|--------|
|          | High                       | Moderate | Marginal | Total  |
| Katigora | -                          | -        | 248.96   | 248.96 |
| Lakhipur | -                          | -        | -        | -      |
| Silchar  | -                          | -        | -        | -      |
| Sonai    | -                          | -        | -        | -      |
| Udarbond | -                          | -        | -        | -      |
| Total    | -                          | -        | 248.96   | 248.96 |

Table 9.3

| Block    | Suitable areas for Muga(ha) |          |          |          |
|----------|-----------------------------|----------|----------|----------|
|          | High                        | Moderate | Marginal | Total    |
| Katigora | 596.79                      | 757.07   | 1314.03  | 2667.89  |
| Lakhipur | 666.85                      | 503.68   | 635.82   | 1806.35  |
| Silchar  | 1139.17                     | 2375.99  | 2983.75  | 6498.90  |
| Sonai    | 2276.82                     | 3269.77  | 2336.5   | 7883.09  |
| Udarbond | 452.59                      | 626.29   | 684.39   | 1763.27  |
| Total    | 5132.22                     | 7532.80  | 7954.49  | 20619.50 |

Fig. 8.1: Suitable areas for Mulberry in Cachar district of Assam



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Fig. 8.2: Suitable areas for Eri in Cachar district of Assam

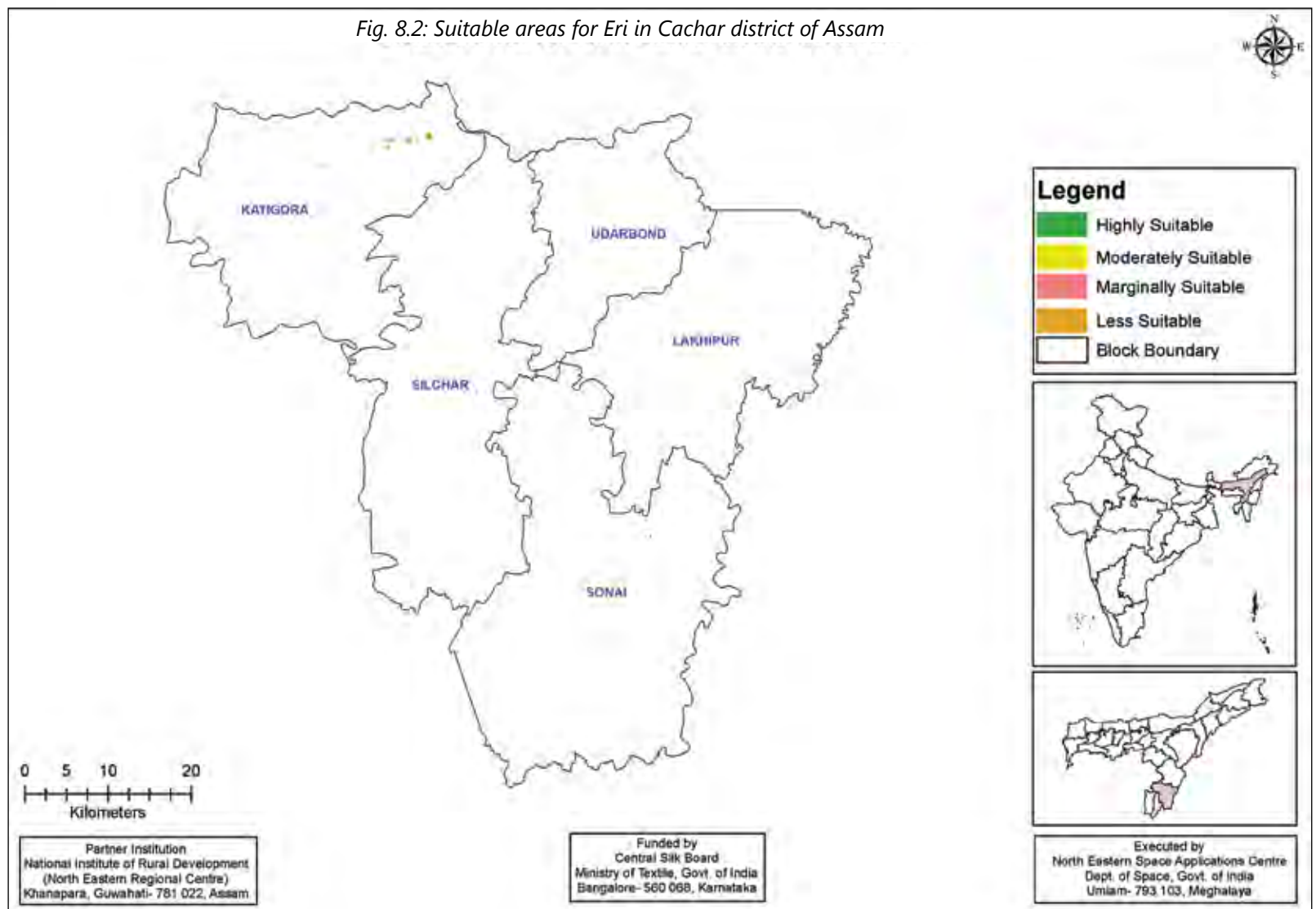
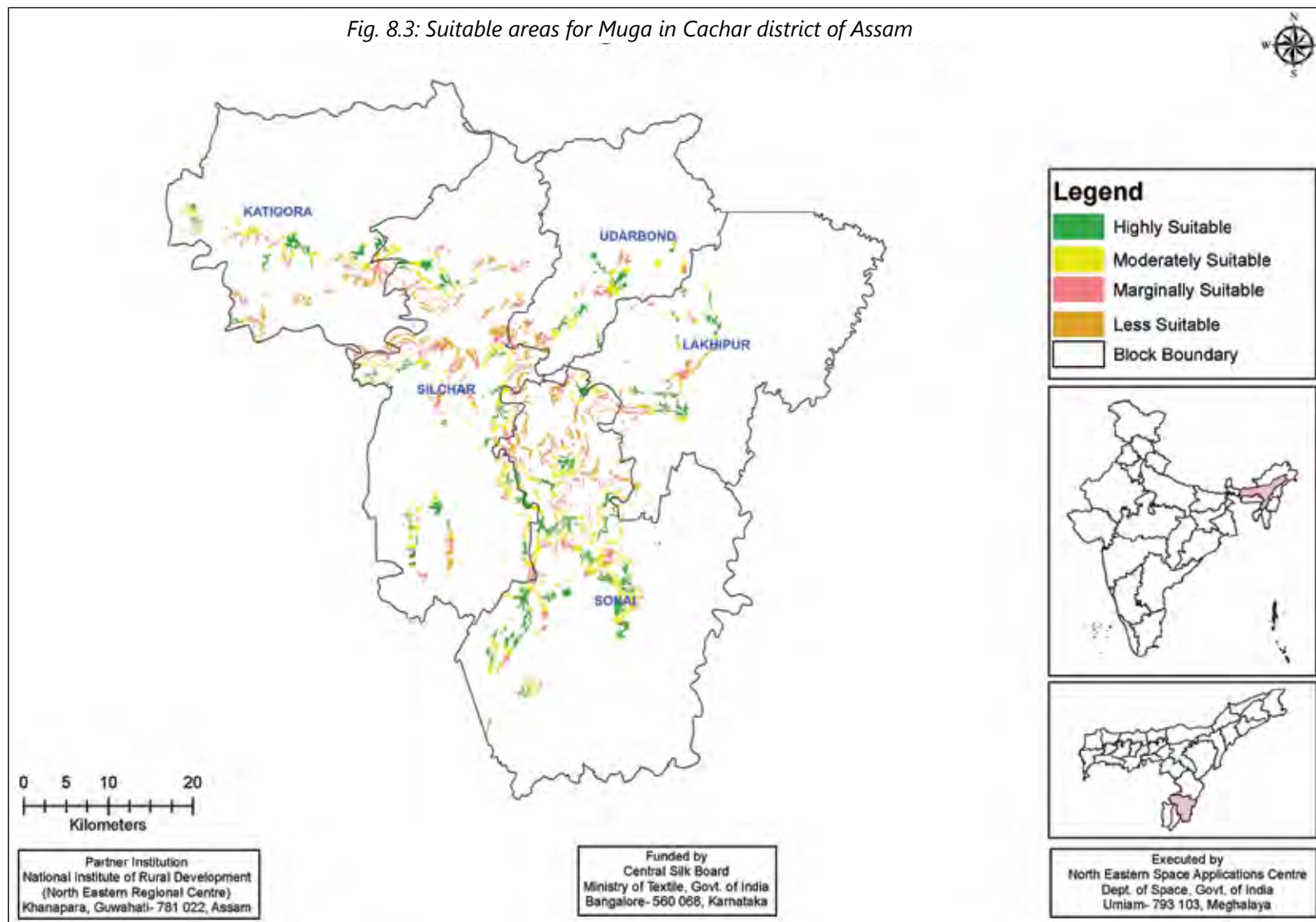


Fig. 8.3: Suitable areas for Muga in Cachar district of Assam



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Tables 9.4-9.5: Suitable Areas for Mulberry, Eri, Muga & Tasar in Dhubri District of Assam

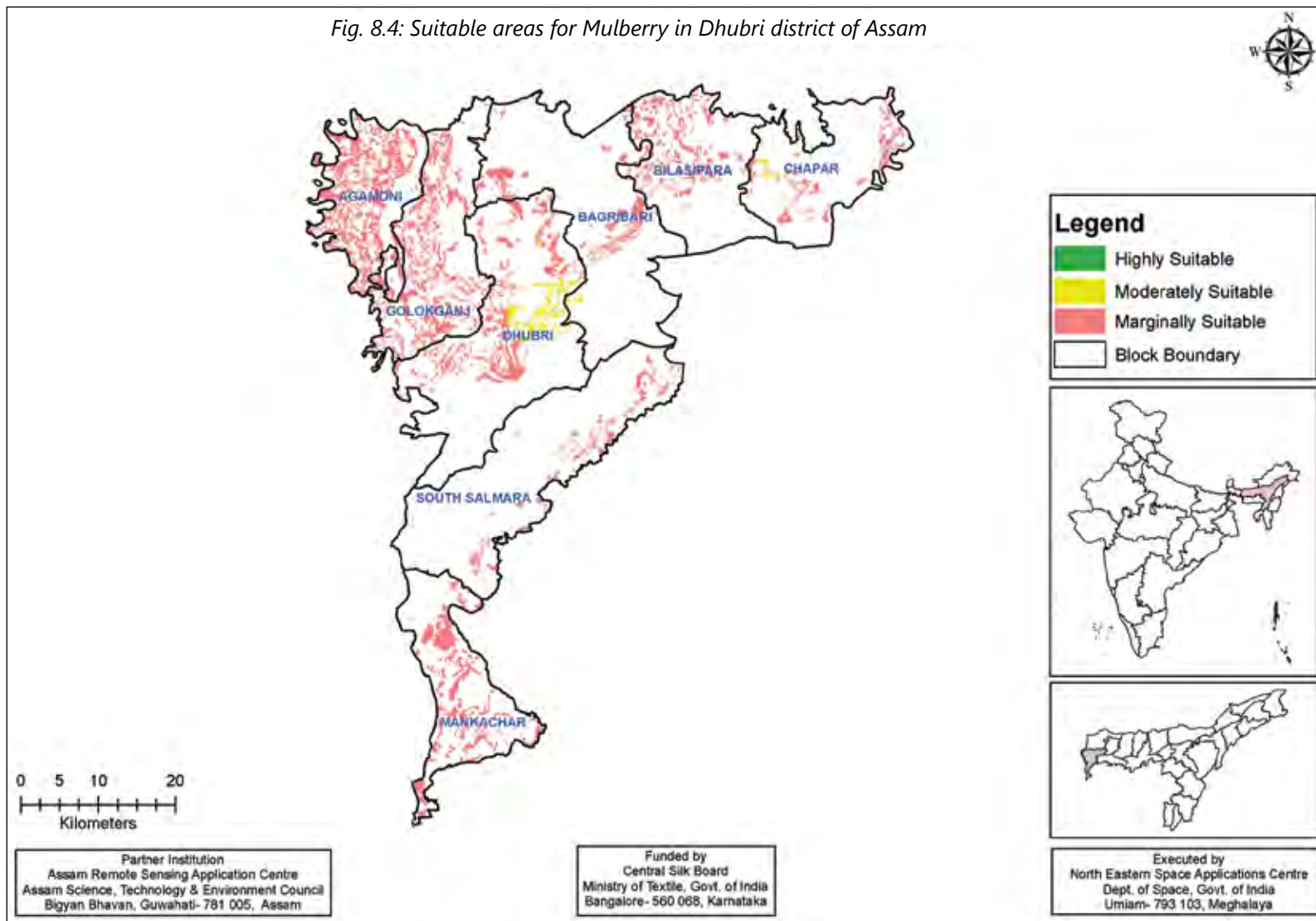
Table 9.4

| Block         | Suitable areas for Mulberry (ha) |          |          |          |
|---------------|----------------------------------|----------|----------|----------|
|               | High                             | Moderate | Marginal | Total    |
| Agamoni       | -                                | -        | 8575.59  | 8575.59  |
| Bagribari     | -                                | 150.98   | 2723.93  | 2874.91  |
| Bilasipara    | -                                | -        | 3640.64  | 3640.64  |
| Chapar        | -                                | 184.61   | 2020.73  | 2205.34  |
| Dhubri        | -                                | 1658.76  | 5434.65  | 7093.42  |
| Golokganj     | -                                | -        | 7643.42  | 7643.42  |
| Mankachar     | -                                | -        | 4822.96  | 4822.96  |
| South Salmara | -                                | -        | 2216.83  | 2216.83  |
| Total         | -                                | 1994.35  | 37078.75 | 39073.10 |

Table 9.5

| Block         | Suitable areas for Eri, Muga & Tasar (ha) |          |          |          |
|---------------|---|----------|----------|----------|
|               | High                                      | Moderate | Marginal | Total    |
| Agamoni       | 423.07                                    | 620.44   | 7810.34  | 8853.86  |
| Bagribari     | -   | 26.44    | 6244.09  | 6270.53  |
| Bilasipara    | 341.37                                    | 288.99   | 3539     | 4169.35  |
| Chapar        | 152.21                                    | 403.15   | 4811.18  | 5366.55  |
| Dhubri        | 1429.82                                   | 1118.42  | 6089.64  | 8637.88  |
| Golokganj     | 929.33                                    | 814.52   | 6216.24  | 7960.09  |
| Mankachar     | 1648.88                                   | 727.11   | 3689.4   | 6065.39  |
| South Salmara | -   | -        | 2966.74  | 2966.74  |
| Total         | 4924.68                                   | 3999.08  | 41366.62 | 50290.39 |

Fig. 8.4: Suitable areas for Mulberry in Dhubri district of Assam

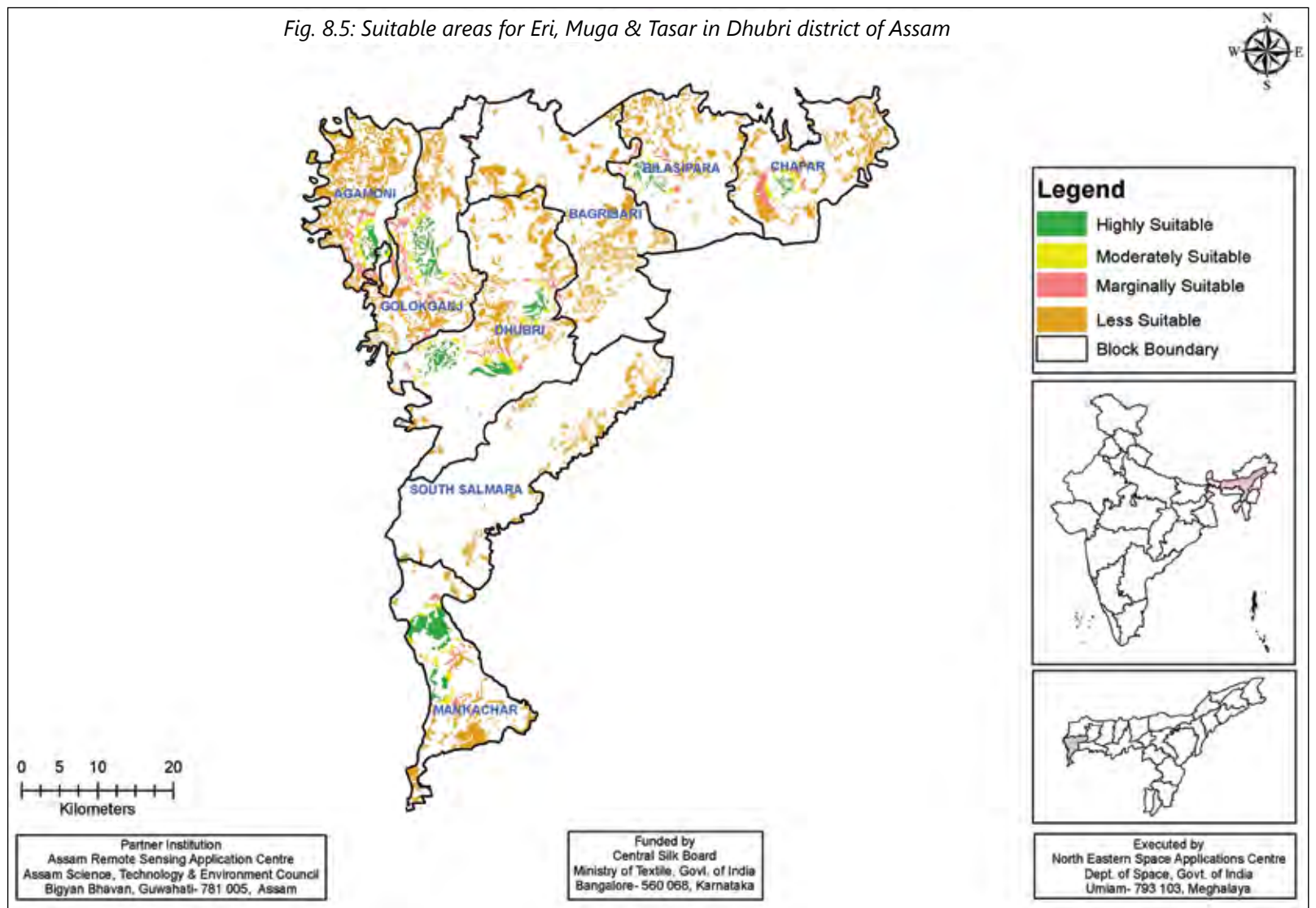


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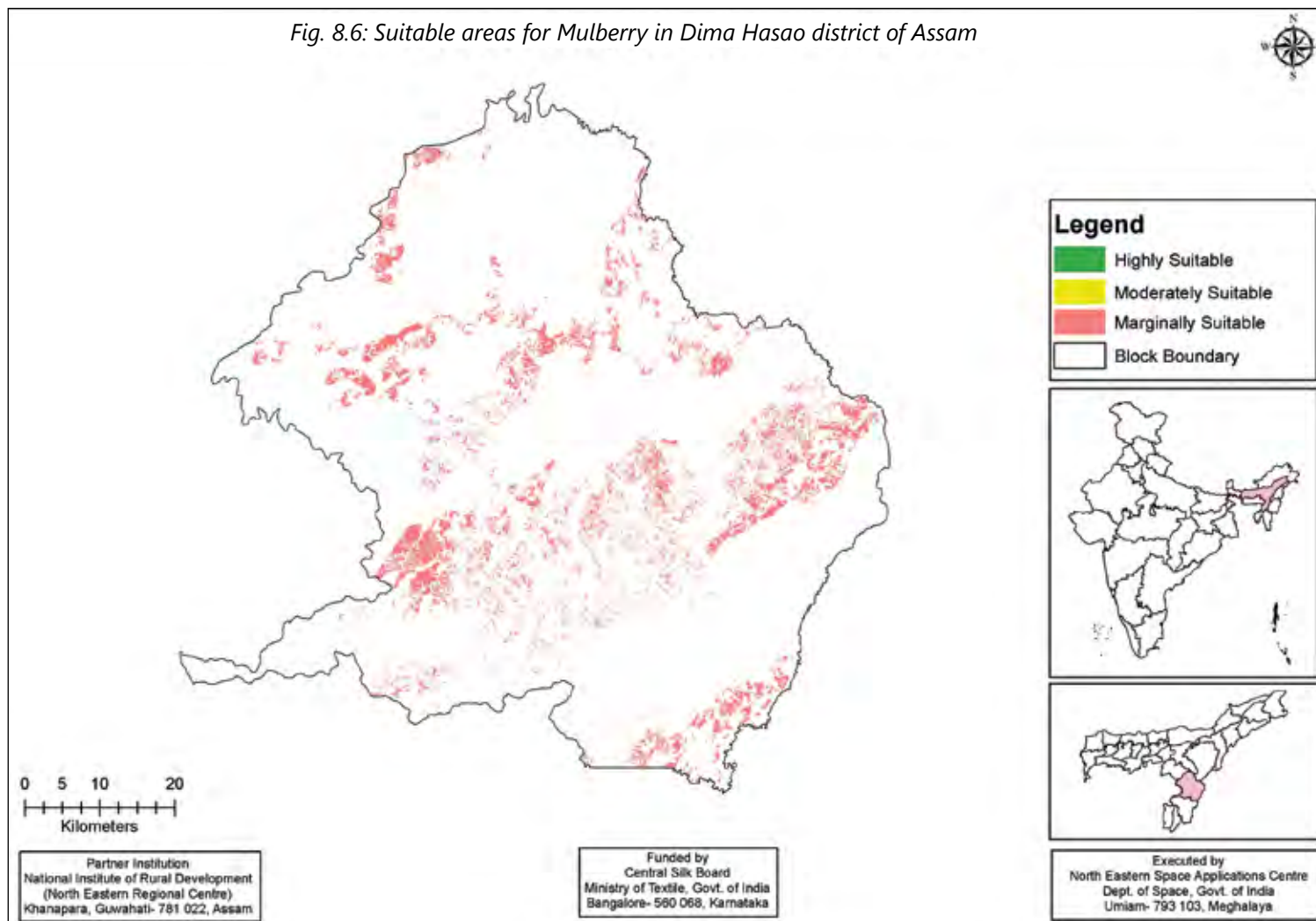
Fig. 8.5: Suitable areas for Eri, Muga & Tasar in Dhubri district of Assam



Tables 9.6: Suitable Areas for Mulberry, Eri, Muga And Tasar in DimaHasao District of Assam

| Suitability Class | Suitable Areas (ha) |          |          |          |
|-------------------|---------------------|----------|----------|----------|
|                   | Mulberry            | Eri      | Muga     | Tasar    |
| High              | -                   | 12542.26 | 17044.57 | 3543.79  |
| Moderate          | -                   | 26800.03 | 37579.48 | 7290.57  |
| Marginal          | 38302.84            | 30384.3  | 42282.78 | 10066.1  |
| Total             | 38302.84            | 69726.59 | 96906.82 | 20900.46 |

Fig. 8.6: Suitable areas for Mulberry in Dima Hasao district of Assam



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Fig. 8.7: Suitable areas for Eri in Dima Hasao district of Assam

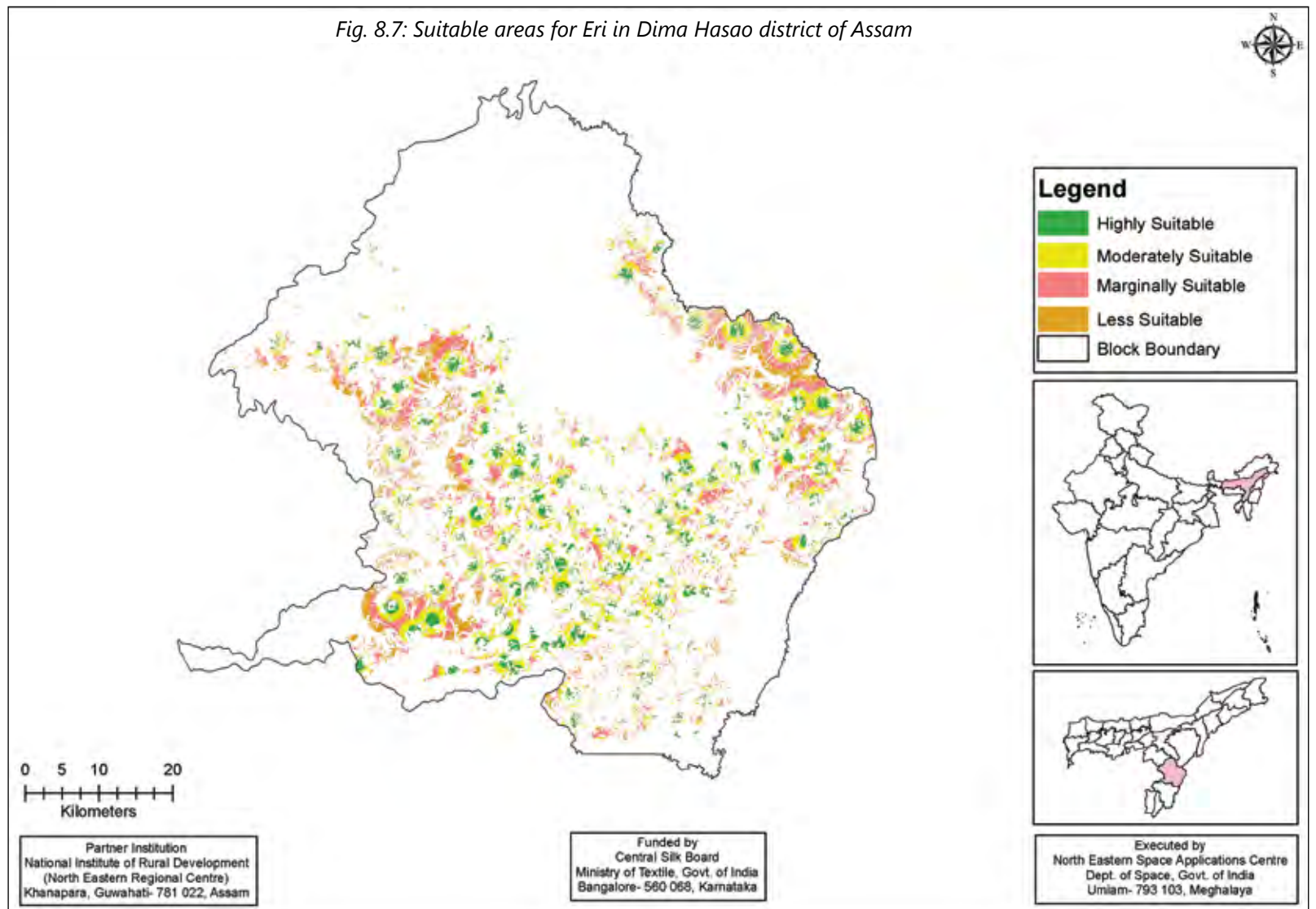
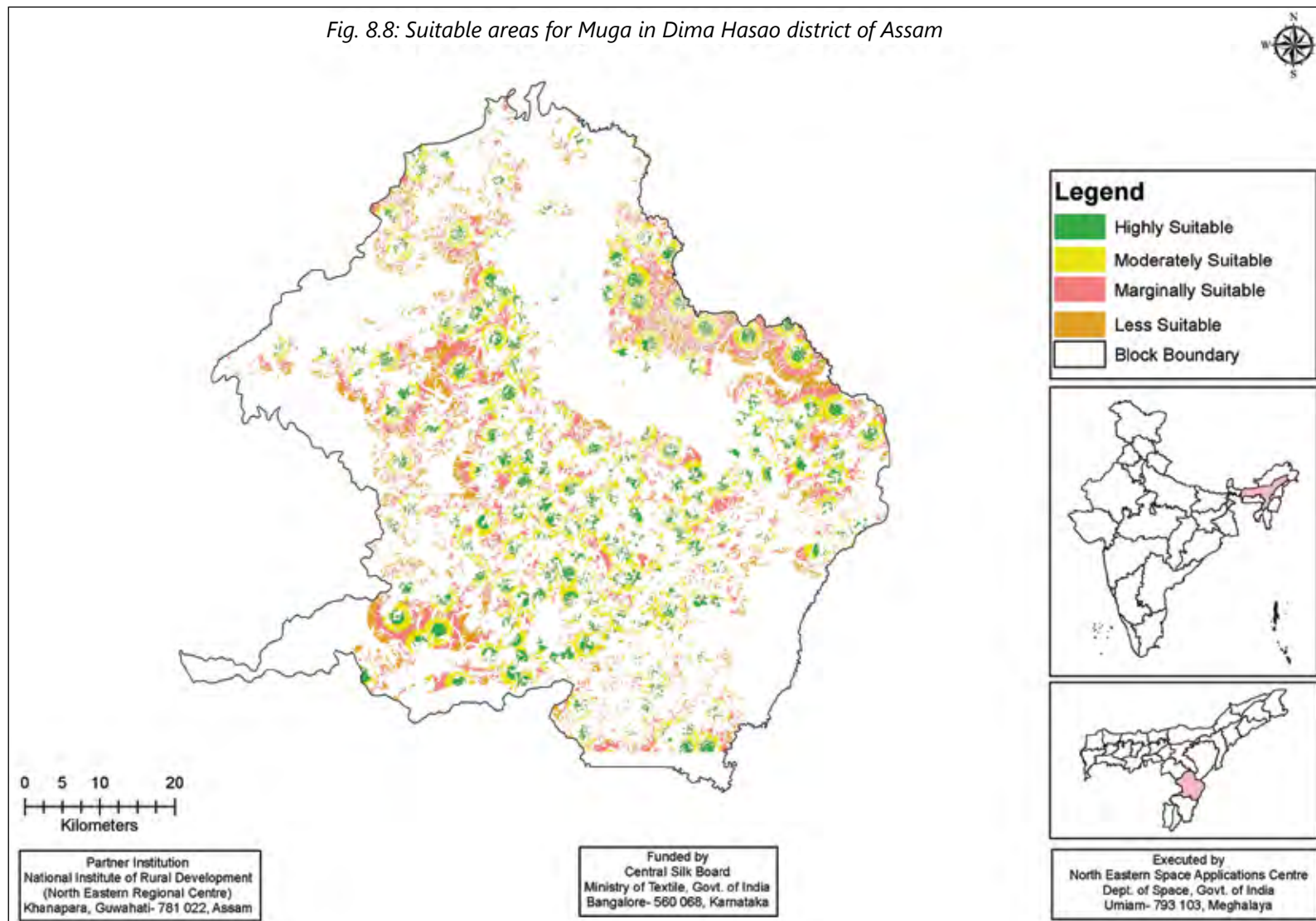


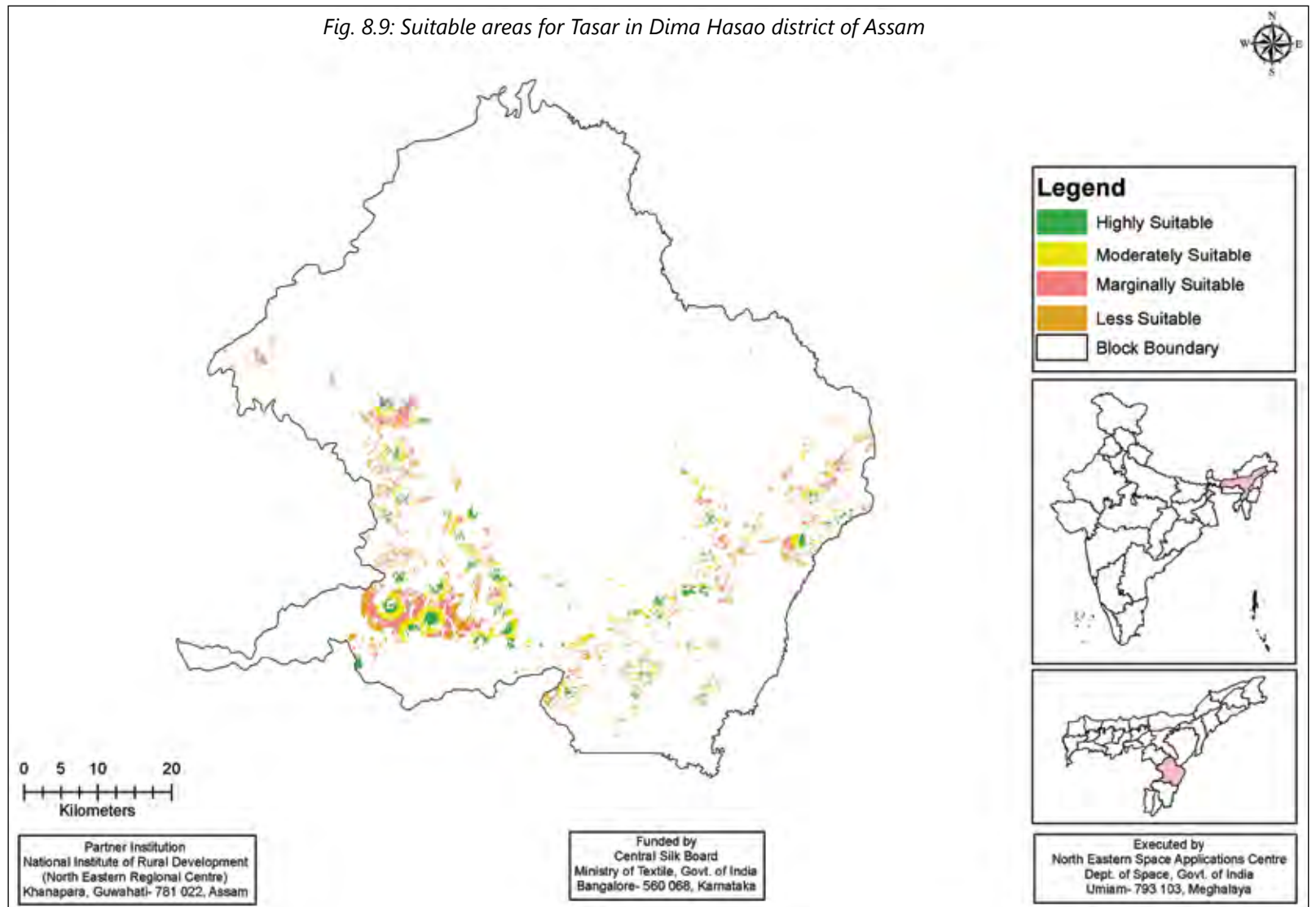
Fig. 8.8: Suitable areas for Muga in Dima Hasao district of Assam



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Fig. 8.9: Suitable areas for Tasar in Dima Hasao district of Assam



Tables 9.7: Suitable Areas for Mulberry in Golaghat District of Assam

| Block       | Suitable areas for Mulberry (ha) |          |          |          |
|-------------|----------------------------------|----------|----------|----------|
|             | High                             | Moderate | Marginal | Total    |
| Bokakhat    | -                                | -        | 5969.37  | 5969.37  |
| Brahmaputra | -                                | -        | 523.48   | 523.48   |
| Der Gaon    | -                                | -        | 4810.53  | 4810.53  |
| Golaghat    | -                                | -        | 19773.76 | 19773.76 |
| Khumtai     | -                                | -        | 4137.60  | 4137.60  |
| Morongi     | -                                | -        | 10131.28 | 10131.28 |
| Na          | -                                | -        | -        | -        |
| Sarupathar  | -                                | -        | 11798.98 | 11798.98 |
| Total       | -                                | -        | 57145.00 | 57145.00 |

Table 9.8: Suitable Areas for Non-Mulberry in Golaghat District of Assam

| Block       | Suitable areas for Eri, Muga & Tasar (ha) |          |          |          |
|-------------|---|----------|----------|----------|
|             | High                                      | Moderate | Marginal | Total    |
| Bokakhat    | 219.32                                    | 258.33   | 7488.87  | 7966.51  |
| Brahmaputra | -   | -        | -        | -        |
| Der Gaon    | 1566.95                                   | 1463.19  | 5183.02  | 8213.16  |
| Golaghat    | 6280.58                                   | 2892.89  | 11250.93 | 20424.40 |
| Khumtai     | 599.52                                    | 886.02   | 2837.41  | 4322.97  |
| Morongi     | 1258.73                                   | 1159.03  | 3864.48  | 6282.24  |
| Na          | 242.75                                    | 540.48   | 3717.14  | 4500.37  |
| Sarupathar  | 2354.66                                   | 2089.38  | 16196.3  | 20640.34 |
| Grand Total | 12522.52                                  | 9289.30  | 50538.16 | 72349.98 |

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Fig. 8.10: Suitable areas for Mulberry in Golaghat district of Assam

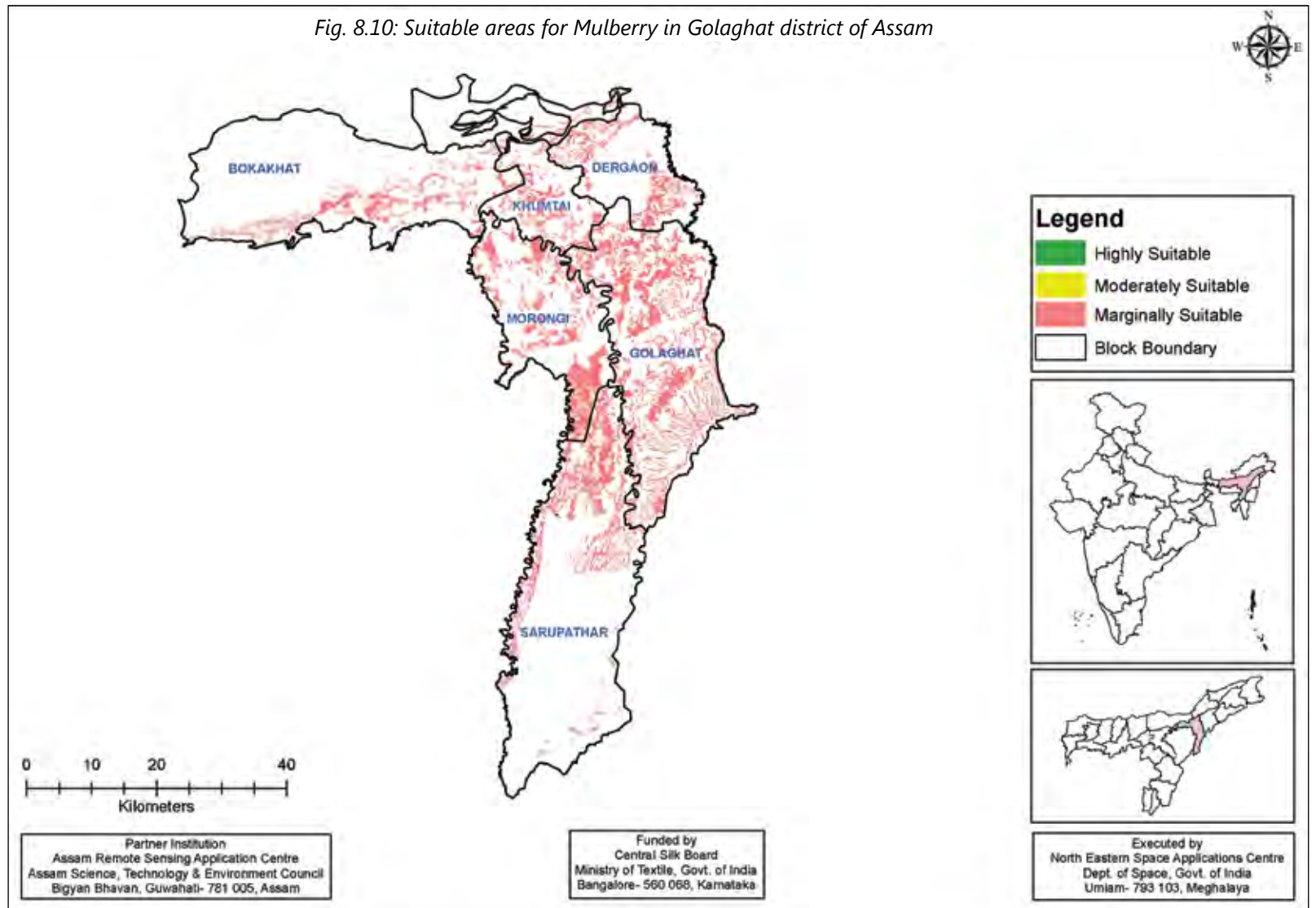
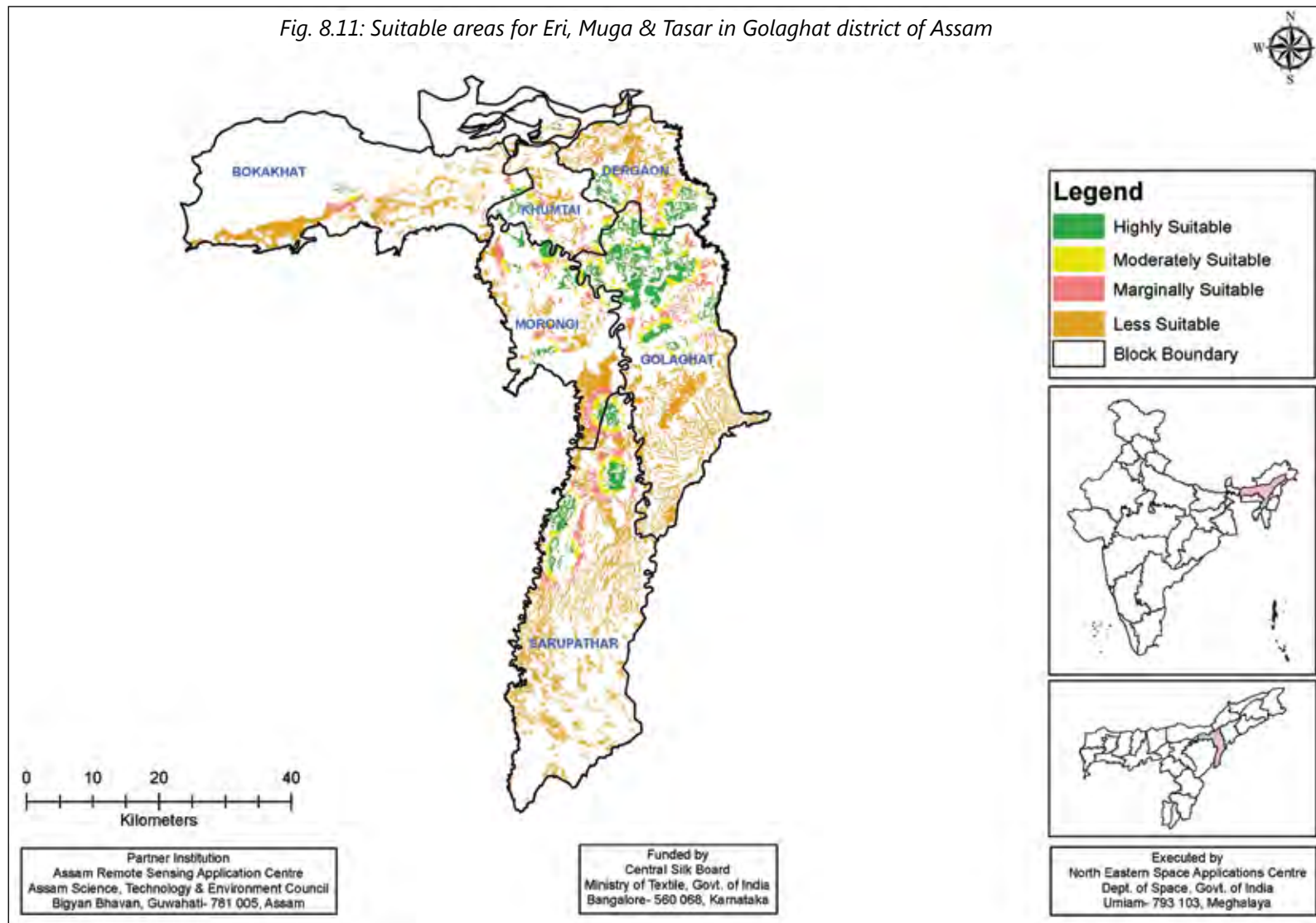


Fig. 8.11: Suitable areas for Eri, Muga & Tasar in Golaghat district of Assam



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Tables 9.9-9.10: Suitable Areas for Mulberry & Muga in Hailakandi District of Assam

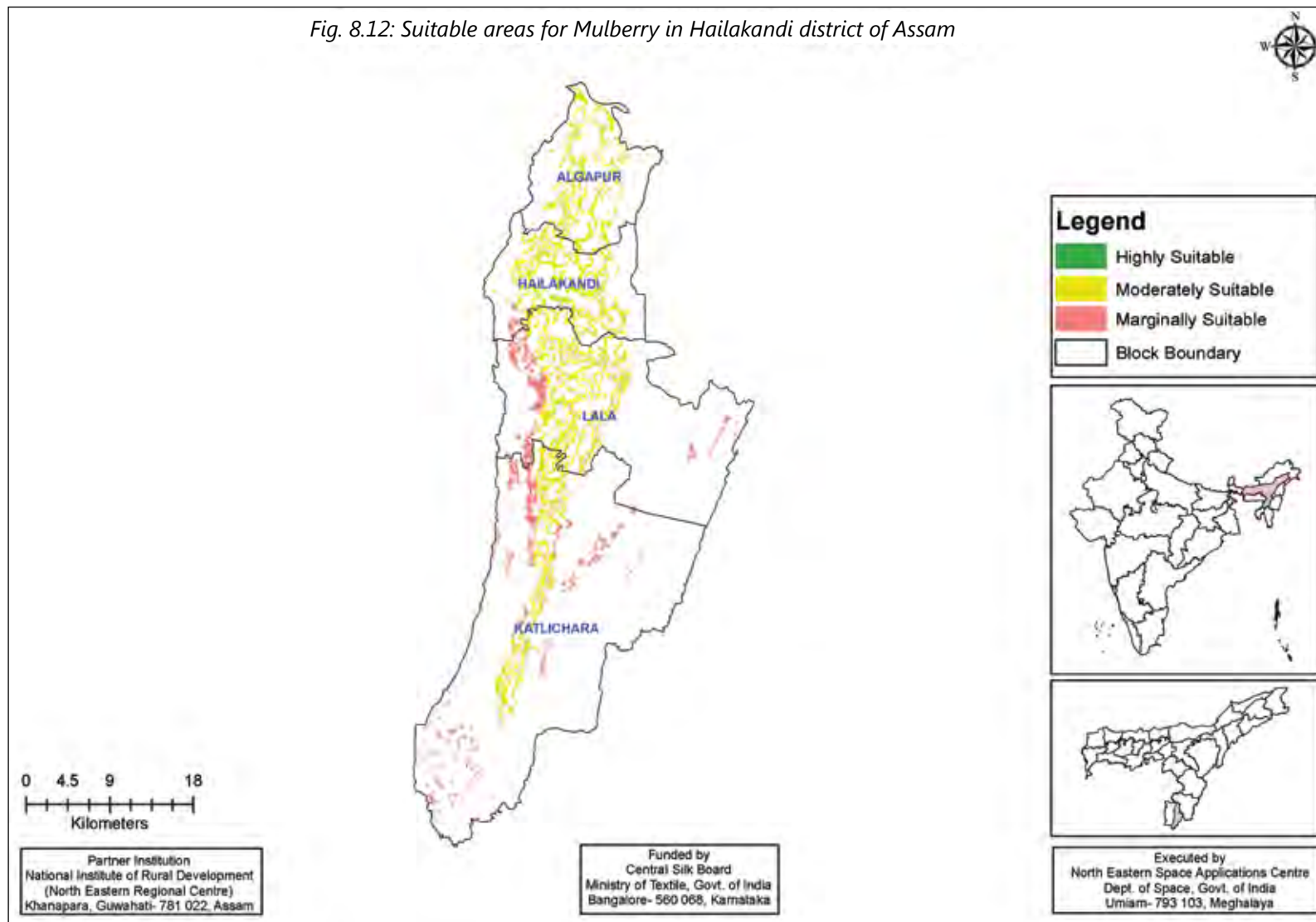
Table 9.9

| Block      | Suitable areas for Mulberry (ha) |          |          |          |
|------------|----------------------------------|----------|----------|----------|
|            | High                             | Moderate | Marginal | Total    |
| Algapur    | -                                | 2747.99  | 51.33    | 2799.32  |
| Hailakandi | -                                | 3345.49  | 213.67   | 3559.16  |
| Katlichara | -                                | 2782.59  | 2428.43  | 5211.02  |
| Lala       | -                                | 4342.11  | 1564.69  | 5906.80  |
| Total      | -                                | 13218.17 | 4258.12  | 17476.29 |

Table 9.10

| Block      | Suitable areas for Muga (ha) |          |          |          |
|------------|------------------------------|----------|----------|----------|
|            | High                         | Moderate | Marginal | Total    |
| Algapur    | 823.94                       | 1113.04  | 1108.98  | 3045.96  |
| Hailakandi | 1290.44                      | 1757.44  | 664.52   | 3712.41  |
| Katlichara | 1710.85                      | 2224.08  | 1343.12  | 5278.05  |
| Lala       | 1300.87                      | 3046.95  | 2191.68  | 6539.51  |
| Total      | 5126.10                      | 8141.52  | 5308.3   | 18575.92 |

Fig. 8.12: Suitable areas for Mulberry in Hailakandi district of Assam



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Fig. 8.13: Suitable areas for Muga in Hailakandi district of Assam

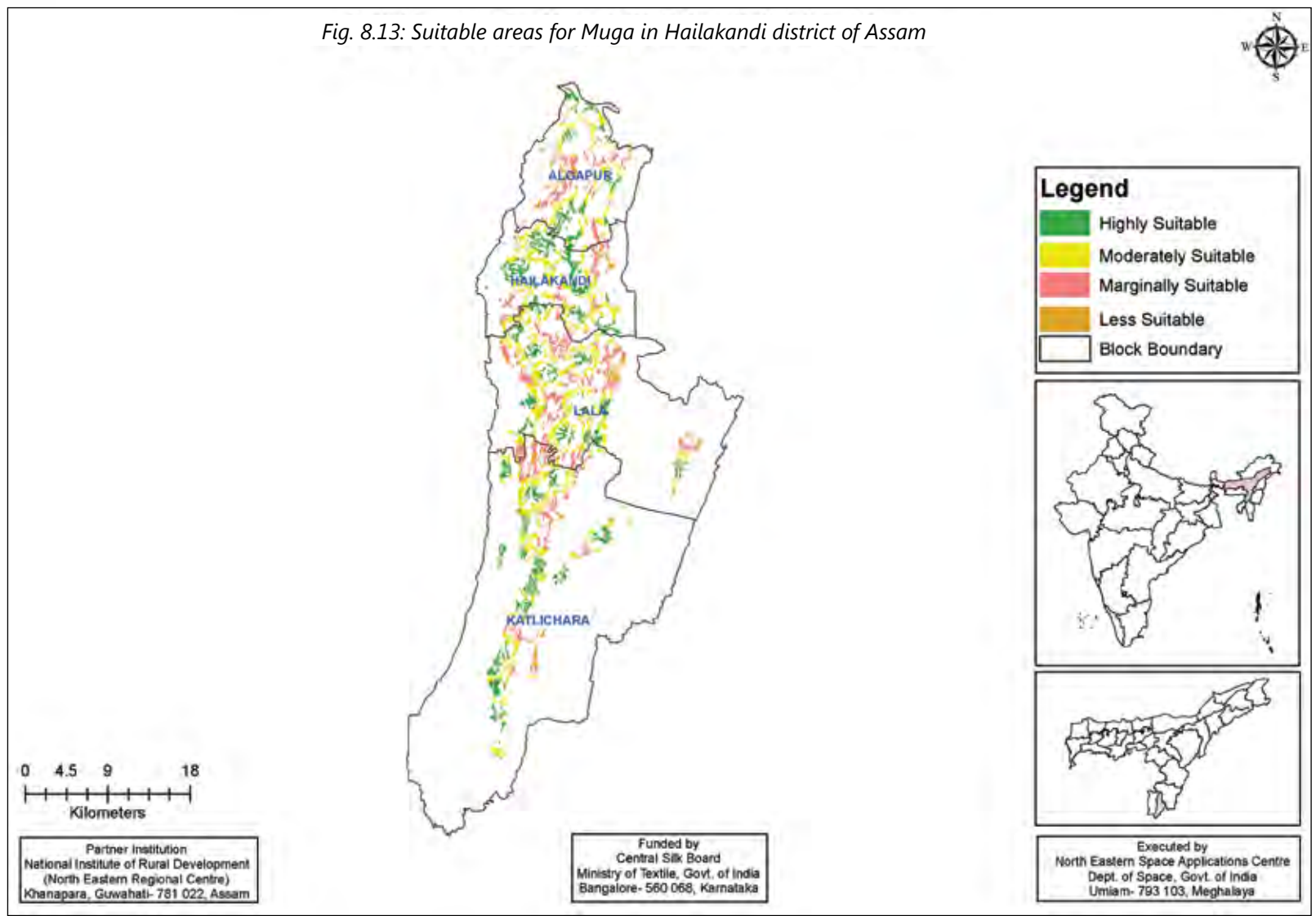
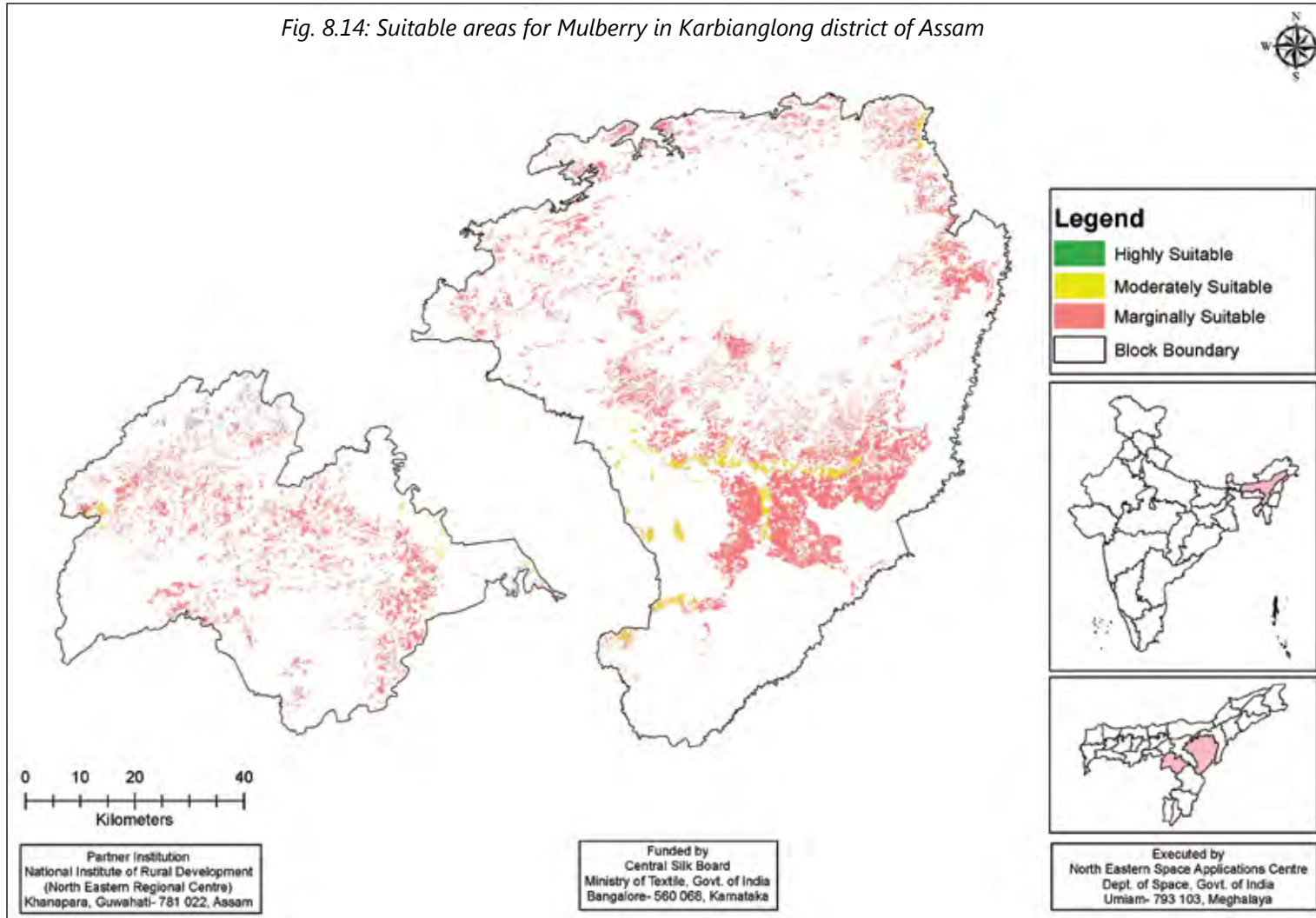


Table 9.II: Suitable Areas for Mulberry, Eri, Muga and Tasar in Karbianglong District of Assam

| Suitability Class | Suitable areas (ha) |           |           |          |
|-------------------|---------------------|-----------|-----------|----------|
|                   | Mulberry            | Eri       | Muga      | Tasar    |
| High              | 5.41                | 23664.91  | 44995.39  | -        |
| Moderate          | 6478.40             | 57770.52  | 100367.52 | -        |
| Marginal          | 107565.12           | 86940.67  | 117802.1  | 10047.71 |
| Total             | 114048.93           | 168376.09 | 263164.99 | 10047.71 |

Fig. 8.14: Suitable areas for Mulberry in Karbianglong district of Assam



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Fig. 8.15: Suitable areas for Eri in Karbianglong district of Assam

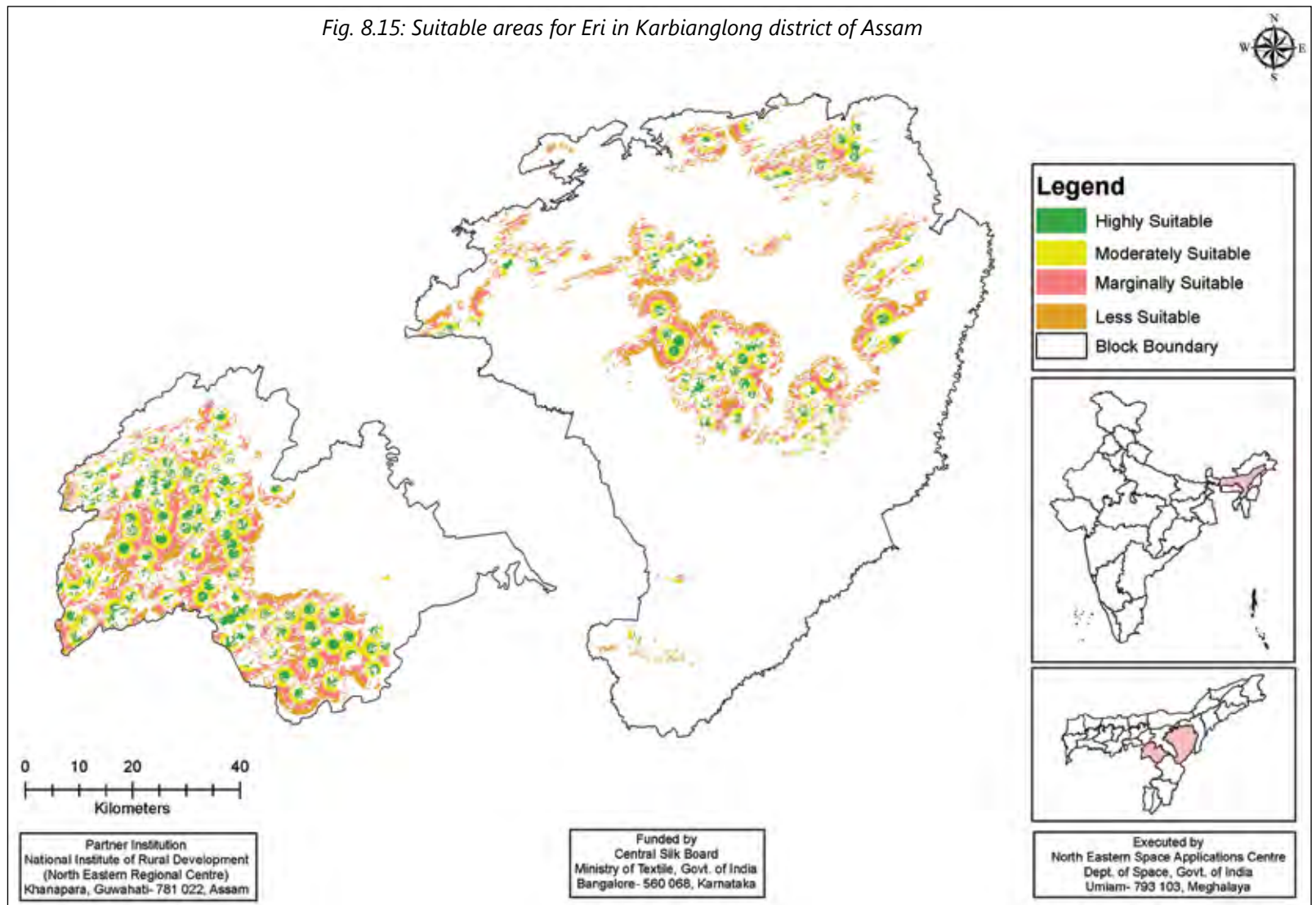
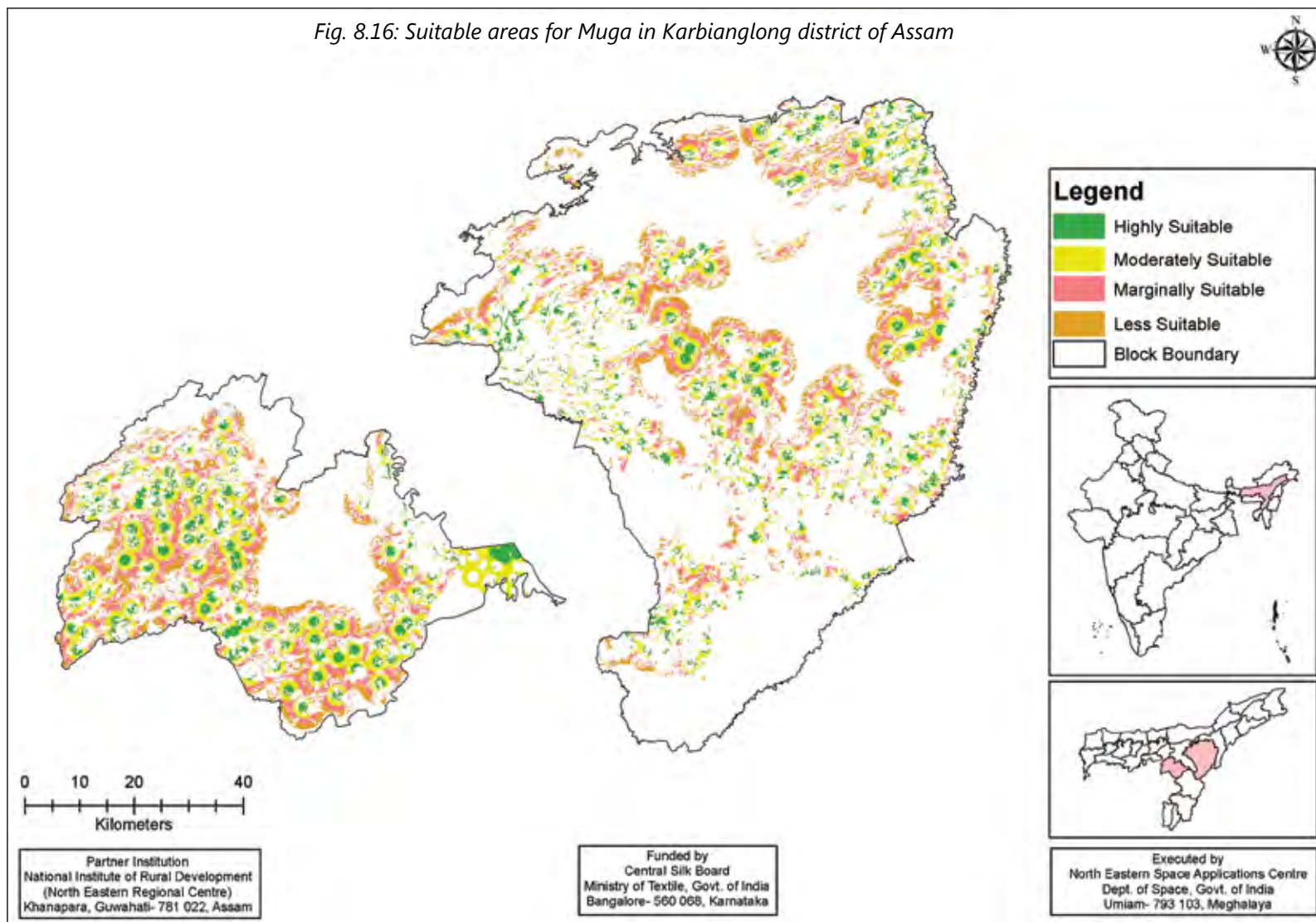


Fig. 8.16: Suitable areas for Muga in Karbianglong district of Assam



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Fig. 8.17: Suitable areas for Tasar in Karbianglong district of Assam

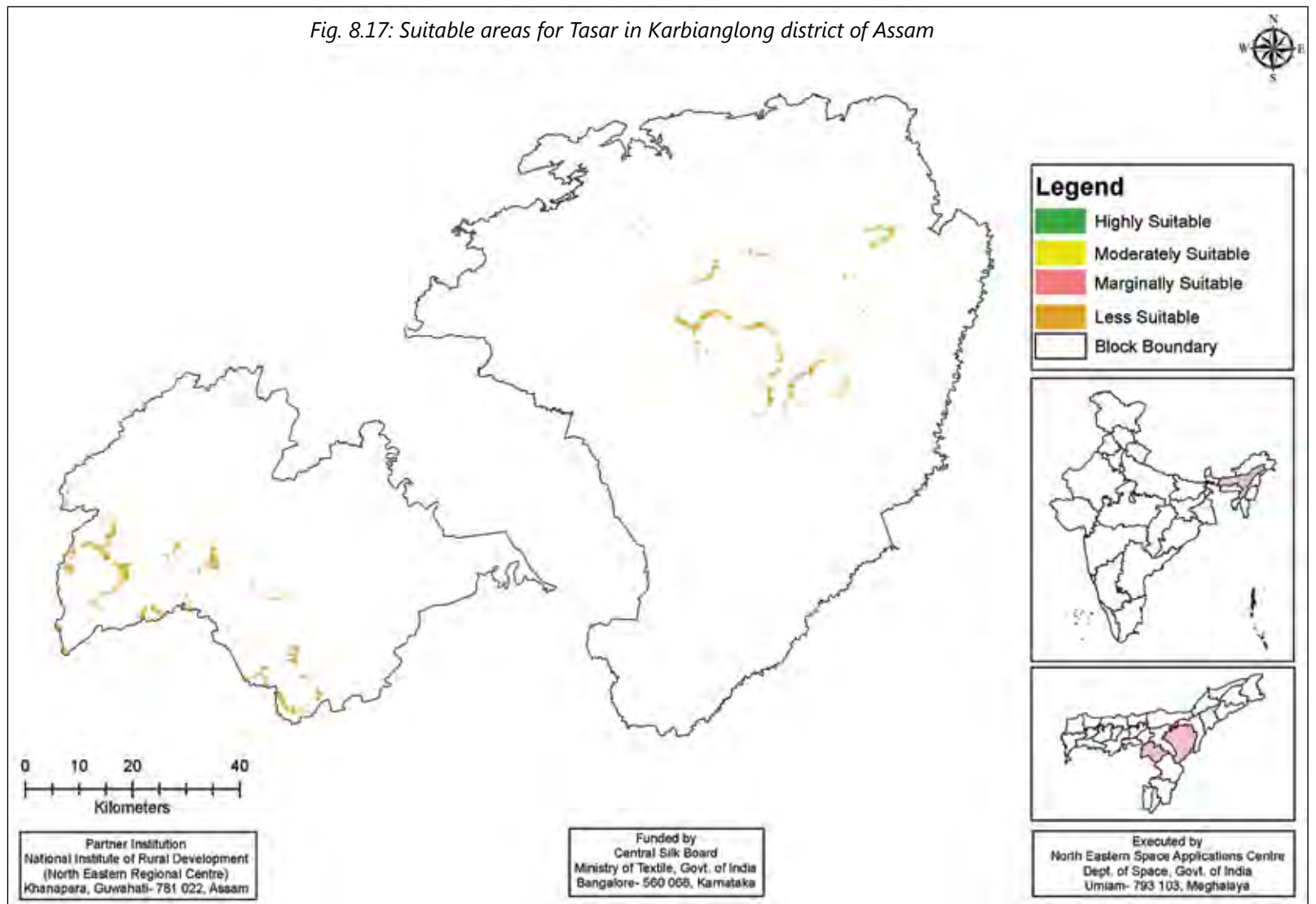


Table 9.12-9.13: Suitable Areas for Mulberry & Muga in Karimganj District of Assam

Tables 9.12

| Block          | Suitable areas for Mulberry (ha) |          |          |          |
|----------------|----------------------------------|----------|----------|----------|
|                | High                             | Moderate | Marginal | Total    |
| Forest         | -                                | 1036.60  | 2445.81  | 3482.40  |
| Karimganj      | -                                | 6998.89  | 267.69   | 7266.57  |
| Nilambazar     | -                                | 4329.07  | 131.24   | 4460.31  |
| Patherkandi    | -                                | 2375.58  | 852.36   | 3227.94  |
| Ramkrisnanagar | -                                | 6105.04  | 673.12   | 6778.16  |
| Total          | -                                | 20845.17 | 4370.22  | 25215.39 |

Table 9.13

| Block          | Suitable areas for Muga (ha) |          |          |          |
|----------------|------------------------------|----------|----------|----------|
|                | High                         | Moderate | Marginal | Total    |
| Forest         | 902.10                       | 1262.38  | 513.31   | 2677.79  |
| Karimganj      | 1236.08                      | 1946.06  | 3664.68  | 6846.82  |
| Nilambazar     | 0.84                         | 108.88   | 666.6    | 776.32   |
| Patherkandi    | 1209.06                      | 1406.09  | 1681.81  | 4296.96  |
| Ramkrisnanagar | 1356.66                      | 2597.34  | 2497.85  | 6451.84  |
| Total          | 4704.74                      | 7320.73  | 9024.25  | 21049.73 |

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Fig. 8.18: Suitable areas for Mulberry in Karimganj district of Assam

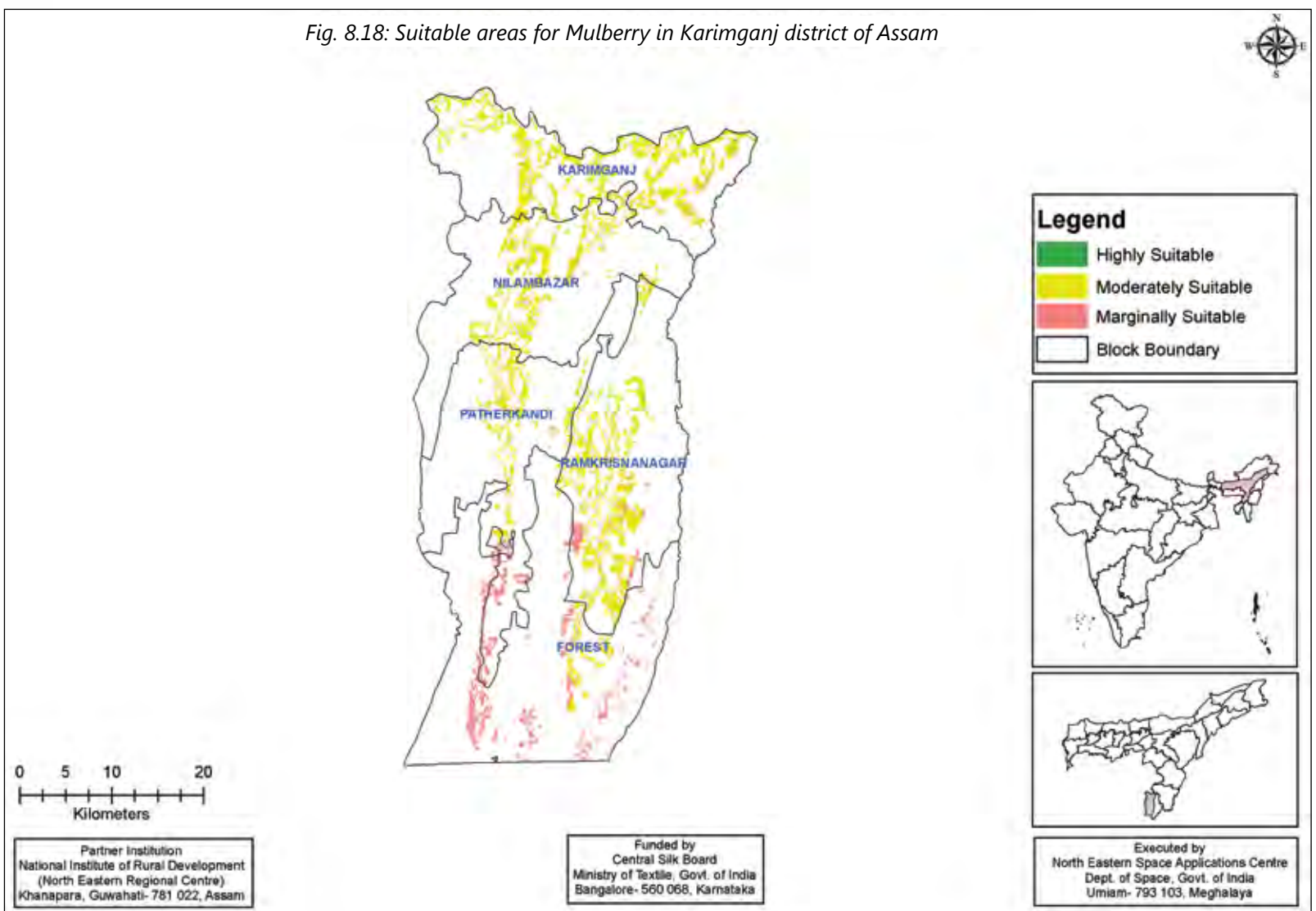
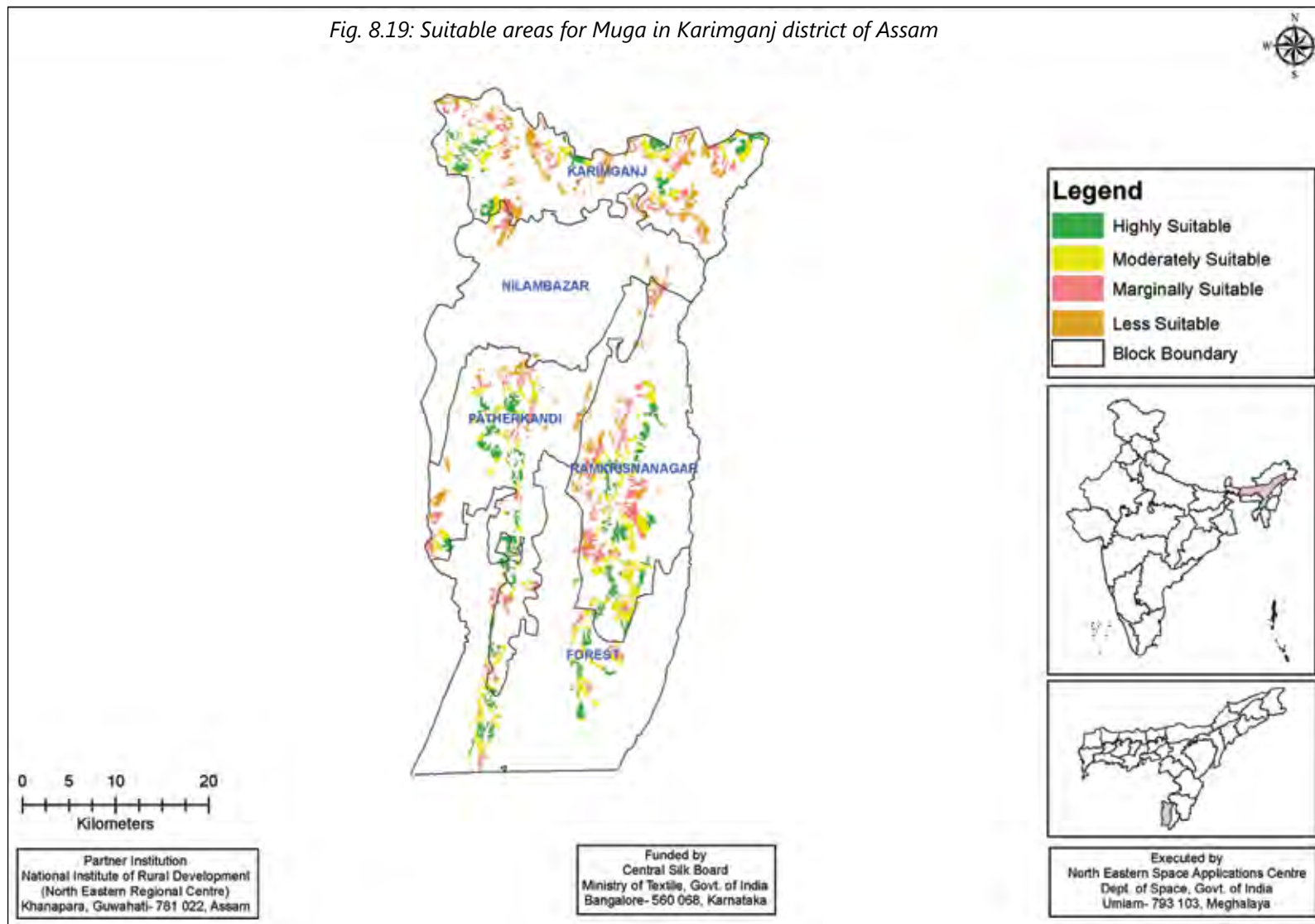


Fig. 8.19: Suitable areas for Muga in Karimganj district of Assam



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Tables 9.14-9.16: Suitable Areas for Mulberry, Eri, Tasar & Muga in Lakhimpur District of Assam

Table 9.14

| Block       | Suitable areas for Mulberry (ha) |          |          |          |
|-------------|----------------------------------|----------|----------|----------|
|             | High                             | Moderate | Marginal | Total    |
| Bihpuria    | 460.27                           | 4779.58  | 5085.29  | 10325.14 |
| Dhakuakhana | -                                | -        | 7815.61  | 7815.61  |
| Kadam       | 12.59                            | 1560.44  | 4082.71  | 5655.75  |
| N.Lakhimpur | 186.92                           | 3293.43  | 7063.16  | 10543.52 |
| Naobaicha   | -                                | 3600.58  | 4609.97  | 8210.54  |
| Narayanpur  | 507.26                           | 2303.14  | 9200.60  | 12011.00 |
| Subansiri   | -                                | -        | 5082.09  | 5082.09  |
| (Blank)     | -                                | 143.66   | 1440.08  | 1583.74  |
| Total       | 1167.05                          | 15680.82 | 44379.52 | 61227.40 |

Table 9.15

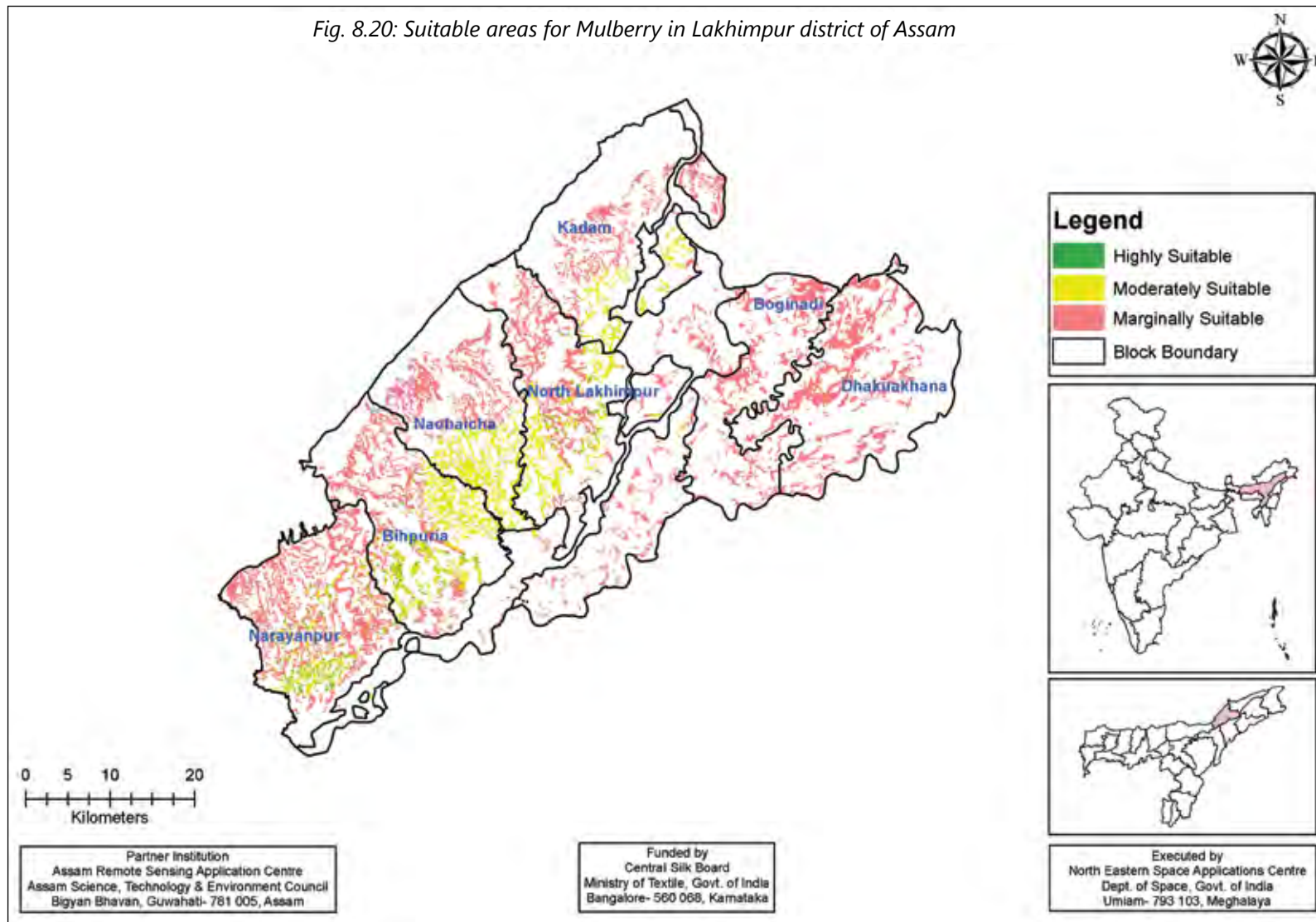
| Block       | Suitable areas for Eri & Tasar (ha) |          |          |          |
|-------------|-------------------------------------|----------|----------|----------|
|             | High                                | Moderate | Marginal | Total    |
| Bihpuria    | 7072.66                             | 1924.71  | 1011.77  | 10009.14 |
| Dhakuakhana | 5711.59                             | 1290.06  | 595.27   | 7596.93  |
| Kadam       | 2381.68                             | 857.59   | 1981.81  | 5221.08  |
| N.Lakhimpur | 7016.58                             | 1196.02  | 1883.28  | 10095.88 |
| Naobaicha   | 4389.49                             | 2266.75  | 1217.17  | 7873.41  |
| Narayanpur  | 10578.19                            | 1116.44  | 95.98    | 11790.61 |
| Subansiri   | 3852.31                             | 945.40   | 502.92   | 5300.63  |
| (Blank)     | 489.74                              | 275.40   | 971.67   | 1736.82  |
| Total       | 41492.24                            | 9872.37  | 8259.87  | 59624.48 |

Table 9.16

| Block       | Suitable areas for Muga (ha) |          |          |          |
|-------------|------------------------------|----------|----------|----------|
|             | High                         | Moderate | Marginal | Total    |
| Bihpuria    | 1720.08                      | 2222.54  | 6066.52  | 10009.14 |
| Dhakuakhana | 208.38                       | 420.33   | 6968.22  | 7596.93  |
| Kadam       | 1250.28                      | 1035.53  | 2935.27  | 5221.08  |
| N.Lakhimpur | 2090.18                      | 1678.63  | 6327.06  | 10095.88 |
| Naobaicha   | 2619.24                      | 1875.65  | 3378.52  | 7873.41  |
| Narayanpur  | 4078.27                      | 2634.94  | 5077.4   | 11790.61 |
| Subansiri   | 20.01                        | 49.42    | 5231.19  | 5300.63  |
| (Blank)     | 9.69                         | 40.40    | 1686.72  | 1736.82  |
| Total       | 11996.12                     | 9957.46  | 37670.89 | 59624.48 |



Fig. 8.20: Suitable areas for Mulberry in Lakhimpur district of Assam



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Fig. 8.21: Suitable areas for Eri & Tasar in Lakhimpur district of Assam

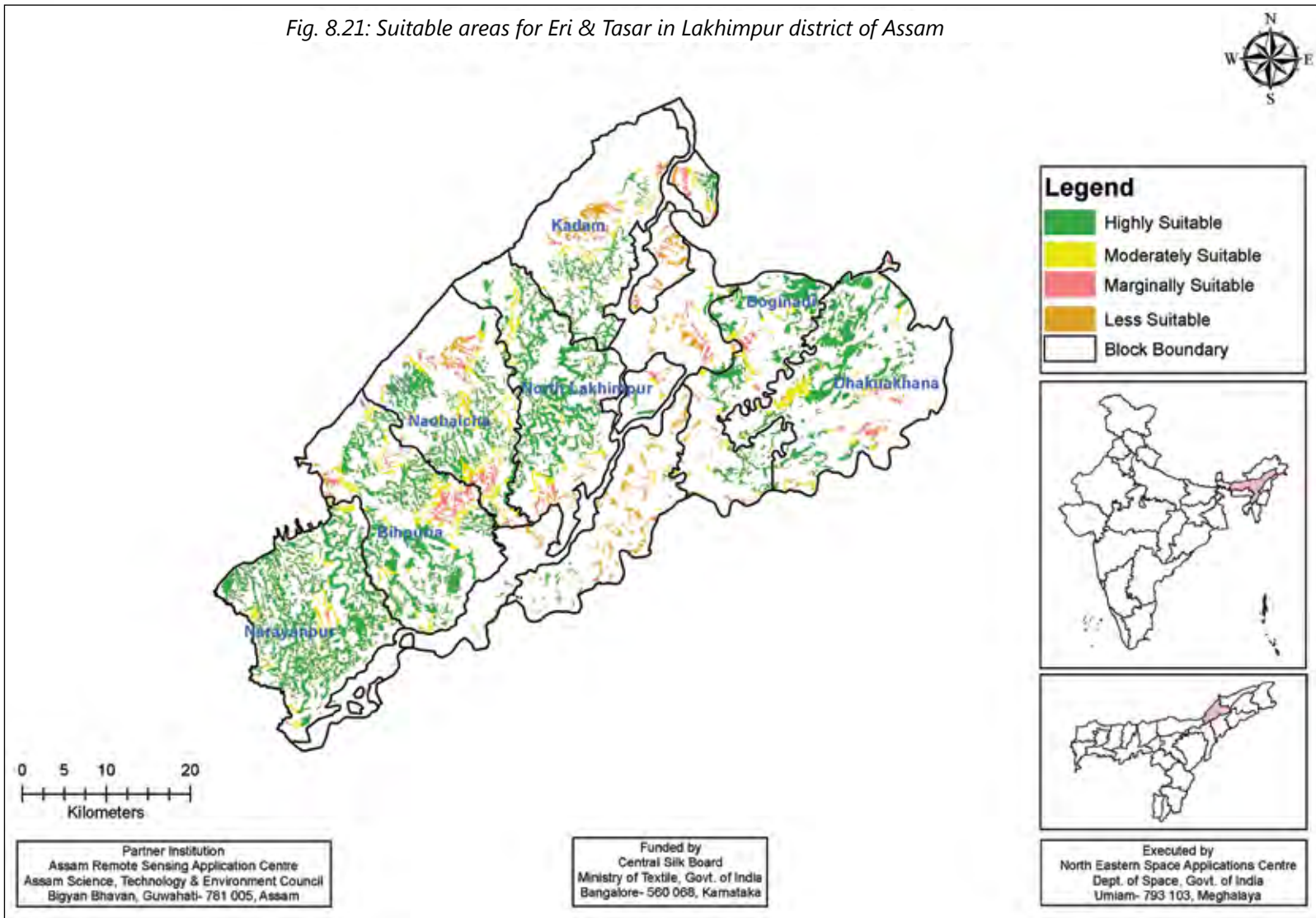
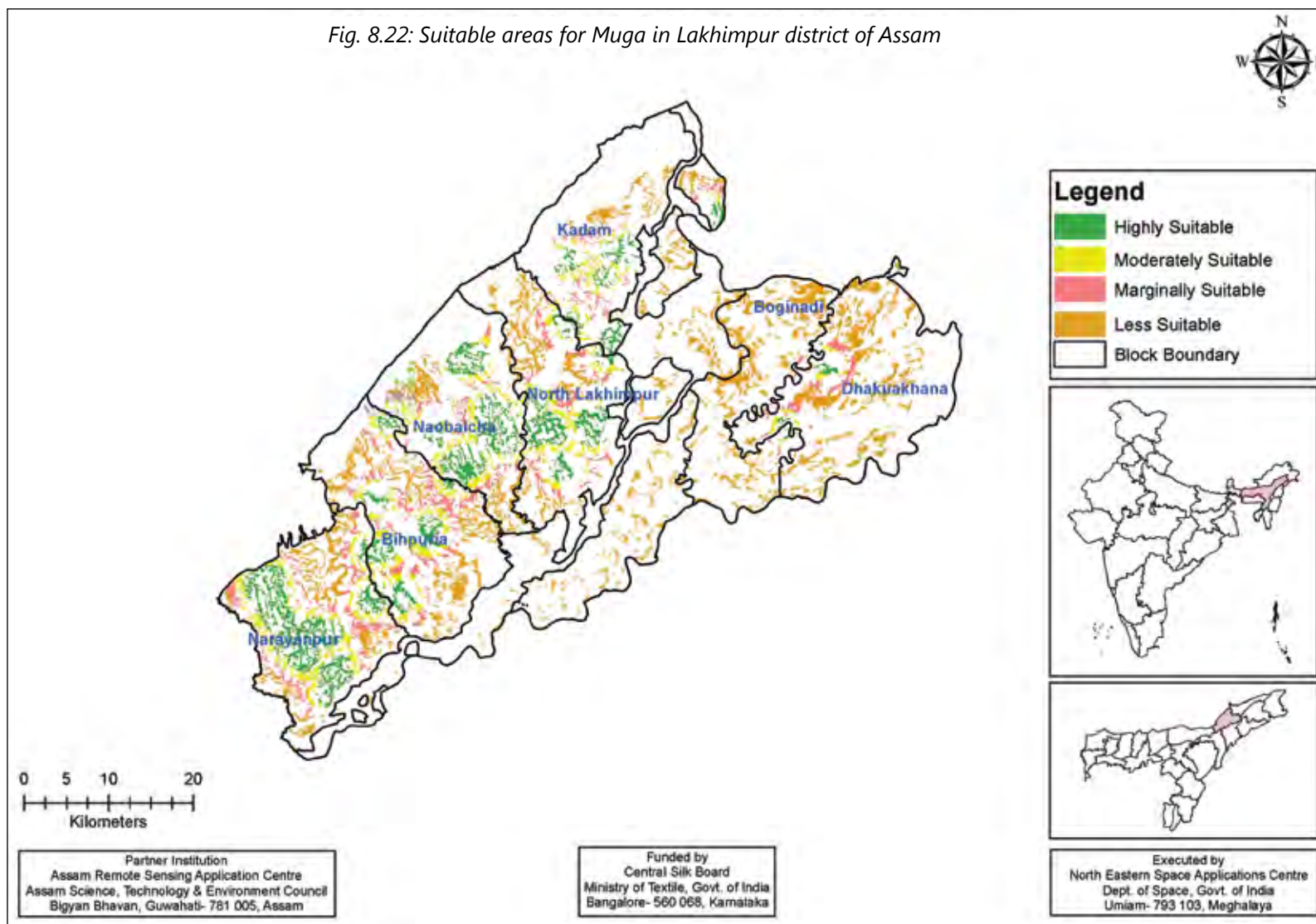


Fig. 8.22: Suitable areas for Muga in Lakhimpur district of Assam



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Tables 9.17-9.18: Suitable Areas for Mulberry & Non-Mulberry in Udalguri District of Assam

Tables 9.17

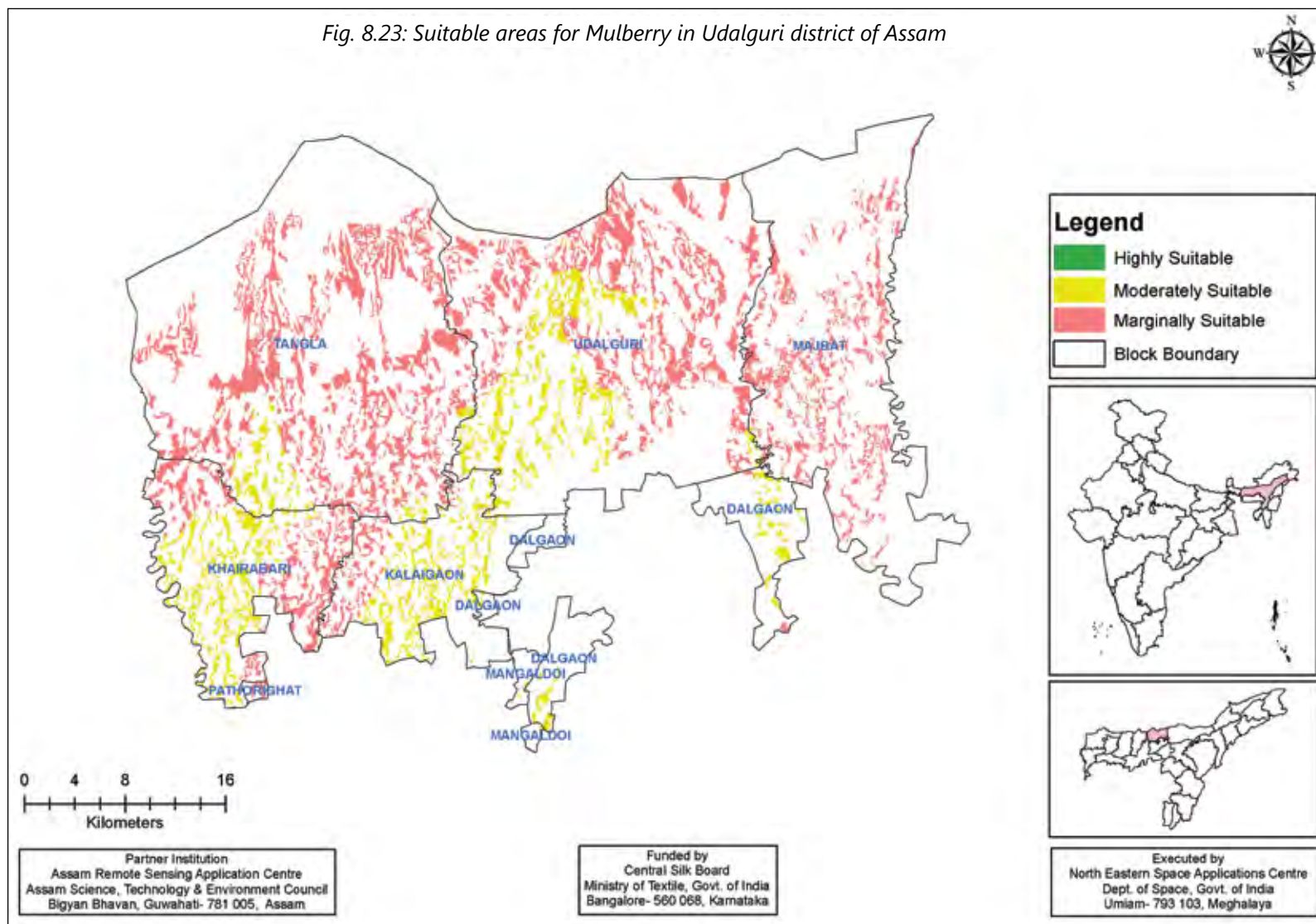
| Block       | Suitable area for Mulberry (ha) |          |          |          |
|-------------|---------------------------------|----------|----------|----------|
|             | High                            | Moderate | Marginal | Total    |
| Dalgaon     | -                               | 761.32   | 84.43    | 845.75   |
| Kalaigaon   | -                               | 2494.91  | 916.05   | 3410.97  |
| Khairabari  | -                               | 2674.96  | 2756.95  | 5431.91  |
| Majbat      | -                               | 70.92    | 4893.73  | 4964.65  |
| Mangaldoi   | -                               | 31.74    | 1.24     | 32.98    |
| Pathorighat | -                               | -        | 88.98    | 88.98    |
| Tangla      | -                               | 1046.65  | 12397.76 | 13444.41 |
| Udalguri    | -                               | 3787.34  | 9071.29  | 12858.63 |
| Total       | -                               | 10867.85 | 30210.44 | 41078.28 |

Table 9.18

| Block       | Suitable area for Eri, Muga & Tasar(ha) |          |          |          |
|-------------|---|----------|----------|----------|
|             | High                                    | Moderate | Marginal | Total    |
| Dalgaon     | 801.36                                  | 450.26   | 998.66   | 2250.29  |
| Kalaigaon   | 2020.50                                 | 846.50   | 1322.28  | 4189.28  |
| Khairabari  | 5117.65                                 | 280.07   | 34.19    | 5431.91  |
| Majbat      | 3425.87                                 | 792.56   | 764.83   | 4983.26  |
| Mangaldoi   | -                                       | 10.52    | 120.3    | 130.82   |
| Pathorighat | 78.23                                   | 10.75    | -        | 88.98    |
| Tangla      | 7255.84                                 | 2685.08  | 3506.46  | 13447.38 |
| Udalguri    | 8640.35                                 | 3836.32  | 1809.51  | 14286.18 |
| Total       | 27339.80                                | 8912.07  | 8556.24  | 44808.10 |



Fig. 8.23: Suitable areas for Mulberry in Udalguri district of Assam

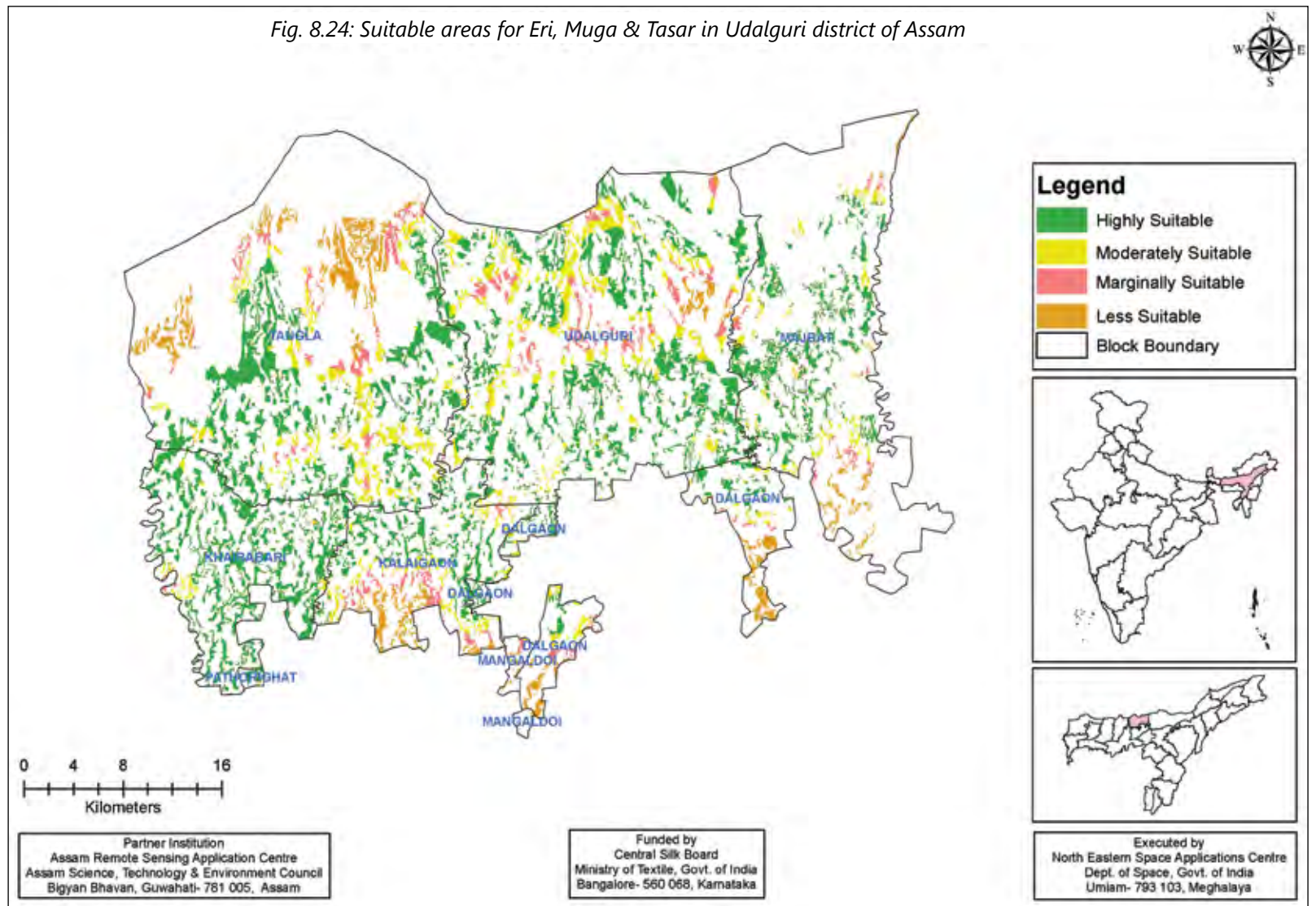


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Fig. 8.24: Suitable areas for Eri, Muga & Tasar in Udalguri district of Assam



## BIHAR

Bihar is situated in northern India covering an area of 94,163 Sq.km. It is located within 24°20'10" to 27°31'15" North latitude and 83°19'50" to 88°17'40" East longitude at 173 ft above sea level having average rainfall of about 1176 mm. The state is bounded by Uttar Pradesh to its west, Nepal to the north, Northern part of West Bengal to the east and by Jharkhand to the south. Bihar is a vast stretch of fertile plain and is divided into two parts by the river Ganges which flows through the middle from west to east. The state has a diverse climate with hot summers and cool winters.

In Bihar approx. there are 22,600 handlooms and 45,500 weavers are working directly or indirectly in reeling, spinning and weaving of silk related fabrics. Bhagalpur is one of the prominent clusters for this avocation. There are 8 Mulberry extension cum training centers, 4 mulberry sub centers , 2 Mulberry reeling training centers, 1 mulberry farm, 5 Tasar pilot project centers and 1 Tasar marketing organization , 1 Eri farm and 1 Bihar Institute of Silk and textile at Bihar state. Three districts viz.,Bhagalpur, Gaya and Munger were covered under the project.

### **Bhagalpur**

Bhagalpur district is one of the important districts of Bihar state and Bhagalpur town is the administrative headquarters of this district. It is a part of Bhagalpur Division. It occupies an area of 2,569 sq km and lies between 25.07'N - 25.30'N Latitude and between 86.37'E - 87.30'E Longitude. It occupies an area of 2,569 Sq.km. The district is surrounded by Munger, Khagaria, Madhepura, Purnea, Kathiar & Banka districts of Bihar and Godda & Sahebganj districts of Jharkhand.

### **Gaya**

Gaya is one of the very old districts of Bihar state. The district is having a common boundary with Jharkhand state in the south. Gaya city is its largest city and the district headquarters. Gaya district occupies an area of 4,976 sq. km. It is surrounded by Aurangabad and Jahanabad districts in west and Nawada and Nalanda districts in the east and North. It lies between Latitude 24°5 to 25 °10 N and Longitudes 84° 4 to 85° 5 E.

### **Munger**

Munger District is located in the southern part of Bihar and it's headquarter is located on the southern bank of river Ganges. The district is spread over 1419.7 Sq. km. accounting for 3.3% of the area of Bihar . It lies between 24 22 N to 25 30 N latitude and 85 30 E to 87 3 E longitude.

Tables 10.1-10.2: Suitable Areas for Mulberry & Eri in Bhagalpur District of Bihar

Table 10.1

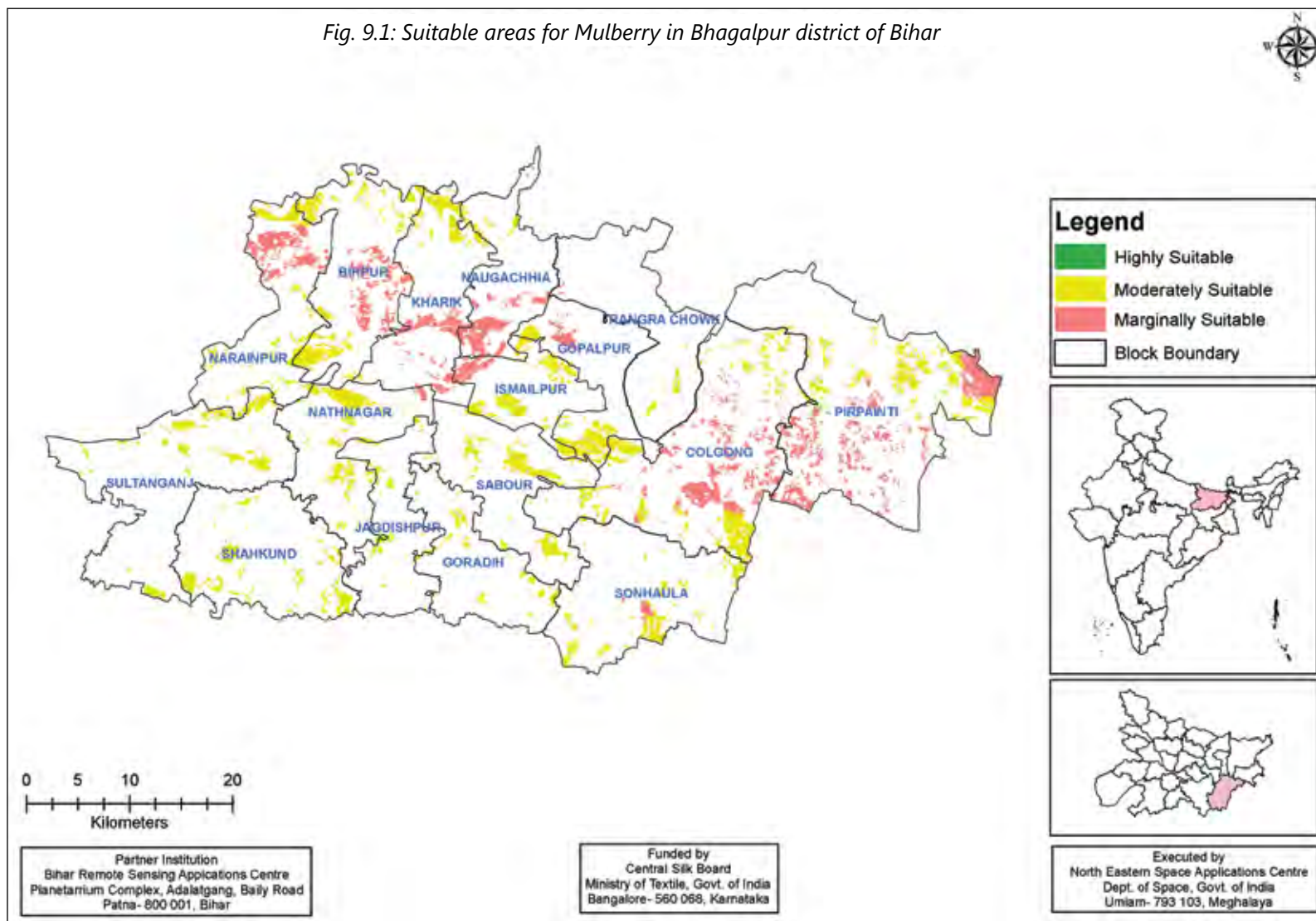
| Block        | Suitable Areas for Mulberry (ha) |          |          |          |
|--------------|----------------------------------|----------|----------|----------|
|              | High                             | Moderate | Marginal | Total    |
| Bihpur       | -                                | 1809.23  | 1172.28  | 2981.51  |
| Colgong      | -                                | 2554.64  | 2345.89  | 4900.53  |
| Gopalpur     | -                                | 1182.59  | 325.48   | 1508.07  |
| Goradih      | -                                | 606.61   | -        | 606.61   |
| Ismailpur    | -                                | 1339.26  | 467.59   | 1806.85  |
| Jagdishpur   | -                                | 444.36   | 3.38     | 447.74   |
| Kharik       | -                                | 936.93   | 976.02   | 1912.95  |
| Narainpur    | -                                | 1168.99  | 1305.60  | 2474.58  |
| Nathnagar    | -                                | 1556.46  | 87.54    | 1643.99  |
| Naugachhia   | -                                | 266.85   | 1151.81  | 1418.66  |
| Pirpainti    | -                                | 2042.91  | 3168.65  | 5211.56  |
| Rangra Chowk | -                                | 196.83   | 37.45    | 234.27   |
| Sabour       | -                                | 1394.83  | -        | 1394.83  |
| Shahkund     | -                                | 1291.50  | 32.84    | 1324.34  |
| Sonhaura     | -                                | 1267.19  | 147.06   | 1414.26  |
| Sultanganj   | -                                | 1470.79  | 4.87     | 1475.66  |
| Total        | -                                | 19529.97 | 11226.46 | 30756.43 |

Table 10.2

| Block        | Suitable Areas for Eri (ha) |          |
|--------------|-----------------------------|----------|
|              | High                        | Moderate |
| Bihpur       | 3642.22                     | 3642.22  |
| Colgong      | 5164.37                     | 5164.37  |
| Gopalpur     | 3293.25                     | 3293.25  |
| Goradih      | 1104.31                     | 1104.31  |
| Ismailpur    | 3103.73                     | 3103.73  |
| Jagdishpur   | 509.32                      | 509.32   |
| Kharik       | 2542.90                     | 2542.90  |
| Narainpur    | 3565.01                     | 3565.01  |
| Nathnagar    | 2139.47                     | 2139.47  |
| Naugachhia   | 1904.63                     | 1904.63  |
| Pirpainti    | 7205.22                     | 7205.22  |
| Rangra Chowk | 3575.84                     | 3575.84  |
| Sabour       | 2126.61                     | 2126.61  |
| Shahkund     | 1370.36                     | 1370.36  |
| Sonhaura     | 1449.07                     | 1449.07  |
| Sultanganj   | 2119.02                     | 2119.02  |
| Total        | 44815.35                    | 44815.35 |



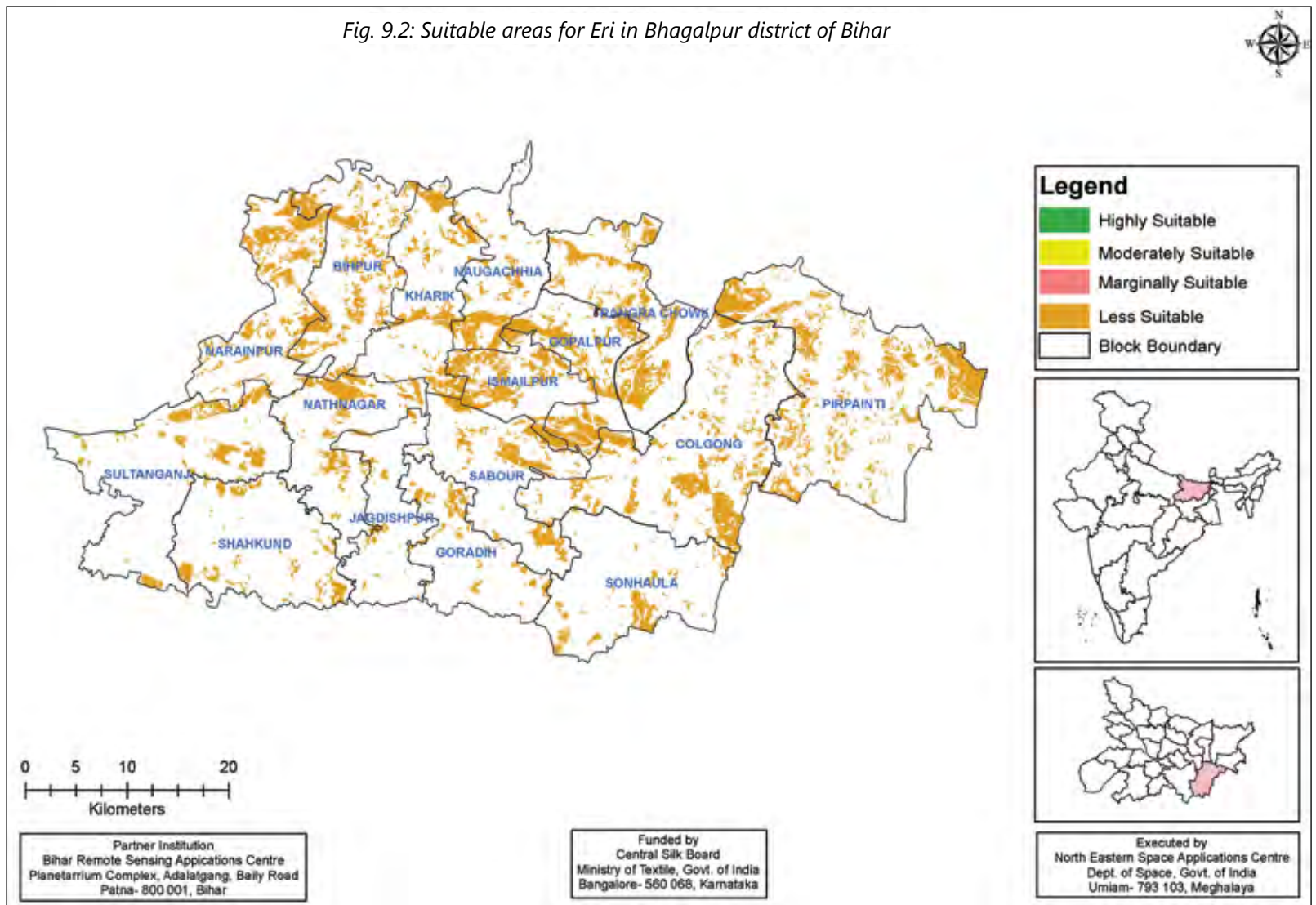
Fig. 9.1: Suitable areas for Mulberry in Bhagalpur district of Bihar



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Fig. 9.2: Suitable areas for Eri in Bhagalpur district of Bihar



Tables 10.3-10.4: Suitable Areas for Mulberry & Eri in Gaya District of Bihar

Table 10.3

| Block       | Suitable Areas for Mulberry (ha) |          |          |          |
|-------------|----------------------------------|----------|----------|----------|
|             | High                             | Moderate | Marginal | Total    |
| Amas        | -                                | 1008.01  | 4823.06  | 5831.07  |
| Atri        | -                                | 3156.75  | 2443.80  | 5600.55  |
| Barachatti  | -                                | 3461.76  | 337.43   | 3799.18  |
| Belaganj    | -                                | 1176.02  | 184.16   | 1360.18  |
| Bodh Gaya   | -                                | 731.21   | 25.02    | 756.23   |
| Dumaria     | -                                | 3707.42  | 2846.57  | 6553.99  |
| Fatehpur    | -                                | 5418.57  | 537.63   | 5956.21  |
| Garua       | -                                | 141.25   | 76.00    | 217.25   |
| Gaya        | -                                | 339.88   | 8.65     | 348.52   |
| Imamganj    | -                                | 1806.82  | 9238.32  | 11045.14 |
| Khizirsaral | -                                | 24.47    | 6.33     | 30.80    |
| Konch       | -                                | 211.68   | 1531.49  | 1743.17  |
| Manpur      | -                                | 709.45   | 73.43    | 782.88   |
| Mohanpur    | -                                | 4426.31  | 269.66   | 4695.97  |
| Paraiya     | -                                | 2214.06  | 560.99   | 2775.05  |
| Sherghati   | -                                | 395.15   | 821.81   | 1216.96  |
| Tikari      | -                                | 1800.50  | 377.89   | 2178.39  |
| Wazirganj   | -                                | 1821.29  | 301.27   | 2122.56  |
| Total       | -                                | 32550.59 | 24463.50 | 57014.09 |

Table 10.4

| Block       | Suitable Areas for Eri (ha) |           |
|-------------|-----------------------------|-----------|
|             | High                        | Moderate  |
| Amas        | 7917.00                     | 7917.00   |
| Atri        | 7953.35                     | 7953.35   |
| Barachatti  | 7961.27                     | 7961.27   |
| Belaganj    | 2847.10                     | 2847.10   |
| Bodh Gaya   | 5964.27                     | 5964.27   |
| Dumaria     | 6162.15                     | 6162.15   |
| Fatehpur    | 12929.84                    | 12929.84  |
| Garua       | 9265.97                     | 9265.97   |
| Gaya        | 3370.83                     | 3370.83   |
| Imamganj    | 11086.97                    | 11086.97  |
| Khizirsaral | 1600.56                     | 1600.56   |
| Konch       | 2927.25                     | 2927.25   |
| Manpur      | 1325.40                     | 1325.40   |
| Mohanpur    | 12123.25                    | 12123.25  |
| Paraiya     | 8826.39                     | 8826.39   |
| Sherghati   | 8536.18                     | 8536.18   |
| Tikari      | 3466.21                     | 3466.21   |
| Wazirganj   | 9199.78                     | 9199.78   |
| Total       | 123463.77                   | 123463.77 |

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Fig. 9.3: Suitable areas for Mulberry in Gaya district of Bihar

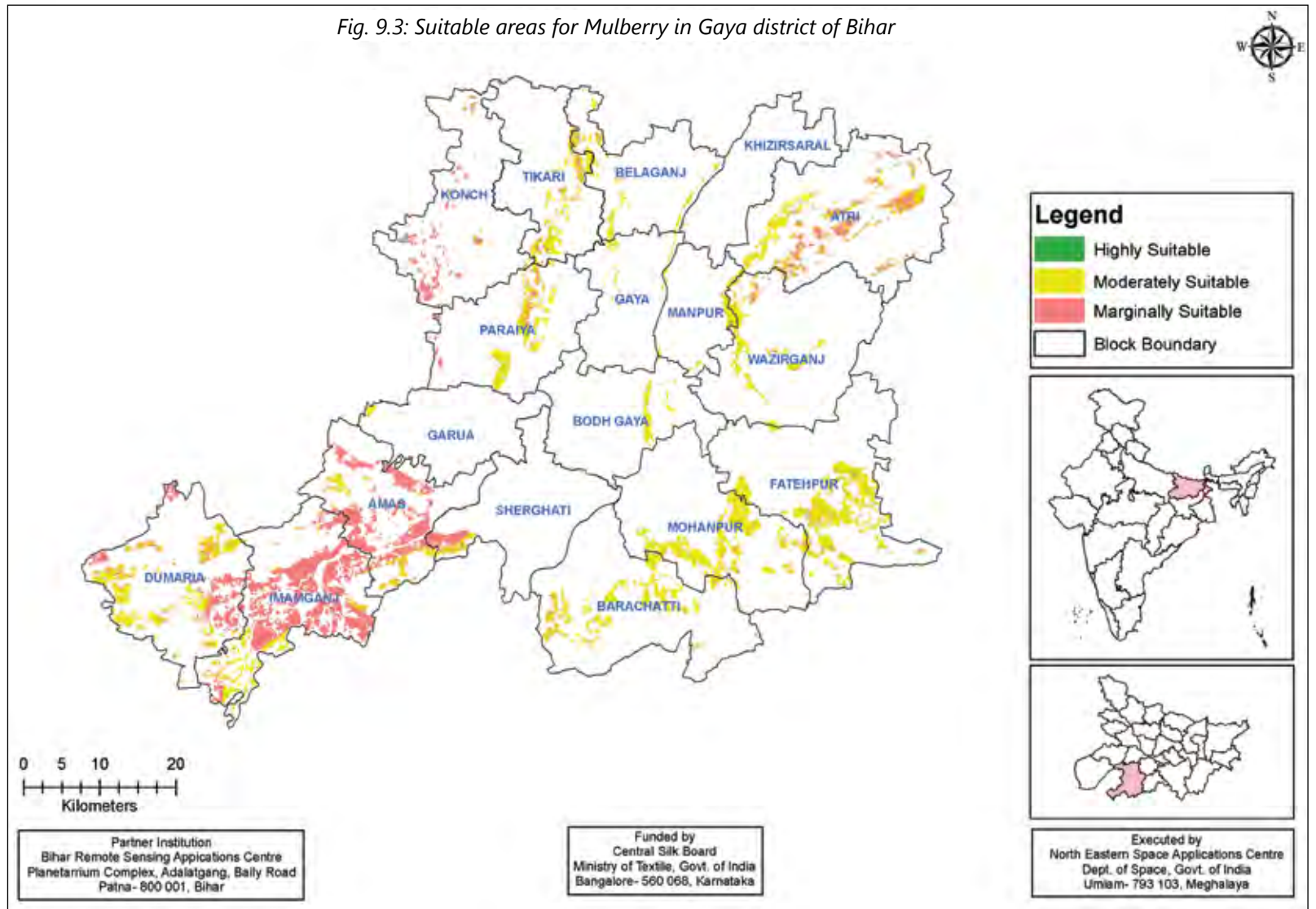
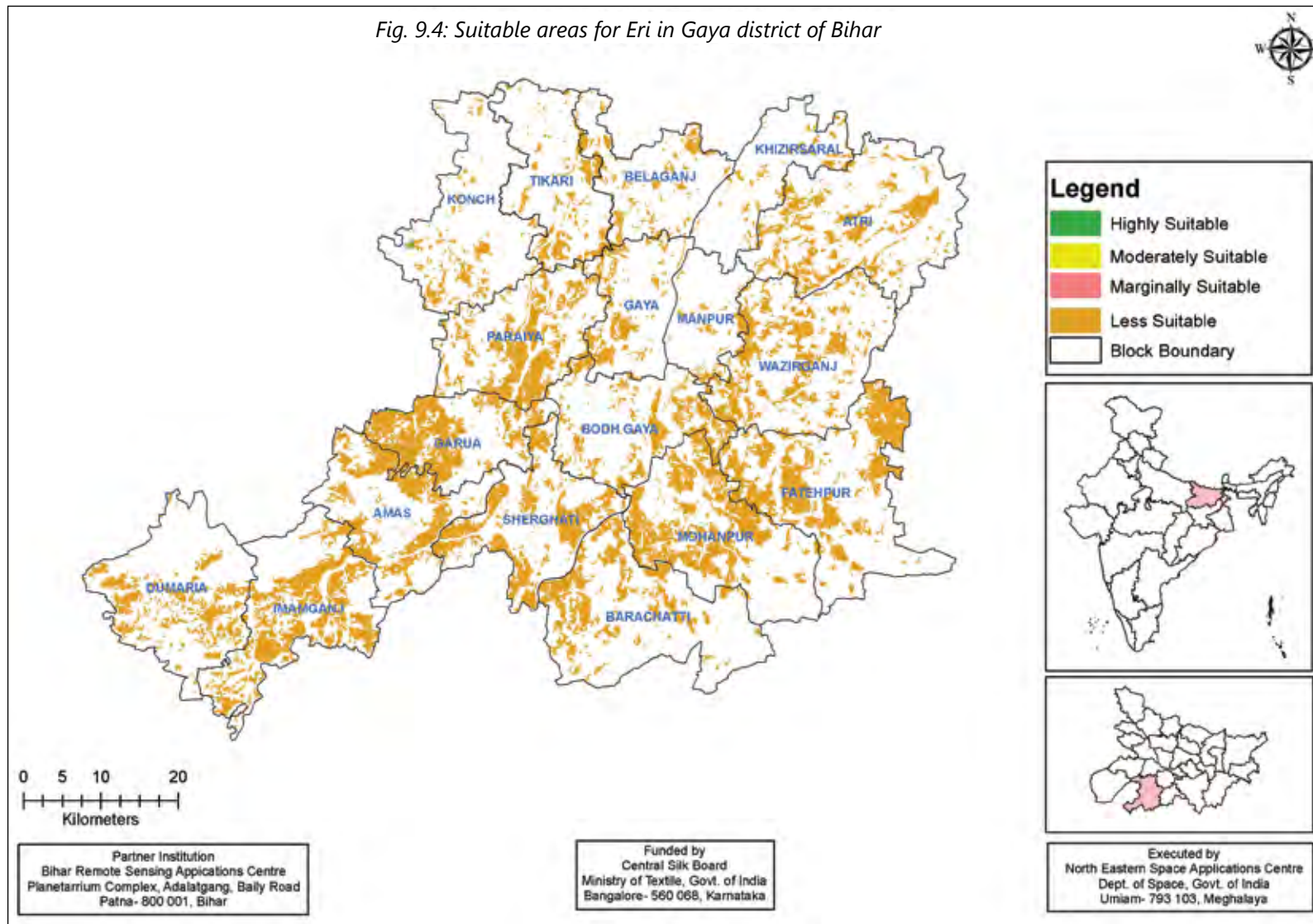


Fig. 9.4: Suitable areas for Eri in Gaya district of Bihar



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Tables 10.5-10.6: Suitable Areas for Mulberry & Eri in Munger District of Bihar

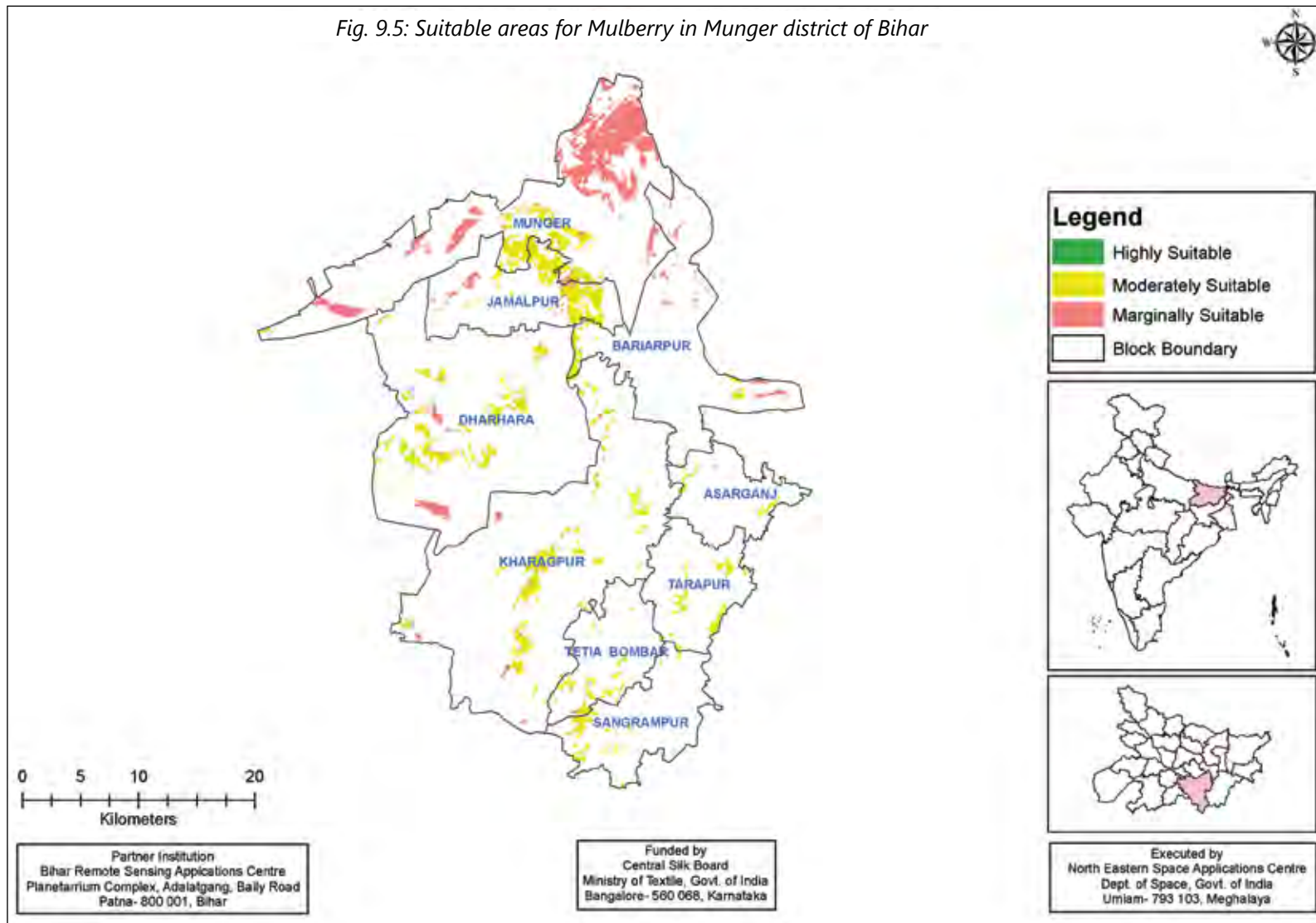
Table 10.5

| Block        | Suitable Areas for Mulberry (ha) |          |          |          |
|--------------|----------------------------------|----------|----------|----------|
|              | High                             | Moderate | Marginal | Total    |
| Asarganj     | -                                | 142.39   | 4.36     | 146.75   |
| Bariarpur    | -                                | 364.27   | 295.26   | 659.53   |
| Dharhara     | -                                | 1575.44  | 435.18   | 2010.62  |
| Jamalpur     | -                                | 1453.49  | 229.43   | 1682.92  |
| Kharagpur    | -                                | 1651.16  | 238.72   | 1889.88  |
| Munger       | -                                | 1387.59  | 4514.84  | 5902.44  |
| Sangrampur   | -                                | 405.54   | 20.05    | 425.59   |
| Tarapur      | -                                | 433.37   | -        | 433.37   |
| Tetia Bombar | -                                | 422.04   | 30.63    | 452.67   |
| Total        | -                                | 7835.28  | 5768.47  | 13603.75 |

Table 10.6

| Block        | Suitable Areas for Eri (ha) |          |
|--------------|-----------------------------|----------|
|              | Suitable                    | Total    |
| Asarganj     | 142.69                      | 142.69   |
| Bariarpur    | 2160.75                     | 2160.75  |
| Dharhara     | 6411.49                     | 6411.49  |
| Jamalpur     | 2444.90                     | 2444.90  |
| Kharagpur    | 7795.43                     | 7795.43  |
| Munger       | 4266.12                     | 4266.12  |
| Sangrampur   | 528.11                      | 528.11   |
| Tarapur      | 444.74                      | 444.74   |
| Tetia Bombar | 418.75                      | 418.75   |
| Total        | 24612.98                    | 24612.98 |

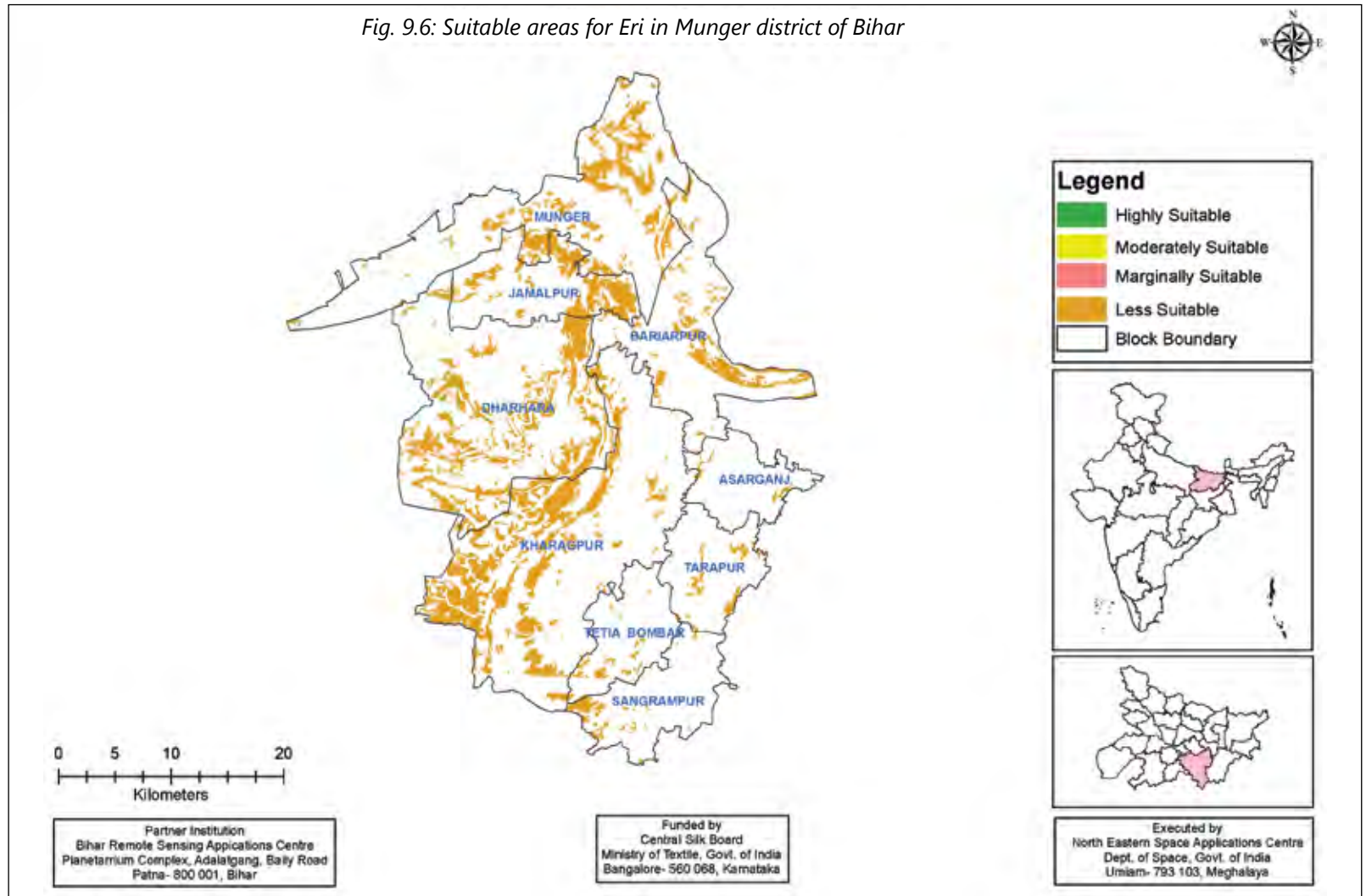
Fig. 9.5: Suitable areas for Mulberry in Munger district of Bihar



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Fig. 9.6: Suitable areas for Eri in Munger district of Bihar



## CHHATTISGARH

Chhattisgarh is the 10th largest state in India, with an area of 135,190 km<sup>2</sup>. With a population of 25.5 million, the state is a source of electricity and steel for India. The northern and southern parts of the state are hilly, while the central part is a fertile plain. In the north lies the edge of the great Indo-Gangetic plain. The Rihand River, a tributary of the Ganges, drains this area. The eastern end of the Satpura Range and the western edge of the Chota Nagpur Plateau form an east-west belt of hills that divide the Mahanadi River basin from the Indo-Gangetic plain. The central part of the state lies in the fertile upper basin of the Mahanadi river and its tributaries. This area has extensive rice cultivation. The upper Mahanadi basin is separated from the upper Narmada basin to the west by the Maikal Hills (part of the Satpuras) and from the plains of Odisha to the east by ranges of hills. The southern part of the state lies on the Deccan plateau, in the watershed of the Godavari River and its tributary, the Indravati River.

The climate of Chhattisgarh is tropical. It is hot and humid because of its proximity to the Tropic of Cancer and its dependence on the monsoons for rains. Among many agro based cottage industries, sericulture provides employment opportunities to significant numbers of poor and tribal population and economically weaker section of society in some of the districts of Chhattisgarh state. Two districts viz., Bastar and Raigarh were selected under the project.

### **Bastar**

Bastar district is located in the southern part of Chhattisgarh with an area of 4029.98 sq km and is situated at a height of 2000 ft plateau from sea level. Jagdalpur is the district headquarter of this district. It is bounded on the northwest by Rajnandgaon District, on the north by Kondagaon District, on the east by Nabarangpur and Koraput districts of Odisha state, on the south and southwest by Dantewada District, and on the west by Gadchiroli District of Maharashtra.

### **Raigarh**

Raigarh district is situated in the easternmost part of Chhattisgarh state. The district lies between latitude 21°22' - 22°42' North latitude and 82°55' to 83°49' East longitudes covering an area of 6530 sq.kms. It is surrounded by Sarguja and Jashpur districts in north, Orissa in the east, Mahasamund district on the south Korba and Janjgir-Champa districts in the west.

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Table 11.1: Suitable Areas for Mulberry in Bastar District of Chhattisgarh

| Block     | Suitable Areas for Mulberry (ha) |          |          |          |
|-----------|----------------------------------|----------|----------|----------|
|           | High                             | Moderate | Marginal | Total    |
| Gadamras  | -                                | 1026.81  | 5793.01  | 6819.82  |
| Karmari   | -                                | -        | 1092.84  | 1092.84  |
| Kondakoti | -                                | -        | 1059.66  | 1059.66  |
| Paroda    | -                                | -        | 1709.17  | 1709.17  |
| Total     | -                                | 1026.81  | 9654.67  | 10681.48 |

Fig. 10.1: Suitable areas for Mulberry in Bastar district of Chhattisgarh

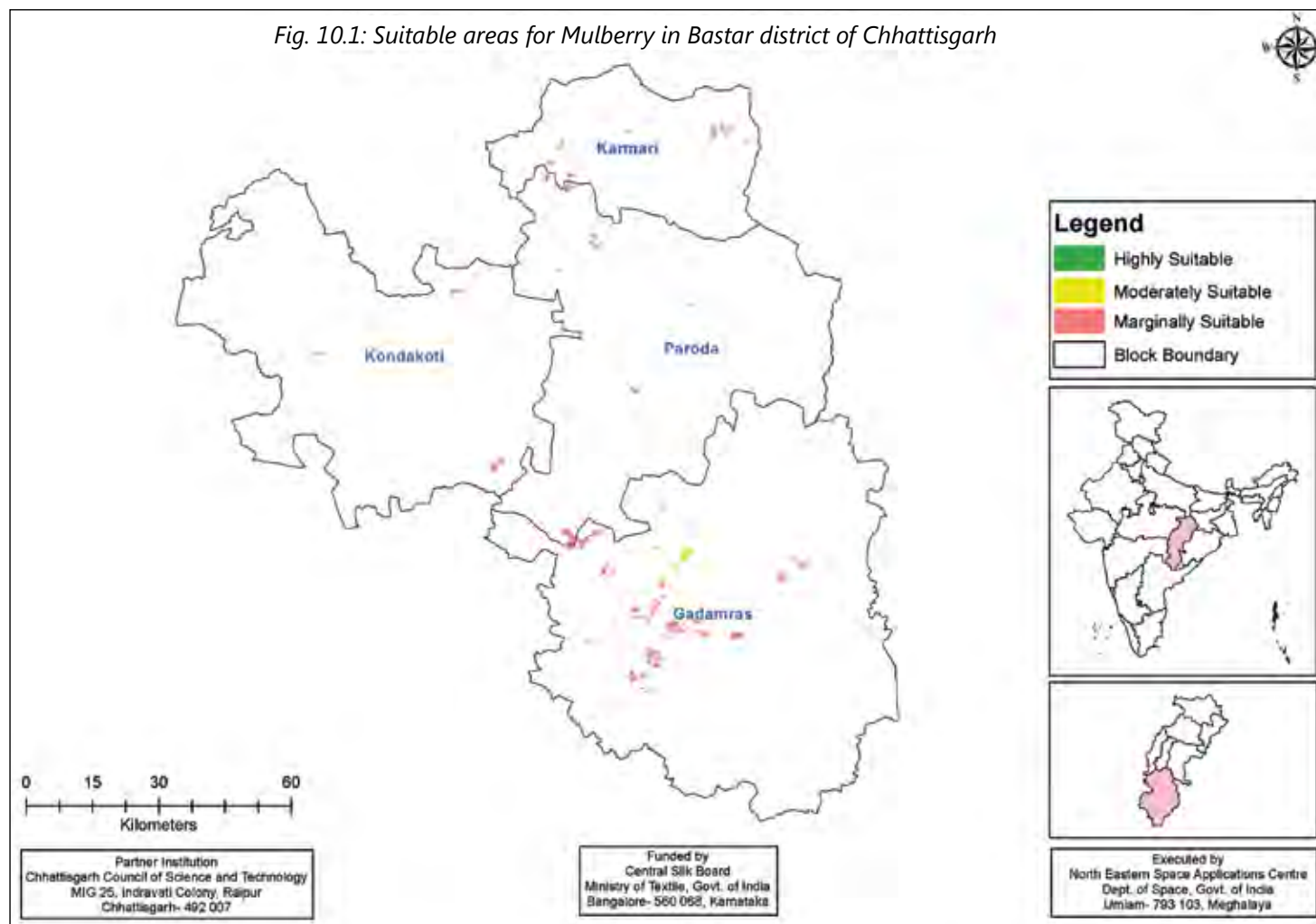
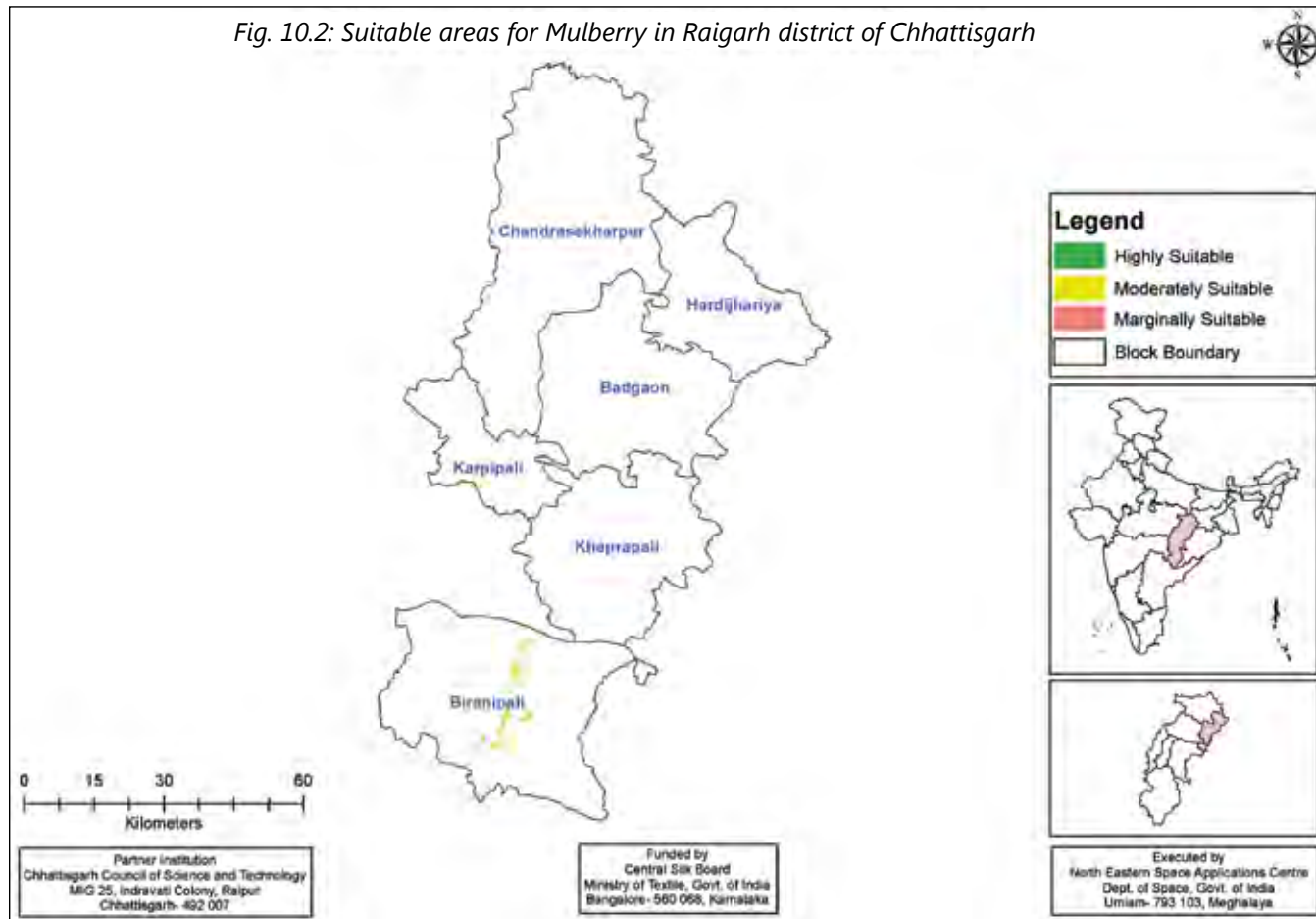


Table 11.2: Suitable Areas for Mulberry in Raigarh District of Chhattisgarh

| Block            | Suitable Areas for Mulberry (ha) |          |          |         |
|------------------|----------------------------------|----------|----------|---------|
|                  | High                             | Moderate | Marginal | Total   |
| Badgaon          | -                                | -        | -        | -       |
| Biranipali       | -                                | 2135.39  | 339.18   | 2474.57 |
| Chandrasekharpur | -                                | -        | -        | -       |
| Hardijhariya     | -                                | -        | -        | -       |
| Karpipali        | -                                | -        | -        | -       |
| Khaprapali       | -                                | -        | -        | -       |
| Total            | -                                | 2135.39  | 339.18   | 2474.57 |

Fig. 10.2: Suitable areas for Mulberry in Raigarh district of Chhattisgarh



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## HIMACHAL PRADESH

Himachal Pradesh located in northern India is spread over 55,670 Sq. km. and is bordered by Jammu and Kashmir on the north, Punjab on the west and south-west, Haryana and Uttarakhand on the south-east and by the Tibet Autonomous Region on the east. Himachal Pradesh is a mountainous state with elevation ranging from about 350 metres to 7,000 metres above the sea level.

The abundance of perennial rivers enables Himachal to sell hydroelectricity to other states such as Delhi, Punjab and Rajasthan. The economy of the state is highly dependent on three sources: hydroelectric power, tourism and agriculture. There is great variation in the climatic conditions of Himachal due to extreme variation in elevation. The climate varies from hot and sub-humid tropical in the southern tracts to cold, alpine and glacial in the northern and eastern mountain ranges with more elevation.

Realizing the potential of the sericulture industry, increase in the export earnings and employment generation, there is scope of expanding the sericulture to new areas in non-traditional states like Himachal Pradesh. Remote sensing technology is now being widely used for obtaining information on land and water resources in several areas in the state. The output of present study include the spatial information as well as statistics on the site suitability for mulberry plantation in four selected districts of Himachal Pradesh viz., Kullu, Sirmour, Una and Kangra.

### **Kullu**

Kullu district stretches from the village of Rampur in the south to the Rohtang Pass in the North. The largest valley in the district is called the Kullu Valley, which is also known as the Valley of the Gods. The total geographic area covers 5,503 sq km and is lies between 31° 20' 25" to 32° 25' 0" North Latitude and 76° 56' 30" to 77° 52' 20" East Longitude. The district is bounded on the north and east by Lahaul & Spiti district. On the south-east by Kinnaur district. On the south by Shimla district. On the south-west and west by Mandi district. and, on the north-west by Kangra District.

### **Sirmour**

Sirmour is the most south-eastern district of Himachal Pradesh. It is largely mountainous and rural, with 90% of its population living in villages. It lies between 30°22'30" to 31°01'20" North Latitude and 77° 01'12" to 77°49'40" East Longitude and covers a total geographic area is 2,825 sq km.

### **Una**

Una district lies in the south western part of the state. It shares its border with the Hoshiarpur District and Ropar district of Punjab. It lies between 31°17'52" - 31°52'0" North latitude and 75°58'2" - 76°28'25" East longitude. The total geography of the area covers an area of 1549 sq kms.



## Kangra

Kangra is the most populous district of Himachal Pradesh, India. Dharamshala is the administrative headquarters of the district. It is situated on the southern escarpment of the Himalayas. It is encapsulated in the north by the districts of Chamba and Lahaul and Spiti, in the south by Hamirpur and Una, in the east by Mandi and in the west by Gurdaspur district of Punjab. The district lies between 31°2 to 32°5 N latitude and 75° to 77°45 E longitude with a total geographical area of 5,739 sq.km.

Tables 12.1-12.4: Suitable Areas for Mulberry in Himachal Pradesh

Table 12.1

| Block       | Suitable Areas for Mulberry in Kullu (ha) |          |          |          |
|-------------|---|----------|----------|----------|
|             | High                                      | Moderate | Marginal | Total    |
| Ani         | 33.70                                     | 2381.28  | 2531.96  | 4946.95  |
| Banjar      | -   | 2978.92  | 2013.29  | 4992.20  |
| Jarri Block | -   | 7036.11  | 6530.62  | 13566.73 |
| Naggar      | -   | 1905.92  | 2440.04  | 4345.96  |
| Nirmand     | 4.01                                      | 1794.35  | 2011.21  | 3809.57  |
| Total       | 37.71                                     | 16096.58 | 15527.13 | 31661.42 |

Table 12.2

| Block   | Suitable Areas for Mulberry in Sirmour (ha) |          |          |          |
|---------|---|----------|----------|----------|
|         | High  | Moderate | Marginal | Total    |
| Dhagera | 2976.46                                     | 4938.91  | 667.04   | 8582.41  |
| Pachhad | 325.95                                      | 5337.30  | 4757.55  | 10420.81 |
| Rajpur  | 648.99                                      | 3014.21  | 971.07   | 4634.27  |
| Sangrah | 201.19                                      | 3929.81  | 3437.39  | 7568.40  |
| Shillai | 189.82                                      | 1923.53  | 1124.31  | 3237.65  |
| Total   | 4342.41                                     | 19143.76 | 10957.36 | 34443.54 |



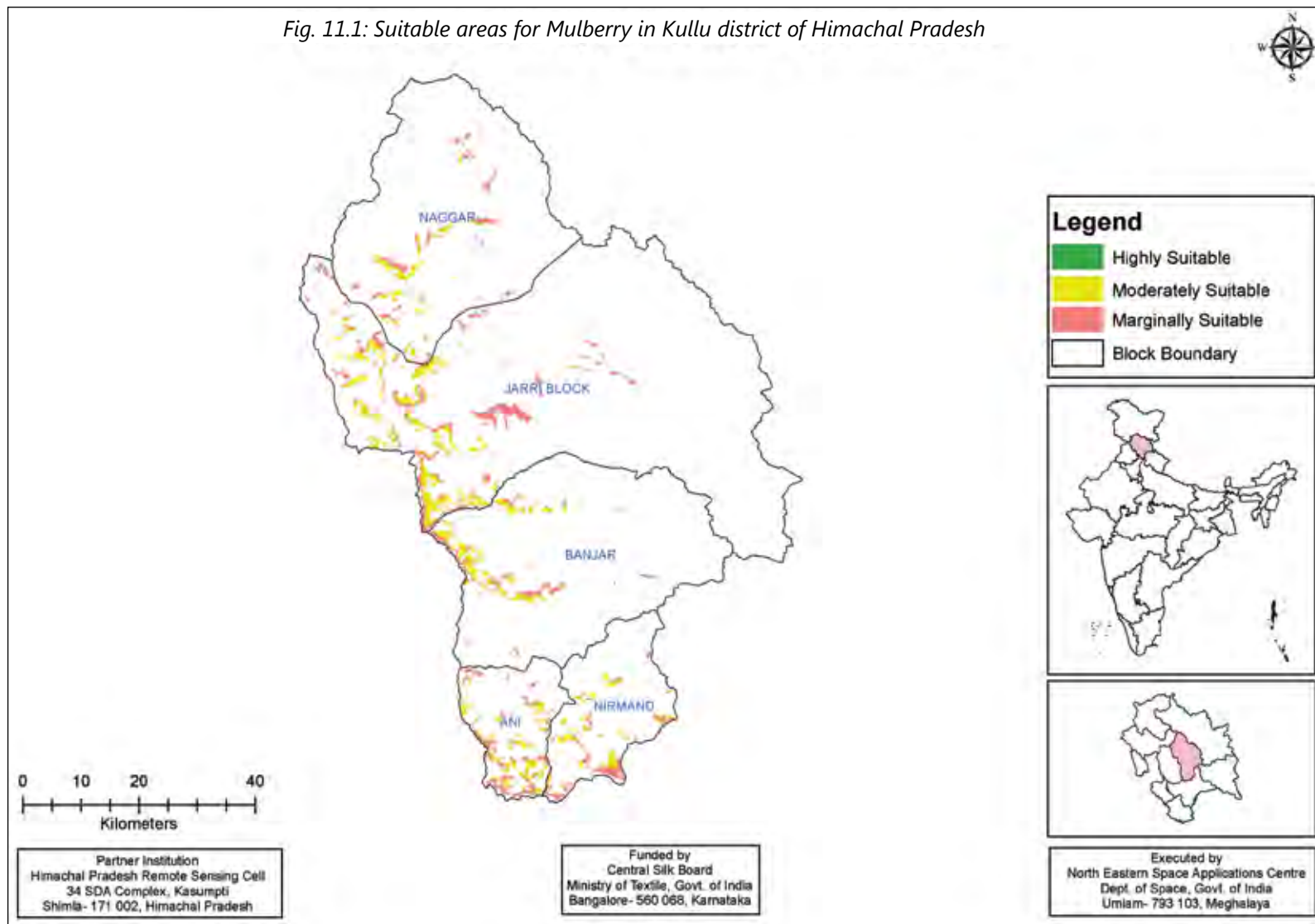
Table 12.3

| Block   | Suitable Areas for Mulberry in Una (ha) |          |          |          |
|---------|---|----------|----------|----------|
|         | High                                    | Moderate | Marginal | Total    |
| Dhagera | 2976.46                                 | 4938.91  | 667.04   | 8582.41  |
| Pachhad | 325.95                                  | 5337.30  | 4757.55  | 10420.81 |
| Rajpur  | 648.99                                  | 3014.21  | 971.07   | 4634.27  |
| Sangrah | 201.19                                  | 3929.81  | 3437.39  | 7568.40  |
| Shillai | 189.82                                  | 1923.53  | 1124.31  | 3237.65  |
| Total   | 4342.41                                 | 19143.76 | 10957.36 | 34443.54 |

Table 12.4

| Block         | Suitable Areas for Mulberry in Kangra (ha) |          |          |          |
|---------------|--|----------|----------|----------|
|               | High                                       | Moderate | Marginal | Total    |
| Bhawarna      | 830.91                                     | 2894.22  | 156.11   | 3881.24  |
| Dadasiba      | 1197.05                                    | 10580.83 | -        | 11777.88 |
| Dehra         | 297.00                                     | 4706.88  | 50.82    | 5054.71  |
| Fatehpur      | 665.88                                     | 1070.96  | 0.00     | 1736.84  |
| Gangth        | 270.51                                     | 1327.46  | 130.26   | 1728.23  |
| Gopalpur      | 65.19                                      | 858.63   | 747.63   | 1671.45  |
| Indora        | 415.80                                     | 1769.18  | -        | 2184.98  |
| Mahakal       | 167.15                                     | 486.79   | 615.36   | 1269.30  |
| NagrotaBagwan | -  | 3989.37  | 849.45   | 4838.82  |
| NagrotaSurian | 222.66                                     | 2498.51  | -        | 2721.17  |
| Rait          | 60.16                                      | 4720.55  | 586.50   | 5367.20  |
| Thural        | 840.26                                     | 6785.85  | 1675.82  | 9301.93  |
| Total         | 5032.57                                    | 41689.24 | 4811.95  | 51533.76 |

Fig. 11.1: Suitable areas for Mulberry in Kullu district of Himachal Pradesh



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Fig. 11.2: Suitable areas for Mulberry in Sirmour district of Himachal Pradesh

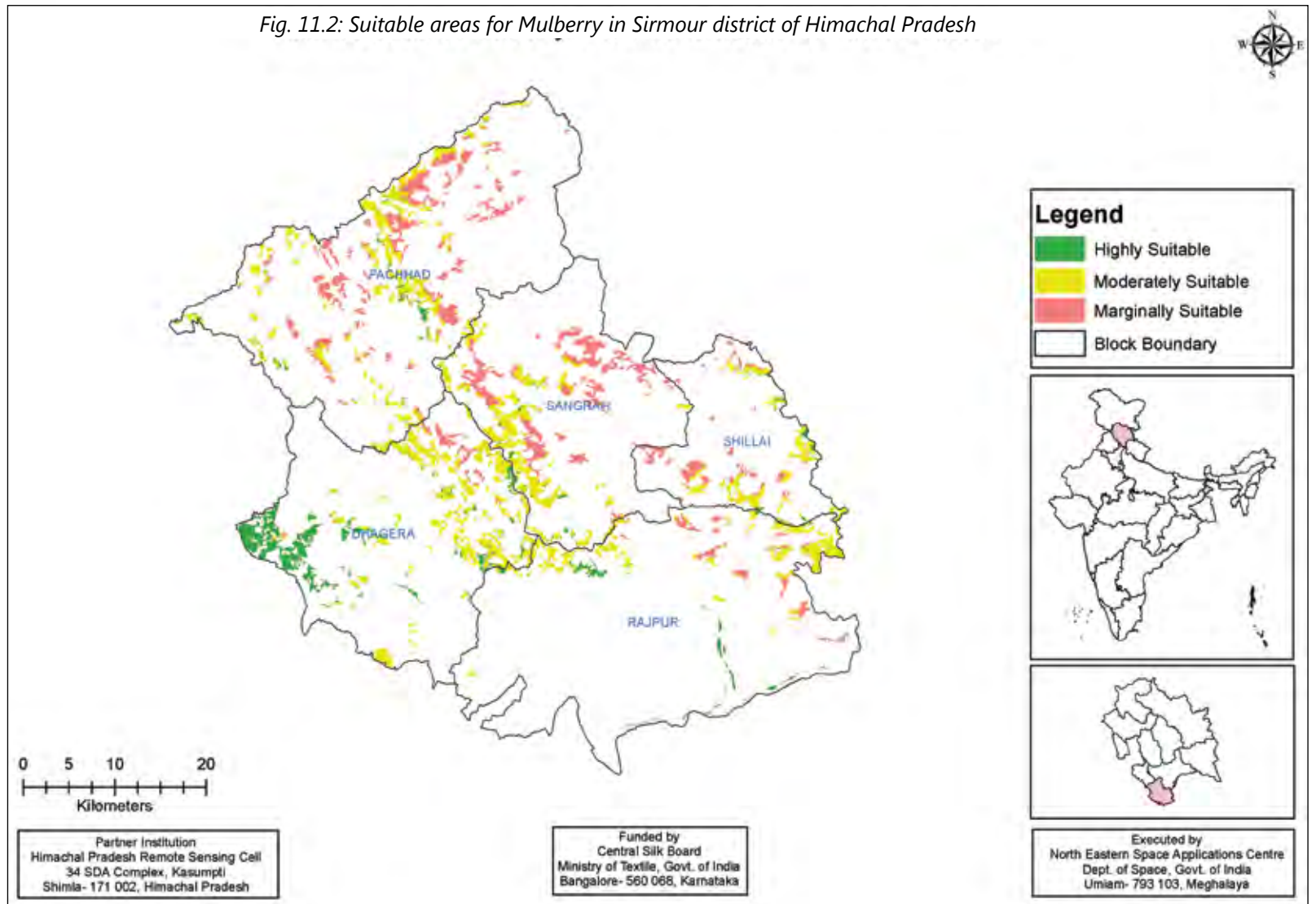
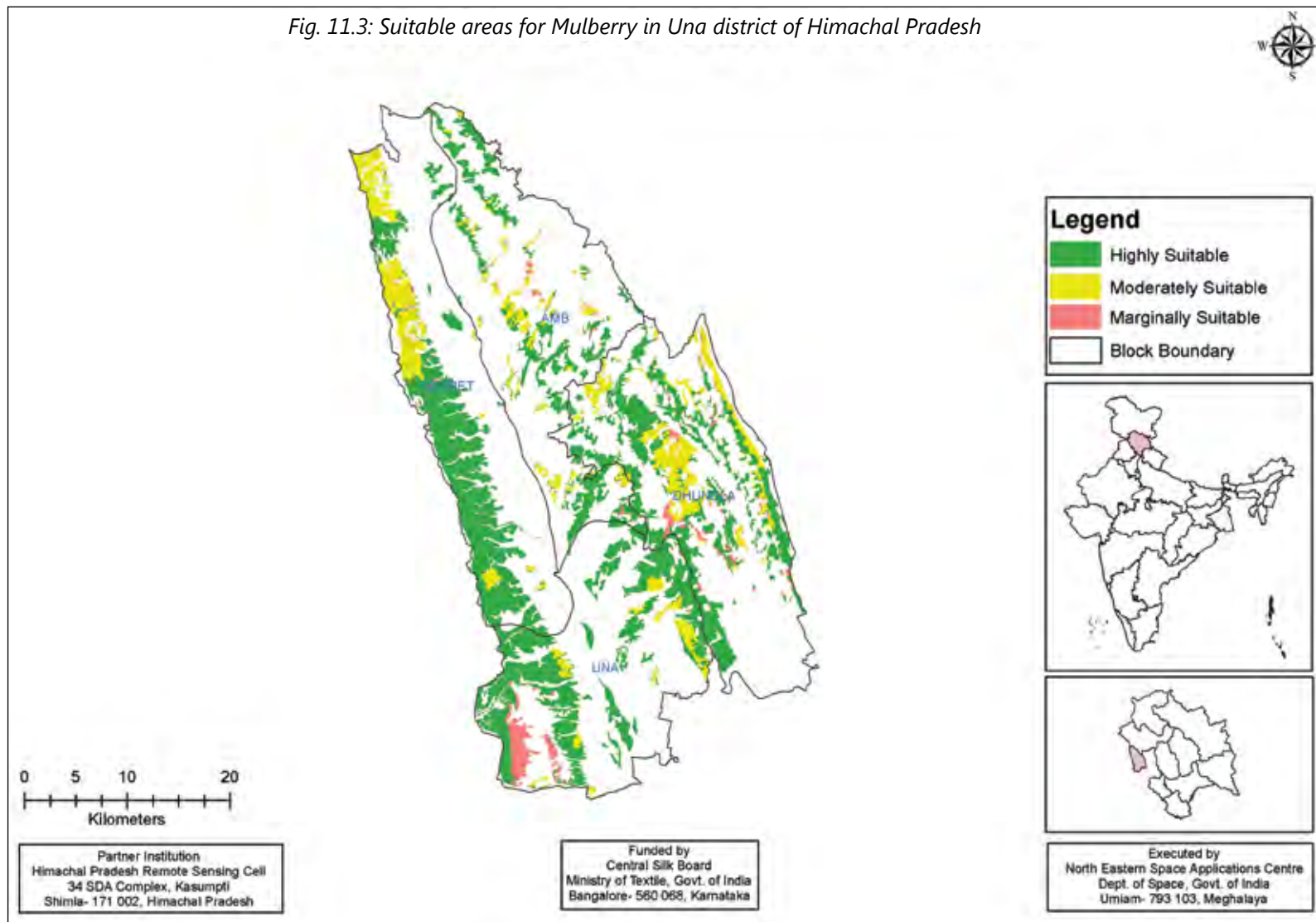


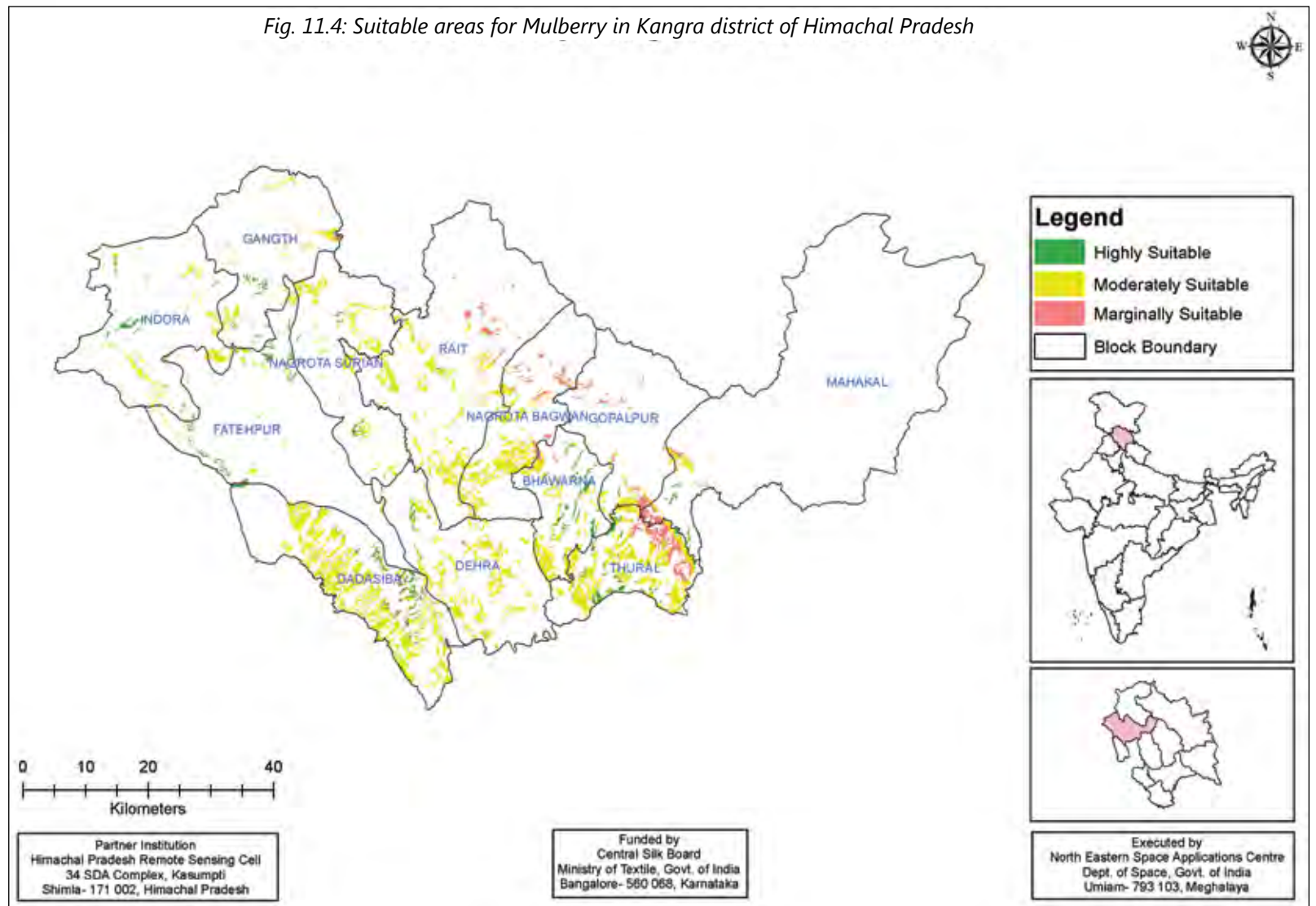
Fig. 11.3: Suitable areas for Mulberry in Una district of Himachal Pradesh



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Fig. 11.4: Suitable areas for Mulberry in Kangra district of Himachal Pradesh



## JAMMU & KASHMIR

Jammu and Kashmir is the northernmost state of India. It is mostly in the Himalayan mountains and shares a border with the states of Himachal Pradesh and Punjab to the south. Jammu and Kashmir has an international border with the People's Republic of China in the north and east while Line of Control separates it from Pakistan-administered territories of Azad Kashmir and Gilgit Baltistan in the west and northwest respectively.

Jammu and Kashmir consists of three regions: Jammu, the Kashmir valley and Ladakh. Srinagar is the summer capital, and Jammu is the winter capital. While the Kashmir valley is famous for its beautiful mountainous landscape, Jammu's numerous shrines attract tens of thousands of Hindu pilgrims every year. Ladakh, also known as "Little Tibet", is renowned for its remote mountain beauty and Buddhist culture. Jammu and Kashmir is home to several valleys such as the Kashmir Valley, Tawi Valley, Chenab Valley, Poonch Valley, Sind Valley and Lidder Valley.

The State of Jammu & Kashmir is famous for its rich Flora and diverse climatic conditions. Since the state is situated in the sub tropical latitudes and having micro level variations in altitudes the climate is favorable for Mulberry plantation. It is documented that sericulture was introduced in this state before 15th century and the region was considered to be the home of silk industry. Till now nine indigenous varieties and twenty three exotic varieties belong to four varieties of Genus Morus are reportedly to be growing in this state. Some exotic varieties have been introduced from China and Japan in order to improve the quality and quantity of silk. In this State, this activity is an agro based industry. Export oriented, generating employment, besides the boost to the economy of the state viz maintaining the environmental balance despite the evolution of many manmade fibers, no match is found for the shine, elegance, lighter weight and luster of the silk which has given it status of queen of textiles. This is again favored by good seasonal trends, good soil, drainage pattern which has helped the state to have sericulture activities on top, even the unviable conditions of the state could be converted into silk worm gene bank for sustaining the sericulture of the whole world. The cultivation of mulberry plant has been practiced since times in memorial. In this connection in 1964 an act was passed where in it was declared that the silk industry is a state monopoly and possession of silk worms and eggs as well as independent sale of cocoons was prohibited.

In the earlier times cocoons were taken to England for reeling of silk and weaving fiber. But in 1934 Government of India, established a silk weaving factory at RajBagh in Srinagar to facilitate the process of weaving. In 1949 another mulberry protection act (2006) was enforced in the state under which cutting of trees, damaging and pruning of these trees except for these use of mulberry leaves for silkworm rearing was prohibited. Sericulture being one of the traditional agro based cottage industry of the state producing high quality Biovoltine silk comparable to international quality helps to improving economic conditions of the rural masses and providing employment opportunity in pre and post cocoon activities.

Sericulture continues to be subsidiary occupation for about 22,000 rural families in 2300 villages in the state. Most of these families belong to economically backward sections of the society. Annually about 830 M.Ts of cocoons are produced in the state generating an income of about Rs 275 lacs. The department is actually engaged in propagation of mulberry plants for its distribution in farmers, providing technical assistance and other inputs in farmers in conducting silkworm rearing, organization of cocoons markets and development of silk rearing in private sector in the state. It is the endeavor of the department to strive for higher productivity levels and this has been achieved by introduction of latest technologies in different production processes. The productivity has increased from 25 to 35 Kgs of cocoons per ounce of seed. Strategies are being developed to double the production in the state. For this purpose new areas will be brought under sericulture activities, adoption of the cluster approach improving quality of cocoons productivity of cocoons per ounce of seed. Two districts viz., Bandipore and Reasi were selected for mapping of potential areas for sericulture development.

### Bandipore

Bandipore also spelled Bandipora, Bandipur, Bandipura is situated on the banks of the Wular Lake, the largest fresh-water lake in Asia, which is home to a lot of migratory birds. It is newly carved District from erstwhile Baramulla District. The district is surrounded by Himalayan Mountains having Kargil District on north, Kupwara in West, Baramulla in south and Ganderbal in east. Bandipore District is sharing border with Kargil District to the East. Bandipore District occupies an area of approximately 398 sq km.

### Reasi

It is surrounding by District Udhanampur on the eastern District, Ramban on the northern eastern fringes, District Rajouri on its western & northern ends, District Jammu on its southern ends a parts of the District also touches District Shopian on Northern fringes.

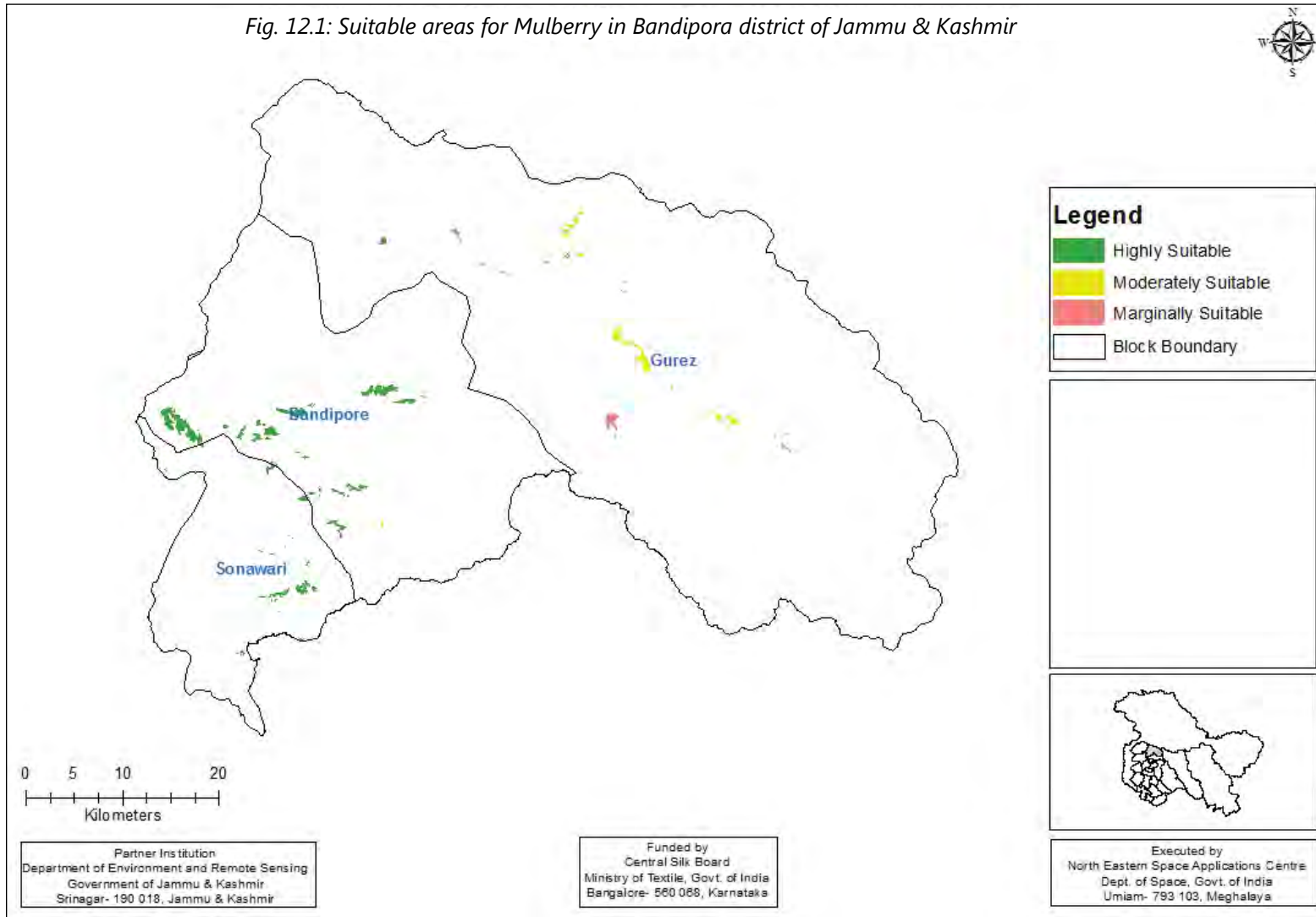
Table 13.1: Suitable Areas for Mulberry in Bandipore District of Jammu & Kashmir

| Block     | Suitable Areas for Mulberry (Ha) |          |          |         |
|-----------|----------------------------------|----------|----------|---------|
|           | High                             | Moderate | Marginal | Total   |
| Bandipore | 1389.49                          | 16.93    | 6.03     | 1412.45 |
| Gurez     | 55.10                            | 534.17   | 277.06   | 866.32  |
| Sonawari  | 339.90                           | 0.00     | -        | 339.90  |
| Total     | 1784.48                          | 551.09   | 283.09   | 2618.66 |

Table 13.2: Suitable Areas for Mulberry in Reasi District of J&K

| Suitability Class | Mulberry |
|-------------------|----------|
| High              | 766.15   |
| Moderate          | 5602.81  |
| Marginal          | 11015.49 |
| Total             | 17384.46 |

Fig. 12.1: Suitable areas for Mulberry in Bandipora district of Jammu & Kashmir

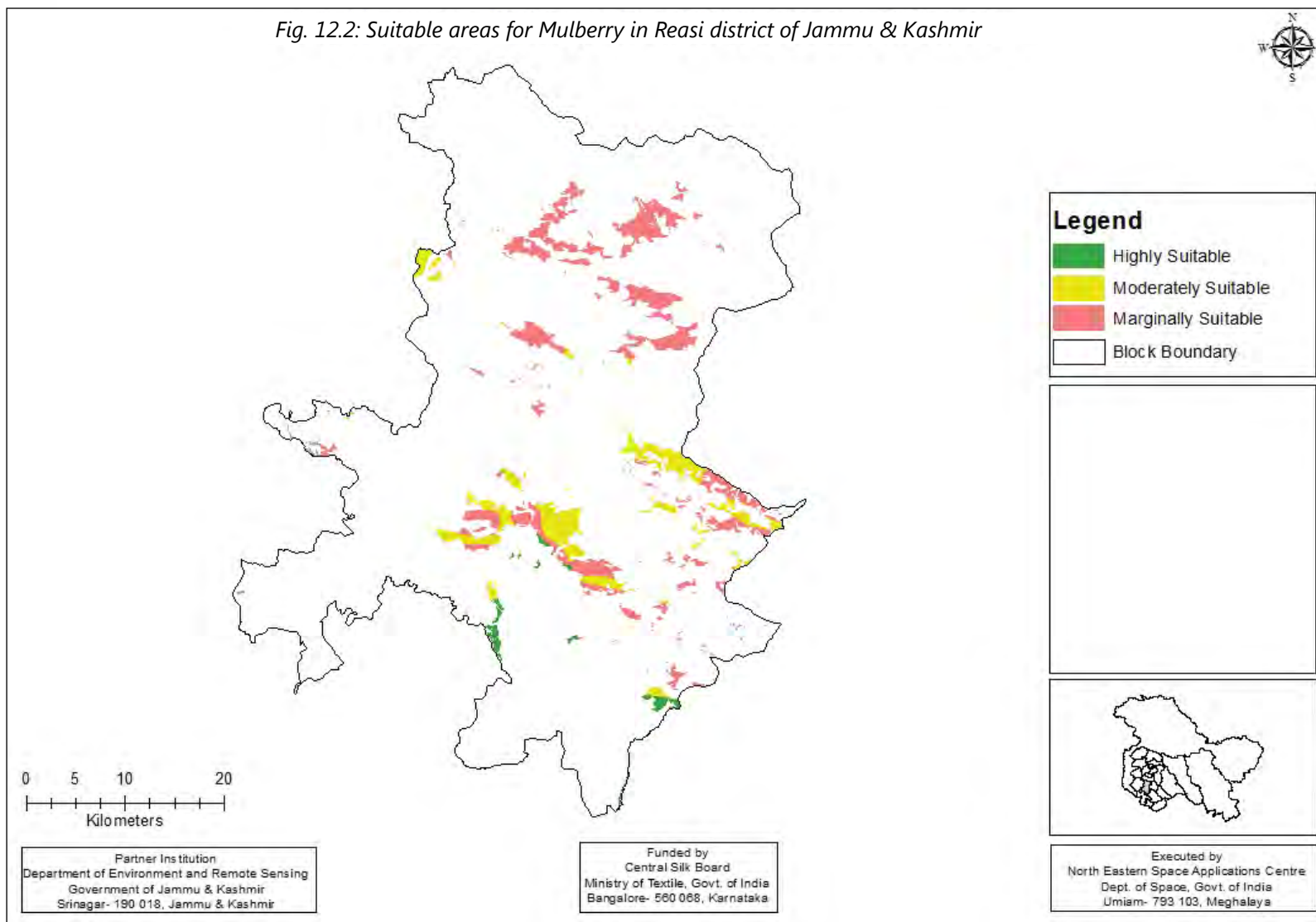


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Fig. 12.2: Suitable areas for Mulberry in Reasi district of Jammu & Kashmir



## JHARKHAND

Jharkhand state was carved out of the southern part of Bihar state on November 15, 2000. Jharkhand shares its border with the states of Bihar to the north, Uttar Pradesh and Chhattisgarh to the west, Odisha to the south and West Bengal to the east. It has an area of 79,710 sq km with the industrial city of Ranchi as its capital. Jharkhand accounts for 40% of the mineral resources of India, out of which Ranchi alone accounts for 50% mineral production of the state, nearing about 18% of nation's mineral production.

The state of Jharkhand has a good potential for sericulture development particularly for Vanya Silks with about one third of geographical area of the state is dominated by forests. Sal being the state tree is the major forest species. Tasar, Mulberry and Eri are different type of silk varieties produced in Jharkhand. Three districts viz., Pakur, Saraikela and Ranchi were selected for mapping of potential areas for sericulture development in the state, out of which Pakur and Ranchi districts were taken for Mulberry and Saraikela district for Tasar.

### **Pakur**

Pakur District is predominantly a hilly district with certain pockets of plain land. It is an administrative district of Jharkhand and its headquarters are at Pakur town. Covering an area of 696.21 sq km, the district is situated on the north-eastern region of Jharkhand state. It is located at 23°40' to 25°18' north latitude and 86° 25' to 87° 57' east longitude. Pakur District is bounded by Sahibganj district in north, Dumka District in south, Godda district in west and by Murshidabad district of West Bengal in the east.

### **Saraikela**

This district is surrounded by the district East Singhbhum in its East, West Singhbhum in its West, Ranchi district and Purulia district of West Bengal in its North and Mayurbhanj, Khyaspur of Sundergarh district of Odisha in its South. The district is situated between 22°29'26" and 23°09'34" north latitudes and 85°30'14" and 86°15'24" east longitudes. The total geographical area covers 2815 sq km. Saraikela town is the district headquarters of Saraikela Kharsawan district.

### **Ranchi**

Ranchi is located on the southern part of the Chota Nagpur plateau, which forms the eastern edge of the Deccan plateau. Ranchi is referred to as the "City of Waterfalls", due to the presence of numerous large and small falls of around the close vicinity of the city. The geographical location is 23.35° N latitude and 85.23° E longitude. The district covers an area of 5231 sq km.

Tables 14.1-14.2: Suitable areas for Mulberry in Pakur & Tasar in Saraikela District of Jharkhand

Table 14.1

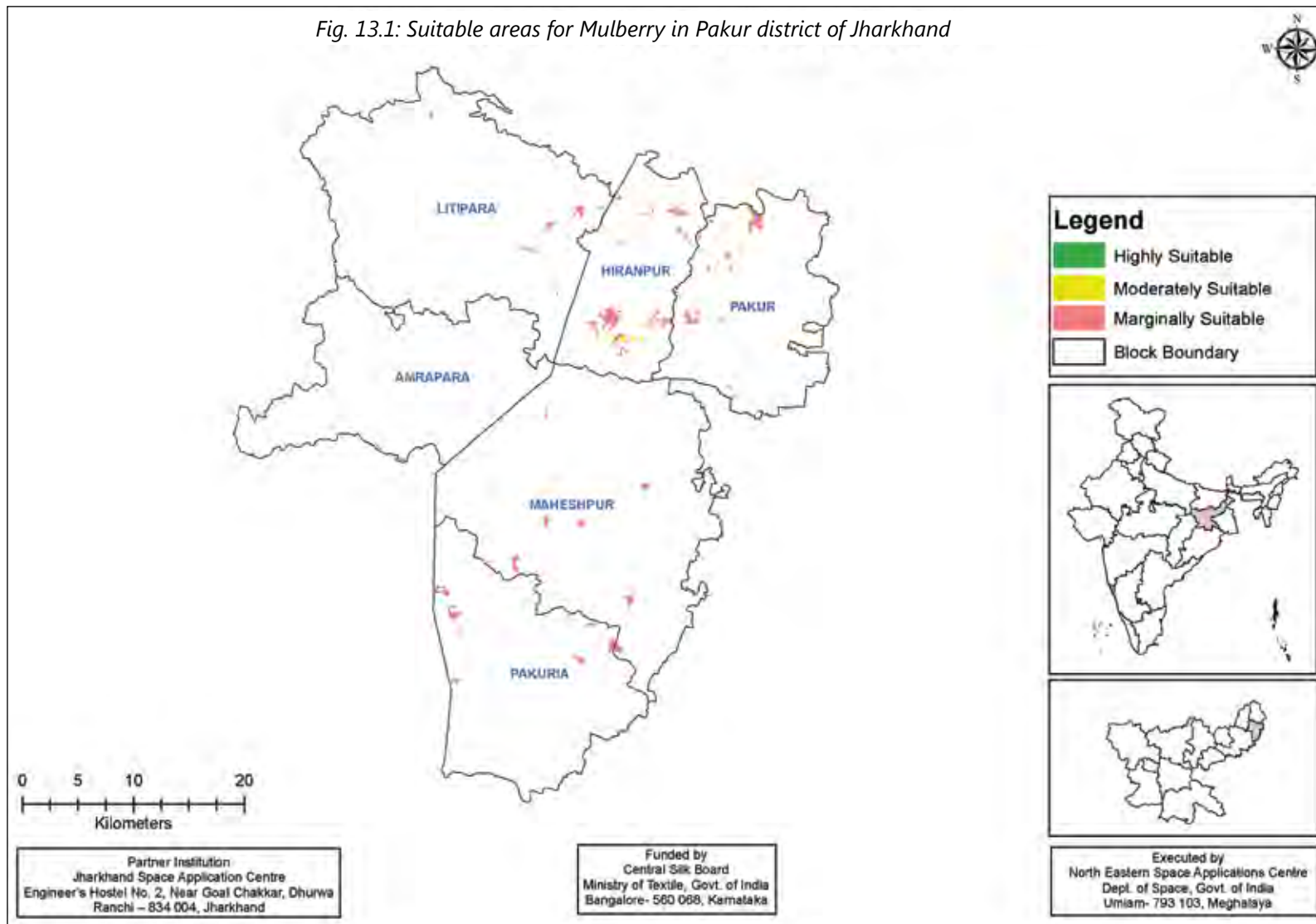
| Block     | Suitable areas for Mulberry in Pakur (ha) |          |          |         |
|-----------|---|----------|----------|---------|
|           | High                                      | Moderate | Marginal | Total   |
| Amrapara  | -   | 1.63     | 31.70    | 33.33   |
| Hiranpur  | -   | 73.86    | 581.06   | 654.91  |
| Litipara  | -   | 16.31    | 155.20   | 171.51  |
| Maheshpur | -   | 9.74     | 304.28   | 314.02  |
| Pakur     | -   | 90.96    | 332.09   | 423.05  |
| Pakuria   | -   | 7.14     | 310.64   | 317.79  |
| Total     | -   | 199.64   | 1714.97  | 1914.61 |

Table 14.2

| Block     | Suitable areas for Tasar in Saraikela (ha) |          |          |          |
|-----------|--|----------|----------|----------|
|           | High                                       | Moderate | Marginal | Total    |
| Adityapur | 1329.20                                    | 1249.74  | -        | 2578.95  |
| Chandil   | 8841.77                                    | 4527.72  | -        | 13369.49 |
| Gobindpur | 114.34                                     | 2473.46  | -        | 2587.81  |
| Ichagarh  | 820.25                                     | 1047.59  | -        | 1867.84  |
| Kharsawan | 2183.96                                    | 3402.03  | -        | 5585.98  |
| Kuchai    | 20853.04                                   | -        | -        | 20853.04 |
| Kukru     | 70.77                                      | 120.39   | -        | 191.16   |
| Nimdih    | 453.83                                     | 4722.63  | -        | 5176.45  |
| Saraikela | 1541.36                                    | 2343.26  | -        | 3884.62  |
| Total     | 36208.52                                   | 19886.82 | -        | 56095.33 |



Fig. 13.1: Suitable areas for Mulberry in Pakur district of Jharkhand



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Fig. 13.2: Suitable areas for Tasar in Saraikela district of Jharkhand

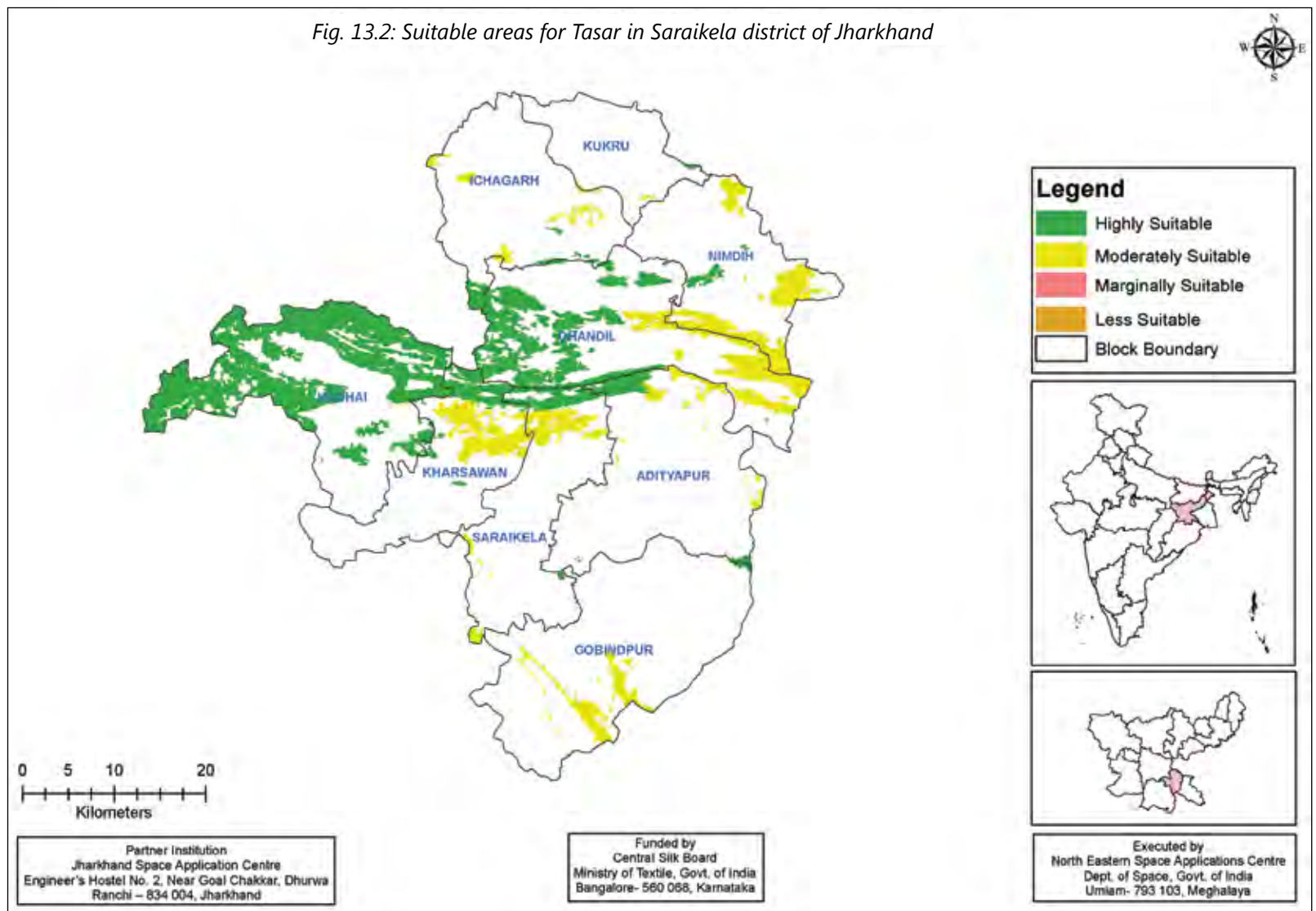


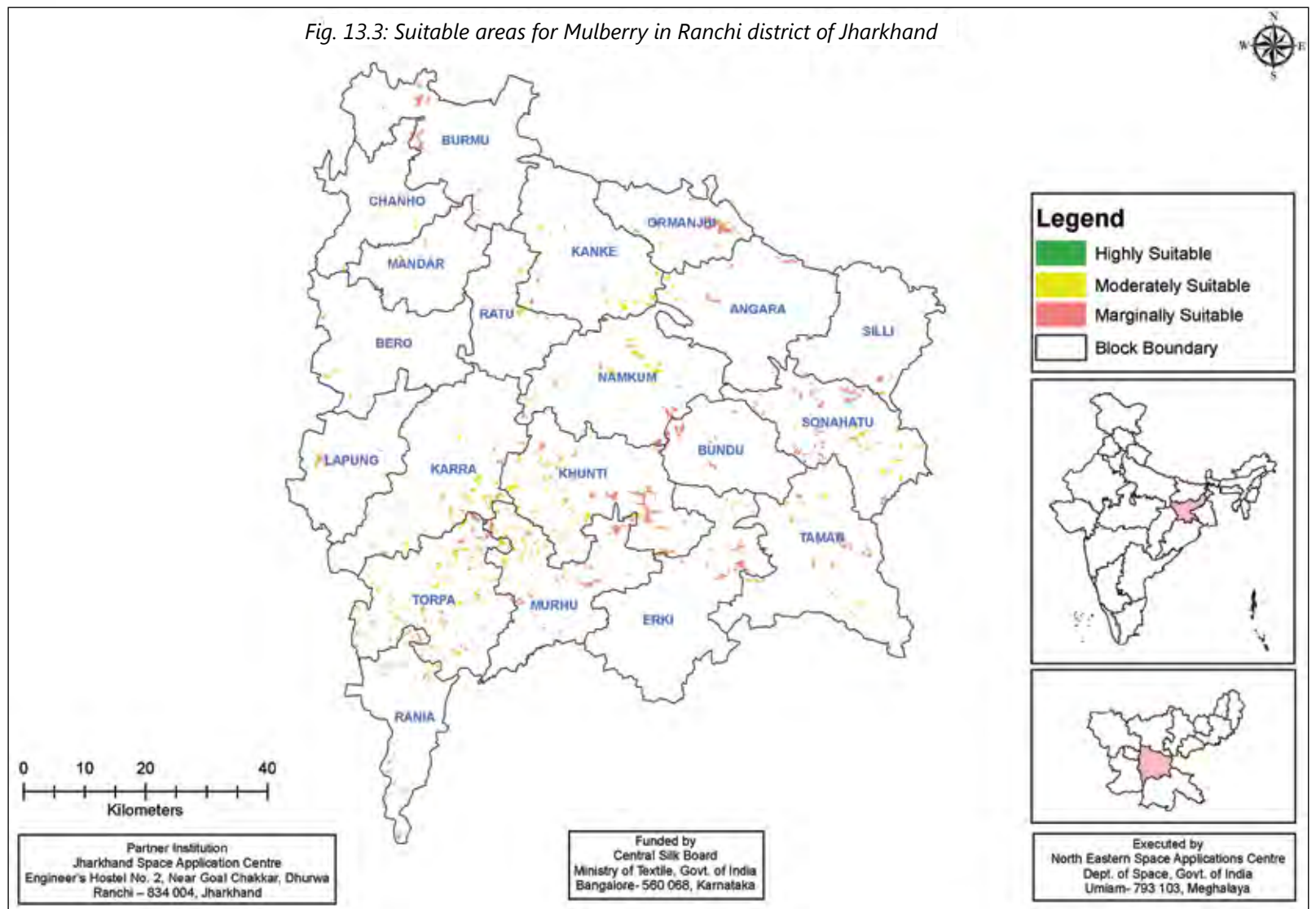
Table 14.3: Suitable Areas for Mulberry in Ranchi District of Jharkhand

| Block    | Suitable Areas for Mulberry (ha) |          |          |          |
|----------|----------------------------------|----------|----------|----------|
|          | High                             | Moderate | Marginal | Total    |
| Angara   | -                                | 124.37   | 272.46   | 396.83   |
| Bero     | -                                | 148.11   | 30.65    | 178.76   |
| Bundu    | -                                | 56.12    | 423.96   | 480.08   |
| Burmu    | -                                | 40.99    | 537.60   | 578.59   |
| Chanho   | -                                | 83.18    | 84.05    | 167.24   |
| Erki     | -                                | 119.32   | 561.32   | 680.64   |
| Kanke    | -                                | 504.41   | 186.33   | 690.74   |
| Karra    | -                                | 804.04   | 459.08   | 1263.12  |
| Khunti   | -                                | 1118.90  | 1394.15  | 2513.04  |
| Lapung   | -                                | 160.52   | 212.30   | 372.82   |
| Mandar   | -                                | 54.24    | 71.07    | 125.31   |
| Murhu    | -                                | 700.78   | 1011.57  | 1712.35  |
| Namkum   | -                                | 597.15   | 572.10   | 1169.24  |
| Ormanjhi | -                                | 153.08   | 608.17   | 761.25   |
| Rania    | -                                | 161.12   | 431.64   | 592.76   |
| Ratu     | -                                | 222.12   | 70.87    | 292.99   |
| Silli    | -                                | 33.28    | 174.01   | 207.29   |
| Sonahatu | -                                | 532.86   | 1141.47  | 1674.32  |
| Tamar    | -                                | 356.18   | 608.46   | 964.64   |
| Torpa    | -                                | 1480.66  | 964.60   | 2445.27  |
| Total    | -                                | 7451.44  | 9815.86  | 17267.30 |

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Fig. 13.3: Suitable areas for Mulberry in Ranchi district of Jharkhand



## KARNATAKA

Karnataka is the eighth largest Indian state and covers an area of 191,976 sq km. The state is bordered by the Arabian Sea and the Laccadive Sea to the west, Goa to the north west, Maharashtra to the north, Andhra Pradesh to the east, Tamil Nadu to the south east, and Kerala to the south west.

The farmers of Karnataka pioneered mori-sericulture and today the state contributes 60 per cent of the total silk production in the country. During the year 2009-10, the extent of moriculture was 82,098 ha in 11,735 villages engaging 141528 farm families. The cocoon production was 54282 T and raw silk production was 7359 MT. Well established infrastructure network facilities are available in the state. The state has established Multivoltine and Bivoltine seed areas. Almost 88 per cent of Karnataka sericulture is practiced in southern parts. But these traditional sericulture areas are losing land to other immediately profitable, though non-sustainable uses such as SEZ of industries, real estate and urbanization. Therefore, there is a compelling need to explore non-traditional areas for establishing sericulture industry to maintain the first position of the state in silk production. Under this project, 4 districts were selected viz., Bagalkote, Belgaum, Bidar and Chitradurga for mapping and categorising suitable areas for sericulture development.

### Bagalkot

The district is located in the northern part of Karnataka. The most elevated portion of the district lies between 450 to 800 meters above the mean sea level and the district covers an area of 6593 sq. kms. The district is bounded by Bijapur district towards north, Gadag district towards south, Raichur district towards east, Koppal district towards south east and Belgaum district towards.

### Bidar

Almost 700 kilometers from Bangalore, Bidar lies at the farthest north-eastern corner of Karnataka. Present day Bidar covering an area of 5448 Sq Km and lies between 17° 35' and 18° 25' North latitudes and 76° 42' minutes and 77° 39' east longitudes. The district is surrounded by Nizamabad and Medak in Andhra Pradesh on the East and the districts of Nanded and Osmanabad in Maharashtra on the west. On the south lies the district of Gulbarga of Karnataka.

### Chitradurga

Chitradurga is located at a distance of about 202 kms northwest of Bangalore, in the heart of the Deccan Plateau. The district is bounded by Tumkur District to the southeast and south, Chikmagalur District to the southwest, Davanagere District to the west, Bellary District to the north, and Anantapur District of Andhra Pradesh state to the east. The total geographical area of the district is 8,440 sq kms.

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## Belgaum

The district covers an area of 13,415 sq kms, and is bounded on the west and north by Maharashtra state, on the northeast by Bijapur District, on the east by Bagalkote District, on the southeast by Gadaga District, on the south by Dharawada District and Uttara Kannada districts, and on the southwest by the state of Goa.

Tables 15.1-15.4: Suitable areas for Mulberry in Karnataka

Table 15.1

| Block     | Suitable areas for Mulberry in Bagalkot (ha) |          |           |           |
|-----------|--|----------|-----------|-----------|
|           | High   | Moderate | Marginal  | Total     |
| Badami    | -  | 6568.34  | 52843.02  | 59411.36  |
| Bagalkot  | -  | 1190.77  | 33012.95  | 34203.73  |
| Bilgi     | -  | 1723.39  | 32435.14  | 34158.54  |
| Hungund   | -  | 51.89    | 38014.29  | 38066.18  |
| Jamkhandi | -  | 561.18   | 79714.91  | 80276.10  |
| Mudhol    | -  | -        | 66277.46  | 66277.46  |
| Total     | -  | 10095.58 | 302297.78 | 312393.36 |

Table 15.2

| Block        | Suitable areas for Mulberry in Bidar (ha) |          |           |           |
|--------------|---|----------|-----------|-----------|
|              | High                                      | Moderate | Marginal  | Total     |
| Aurad        | -   | -        | 92914.31  | 92914.31  |
| Basavakalyan | -   | 545.80   | 81168.62  | 81714.43  |
| Bhalki       | -   | -        | 77022.49  | 77022.49  |
| Bidar        | -   | -        | 40913.12  | 40913.12  |
| Humnabad     | -   | 3413.23  | 45590.53  | 49003.76  |
| Total        | -   | 3959.03  | 337609.08 | 341568.11 |

Table 15.3

| Block       | Suitable areas for Mulberry in Chitradurga (ha) |          |           |           |
|-------------|---|----------|-----------|-----------|
|             | High  | Moderate | Marginal  | Total     |
| Challakere  | -   | 16607.07 | 123534.00 | 140141.07 |
| Chitradurga | -   | 13699.32 | 89284.12  | 102983.44 |
| Hiriyur     | -   | 6932.46  | 104117.51 | 111049.97 |
| Holalkere   | -   | 10210.68 | 59190.10  | 69400.78  |
| Hosadurga   | -   | 11672.82 | 62066.84  | 73739.67  |
| Molakalmuru | -   | 3866.72  | 35111.21  | 38977.94  |
| Total       | -   | 62989.07 | 473303.79 | 536292.86 |

Table 15.4

| Block       | Suitable areas for Mulberry in Belgaum (ha) |          |           |           |
|-------------|---|----------|-----------|-----------|
|             | High  | Moderate | Marginal  | Total     |
| Athni       | -   | 2059.67  | 119274.26 | 121333.93 |
| Bail Hongal | -   | 338.22   | 71320.57  | 71658.79  |
| Belgaum     | -   | -        | 45820.93  | 45820.93  |
| Chikodi     | -   | -        | 53540.63  | 53540.63  |
| Gokak       | -   | 800.88   | 49323.97  | 50124.86  |
| Hukeri      | -   | -        | 30866.36  | 30866.36  |
| Khanapur    | -   | -        | 20584.98  | 20584.98  |
| Ramdurg     | -   | 2022.97  | 72549.63  | 74572.60  |
| Raybag      | -   | -        | 28157.88  | 28157.88  |
| Saundatti   | -   | 167.71   | 54515.54  | 54683.25  |
| Total       | -   | 5389.45  | 545954.77 | 551344.22 |

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Fig. 14.1: Suitable areas for Mulberry in Bagalkote district of Karnataka

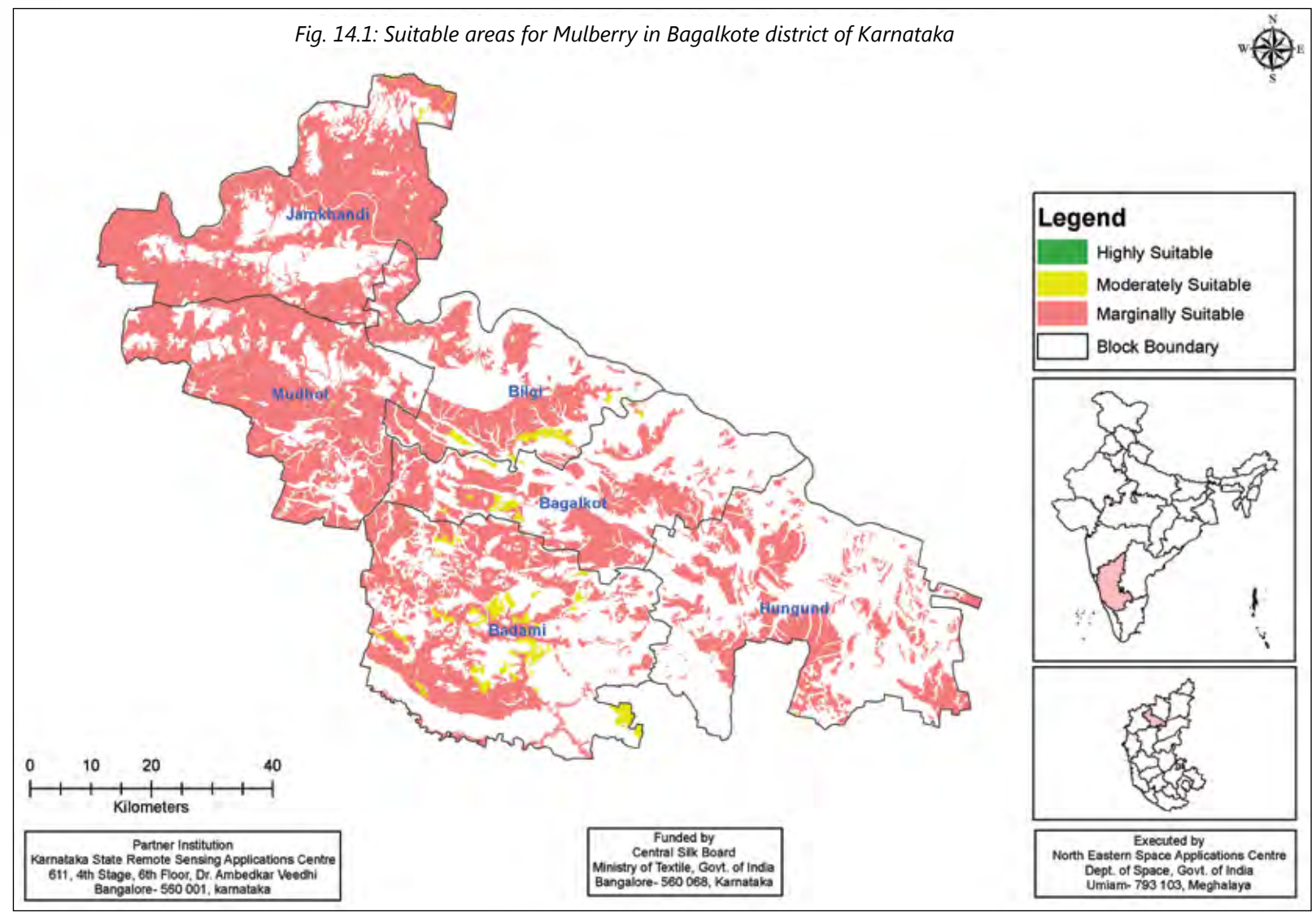
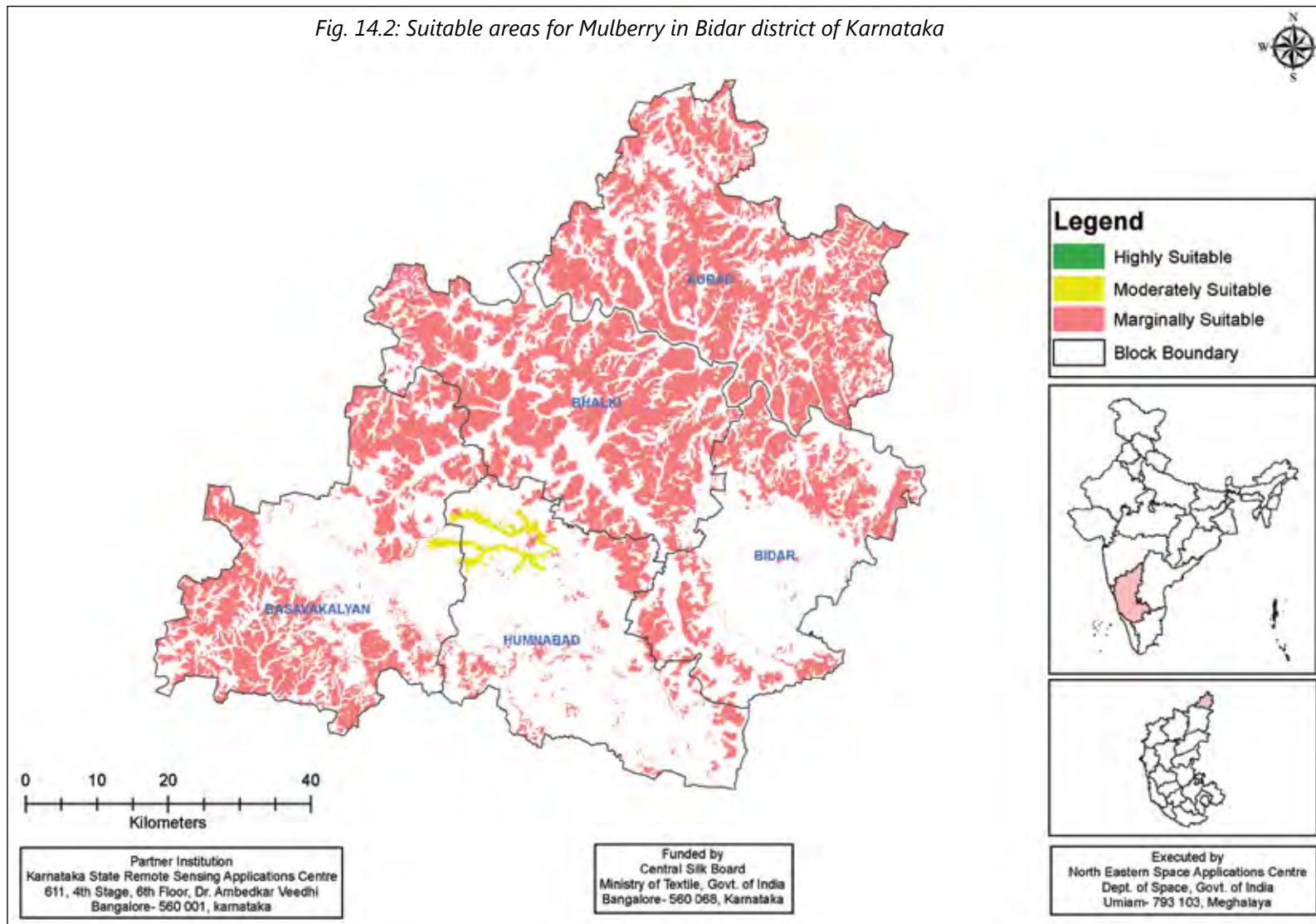


Fig. 14.2: Suitable areas for Mulberry in Bidar district of Karnataka



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Fig. 14.3: Suitable areas for Mulberry in Chitrdurga district of Karnataka

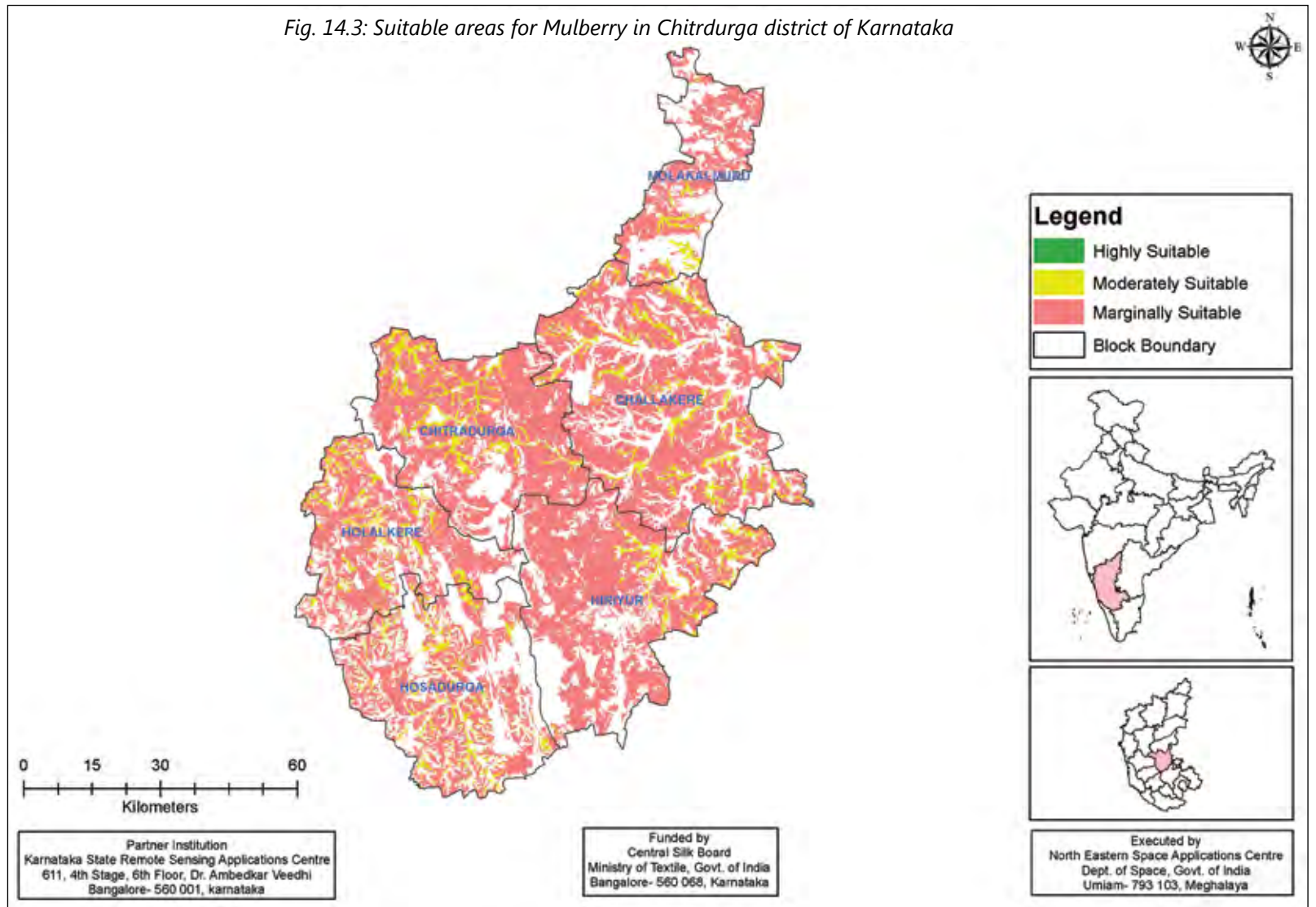
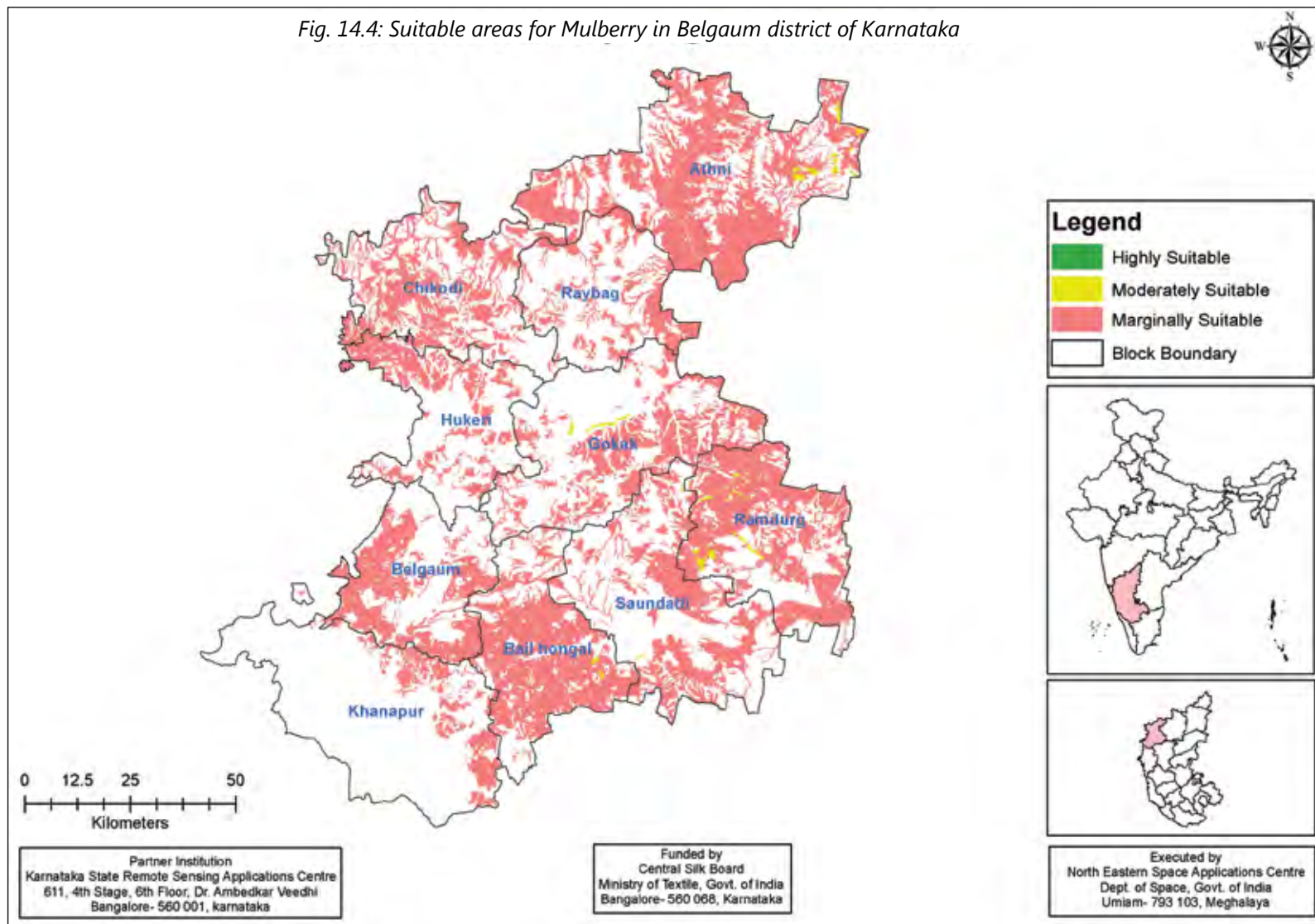


Fig. 14.4: Suitable areas for Mulberry in Belgaum district of Karnataka



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## KERALA

Kerala is located in the south-west region of India on the Malabar coast with Thiruvananthapuram as its capital. Spread over 38,863 sq km the state is bordered by Karnataka to the north and north east, Tamil Nadu to the east and south, and the Laccadive Sea to the west. The state is wedged between the Lakshadweep Sea and the Western Ghats and lies between north latitudes 8° 18' and 12° 48' and east longitudes 74° 52' and 77° 22'.

Kerala experiences humid equatorial tropic climate. With around 120-140 rainy days per year, Kerala has a wet and maritime tropical climate influenced by the seasonal heavy rains of the southwest summer monsoon and northeast winter monsoon. Production of pepper and natural rubber contribute a prominent portion of the total national output. In the agricultural sector, coconut, tea, coffee, cashew and spices are important.

The state of Kerala has vast potential for mulberry development. The climate and other factors are quite favourable for sericulture development. In Kerala, sericulture is practiced in limited pockets of all the 14 districts with the help of state serified and also in some high range areas of Idukki and Palakkad district with mulberry cultivation. The potential area mapping was taken up in these two districts.

### Idukki

With an area of 5,087 sq.km, the district lies between 9°15' and 10°21' of north latitude and 76°37' and 77°25' of east longitudes and ranks first among the districts in the state in terms of area coverage. Located in the middle part of Kerala, the District is bounded on the East by Madurai District of Tamil Nadu State, while on the West by Ernakulam and Kottayam Districts. In the South it is the Pathanamthitta District, while on the North it is bound by Trichur and Coimbatore Districts of Kerala and Tamil Nadu states respectively.

### Palghat

Palghat district covers an area of 4480 sq km with city of Palakkad as the district headquarters. Palakkad is bordered on the northwest by the Malappuram District, on the southwest by the Thrissur District and on the east by Coimbatore district of Tamil Nadu.



Tables 16.1-16.2: Suitable areas for Mulberry in Idukki & Palghat district of Kerala

Table 16.1

| Block       | Suitable areas for Mulberry in Idukki (ha) |          |          |          |
|-------------|--|----------|----------|----------|
|             | High                                       | Moderate | Marginal | Total    |
| Adimali     | 163.10                                     | 3423.80  | 856.40   | 4443.31  |
| Azutha      | 426.30                                     | 4175.87  | 3379.07  | 7981.24  |
| Devikulam   | 204.37                                     | 2073.17  | 5088.12  | 7365.67  |
| Elamdesom   | 245.85                                     | 2556.70  | 449.00   | 3251.55  |
| Idukki      | 77.60                                      | 1019.73  | 1158.07  | 2255.40  |
| Kattappana  | 66.91                                      | 633.30   | 1059.89  | 1760.09  |
| Nedumkandam | 312.38                                     | 2251.11  | 145.25   | 2708.74  |
| Thodupuzha  | 36.00                                      | 253.03   | 268.31   | 557.34   |
| Total       | 1532.51                                    | 16386.73 | 12404.10 | 30323.34 |

Table 16.2

| Block            | Suitable areas for Mulberry in Palghat (ha) |          |          |          |
|------------------|---|----------|----------|----------|
|                  | High  | Moderate | Marginal | Total    |
| Alathur          | 1225.62                                     | 1376.71  | 477.31   | 3079.64  |
| Attappadi        | 12.01                                       | 172.61   | 784.34   | 968.96   |
| Chittur          | 271.78                                      | 6.35     | -        | 278.13   |
| Kollengode       | 368.07                                      | 128.01   | 8.07     | 504.15   |
| Kuzhalmannam     | 258.34                                      | 729.81   | 147.59   | 1135.73  |
| Malampuzha       | 1619.45                                     | 762.18   | 312.46   | 2694.09  |
| Mannarkkad       | 501.52                                      | 198.38   | 123.19   | 823.09   |
| Nemmara          | 790.28                                      | 407.33   | 198.15   | 1395.75  |
| Ottappalam       | 858.99                                      | 452.10   | 77.65    | 1388.75  |
| Palakkad         | 436.55                                      | 141.66   | 74.26    | 652.47   |
| Pattambi         | 646.05                                      | 615.01   | 81.85    | 1342.90  |
| ShornurMunc      | 236.03                                      | 133.53   | 10.07    | 379.63   |
| Sreekrishnapuram | 722.26                                      | 394.36   | 69.26    | 1185.89  |
| Thrithala        | 434.66                                      | 64.78    | 34.40    | 533.84   |
| Total            | 8381.61                                     | 5582.82  | 2398.60  | 16363.02 |

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Fig. 15.1: Suitable areas for Mulberry in Idukki district of Kerala

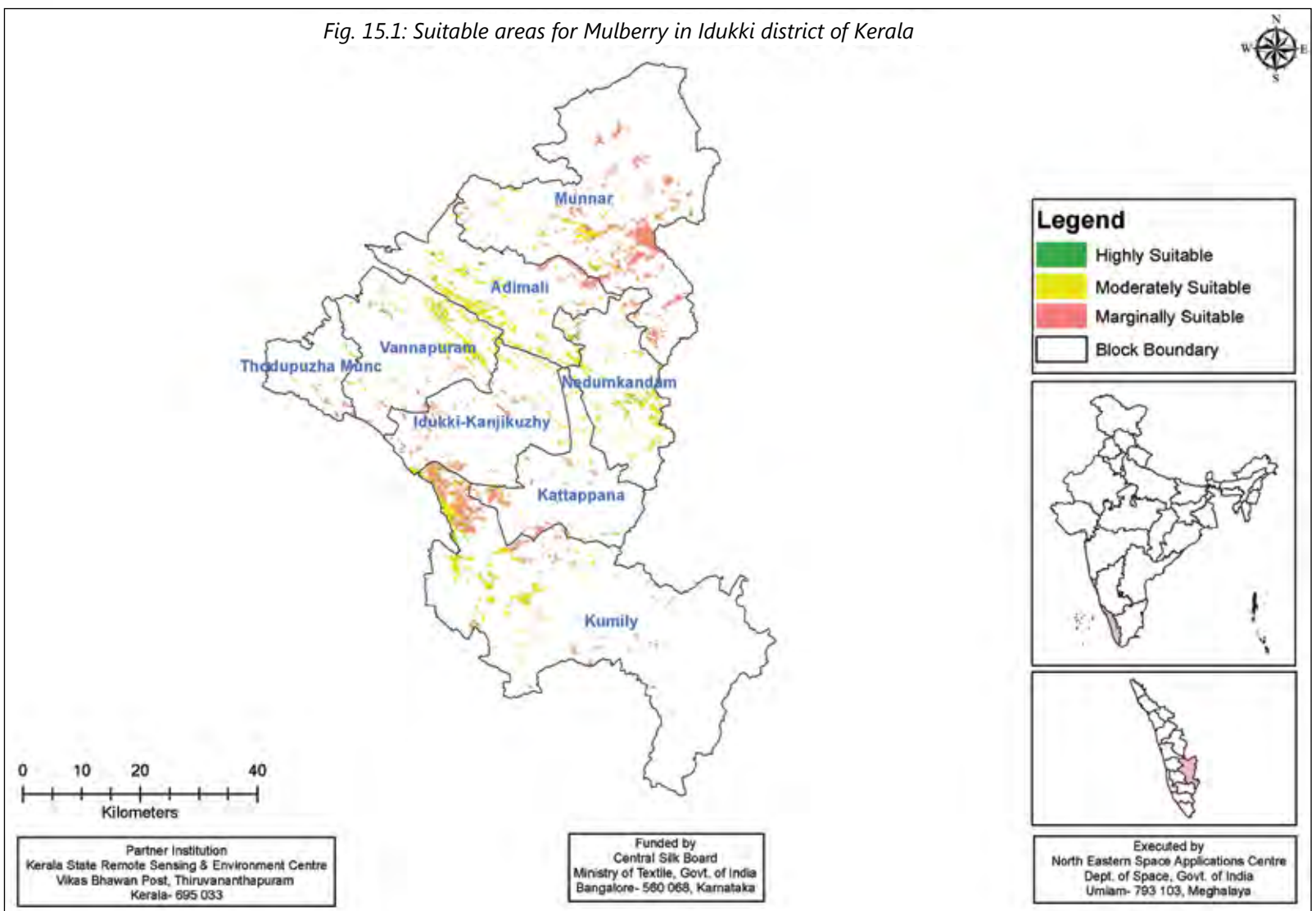
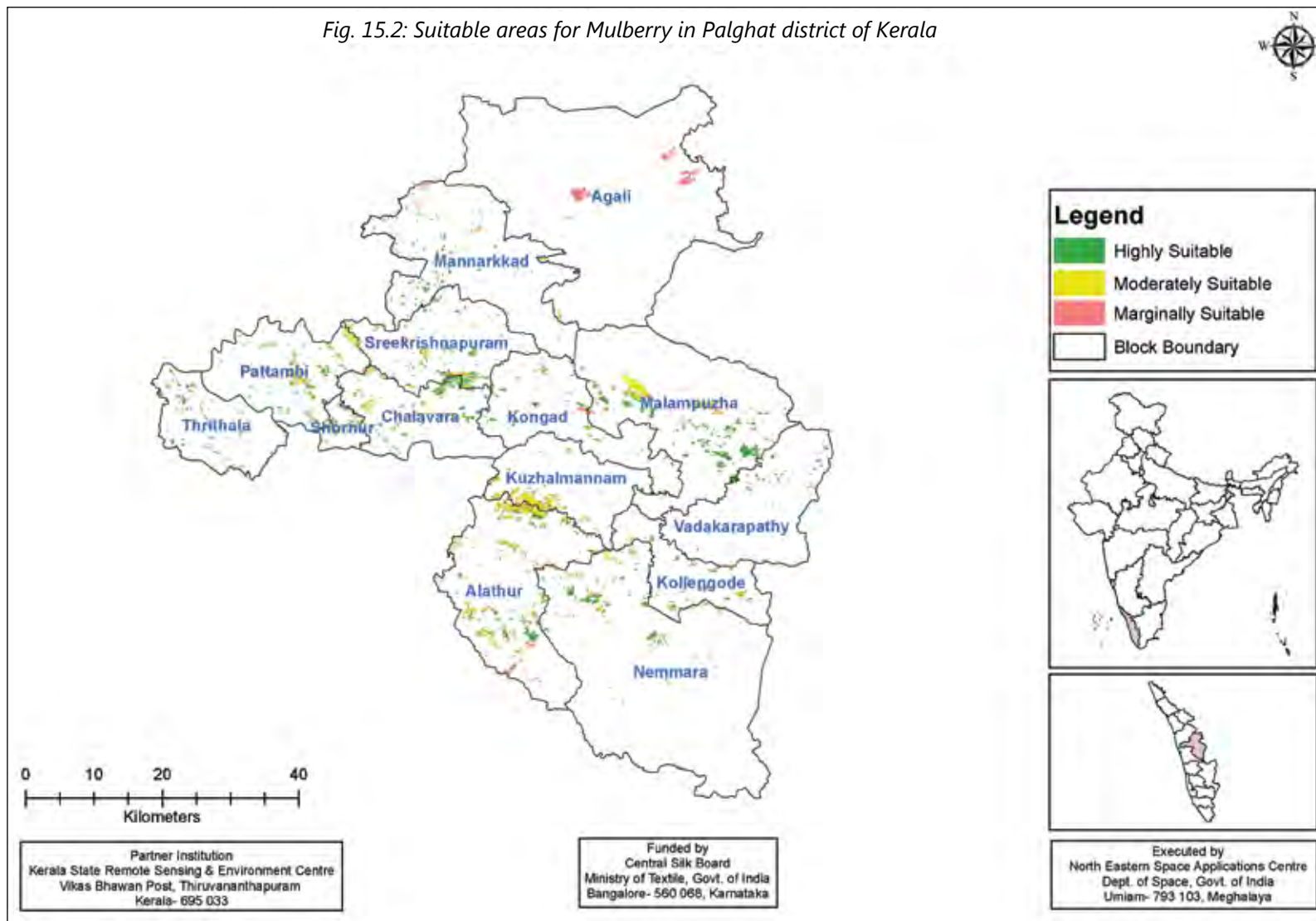


Fig. 15.2: Suitable areas for Mulberry in Palghat district of Kerala



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## MADHYA PRADESH

Madhya Pradesh is the second largest state in the country in terms of geographical area with Bhopal as its capital. Madhya Pradesh literally means "Central Province", and is located in the geographic heart of India, between latitude 21°04'N-26.87°N and longitude 74°02'-82°49' E. The state is bordered on the west by Gujarat, on the northwest by Rajasthan, on the northeast by Uttar Pradesh, on the east by Chhattisgarh, and on the south by Maharashtra. Madhya Pradesh has a subtropical climate and suitable for Mulberry and Tasar rearing. Six districts have been selected for mapping of potential areas for sericulture development.

### Datia

The district is a part of Gwalior Division. It is located at 25.67° N 78.47° E with a total geographical area of 2,038 sq. km. Datia is bounded by the Madhya Pradesh districts of Bhind to the north, Gwalior to the west, and Shivpuri to the south, and by Jhansi District of Uttar Pradesh state to the east.

### Dewas

Dewas district is located on the west-central part of the state and lies between 20 17' and 23 20' North latitude and 75 54' and 77 8' East longitude. The geographical boundaries are Ujjain district to the north, Khandwa district to the south, Indore district to the west and Sehore district to the east. To the northeast is found the district of Shahjapur while Hoshangabad district is to the southeast. The district has a total area of 7,020 square kilometers.

### Hoshangabad

Hoshangabad district lies in the central Narmada Valley and on the northern fringe of the Satpura Plateau. It lies between 21° 53" to 22° 59" north latitude and 76° 47" to 78° 44" east longitude and covers a total geographical area of 5408.23 sq.km. Northern boundary of the district is river Narmada. The district of Betul lies in the south, where as the Harda district faces with the western and south-western boundaries and Narsingpur and Chhindwara districts, close to the north-eastern and south-eastern sides of the district respectively.

### Gwalior

The district is a part of Gwalior Division in Madhya Pradesh State. Gwalior District is bounded by the districts of Bhind to the northeast, Datia to the east, Shivpuri to the south, Sheopur to the east, and Morena to the northwest. The district covers an area of 5,214 sq km.



## Jhabua

Jhabua district lies in the western part of Madhya Pradesh and is surrounded by Panchmahal and Baroda districts of Gujarat, Banswara district of Rajasthan, and Alirajpur, Dhar and Ratlam districts of Madhya Pradesh. It has an area of 3,782 Sq.km with hilly and undulating terrain. Average rainfall in the district is about 800 mm. The district is divided into five tehsils and six community development blocks.

## Vidisha

The district lies between 230 20' and 240 22' north latitudes, and 770 16' and 780 18' east longitudes with city of Vidisha as the administrative headquarters of the district. The Tropic of Cancer passes through the Southern stretch of the District about 2 km South of the District Head Quarters. It is bounded by the districts of Ashoknagar to the northeast, Sagar to the east, Raisen to the south, Bhopal to the southwest, and Guna to the northwest. It covers an area of 7,371 km.

Tables 17.1-17.4: Suitable Areas for Mulberry in Madhya Pradesh

Table 17.1

| Block   | Suitable areas for Mulberry in Datia (ha) |          |          |           |
|---------|---|----------|----------|-----------|
|         | High                                      | Moderate | Marginal | Total     |
| Bhander | 46.63                                     | 4090.92  | 20831.93 | 24969.48  |
| Datia   | -   | 1570.00  | 24684.90 | 26254.89  |
| Seondha | 113.40                                    | 20245.63 | 29072.46 | 49431.49  |
| Total   | 160.03                                    | 25906.55 | 74589.29 | 100655.86 |

Table 17.2

| Block     | Suitable areas for Mulberry in Dewas (ha) |          |          |          |
|-----------|---|----------|----------|----------|
|           | High                                      | Moderate | Marginal | Total    |
| Bagli     | -   | 55.31    | 4611.94  | 4667.26  |
| Dewas     | -   | 3.38     | 2782.78  | 2786.16  |
| Kannod    | 131.34                                    | 164.39   | 2186.90  | 2482.63  |
| Khategaon | -   | 450.38   | 3607.17  | 4057.55  |
| Sonkatch  | -   | 6.54     | 8874.51  | 8881.05  |
| TonrKhurd | -   | 87.27    | 7401.58  | 7488.85  |
| Total     | 131.34                                    | 767.28   | 29464.88 | 30363.50 |



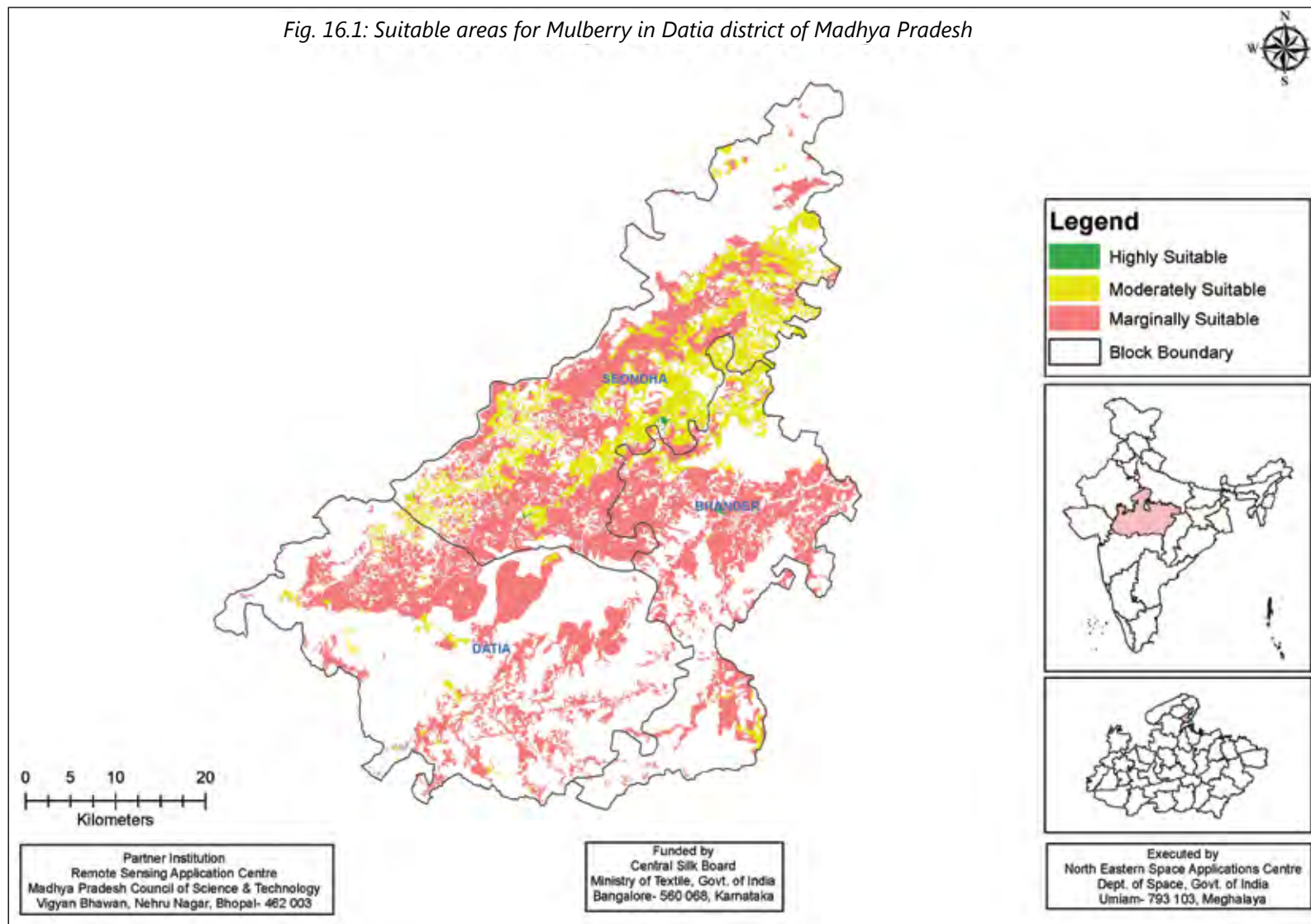
Table 17.3

| Block       | Suitable areas for Mulberry in Chitradurga (ha) |          |          |          |
|-------------|---|----------|----------|----------|
|             | High  | Moderate | Marginal | Total    |
| Babai       | -   | 355.61   | 390.03   | 745.64   |
| Bankhedi    | -   | 4764.92  | 2852.43  | 7617.35  |
| Hoshangabad | -   | 595.77   | 721.10   | 1316.87  |
| Itarsi      | 113.48  | 127.47   | 4913.47  | 5154.42  |
| Pipariya    | -   | 2316.50  | 1134.00  | 3450.50  |
| Seoni-Malwa | -   | 1875.19  | 8252.77  | 10127.95 |
| Sohagpur    | -   | 874.16   | 1297.19  | 2171.35  |
| Total       | 113.48  | 10909.61 | 19560.98 | 30584.08 |

Table 17.4

| Block     | Suitable areas for Mulberry in Belgaum (ha) |          |          |          |
|-----------|---|----------|----------|----------|
|           | High  | Moderate | Marginal | Total    |
| Bhitarwar | 72.64                                       | 1546.97  | 8279.10  | 9898.71  |
| Dabra     | 589.55                                      | 3477.59  | 25210.07 | 29277.22 |
| Gird      | -   | 10096.91 | 3908.47  | 14005.38 |
| Total     | 662.20                                      | 15121.47 | 37397.65 | 53181.31 |

Fig. 16.1: Suitable areas for Mulberry in Datia district of Madhya Pradesh



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Fig. 16.2: Suitable areas for Mulberry in Dewas district of Madhya Pradesh

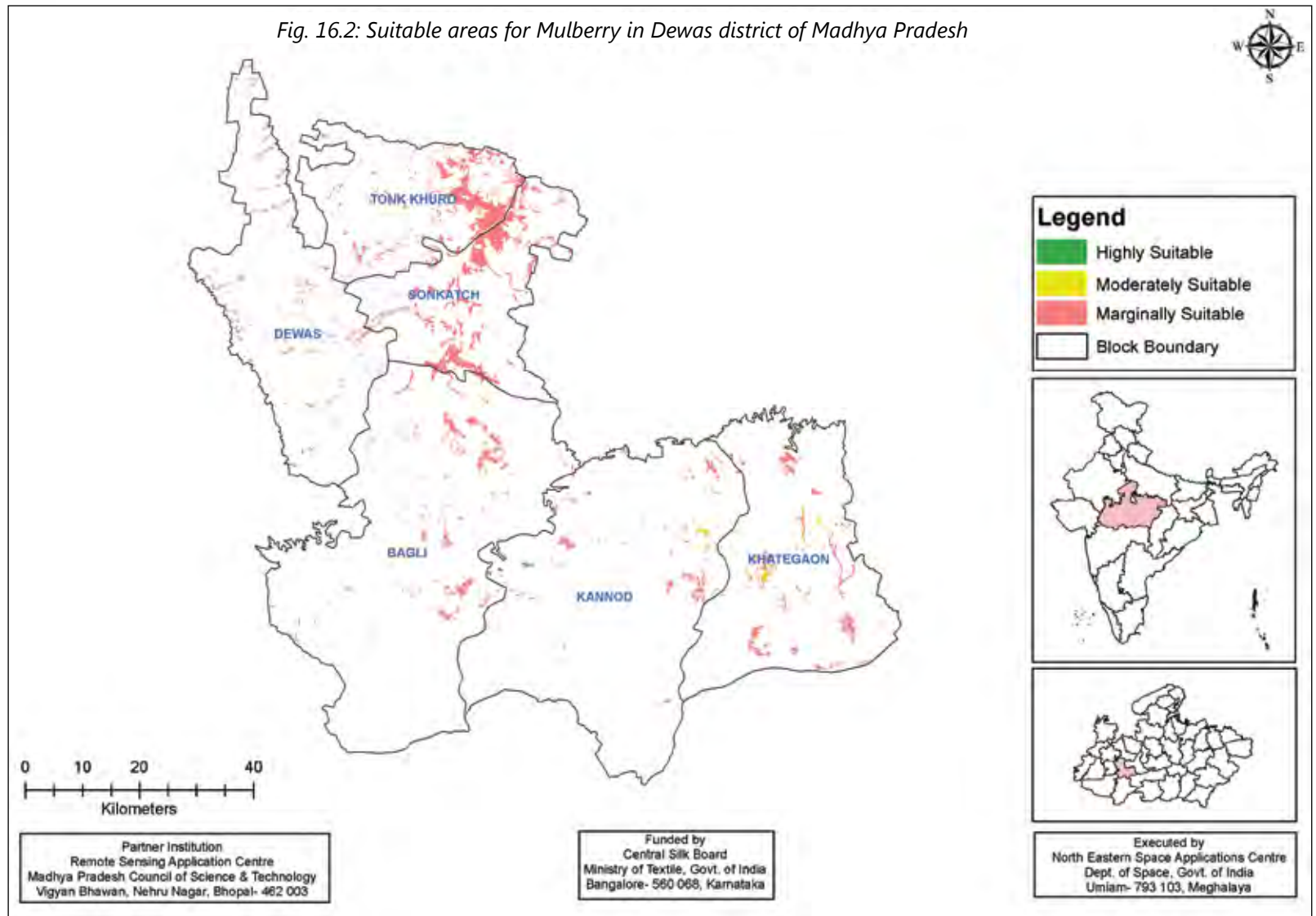
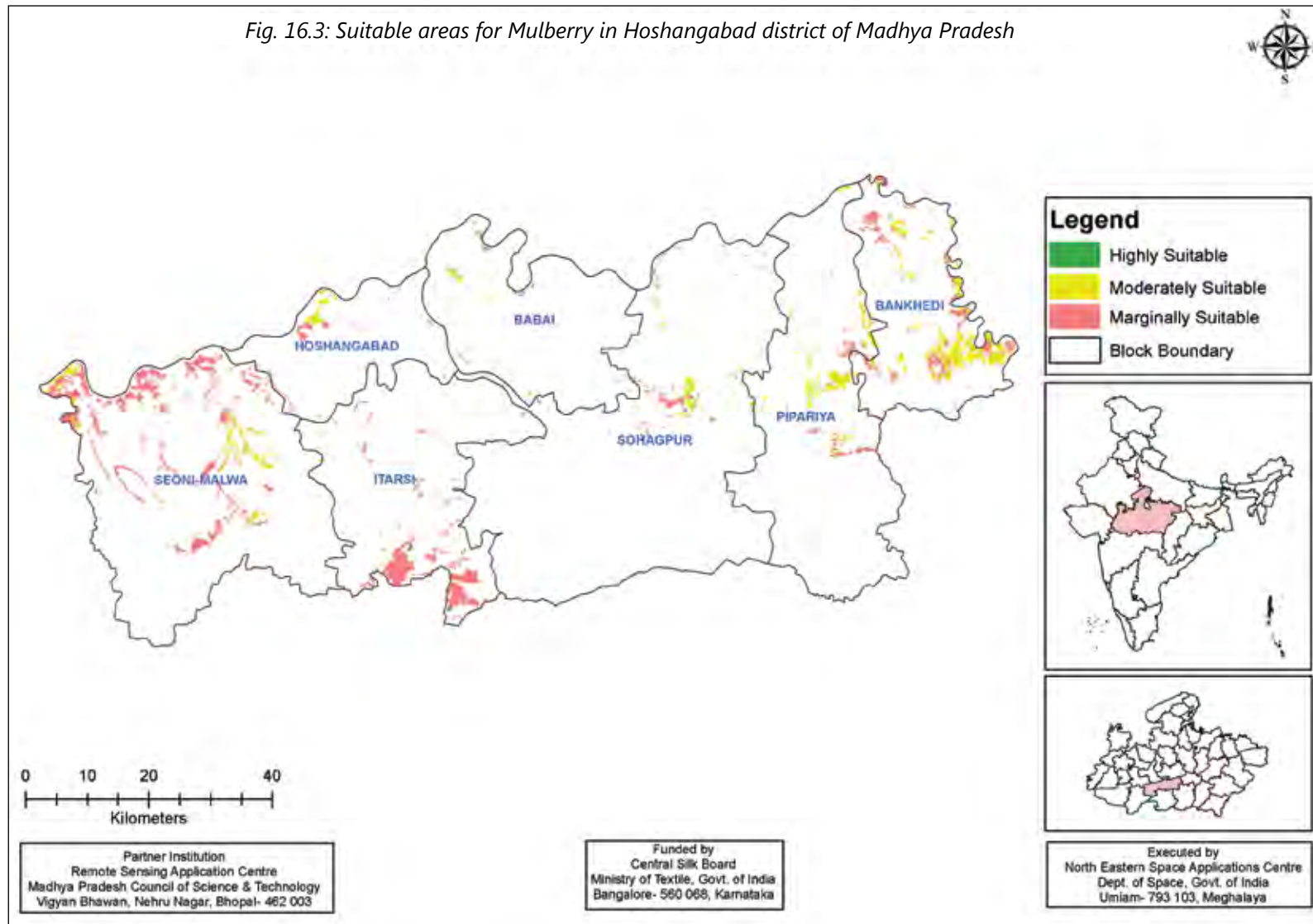


Fig. 16.3: Suitable areas for Mulberry in Hoshangabad district of Madhya Pradesh

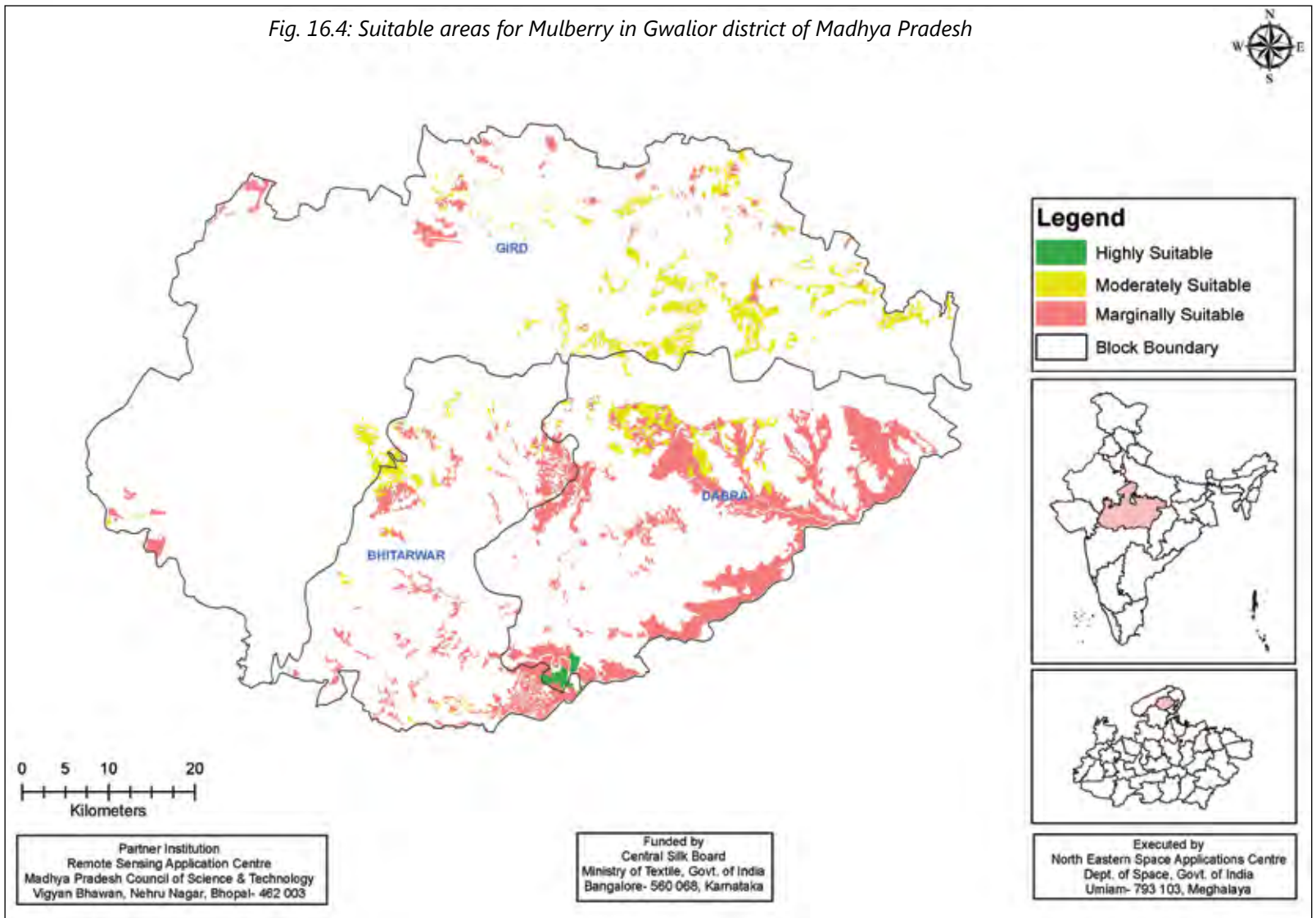


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Fig. 16.4: Suitable areas for Mulberry in Gwalior district of Madhya Pradesh



Tables 17.5-17.6: Suitable Areas for Mulberry in Jhabua & Vidisha district of Madhya Pradesh

Table 17.5

| Block      | Suitable areas for Mulberry in Jhabua (ha) |          |          |          |
|------------|--|----------|----------|----------|
|            | High                                       | Moderate | Marginal | Total    |
| Jhabua     | -  | 2250.15  | 11872.60 | 14122.75 |
| Meghanagar | -  | 5912.04  | 4351.46  | 10263.50 |
| Petlawad   | -  | 1111.64  | 14242.54 | 15354.19 |
| Ranapur    | 68.76                                      | 2898.32  | 4345.71  | 7312.78  |
| Thandla    | -  | 2464.51  | 8632.14  | 11096.65 |
| Total      | 68.76                                      | 14636.67 | 43444.44 | 58149.87 |

Table 17.6

| Block     | Suitable areas for Mulberry in Vidisha (ha) |          |          |          |
|-----------|---|----------|----------|----------|
|           | High  | Moderate | Marginal | Total    |
| Basoda    | -   | 218.05   | 24524.40 | 24742.45 |
| Gyaraspur | -   | 364.50   | 323.90   | 688.41   |
| Kurwai    | -   | -        | 19024.22 | 19024.22 |
| Lateri    | -   | 4125.07  | 9034.55  | 13159.62 |
| Nateran   | -   | 778.48   | 7665.67  | 8444.16  |
| Sironj    | -   | 4380.36  | 14327.66 | 18708.02 |
| Vidisha   | -   | -        | 205.48   | 205.48   |
| Total     | -   | 9866.47  | 75105.90 | 84972.36 |

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Fig. 16.5: Suitable areas for Mulberry in Jhabua district of Madhya Pradesh

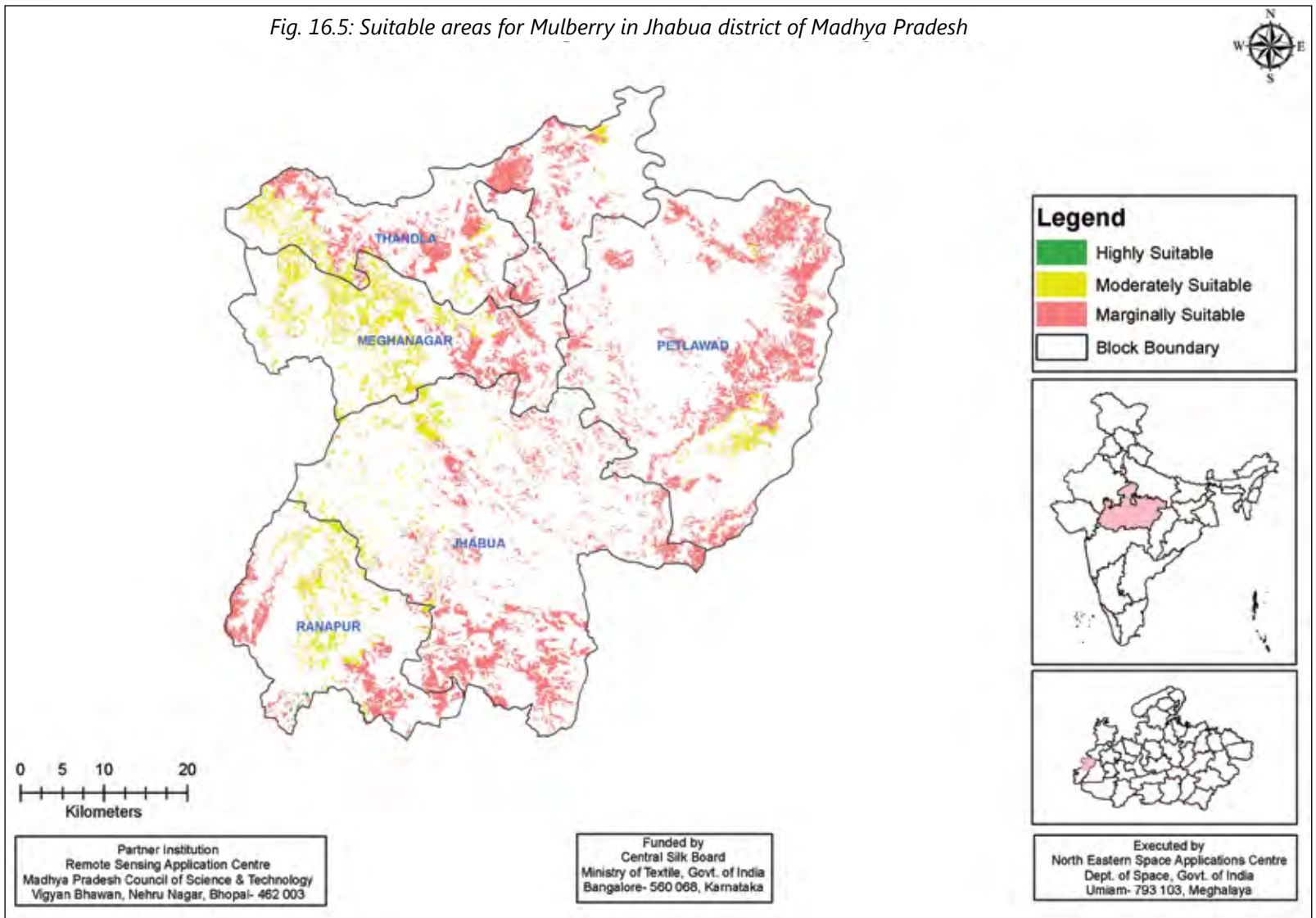
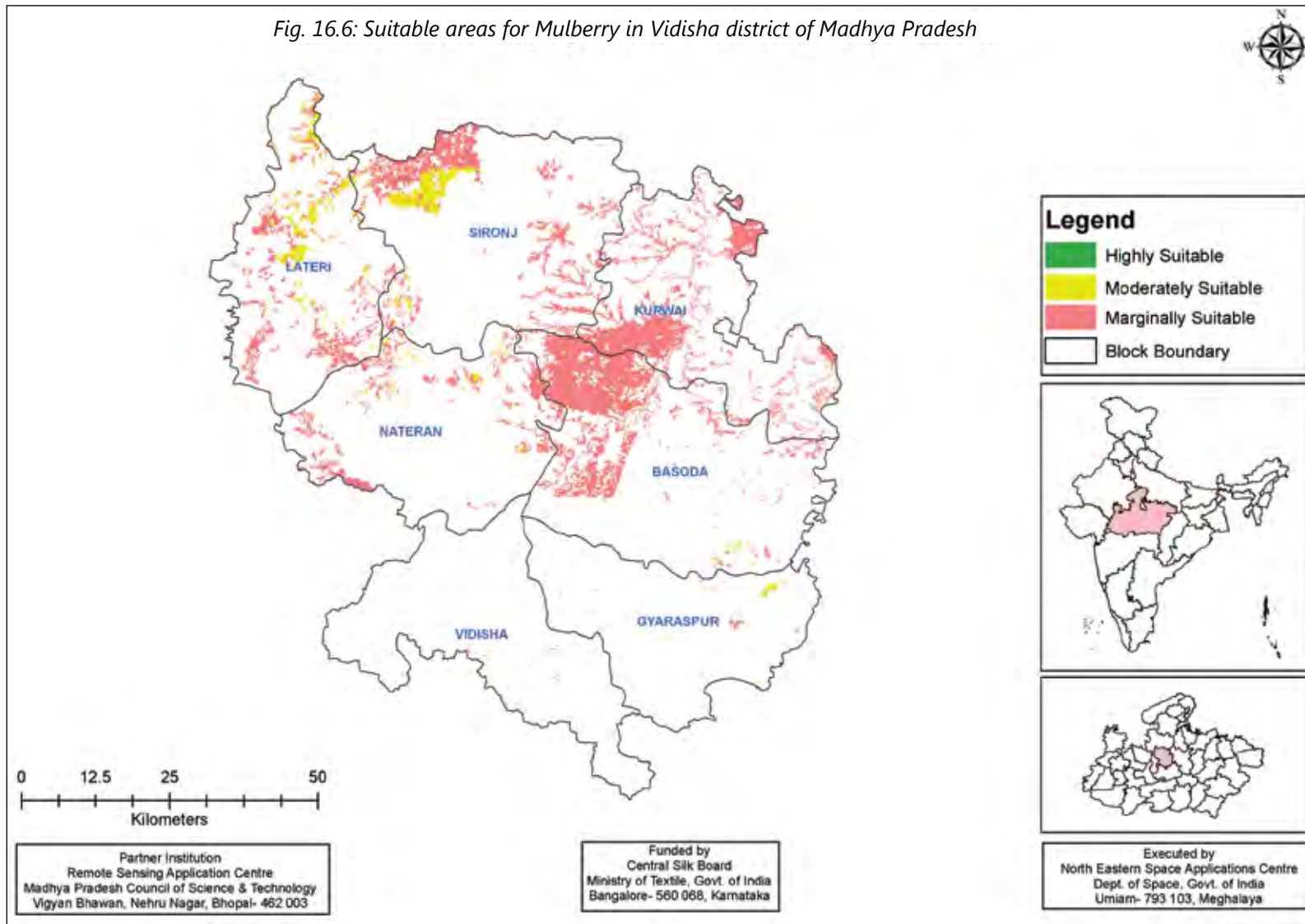


Fig. 16.6: Suitable areas for Mulberry in Vidisha district of Madhya Pradesh



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## MAHARASHTRA

Maharashtra is situated in western sea coastline of India with Mumbai as the capital city. The state covers an area of 3,07,731 sq. km. is the third-largest state of India, both in terms of area and also in terms of population. Maharashtra is bordered by the Arabian Sea to the west, Gujarat and the Union territory of Dadra and Nagar Haveli to the northwest, Madhya Pradesh to the northeast, Chhattisgarh to the east, Karnataka to the south, Andhra Pradesh to the southeast, and Goa to the southwest. Rice is the dominant crop of the state, but cashews, mangoes, vegetable cotton, oilseeds, and tobacco are also important.

Maharashtra state comes under non-traditional category in terms of Sericulture development, as this industry is limited to few districts only. The districts, which lead in Silk generation, are Bhandara, Gondia, Chandrapur and Gadchiroli. But there is ample scope of expanding area under sericulture with large tract of culturable wastelands that can be brought under plantation of silkworm hostplants. Seven districts were selected for mapping of potential areas viz. Beed, Jalna, Latur, Parbhani, Nagpur, Pune and Satara.

### Beed

Beed district is situated at the Central West of the Aurangabad surrounded by Aurangabad and Jalna in the North, Parbhani and Latur in the East, Ahmednagar and Osmanabad in the South and Ahmednagar in the West. It lies between 18.3 to 19.3 Degrees North Latitude and 74.5 to 76.6 Degrees East Latitude. The district covers an area of 10,693 km.

### Jalna

The district is situated at the central Maharashtra, in the north Marathwada region, which is a part of Aurangabad division. The district is bounded on the north by Jalgaon district, on the east by Parbhani and Buldhana districts, on the south by Beed district and on the west by Aurangabad district. Geographical location of the district is 19.01' N - 21.03'N and 75.04'E - 76.04'E with an area of 7718 km.

### Latur

The Latur District is in the south-eastern part of the state. The district is situated on the Maharashtra Karnataka boundary. On the eastern side of the Latur is Bidar district of Karnataka, whereas Nanded is on the northeast, Parbhani on the northern side, Beed on the Northwest and Osmanabad on the western and southern side. It lies between 17°52' North



to 18°50' North and 76°18' East to 79°12' East in the Deccan plateau. The geographical area covers by the district is 7,157 sq km.

### **Parbhani**

Parbhani, earlier also known as " Prabhavatinagar ", is one of the Eight districts in the Marathawada region of Marashtra State. Parbhani district lies between 18.45 and 20.10 North Latitudes and 76.13 and 77.39 East Longitude. The district is bounded on the north by Hingoli and Buldhana district. On the east by Nanded and Hingoli district, on the South by Latur and on the West by Beed and Jalna districts.

### **Nagpur**

Nagpur district is located in the Vidarbha region of Maharashtra with city of Nagpur is the district headquarters. Nagpur district is bounded by Bhandara district on the east, Chandrapur district on the southeast, Wardha district on the southwest, Amravati district on the northwest and Chhindwara district of Madhya Pradesh state on the north.

### **Pune**

Pune is the second largest district in the state and covers 5.10% of the total geographical area of the state with a total geographical area of 15.642sq.km. It is located between 17.5° to 19.2° North Latitude and 73.2° to 75.1° East Longitude. Pune district is bounded by Thane District to the northwest, Raigad District to the west, Satara District to the south, Solapur District to the southeast, and Ahmednagar District to the north and northeast.

### **Satara**

Satara district is situated in the river basins of the Bhima and Krishna river. The geographical location of the districts lies between 17.5 to 18.11 North Latitudes and 73.33 to 74.54 East Longitudes with an area of 10,480 sq.km. the district is bounded by Pune district to the north, Solapur district to the east, Sangli district to the south and Ratnagiri district to the west. Raigad district lies to its north-west.

Tables 18.1-18.4: Suitable areas for Mulberry in Beed, Jalna, Latur & Parbani district of Maharashtra

Table 18.1

| Block        | Suitable areas for Mulberry in Beed (ha) |          |          |         |
|--------------|--|----------|----------|---------|
|              | High                                     | Moderate | Marginal | Total   |
| Ambejogai    | -  | 1.11     | 479.76   | 480.87  |
| Ashti        | -  | 6.74     | 1513.90  | 1520.64 |
| Beed         | -  | 7.95     | 742.38   | 750.33  |
| Dharur       | -  | 1.19     | 46.95    | 48.13   |
| Georai       | -  | 4.04     | 1327.97  | 1332.02 |
| Kaij         | -  | 2.02     | 139.37   | 141.39  |
| Majalgaon    | -  | 8.87     | 712.38   | 721.25  |
| Parli        | -  | 5.89     | 1332.22  | 1338.11 |
| Patoda       | -  | -        | 319.10   | 319.10  |
| Shirur-Kasar | -  | 2.09     | 628.71   | 630.80  |
| Wadwani      | -  | 4.80     | 365.22   | 370.02  |
| Total        | -  | 44.70    | 7607.97  | 7652.67 |

Table 18.2

| Block       | Suitable areas for Mulberry in Jalna (ha) |          |          |          |
|-------------|---|----------|----------|----------|
|             | High                                      | Moderate | Marginal | Total    |
| Ambad       | -   | -        | 1497.44  | 1497.44  |
| Badnapur    | -   | -        | 735.55   | 735.55   |
| Bhokardan   | -   | -        | 1350.55  | 1350.55  |
| Ghansavangi | -   | -        | 2012.57  | 2012.57  |
| Jafrabad    | -   | -        | 1138.37  | 1138.37  |
| Jalna       | -   | -        | 3885.67  | 3885.67  |
| Mantha      | -   | -        | 1492.59  | 1492.59  |
| Partur      | -   | -        | 617.79   | 617.79   |
| Total       | -   | -        | 12730.52 | 12730.52 |



Table 18.3

| Block           | Suitable areas for Mulberry in Latur (ha) |          |          |         |
|-----------------|---|----------|----------|---------|
|                 | High                                      | Moderate | Marginal | Total   |
| Ahmadpur        | -   | -        | 788.04   | 788.04  |
| Ausa            | -   | 1.89     | 431.21   | 433.10  |
| Chakur          | -   | -        | 103.75   | 103.75  |
| Deoni           | -   | -        | 615.98   | 615.98  |
| Jalkot          | -   | -        | 281.11   | 281.11  |
| Latur           | -   | -        | 145.63   | 145.63  |
| Nilanga         | -   | 21.52    | 1315.30  | 1336.82 |
| Renapur         | -   | -        | 373.84   | 373.84  |
| Shirur-Anantpal | -   | -        | 23.25    | 23.25   |
| Udgir           | -   | -        | 829.14   | 829.14  |
| Total           | -   | 23.40    | 4907.25  | 4930.65 |

Table 18.4

| Block     | Suitable areas for Mulberry in Parbhani (ha) |          |          |         |
|-----------|--|----------|----------|---------|
|           | High   | Moderate | Marginal | Total   |
| Gangakhed | -  | 0.82     | 2553.86  | 2554.68 |
| Jintur    | -  | 53.70    | 459.98   | 513.68  |
| Manwat    | -  | 49.53    | 62.40    | 111.93  |
| Palam     | -  | 16.37    | 150.89   | 167.26  |
| Parbhani  | -  | 653.77   | 1154.82  | 1808.59 |
| Pathri    | -  | 119.80   | 570.11   | 689.91  |
| Purna     | -  | 94.58    | 333.17   | 427.76  |
| Selu      | -  | 515.10   | 199.77   | 714.87  |
| Sonpeth   | -  | 0.35     | 289.48   | 289.83  |
| Total     | -  | 1504.03  | 5774.49  | 7278.52 |

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Fig. 17.1: Suitable areas for Mulberry in Beed district of Maharashtra

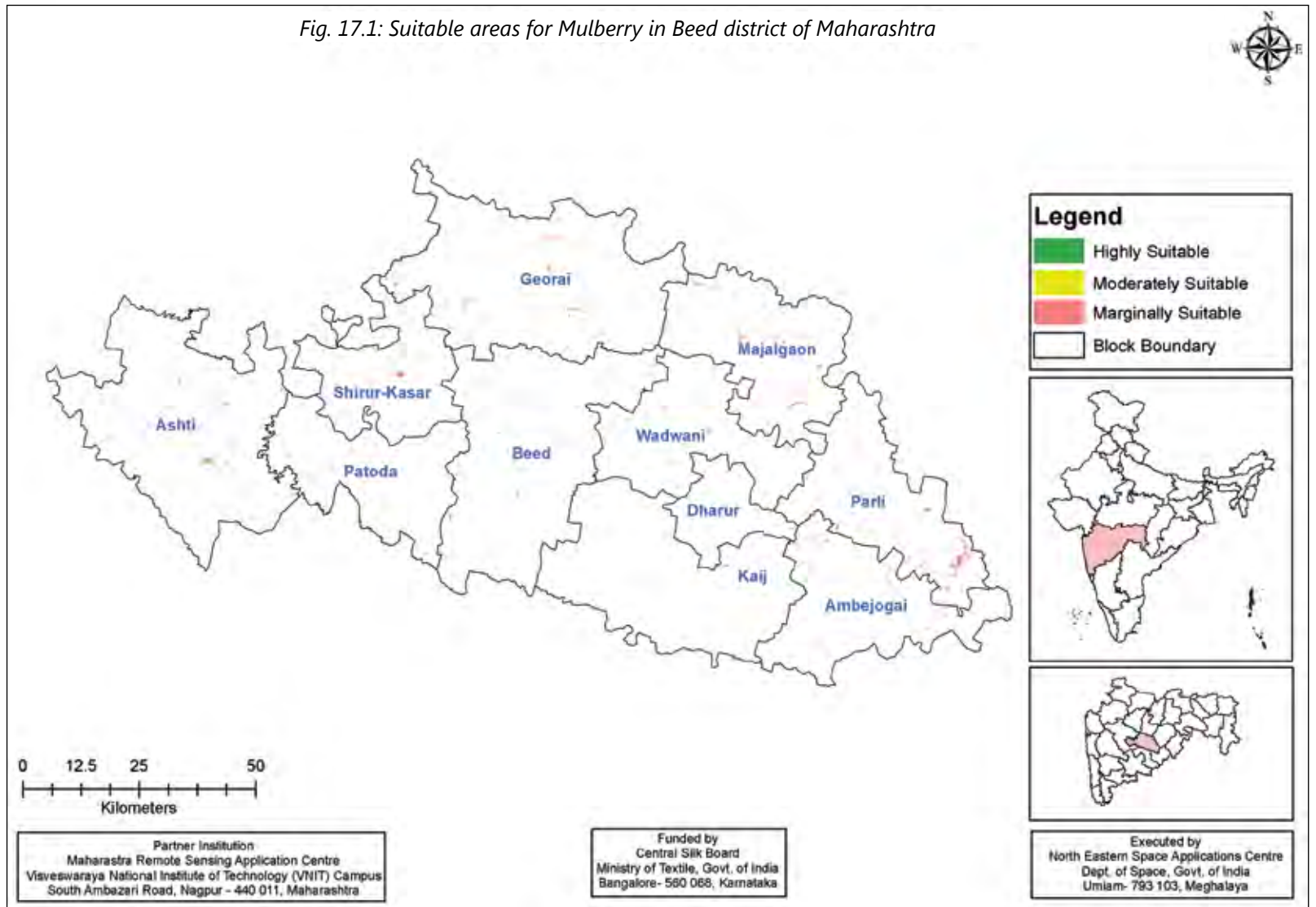
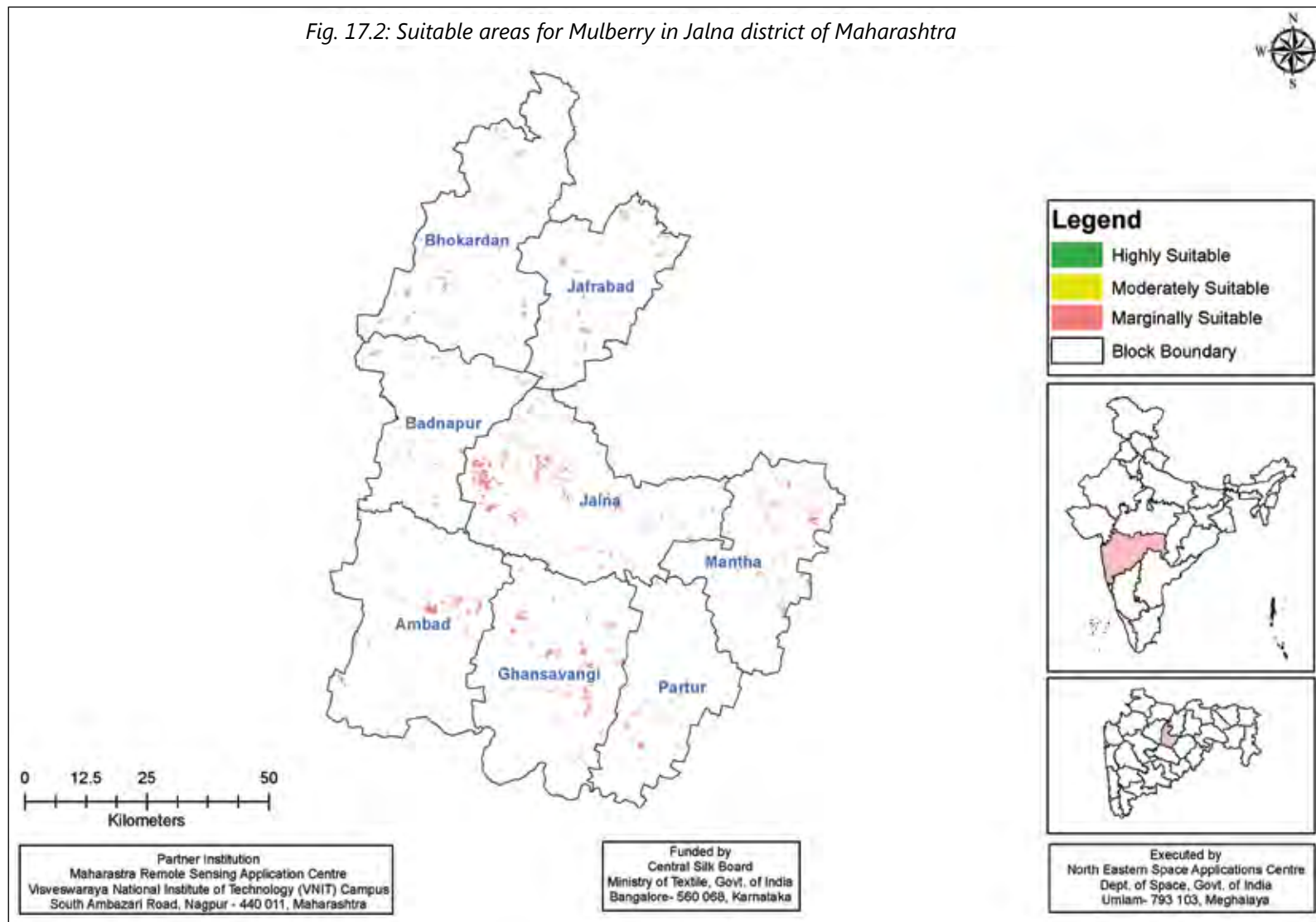


Fig. 17.2: Suitable areas for Mulberry in Jalna district of Maharashtra



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Fig. 17.3: Suitable areas for Mulberry in Latur district of Maharashtra

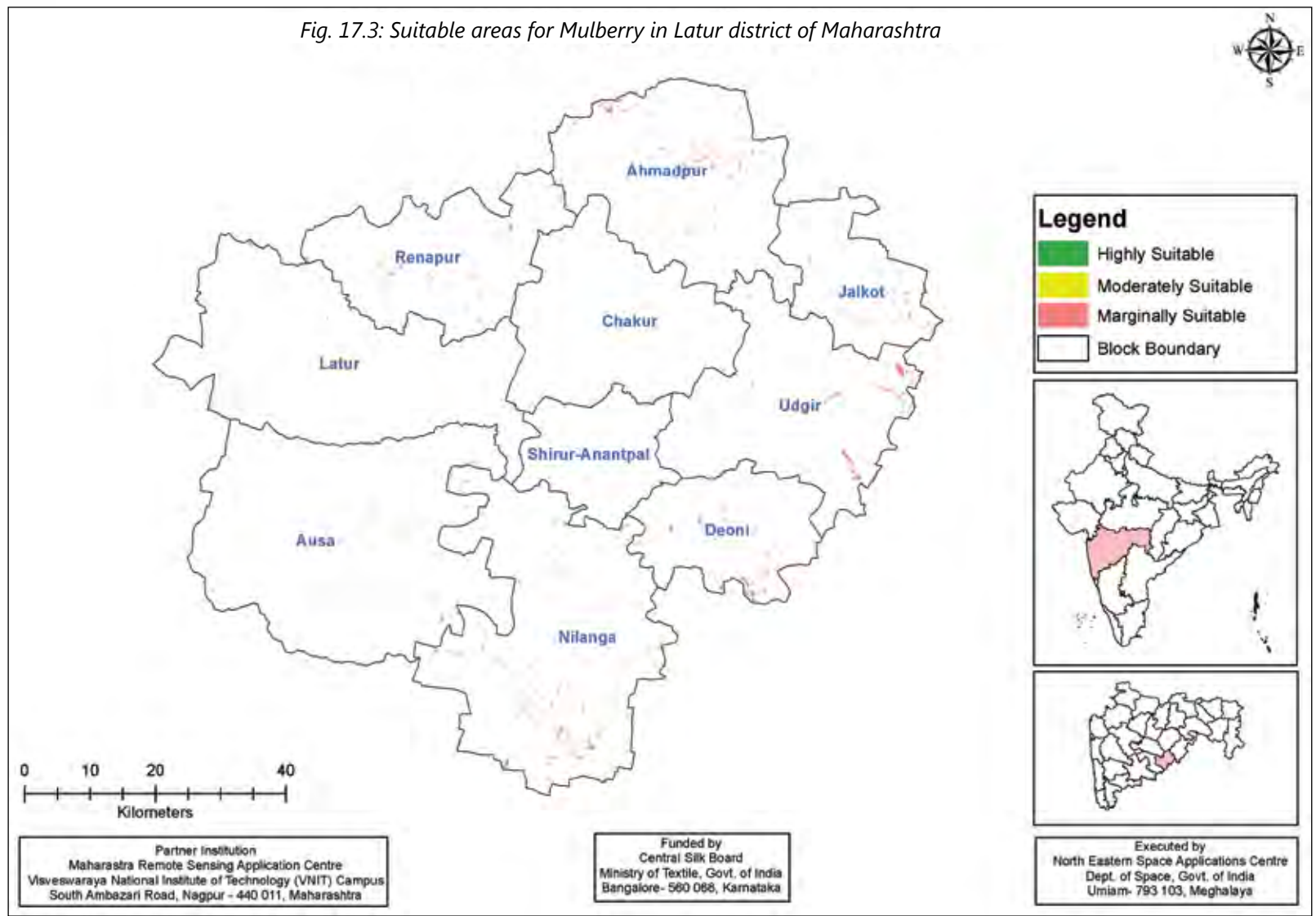
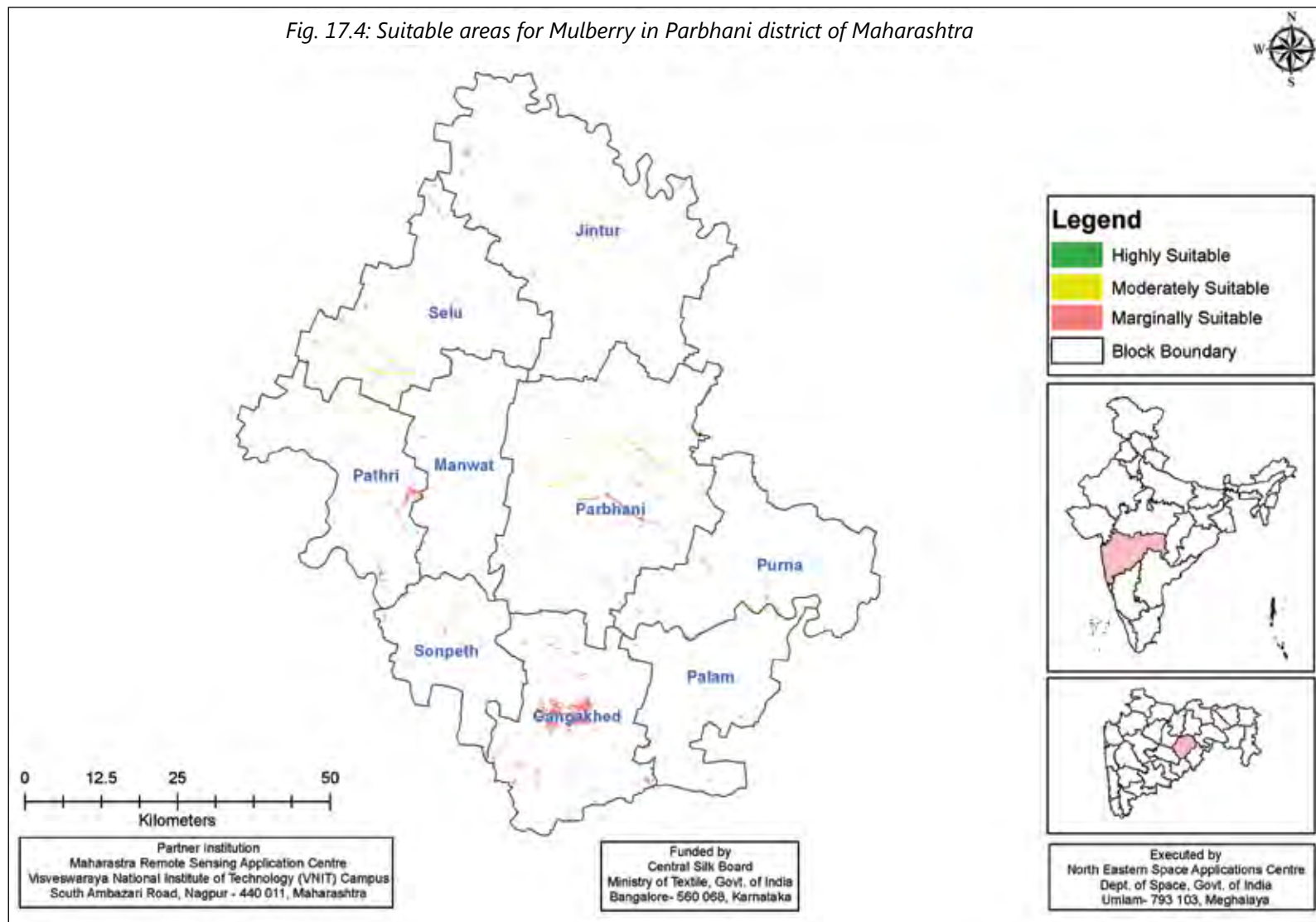


Fig. 17.4: Suitable areas for Mulberry in Parbhani district of Maharashtra



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Tables 18.5-18.6: Suitable Areas for Mulberry in Nagpur & Pune district of Maharashtra

Table 18.5

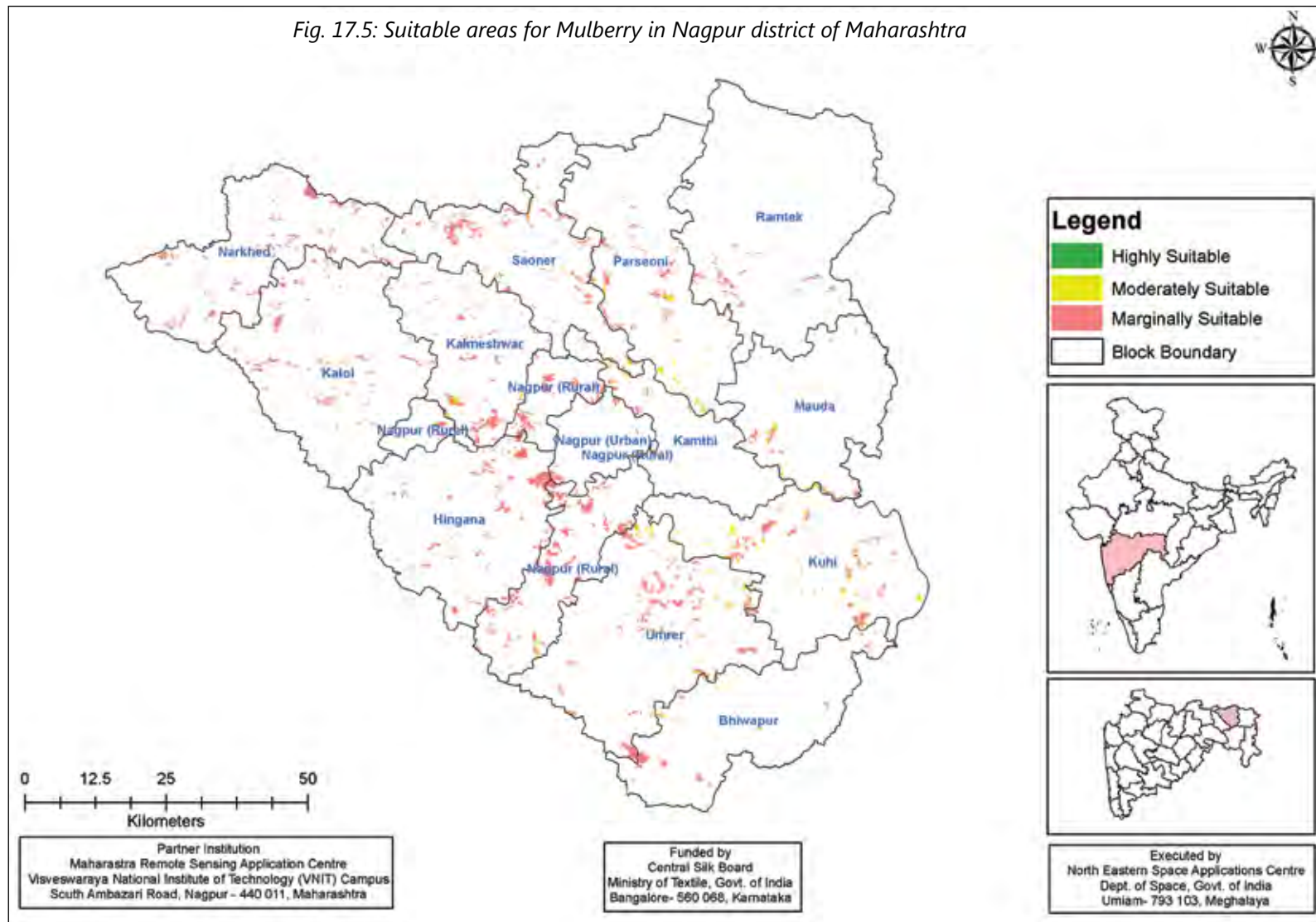
| Block          | Suitable areas for Mulberry in Nagpur (ha) |          |          |          |
|----------------|--|----------|----------|----------|
|                | High                                       | Moderate | Marginal | Total    |
| Bhiwapur       | -  | 248.66   | 888.93   | 1137.59  |
| Hingana        | -  | 31.92    | 3053.81  | 3085.73  |
| Kalmeshwar     | -  | 261.83   | 2075.82  | 2337.66  |
| Kamthi         | -  | 213.59   | 394.07   | 607.66   |
| Katol          | -  | 47.62    | 2088.77  | 2136.39  |
| Kuhi           | -  | 1075.70  | 2018.71  | 3094.42  |
| Mauda          | -  | 275.39   | 771.28   | 1046.67  |
| Nagpur (Rural) | -  | 300.25   | 5309.51  | 5609.76  |
| Nagpur (Urban) | -  | 100.48   | 453.23   | 553.71   |
| Narkhed        | -  | 144.53   | 2368.40  | 2512.94  |
| Parseoni       | -  | 610.34   | 1454.26  | 2064.60  |
| Ramtek         | -  | 7.65     | 1017.64  | 1025.29  |
| Saoner         | -  | 254.38   | 2683.44  | 2937.83  |
| Umrer          | -  | 720.17   | 3606.48  | 4326.64  |
| Total          | -  | 4292.52  | 28184.36 | 32476.88 |

Table 18.6

| Block     | Suitable areas for Mulberry in Pune (ha) |          |          |          |
|-----------|--|----------|----------|----------|
|           | High                                     | Moderate | Marginal | Total    |
| Ambegaon  | -  | 17.10    | 725.91   | 743.01   |
| Baramati  | -  | 77.38    | 1399.63  | 1477.00  |
| Bhor      | -  | 7.82     | 518.53   | 526.35   |
| Daund     | -  | 177.76   | 1001.43  | 1179.19  |
| Haveli    | -  | 6.16     | 1873.62  | 1879.77  |
| indapur   | -  | 18.50    | 595.33   | 613.83   |
| Junnar    | -  | 1.01     | 377.32   | 378.33   |
| Khed      | -  | -        | 691.17   | 691.17   |
| Mawal     | -  | -        | 1341.74  | 1341.74  |
| Mulshi    | -  | -        | 303.96   | 303.96   |
| Pune City | -  | -        | 34.18    | 34.18    |
| Purandhar | -  | 13.68    | 2127.11  | 2140.80  |
| Shirur    | -  | 34.13    | 529.77   | 563.90   |
| Velhe     | -  | -        | 185.42   | 185.42   |
| Total     | -  | 353.53   | 11705.11 | 12058.64 |



Fig. 17.5: Suitable areas for Mulberry in Nagpur district of Maharashtra



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Fig. 17.6: Suitable areas for Mulberry in Pune district of Maharashtra

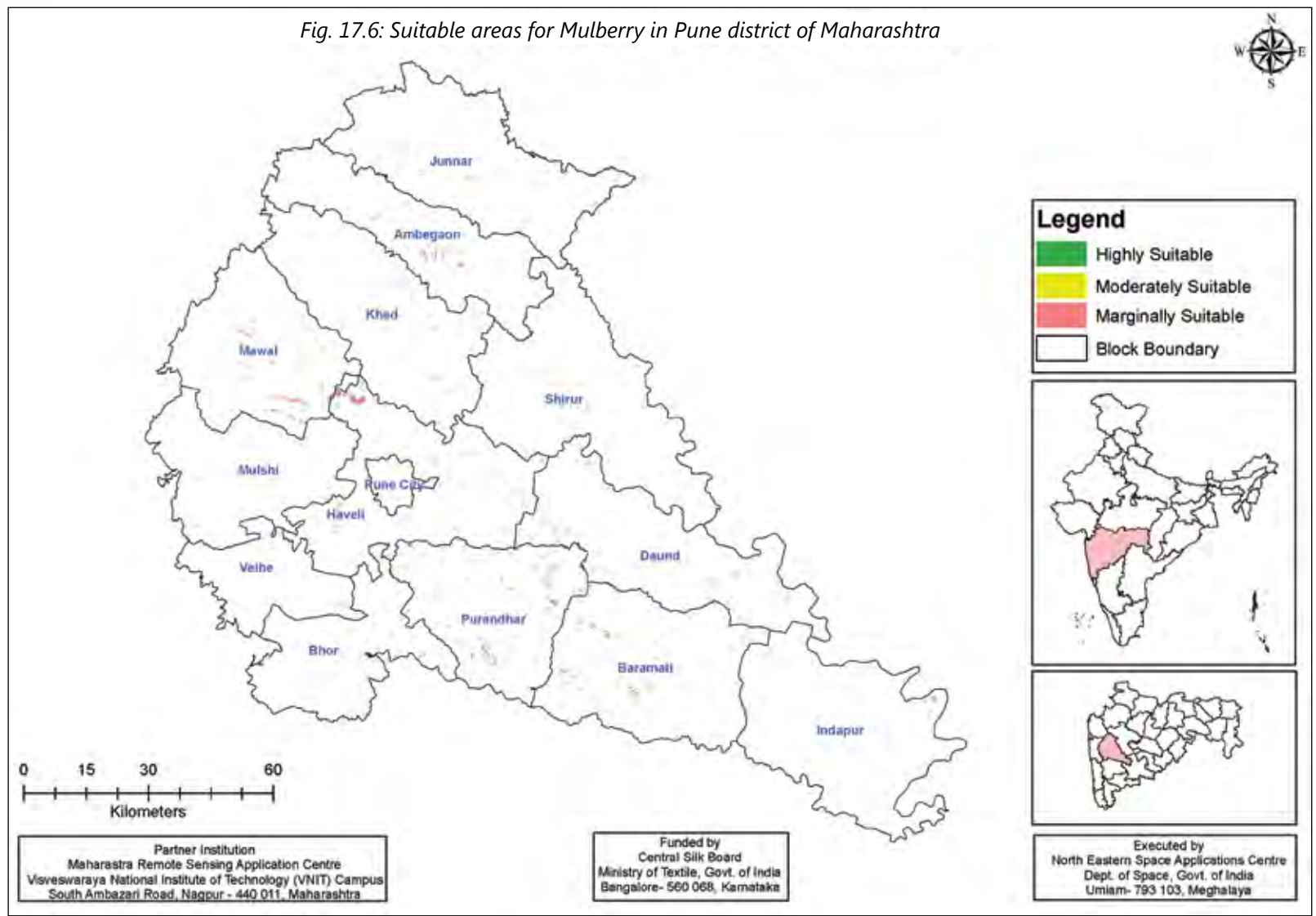


Table 18.7: Suitable Areas for Mulberry in Satara District of Maharashtra

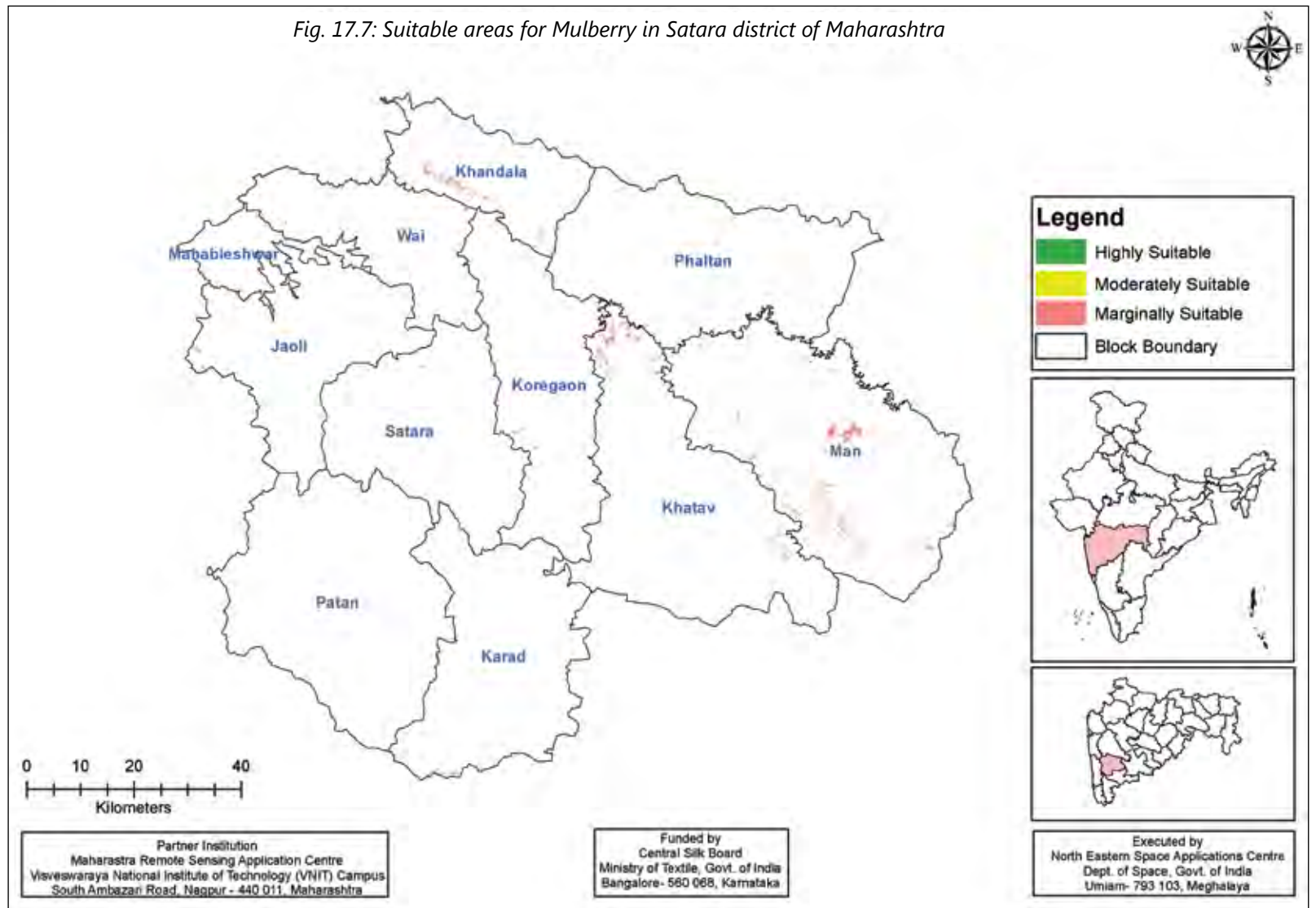
| Block        | Suitable areas for Mulberry (ha) |          |          |         |
|--------------|----------------------------------|----------|----------|---------|
|              | High                             | Moderate | Marginal | Total   |
| Jaoli        | -                                | -        | 80.87    | 80.87   |
| Karad        | -                                | 0.79     | 195.70   | 196.49  |
| Khandala     | -                                | -        | 785.59   | 785.59  |
| Khatav       | -                                | 9.45     | 1137.50  | 1146.95 |
| Koregaon     | -                                | 4.01     | 115.31   | 119.32  |
| Mahableshwar | -                                | -        | 24.57    | 24.57   |
| Man          | -                                | 112.83   | 2526.71  | 2639.54 |
| Patan        | -                                | 0.00     | 71.13    | 71.13   |
| Phaltan      | -                                | 96.08    | 346.86   | 442.94  |
| Satara       | -                                | -        | 126.11   | 126.11  |
| Wai          | -                                | -        | 81.43    | 81.43   |
| Total        | -                                | 223.16   | 5491.78  | 5714.94 |

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Fig. 17.7: Suitable areas for Mulberry in Satara district of Maharashtra



## MANIPUR

Manipur is one of the seven sister states of NER which is known for rich cultural heritage. It lies between 23.830N to 25.680N latitude and 93.030E to 94.780E longitude with Imphal as the state capital. The state is bounded by Nagaland to the north, Mizoram to the south, and Assam to the west; Burma lies to the east. It covers an area of 22,347 square kilometers.

The vegetation consists of a large variety of plants ranging from short and tall grasses, reeds and bamboos to trees of various species. Rice and cash crops make up the main vegetation cover in the valley.

Manipur is the home for serideginous insects thereby producing all the four types of silk (Tasar, Eri, Muga & Mulberry). The Sericulture is recognised as one of the most promising and an ideally suited Industry in the state to the rural socio-economic developments providing employment opportunities with minimum investment and profitable return within a short gestation period. Being a labour intensive rural based Industry it offers a qualitative and quantitative change in the poverty alleviation with a chain creation of employment from unskilled farm labourer to skill artisans to all sections especially women folk. It will generate income for people living below the poverty line in the rural masses particularly for women. All the 9 districts in the state were selected for mapping of potential areas for expansion of sericulture activities in the state.

### **Bishnupur**

The Bishnupur with its headquarter at Bishnupur is 27 Km. from Imphal. Stretching between 93.43 E and 93.53 E Longitudes and 24.18 N and 24.44 N Latitudes the total geographical area of the District is 530 Sq. Km. It is bounded on the North by Imphal West District, on the South by Churachandpur District, on the East by Imphal and Thoubal Districts.

### **Chandel**

The Chandel District is about 64 km. away from Imphal and a hill district with an area of 3,313 sq. km. The District lies in the south-eastern part of Manipur at 24o40' N Latitude and 93o50' E Longitude. Its neighbors are Myanmar on the south, Ukhrul district on the east, Churachandpur district on the south and west, and Thoubal district on the north.

### **Churachandpur**

Churachandpur is the largest district in the state covering an area of 4570 sq km. It lies between 93.15oE and 94.0oE Longitude and 24.0oN and 24.3oN Latitude.

### **Imphal East**

The District is situated in two separate valleys of the state namely Central Valley and Jiribam Valley. The total area of District is 469.44 km<sup>2</sup>. As of 2011 it is the second most populous district in the state, after Imphal West. Porompat town is the administrative headquarters of the district.

### **Imphal West**

The Imphal West District is a tiny plain district at the centre of Manipur surrounded by Plains of other districts. Imphal City, the State Capital is the nodal functional centre of this District. It is surrounded by Senapati District on the north, on the east by Imphal East and Thoubal districts, on the south by Thoubal and Bishnupur Districts, and on the west by Senapati and Bishnupur Districts. The total geographical area of the district is 558 sq. km.

### **Senapati**

Senapati District is located between 93.29° and 94.15° East Longitude and 24.37° and 25.37° North Latitude and is located in the northern part of the state. The District is bounded on the south by Imphal East District and Imphal West District, on the east by Ukhrul District, on the west by Tamenglong District and on the north by Phek district of Nagaland. The total geographical area of the district is 3271 sq. km.

### **Tamenglong**

Tamenglong is located along the western boundary of the state. Tamenglong is entirely composed of hills, ranges and narrow valleys. Tamenglong town is the headquarters of this district. The total geographical area of the District is 4391 Sq. Km. This district is bounded by Nagaland state on the north, by Senapati district on the north and east, by Churhandpur district on the south and by Imphal West district and Assam state on the west. The district occupies an area of 4391 km.

### **Thoubal**

The district occupies the larger part of the eastern half of the Manipur Valley. It lies between 23° 45' N and 24°45' N latitude and 93°45' E and 94°15' E longitude. It is bounded by Senapati district on the north, Ukhrul and Chandel districts on the east, Churhandpur and Bishnupur districts on the south and Imphal West and Imphal East districts on the west. The district occupies an area of 519 km<sup>2</sup>.

### **Ukhrul**

Ukhrul is located in the north eastern part of the state and lies between 24°0N - 25.410 N latitude and 94°0 E - 94.470 E longitude. It is bounded by Myanmar in the East, Chandel District in the South, Imphal East and Senapati Districts in the West and Nagaland State in the North.



Tables 19.1-19.3: Suitable Areas for Eri, Muga & Tasar in Bishnupur District of Manipur

Table 19.1

| Block     | Suitable Area for Eri (ha) |          |          |         |
|-----------|----------------------------|----------|----------|---------|
|           | High                       | Moderate | Marginal | Total   |
| Bishnupur | 371.52                     | 266.31   | 578.74   | 1216.58 |
| Moirang   | 655.19                     | 715.12   | 1783.51  | 3153.82 |
| Nambol    | 6.95                       | 53.3     | 47.52    | 107.77  |
| Total     | 1033.66                    | 1034.73  | 2409.78  | 4478.17 |

Table 19.2

| Block     | Suitable Area for Muga (ha) |          |          |         |
|-----------|-----------------------------|----------|----------|---------|
|           | High                        | Moderate | Marginal | Total   |
| Bishnupur | 371.52                      | 266.31   | 578.74   | 1216.58 |
| Moirang   | 655.19                      | 715.12   | 1783.51  | 3153.82 |
| Nambol    | 6.95                        | 53.3     | 47.52    | 107.77  |
| Total     | 1033.66                     | 1034.73  | 2409.78  | 4478.17 |

Table 19.3

| Block     | Suitable Area for Tasar (ha) |          |          |         |
|-----------|------------------------------|----------|----------|---------|
|           | High                         | Moderate | Marginal | Total   |
| Bishnupur | 371.52                       | 266.31   | 578.74   | 1216.58 |
| Moirang   | 655.19                       | 715.12   | 1783.51  | 3153.82 |
| Nambol    | 6.95                         | 53.3     | 47.52    | 107.77  |
| Total     | 1033.66                      | 1034.73  | 2409.78  | 4478.17 |

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Fig. 18.1: Suitable areas for Eri in Bishnupur district of Manipur

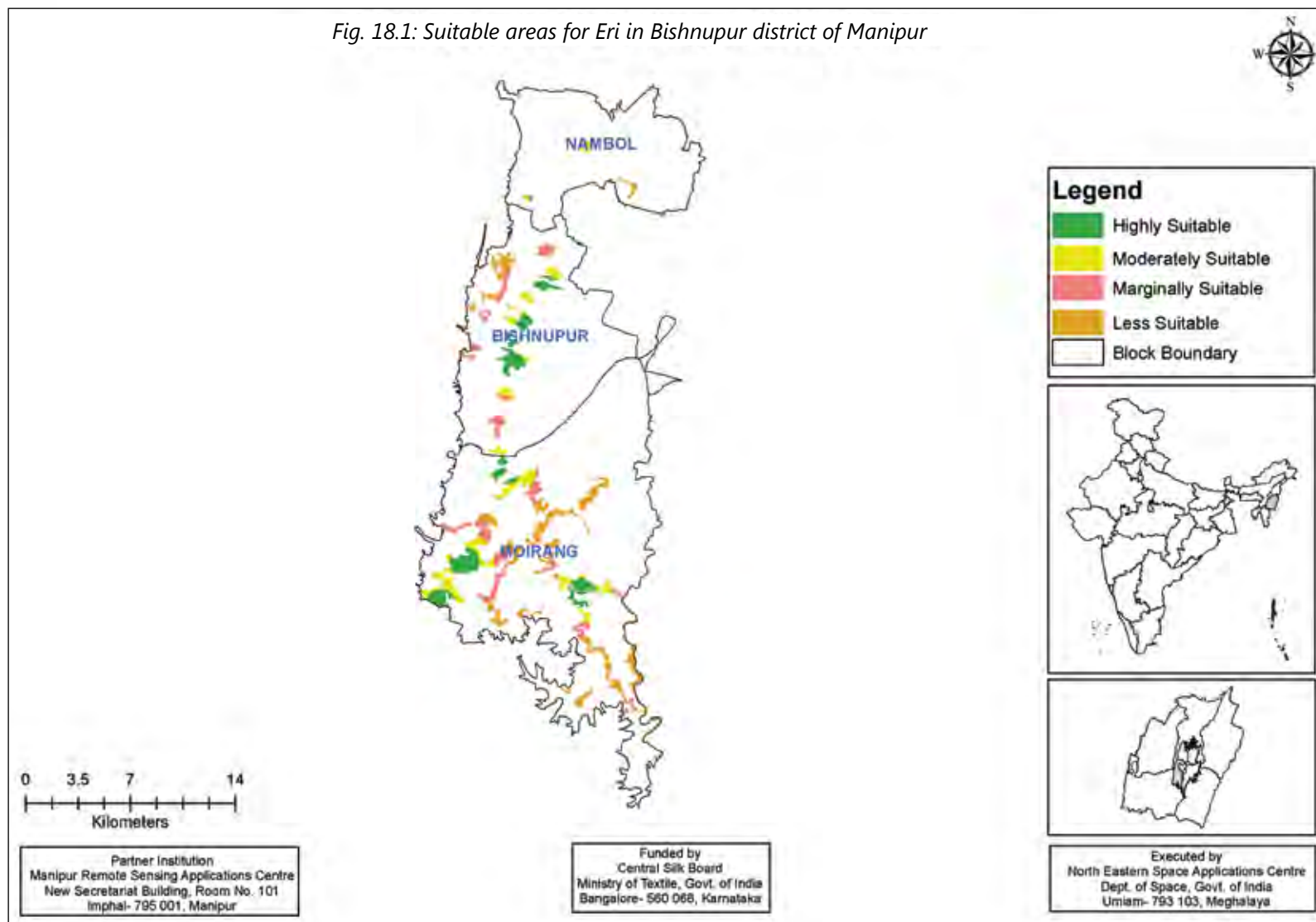
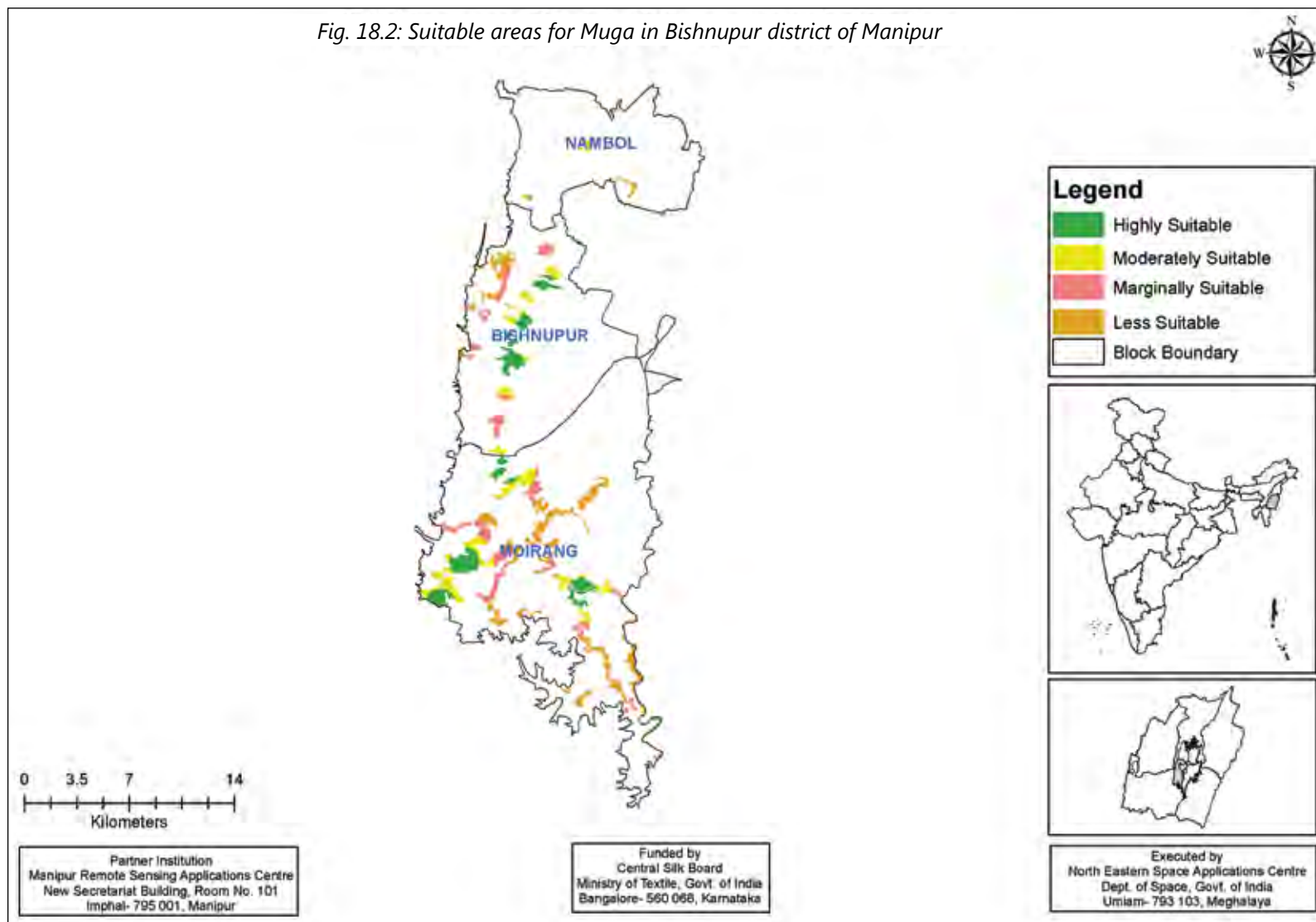


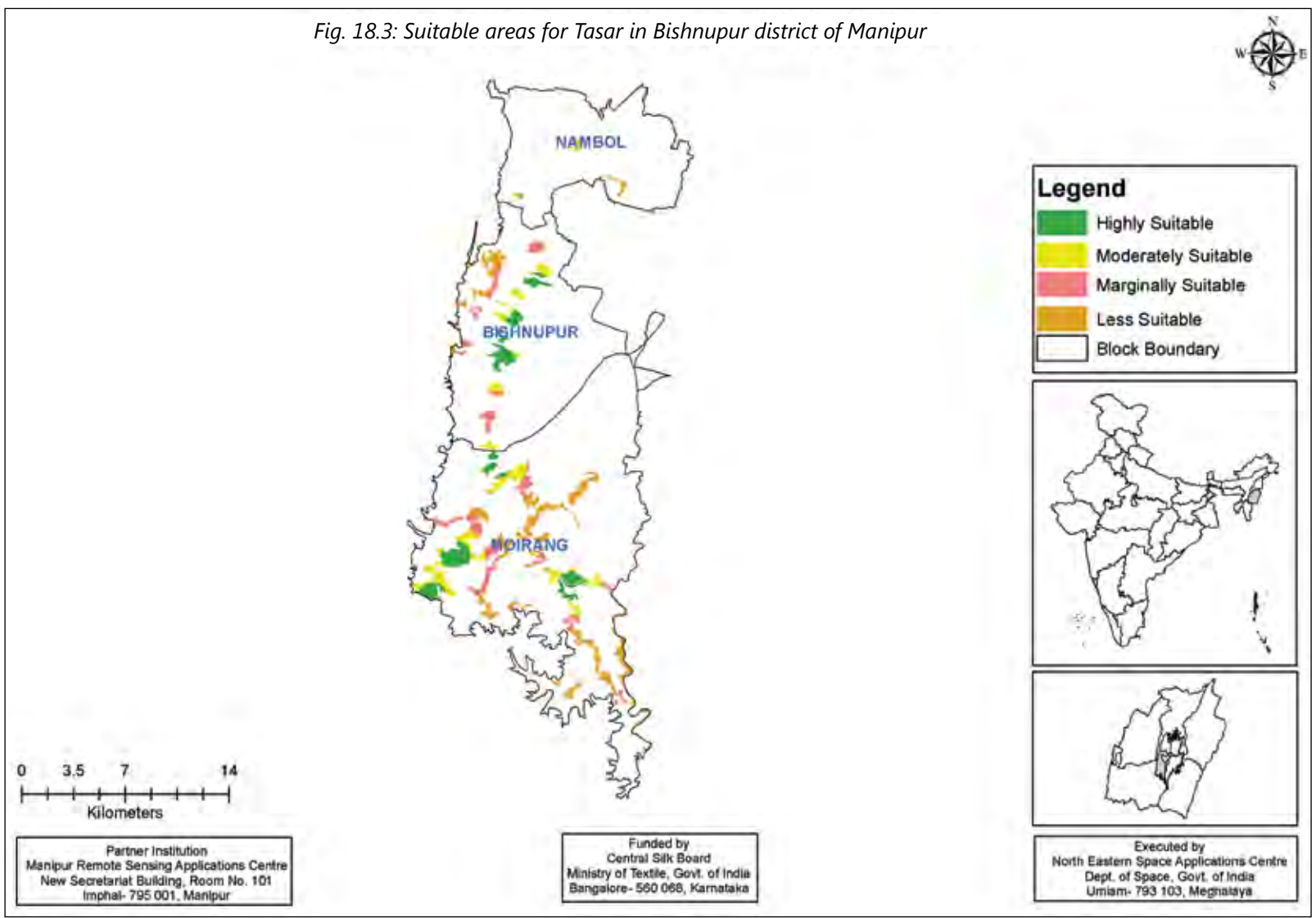
Fig. 18.2: Suitable areas for Muga in Bishnupur district of Manipur



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Fig. 18.3: Suitable areas for Tasar in Bishnupur district of Manipur



Tables 19.4-19.7: Suitable Areas for Mulberry, Eri, Muga & Tasar in Chandel District of Manipur

Table 19.4

| Block        | Suitable Areas for Mulberry (ha) |          |          |          |
|--------------|----------------------------------|----------|----------|----------|
|              | High                             | Moderate | Marginal | Total    |
| Chakpikarong | 167.59                           | 1772.46  | 5907.33  | 7847.38  |
| Chandel      | 1052.23                          | 3855.51  | 5387.60  | 10295.34 |
| Machi        | 254.74                           | 1379.55  | 3864.74  | 5499.03  |
| Tengnoupal   | 127.79                           | 271.67   | 515.69   | 915.15   |
| Total        | 1602.34                          | 7279.19  | 15675.36 | 24556.89 |

Table 19.5

| Block        | Suitable Areas for Eri (ha) |          |           |           |
|--------------|-----------------------------|----------|-----------|-----------|
|              | High                        | Moderate | Marginal  | Total     |
| Chakpikarong | -                           | -        | 49682.73  | 49682.7   |
| Chandel      | 154.25                      | 490.76   | 24156.29  | 24801.3   |
| Machi        | 33.88                       | 31.95    | 12332.57  | 12398.4   |
| Tengnoupal   | 117.68                      | 211.02   | 19275.15  | 19603.9   |
| Total        | 305.82                      | 733.74   | 105446.73 | 106486.29 |

Table 19.6

| Block        | Suitable Areas for Muga (ha) |          |           |           |
|--------------|------------------------------|----------|-----------|-----------|
|              | High                         | Moderate | Marginal  | Total     |
| Chakpikarong | -                            | -        | 54467.35  | 54467.35  |
| Chandel      | 154.25                       | 490.76   | 24158.43  | 24803.44  |
| Machi        | 33.88                        | 31.95    | 12330.80  | 12396.63  |
| Tengnoupal   | 117.93                       | 211.02   | 21146.22  | 21475.17  |
| Total        | 306.06                       | 733.74   | 112102.80 | 113142.60 |

Table 19.7

| Block        | Suitable Areas for Tasar (ha) |          |          |         |
|--------------|-------------------------------|----------|----------|---------|
|              | High                          | Moderate | Marginal | Total   |
| Chakpikarong | -                             | -        | 32781.9  | 32781.9 |
| Chandel      | 154.25                        | 470.25   | 22620.7  | 23245.2 |
| Machi        | 34.42                         | 32.45    | 9577.9   | 9644.77 |
| Tengnoupal   | 86.02                         | 148.48   | 9461.06  | 9695.56 |
| Total        | 274.69                        | 651.18   | 74441.6  | 75367.5 |





Fig. 18.4: Suitable areas for Mulberry in Chandel district of Manipur

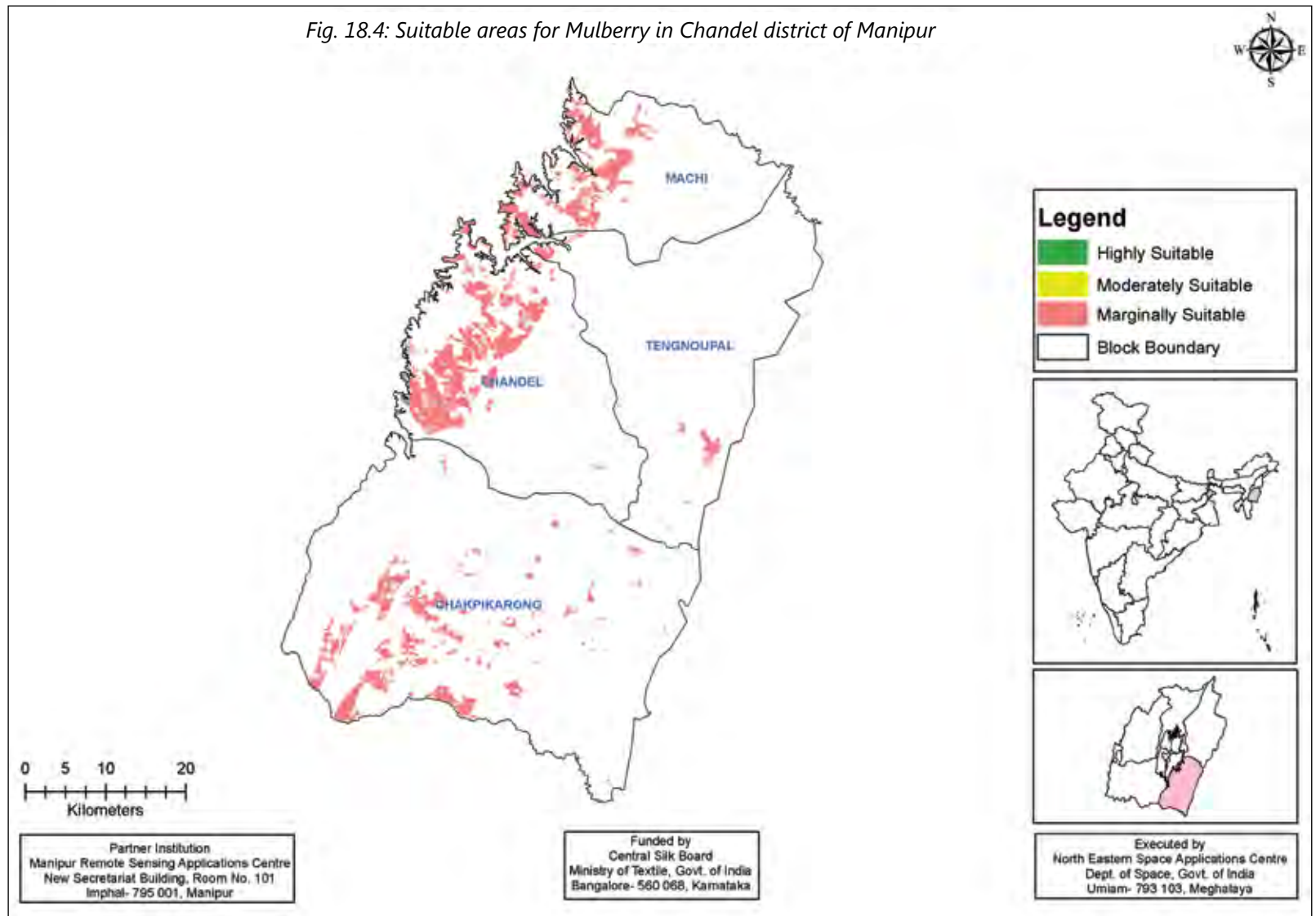
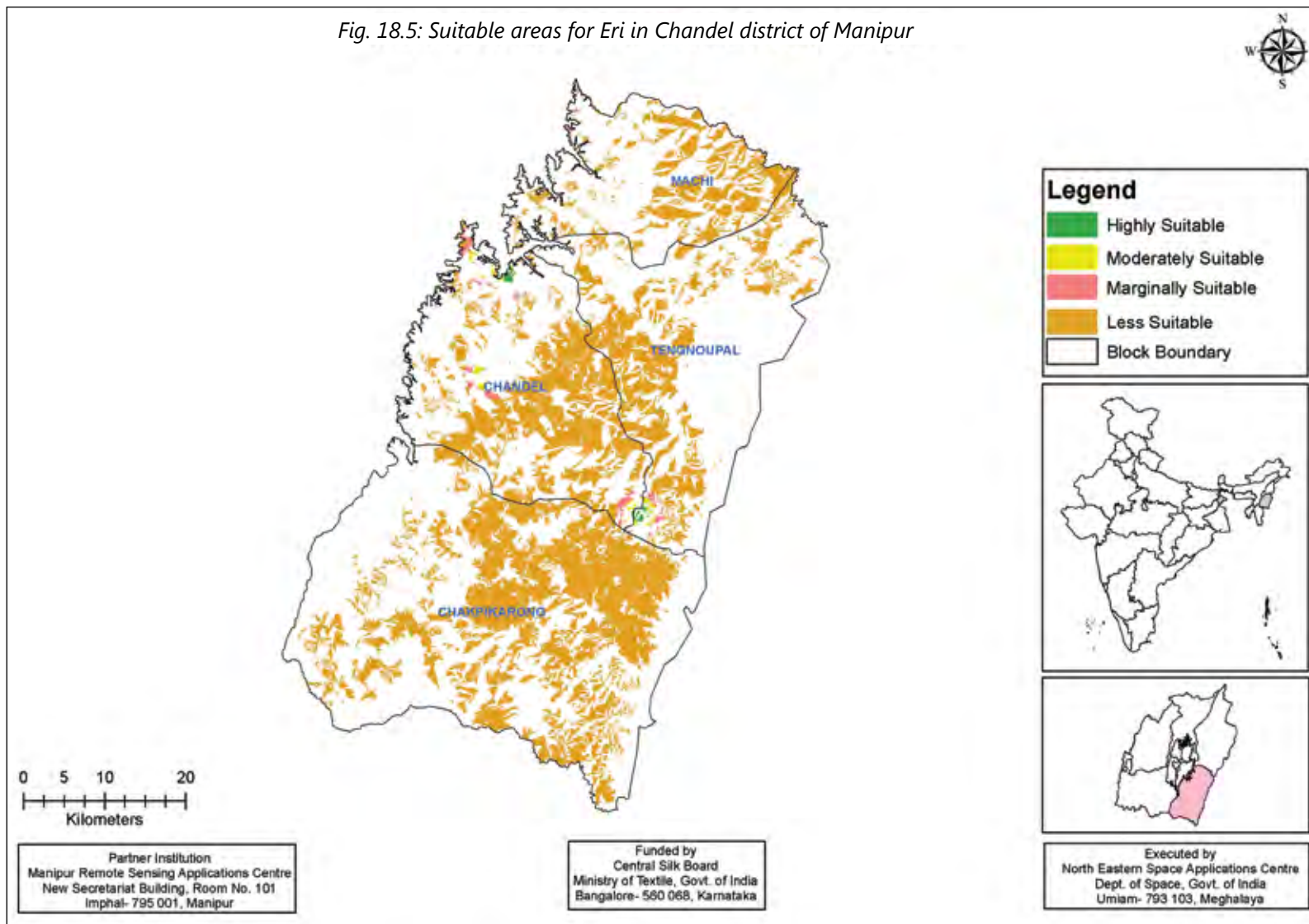


Fig. 18.5: Suitable areas for Eri in Chandel district of Manipur



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Fig. 18.6: Suitable areas for Muga in Chandel district of Manipur

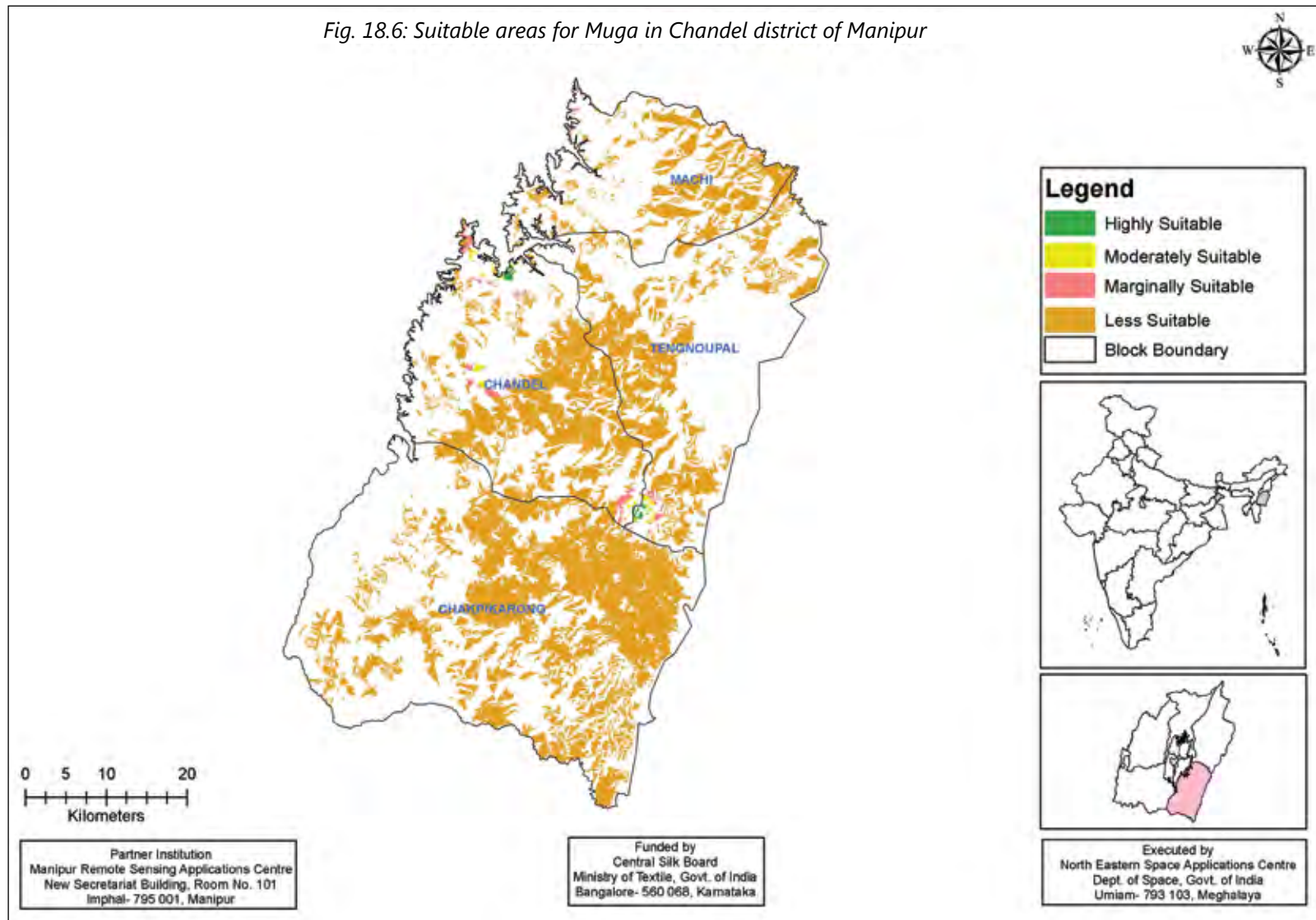
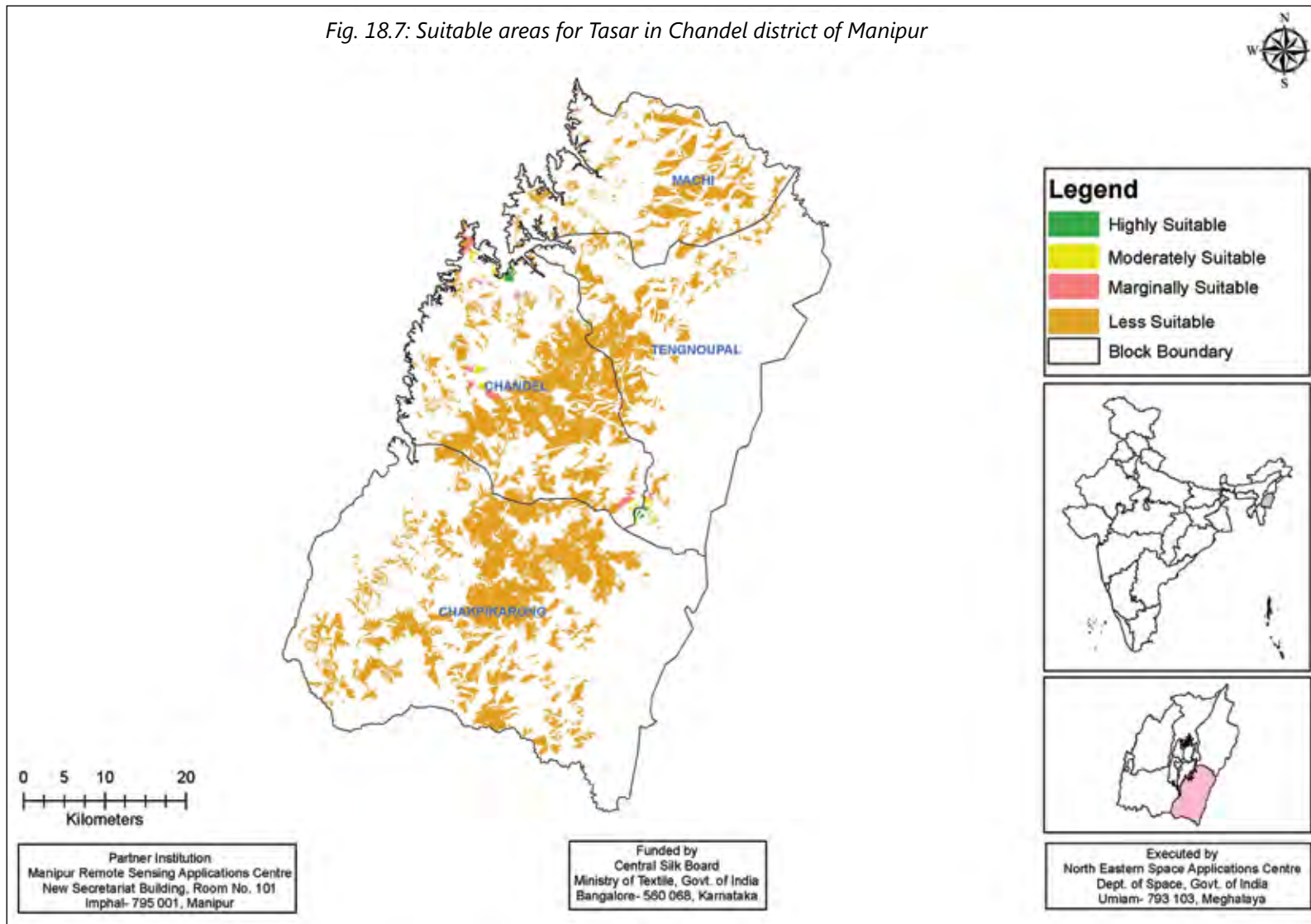


Fig. 18.7: Suitable areas for Tasar in Chandel district of Manipur



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Tables 19.8-19.11: Suitable Areas for Mulberry, Eri, Muga & Tasar in Churchandrapur District of Manipur

Table 19.8

| Block         | Suitable Areas for Mulberry (ha) |          |          |          |
|---------------|----------------------------------|----------|----------|----------|
|               | High                             | Moderate | Marginal | Total    |
| Churachandpur | -                                | -        | 5779.59  | 5779.59  |
| Henglep       | -                                | -        | 319.26   | 319.26   |
| Singngat      | -                                | -        | 6470.13  | 6470.13  |
| Thanlon       | -                                | -        | 489.62   | 489.62   |
| Tipaimukh     | -                                | -        | 3258.39  | 3258.39  |
| Total         | -                                | -        | 16316.99 | 16316.99 |

Table 19.9

| Block         | Suitable Areas for Eri (ha) |          |           |           |
|---------------|-----------------------------|----------|-----------|-----------|
|               | High                        | Moderate | Marginal  | Total     |
| Churachandpur | 1.07                        | 11.13    | 1877.80   | 1889.98   |
| Henglep       | 3.86                        | 179.95   | 23451.17  | 23634.98  |
| Singngat      | -                           | 61.58    | 34258.06  | 34319.63  |
| Thanlon       | -                           | -        | 58498.69  | 58498.69  |
| Tipaimukh     | -                           | -        | 36852.75  | 36852.75  |
| Total         | 4.92                        | 252.65   | 154938.46 | 155196.03 |

Table 19.10

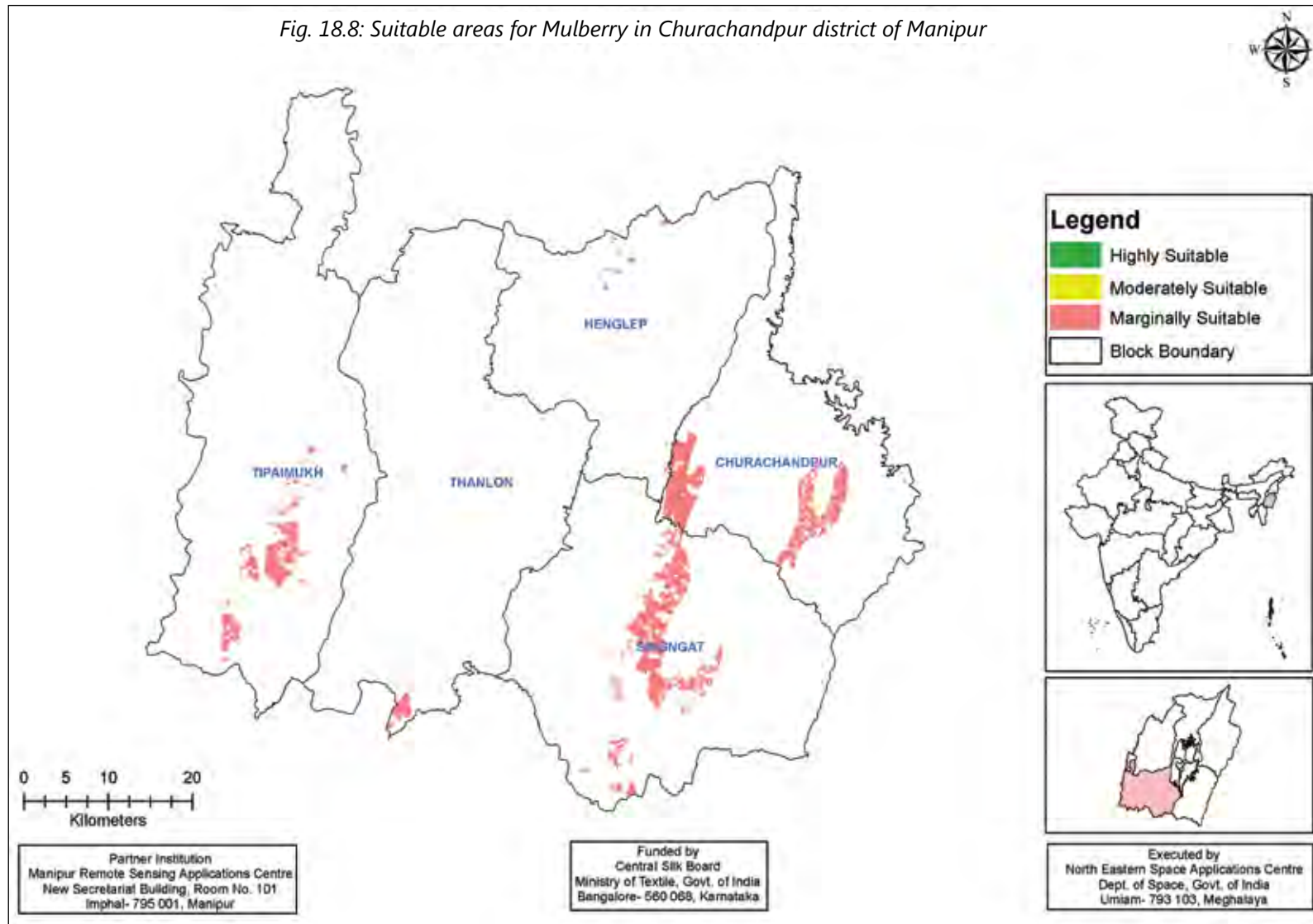
| Block         | Suitable Areas for Muga (ha) |          |          |         |
|---------------|------------------------------|----------|----------|---------|
|               | High                         | Moderate | Marginal | Total   |
| Churachandpur | 1.07                         | 11.13    | 1877.8   | 1889.98 |
| Henglep       | 3.86                         | 179.95   | 24248.7  | 24432.5 |
| Singngat      | -                            | 61.58    | 34202.4  | 34264   |
| Thanlon       | -                            | -        | 67384.7  | 67384.7 |
| Tipaimukh     | -                            | -        | 49362.6  | 49362.6 |
| Total         | 4.92                         | 252.65   | 177076   | 177334  |

Table 19.11

| Block         | Suitable Areas for Tasar (ha) |          |          |         |
|---------------|-------------------------------|----------|----------|---------|
|               | High                          | Moderate | Marginal | Total   |
| Churachandpur | 1.07                          | 11.13    | 1877.8   | 1889.98 |
| Henglep       | 3.86                          | 161.06   | 13470.3  | 13635.2 |
| Singngat      | -                             | 61.58    | 30640.2  | 30701.7 |
| Thanlon       | -                             | -        | 24582.8  | 24582.8 |
| Tipaimukh     | -                             | -        | 10860.8  | 10860.8 |
| Total         | 4.92                          | 233.76   | 81431.8  | 81670.5 |



Fig. 18.8: Suitable areas for Mulberry in Churachandpur district of Manipur



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Fig. 18.9: Suitable areas for Eri in Churachandpur district of Manipur

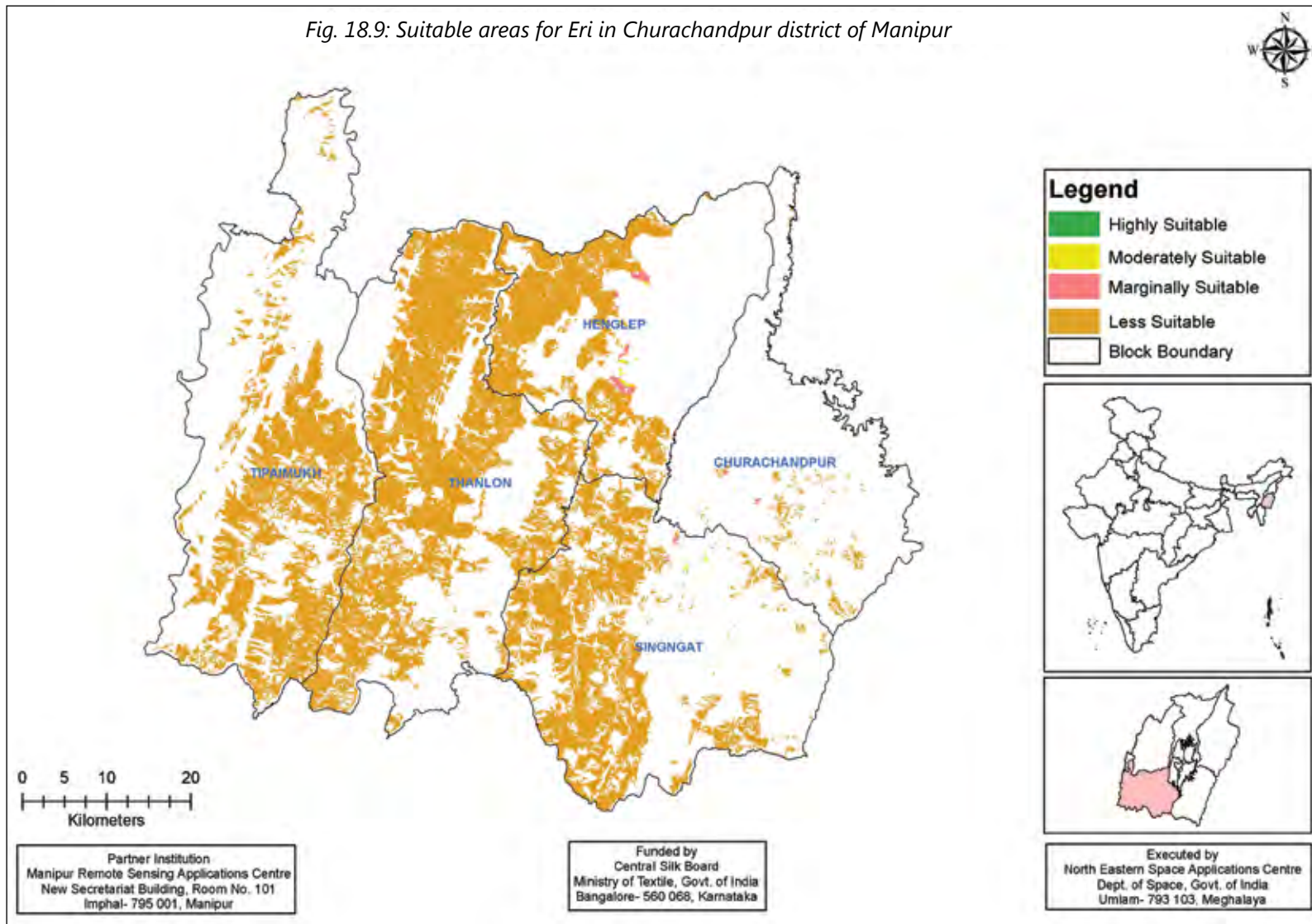
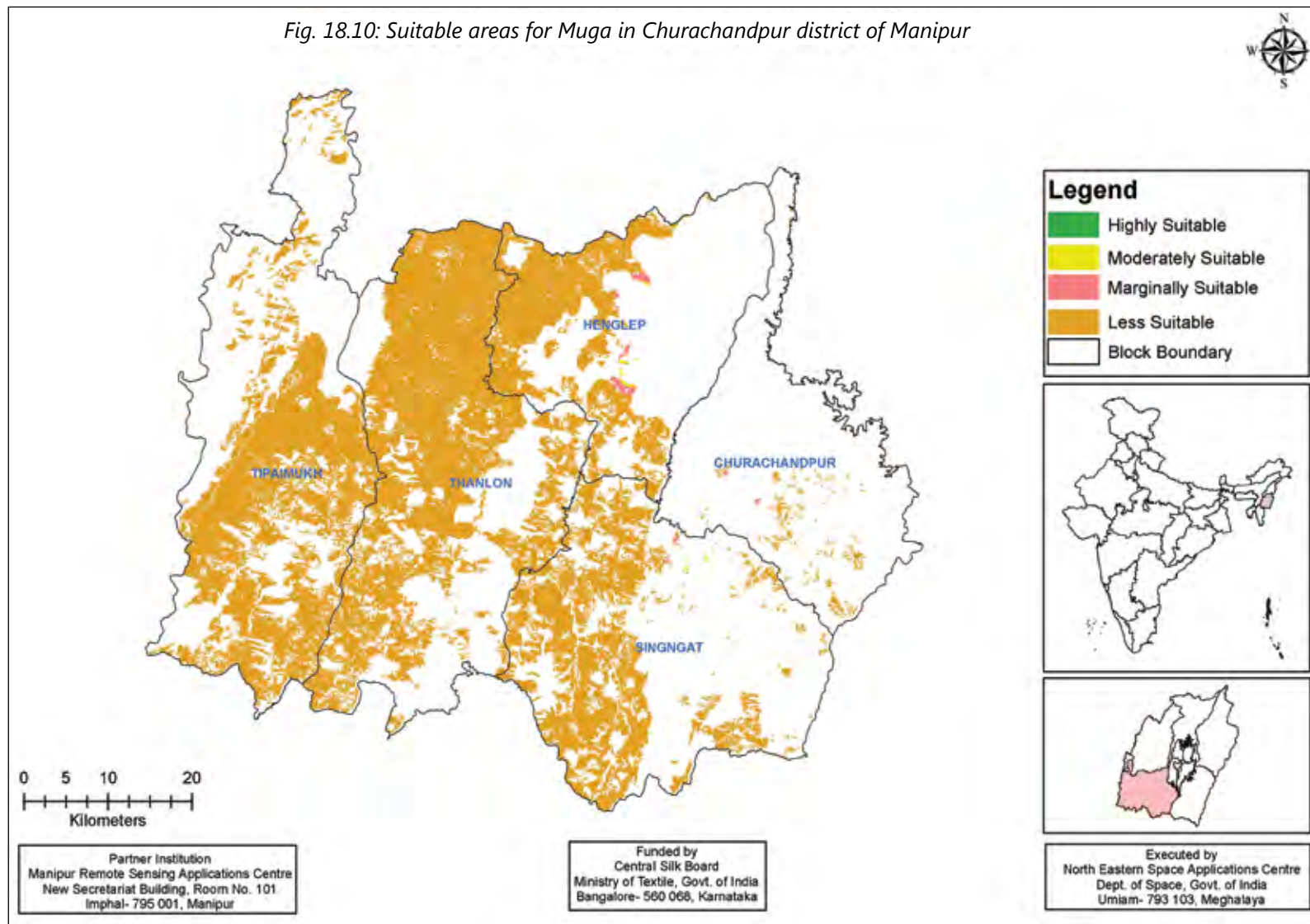


Fig. 18.10: Suitable areas for Muga in Churachandpur district of Manipur

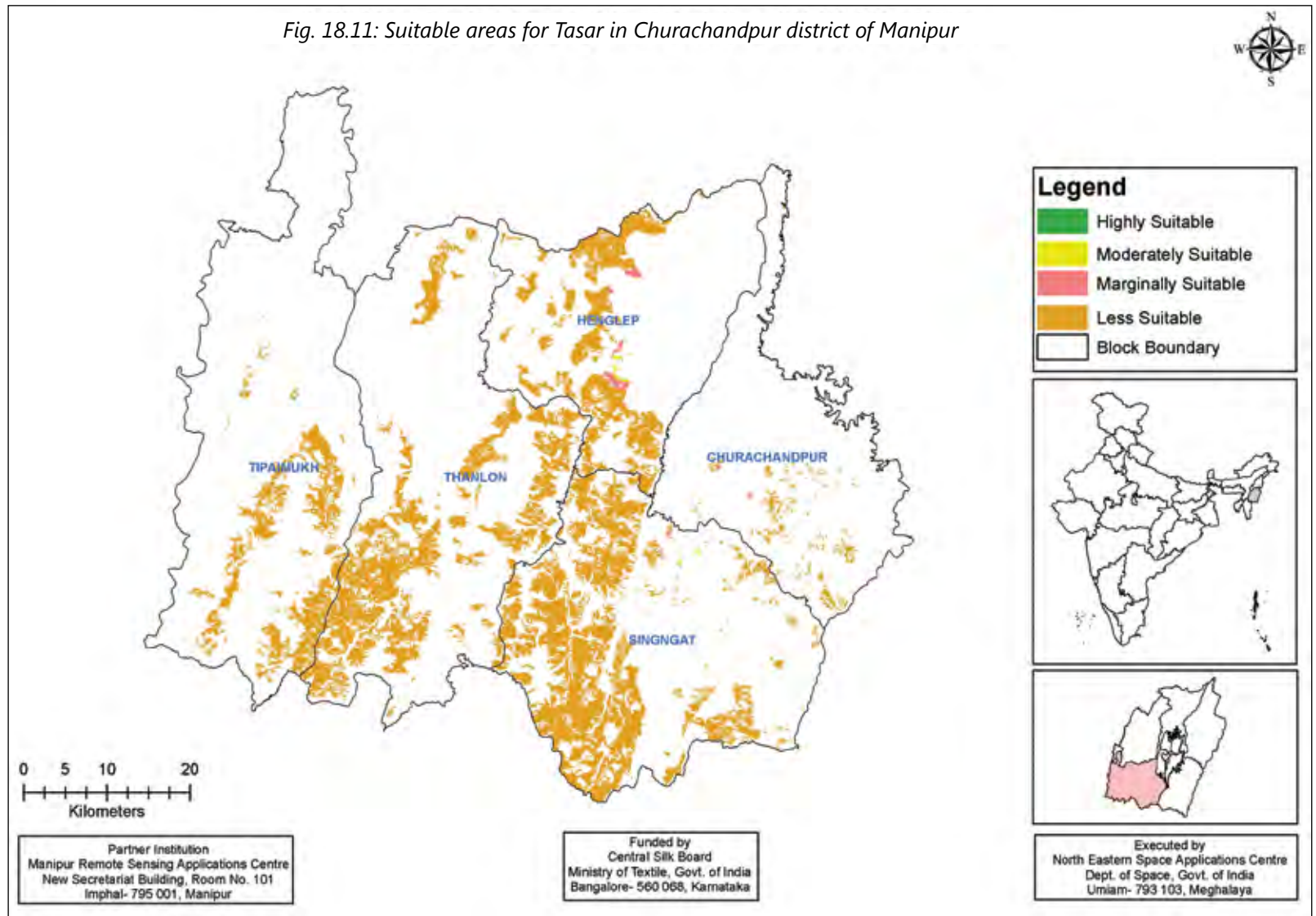


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Fig. 18.11: Suitable areas for Tasar in Churachandpur district of Manipur



Tables 19.12-19.14: Suitable Areas for Eri, Muga & Tasar in Imphal East District of Manipur

Table 19.12

| Block       | Suitable Areas for Eri (ha) |          |          |         |
|-------------|-----------------------------|----------|----------|---------|
|             | High                        | Moderate | Marginal | Total   |
| Jiribam     | -                           | -        | 60.38    | 60.38   |
| KeiraoBitra | 312.51                      | 444.62   | 318.43   | 1075.56 |
| Porompat    | 550.46                      | 587.39   | 20.69    | 1158.54 |
| Sawombung   | 996.75                      | 733.51   | 575.48   | 2305.74 |
| Total       | 1859.72                     | 1765.52  | 974.98   | 4600.22 |

Table 19.13

| Block       | Suitable Areas for Muga (ha) |          |          |         |
|-------------|------------------------------|----------|----------|---------|
|             | High                         | Moderate | Marginal | Total   |
| Jiribam     | 57.26                        | 219.78   | 3578.09  | 3855.13 |
| KeiraoBitra | 312.51                       | 444.62   | 318.43   | 1075.56 |
| Porompat    | 550.46                       | 587.73   | 20.69    | 1158.88 |
| Sawombung   | 995.58                       | 750.07   | 596.03   | 2341.67 |
| Total       | 1915.82                      | 2002.2   | 4513.22  | 8431.24 |

Table 19.14

| Block       | Suitable Areas for Tasar (ha) |          |          |         |
|-------------|-------------------------------|----------|----------|---------|
|             | High                          | Moderate | Marginal | Total   |
| Jiribam     | -                             | -        | -        | -       |
| KeiraoBitra | 313.43                        | 444.62   | 318.43   | 1076.48 |
| Porompat    | 550.46                        | 587.73   | 20.69    | 1158.88 |
| Sawombung   | 995.31                        | 732.3    | 571.62   | 2299.22 |
| Total       | 1859.2                        | 1764.64  | 910.74   | 4534.58 |

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Fig. 18.12: Suitable areas for Eri in Imphal East district of Manipur

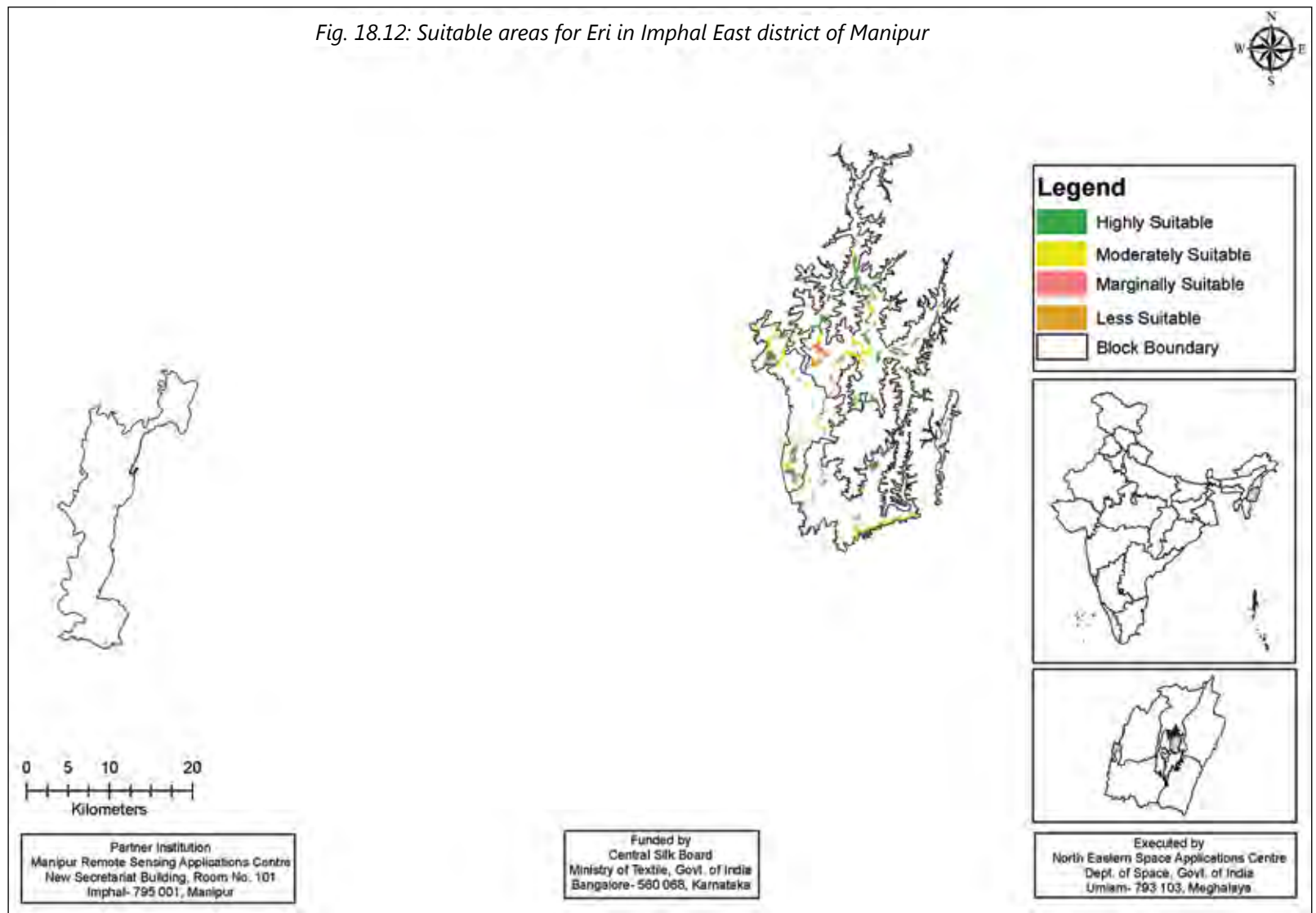
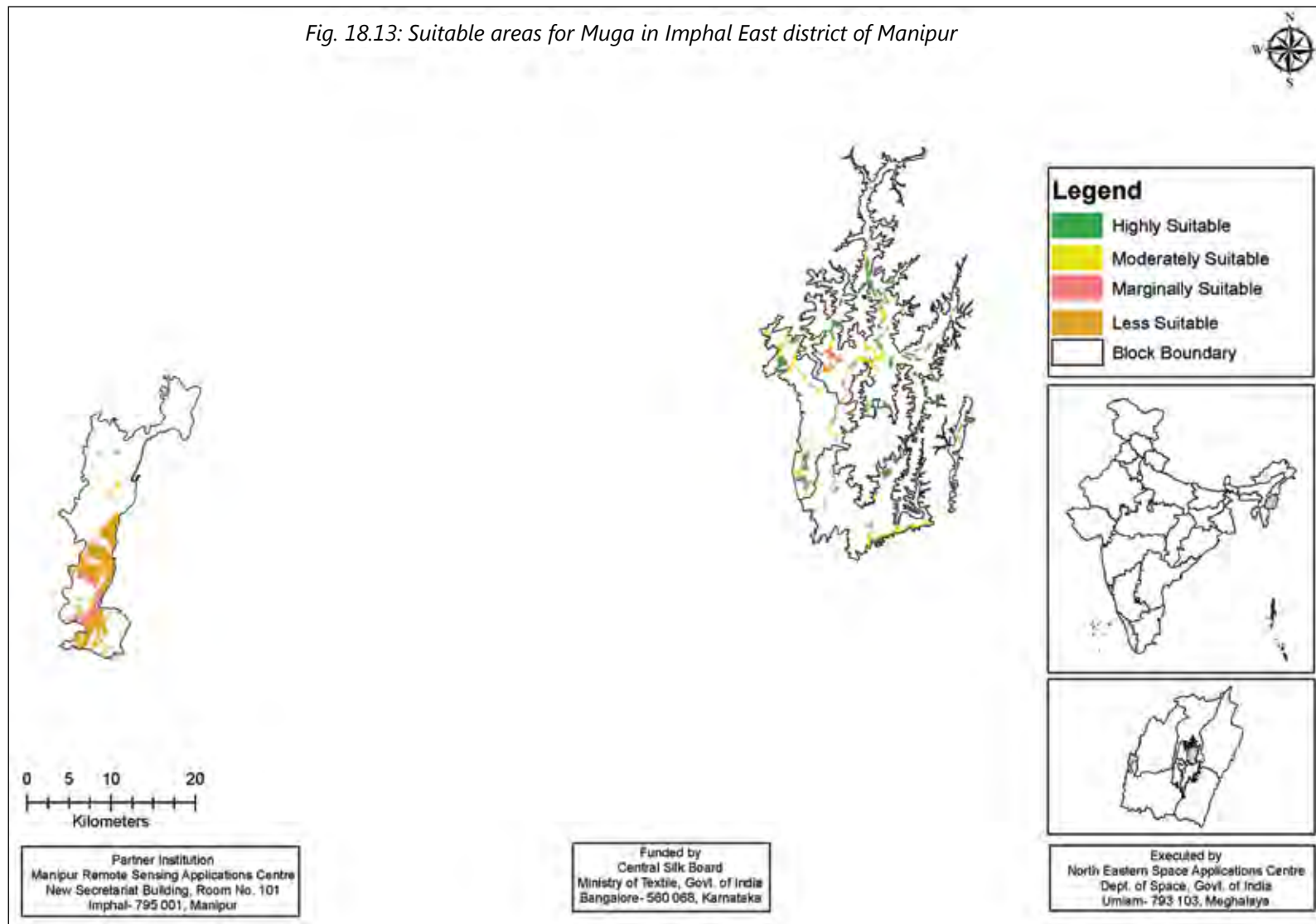


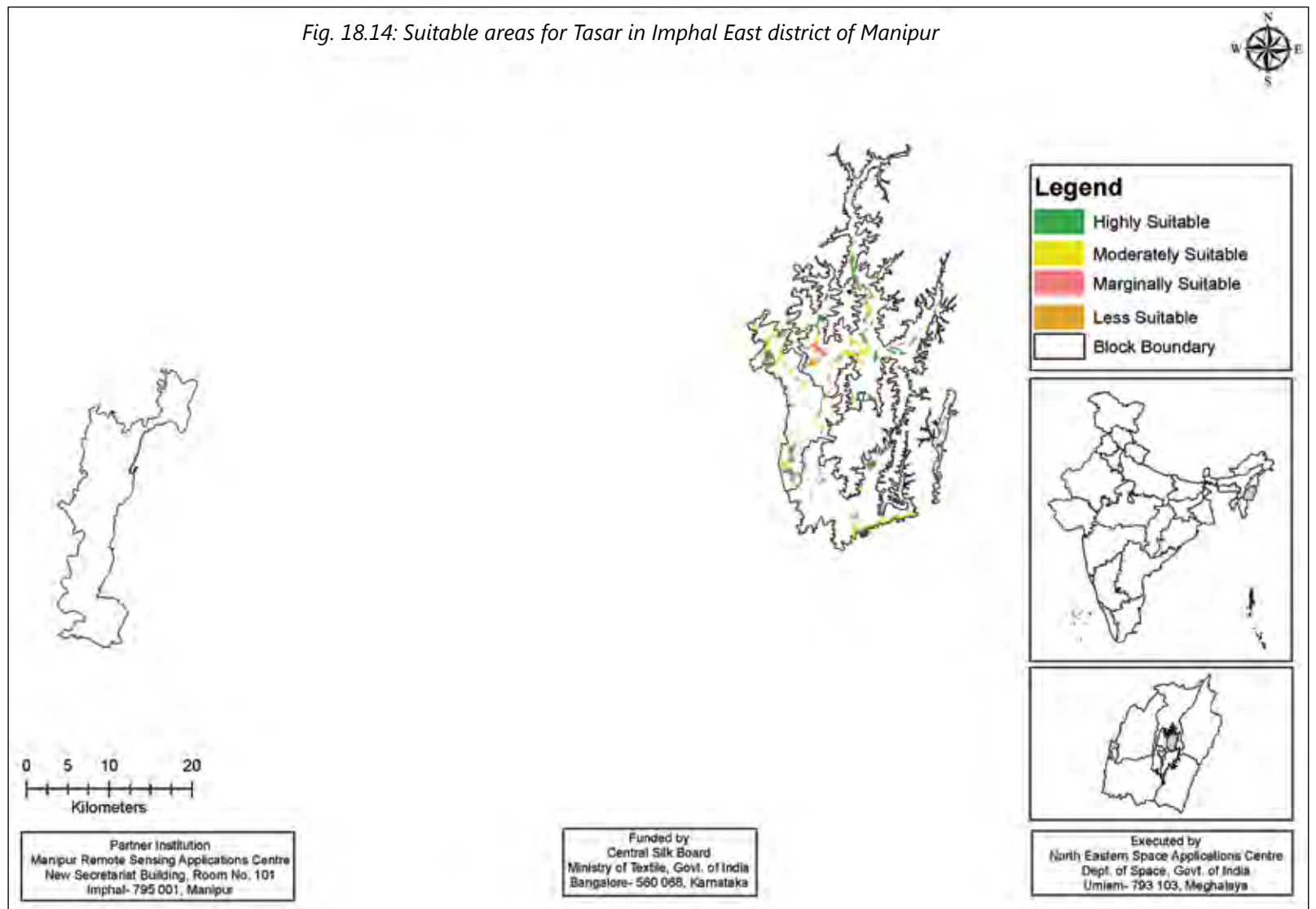
Fig. 18.13: Suitable areas for Muga in Imphal East district of Manipur



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Fig. 18.14: Suitable areas for Tasar in Imphal East district of Manipur



Tables 19.15-19.18: Suitable Areas for Mulberry, Eri, Muga & Tasar in Imphal West District of Manipur

Table 19.15

| Block    | Suitable Areas for Mulberry (ha) |          |          |       |
|----------|----------------------------------|----------|----------|-------|
|          | High                             | Moderate | Marginal | Total |
| Lamshang | 0.09                             | -        | 5.30     | 5.39  |
| Wangoi   | 3.46                             | -        | 68.33    | 71.79 |
| Total    | 3.55                             | -        | 73.62    | 77.17 |

Table 19.16

| Block      | Suitable Areas for Eri (ha) |          |          |         |
|------------|-----------------------------|----------|----------|---------|
|            | High                        | Moderate | Marginal | Total   |
| Lamphelpat | 69.65                       | 44.41    | 2.05     | 116.12  |
| Lamshang   | 1081.13                     | 2180.14  | 2870.91  | 6132.18 |
| Wangoi     | 1                           | 11.8     | 1.65     | 14.45   |
| Total      | 1151.78                     | 2236.35  | 2874.61  | 6262.75 |

Table 19.17

| Block      | Suitable Areas for Muga (ha) |          |          |         |
|------------|------------------------------|----------|----------|---------|
|            | High                         | Moderate | Marginal | Total   |
| Lamphelpat | 69.65                        | 45.99    | 2.97     | 118.61  |
| Lamshang   | 1101.92                      | 2202.24  | 2870.91  | 6175.07 |
| Wangoi     | 1                            | 11.8     | 1.65     | 14.45   |
| Total      | 1172.57                      | 2260.03  | 2875.53  | 6308.13 |

Table 19.18

| Block      | Suitable Areas for Tasar (ha) |          |          |         |
|------------|-------------------------------|----------|----------|---------|
|            | High                          | Moderate | Marginal | Total   |
| Lamphelpat | 69.65                         | 45.99    | 2.97     | 118.61  |
| Lamshang   | 1073.41                       | 2164.01  | 2874.34  | 6111.76 |
| Wangoi     | 1                             | 11.8     | 1.65     | 14.45   |
| Total      | 1144.06                       | 2221.8   | 2878.97  | 6244.82 |



Fig. 18.15: Suitable areas for Mulberry in Imphal West district of Manipur

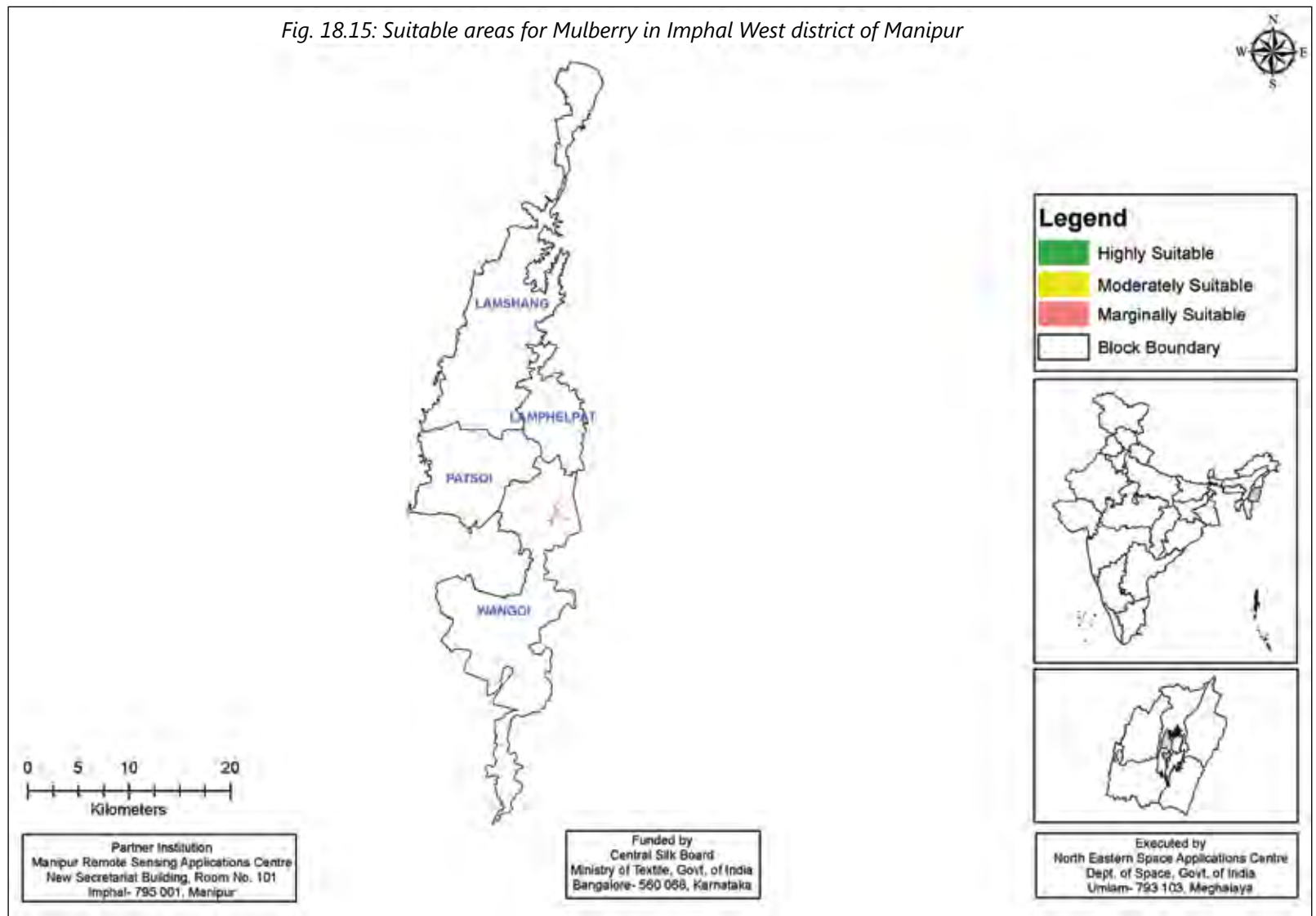
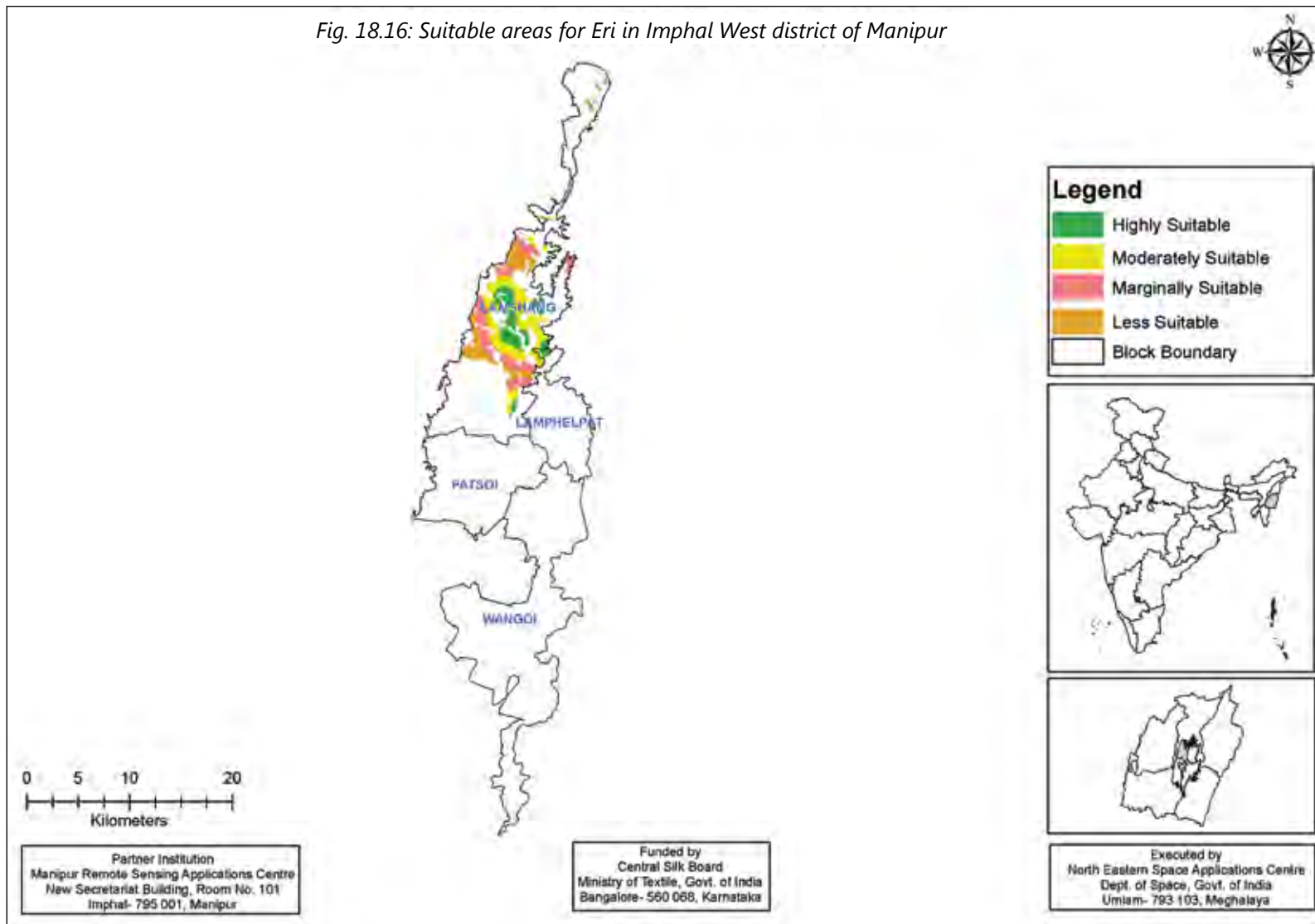


Fig. 18.16: Suitable areas for Eri in Imphal West district of Manipur



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Fig. 18.17: Suitable areas for Muga in Imphal West district of Manipur

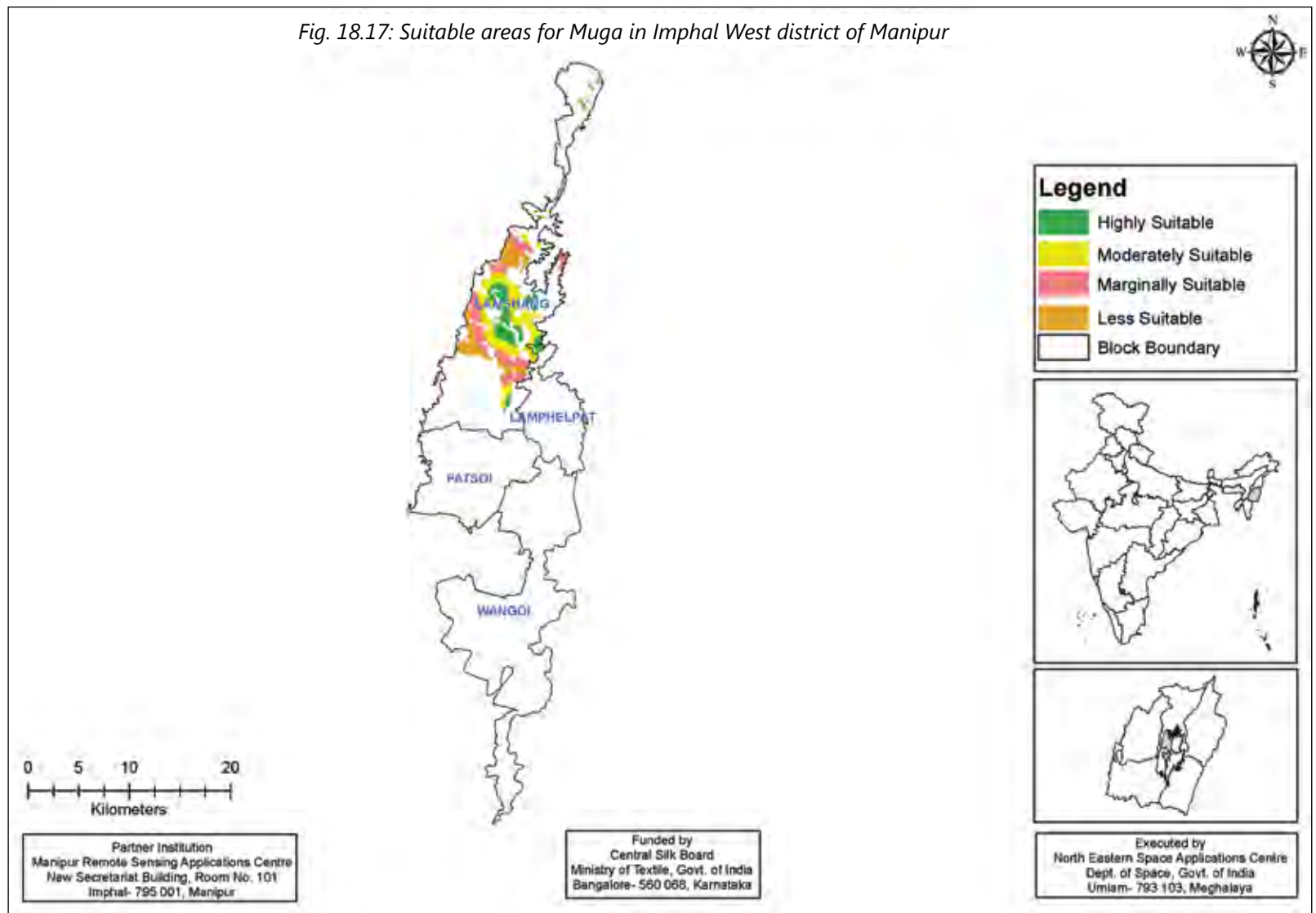
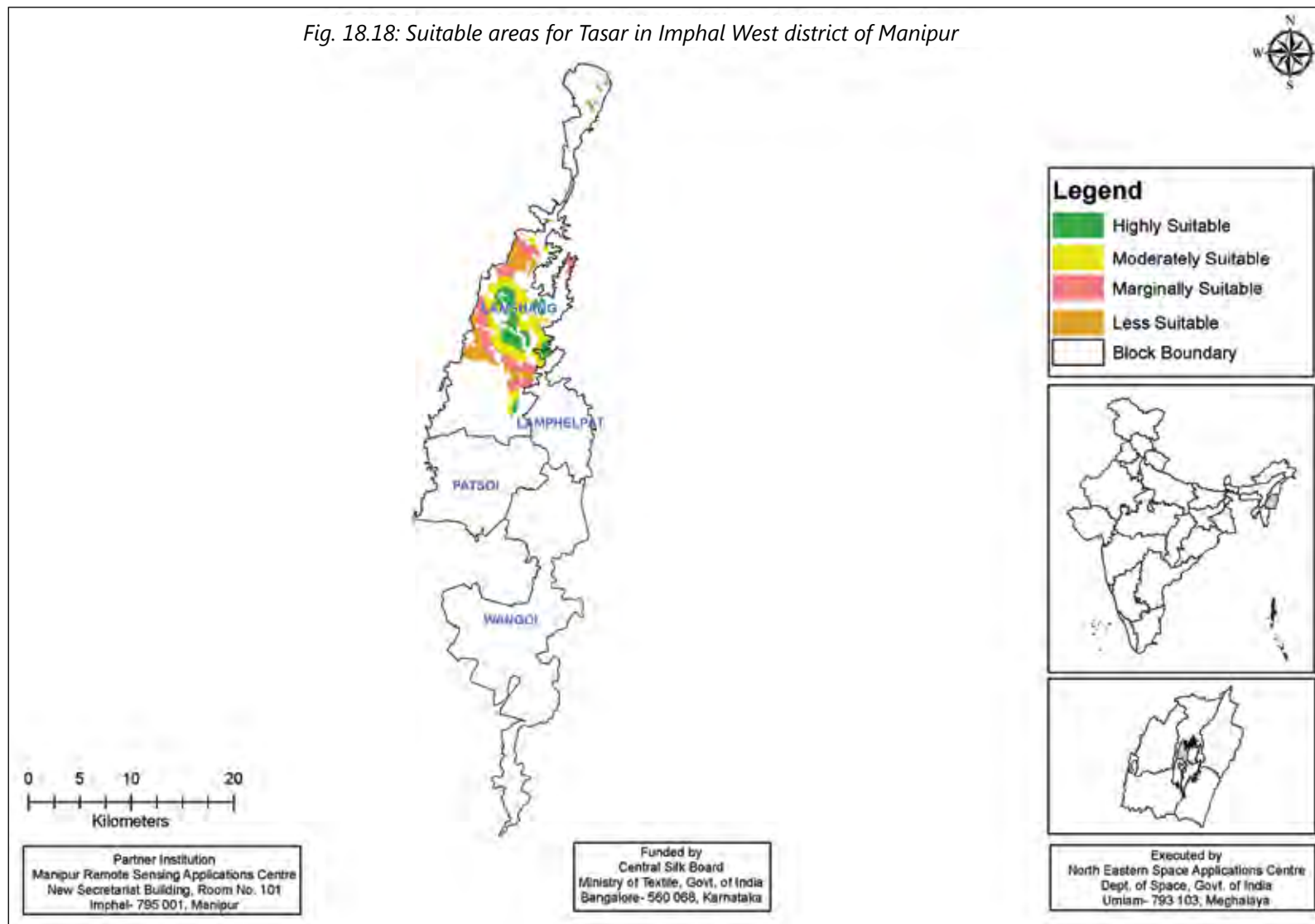


Fig. 18.18: Suitable areas for Tasar in Imphal West district of Manipur



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Tables 19.19-19.22: Suitable Areas for Mulberry, Eri, Muga & Tasar in Senapati District of Manipur

Table 19.19

| Block            | Suitable Areas for Mulberry (ha) |          |          |         |
|------------------|----------------------------------|----------|----------|---------|
|                  | High                             | Moderate | Marginal | Total   |
| Mao maram        | 456.34                           | 132.67   | 513.98   | 1102.99 |
| Paomata          | 74.84                            | 16.95    | 54.49    | 146.28  |
| Sadar hills east | 0.33                             | -        | 4.37     | 4.70    |
| Total            | 531.51                           | 149.62   | 572.84   | 1253.97 |

Table 19.20

| Block            | Suitable Areas for Eri (ha) |          |          |          |
|------------------|-----------------------------|----------|----------|----------|
|                  | High                        | Moderate | Marginal | Total    |
| Mao Maram        | 136.92                      | 517.40   | 8708.75  | 9363.06  |
| Paomata          | -                           | 31.81    | 110.36   | 142.17   |
| Purul            | -                           | -        | -        | -        |
| Sadar Hills East | 437.97                      | 2071.09  | 8580.88  | 11089.94 |
| Sadar Hills West | -                           | -        | 630.59   | 630.59   |
| SaituGamphazol   | 26.05                       | -        | 35.78    | 61.83    |
| Total            | 600.94                      | 2620.31  | 18066.36 | 21287.60 |

Table 19.21

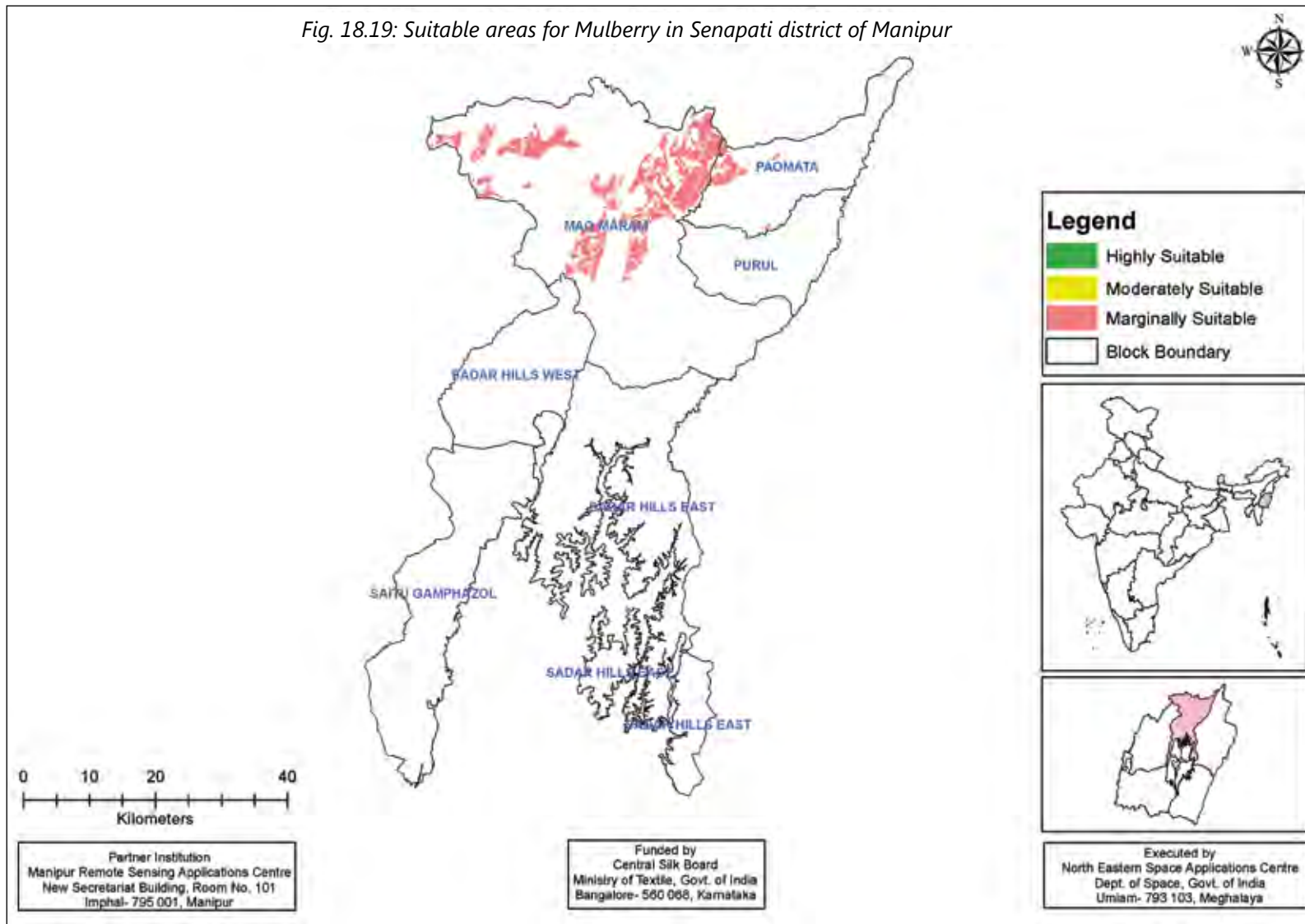
| Block            | Suitable Areas for Muga (ha) |          |          |          |
|------------------|------------------------------|----------|----------|----------|
|                  | High                         | Moderate | Marginal | Total    |
| Mao Maram        | 136.92                       | 517.40   | 8695.86  | 9350.17  |
| Paomata          | -                            | 31.81    | 110.36   | 142.17   |
| Purul            | -                            | -        | -        | -        |
| Sadar Hills East | 578.29                       | 2227.47  | 8998.69  | 11804.46 |
| Sadar Hills West | -                            | -        | 638.41   | 638.41   |
| SaituGamphazol   | 37.87                        | 7.49     | 35.78    | 81.15    |
| Total            | 753.08                       | 2784.18  | 18479.10 | 22016.36 |

Table 19.22

| Block            | Suitable Areas for Tasar (ha) |          |          |          |
|------------------|-------------------------------|----------|----------|----------|
|                  | High                          | Moderate | Marginal | Total    |
| Mao Maram        | 136.92                        | 517.46   | 8257.93  | 8912.30  |
| Paomata          | -                             | 31.81    | 110.36   | 142.17   |
| Purul            | -                             | -        | -        | -        |
| Sadar Hills East | 421.68                        | 1869.31  | 8294.05  | 10585.04 |
| Sadar Hills West | -                             | -        | 630.61   | 630.61   |
| SaituGamphazol   | 26.05                         | -        | 35.78    | 61.83    |
| Total            | 584.65                        | 2418.58  | 17328.73 | 20331.96 |



Fig. 18.19: Suitable areas for Mulberry in Senapati district of Manipur



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Fig. 18.20: Suitable areas for Eri in Senapati district of Manipur

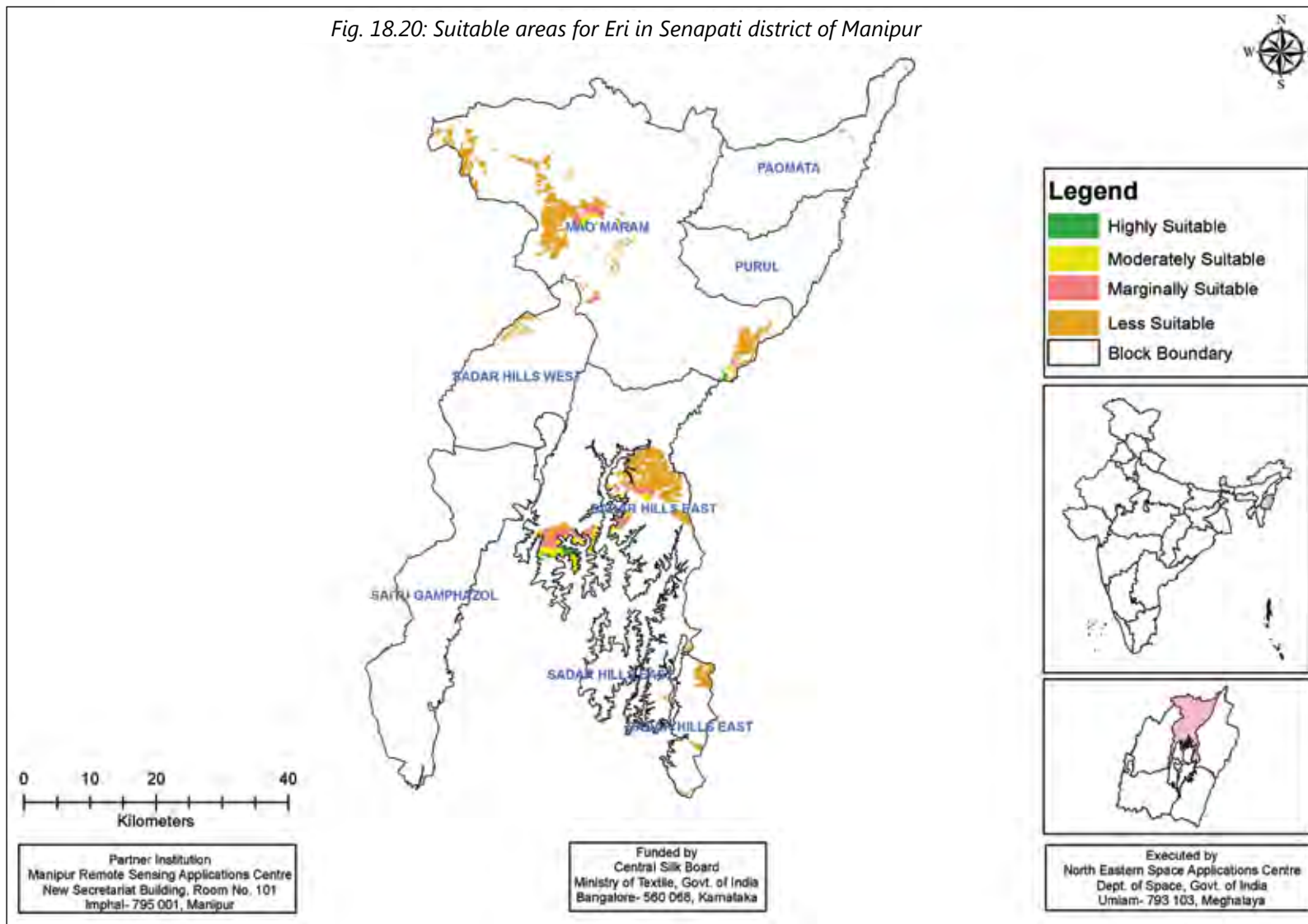
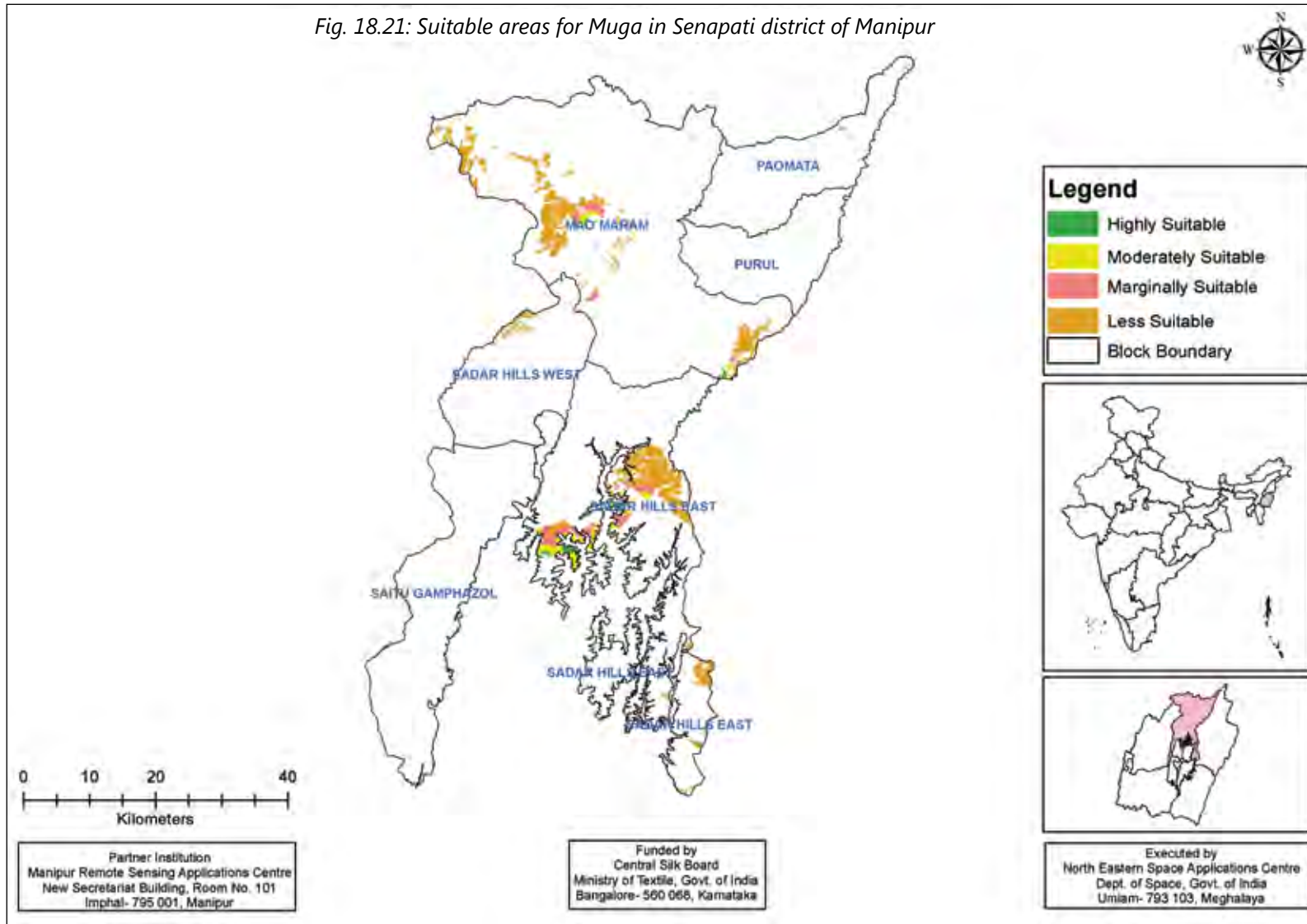


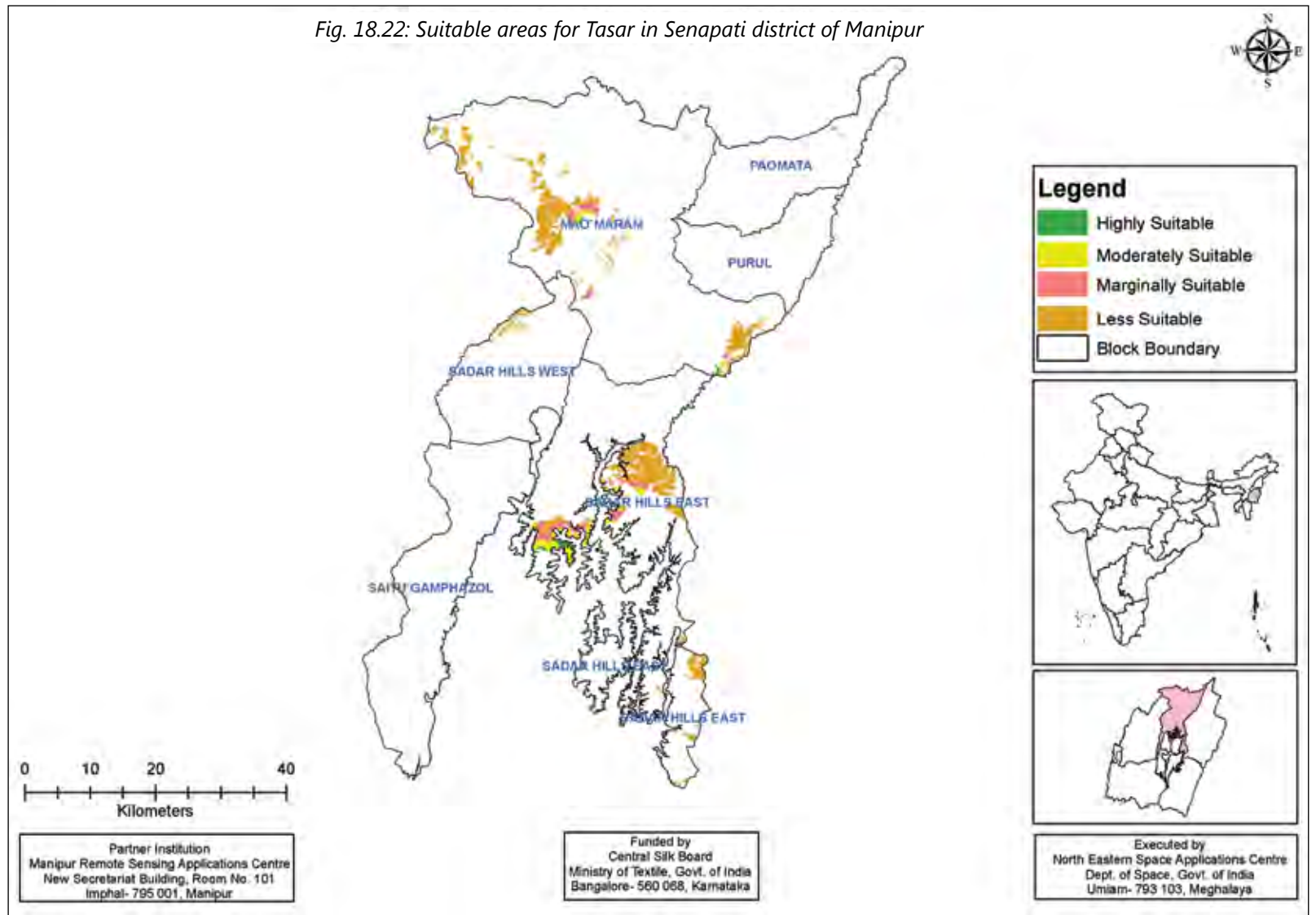
Fig. 18.21: Suitable areas for Muga in Senapati district of Manipur



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Fig. 18.22: Suitable areas for Tasar in Senapati district of Manipur



Tables 19.23-19.26: Suitable Areas for Mulberry, Eri, Muga & Tasar in Tamenglong District of Manipur

Table 19.23

| Block      | Suitable Areas for Mulberry (ha) |          |          |         |
|------------|----------------------------------|----------|----------|---------|
|            | High                             | Moderate | Marginal | Total   |
| Nungba     | 9.43                             | 15.81    | 12.77    | 38.01   |
| Tamei      | 54.88                            | 330.42   | 2601.59  | 2986.89 |
| Tamenglong | 480.67                           | 8.86     | 332.96   | 822.49  |
| Tousem     | 3.13                             | 38.40    | 319.70   | 361.23  |
| Total      | 548.11                           | 393.49   | 3267.03  | 4208.63 |

Table 19.24

| Block      | Suitable Areas for Eri (ha) |          |          |          |
|------------|-----------------------------|----------|----------|----------|
|            | High                        | Moderate | Marginal | Total    |
| Nungba     | -                           | -        | 32171.81 | 32171.81 |
| Tamei      | -                           | -        | 18522.01 | 18522.01 |
| Tamenglong | -                           | -        | 5740.84  | 5740.84  |
| Tousem     | 15.46                       | 195.17   | 11685.83 | 11896.45 |
| Total      | 15.46                       | 195.17   | 68120.48 | 68331.11 |

Table 19.25

| Block      | Suitable Areas for Muga (ha) |          |          |          |
|------------|------------------------------|----------|----------|----------|
|            | High                         | Moderate | Marginal | Total    |
| Nungba     | -                            | -        | 36046.88 | 36046.88 |
| Tamei      | -                            | -        | 18425.43 | 18425.43 |
| Tamenglong | -                            | -        | 6582.78  | 6582.78  |
| Tousem     | 15.46                        | 231.98   | 17226.41 | 17473.85 |
| Total      | 15.46                        | 231.98   | 78281.51 | 78528.94 |

Table 19.26

| Block      | Suitable Areas for Tasar (ha) |          |          |          |
|------------|-------------------------------|----------|----------|----------|
|            | High                          | Moderate | Marginal | Total    |
| Nungba     | -                             | -        | 16196.09 | 16196.09 |
| Tamei      | -                             | -        | 14179.70 | 14179.70 |
| Tamenglong | -                             | -        | 1510.12  | 1510.12  |
| Tousem     | 2.56                          | 8.15     | 3237.98  | 3248.69  |
| Total      | 2.56                          | 8.15     | 35123.89 | 35134.60 |

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Fig. 18.23: Suitable areas for Mulberry in Tamenglong district of Manipur

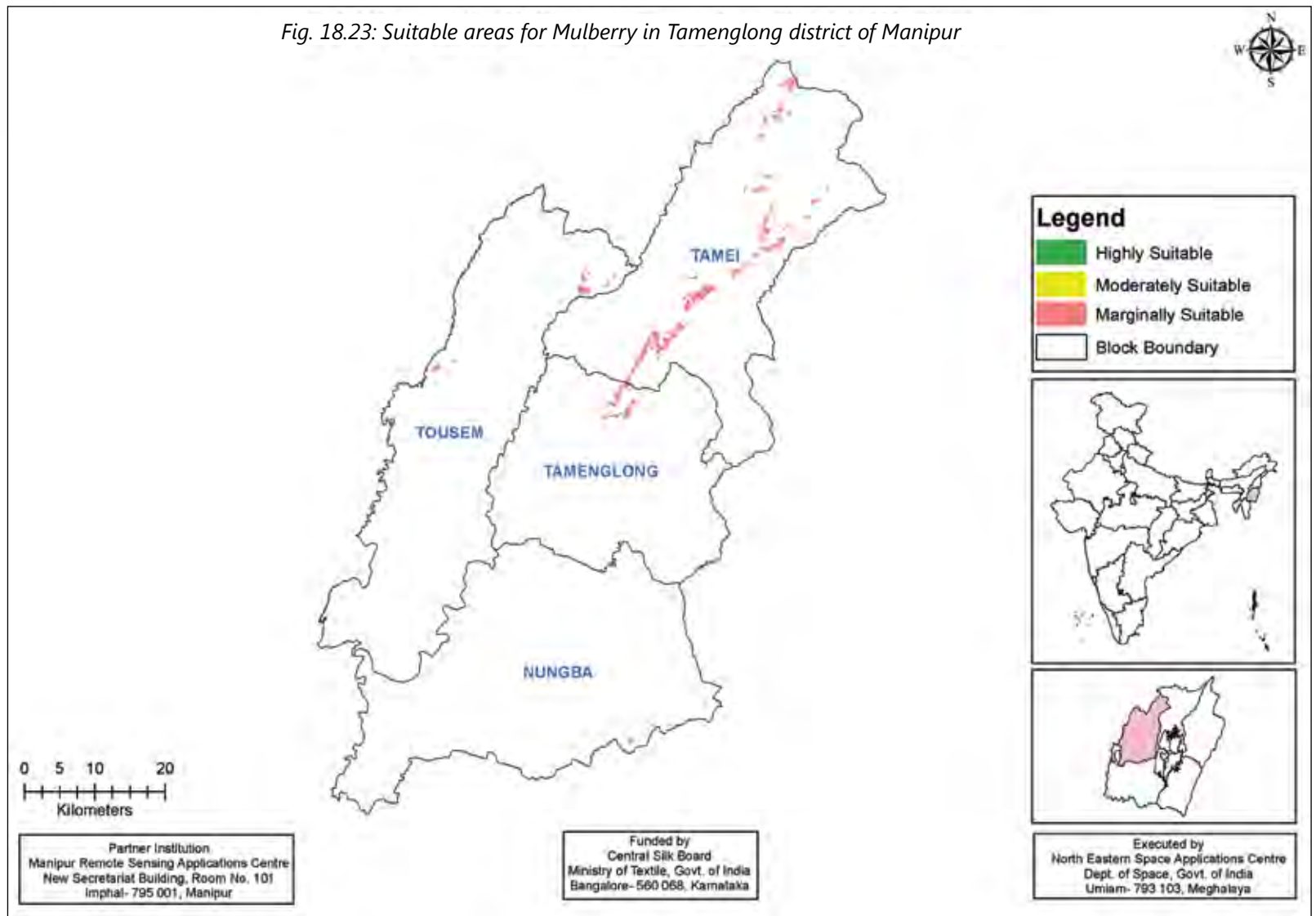
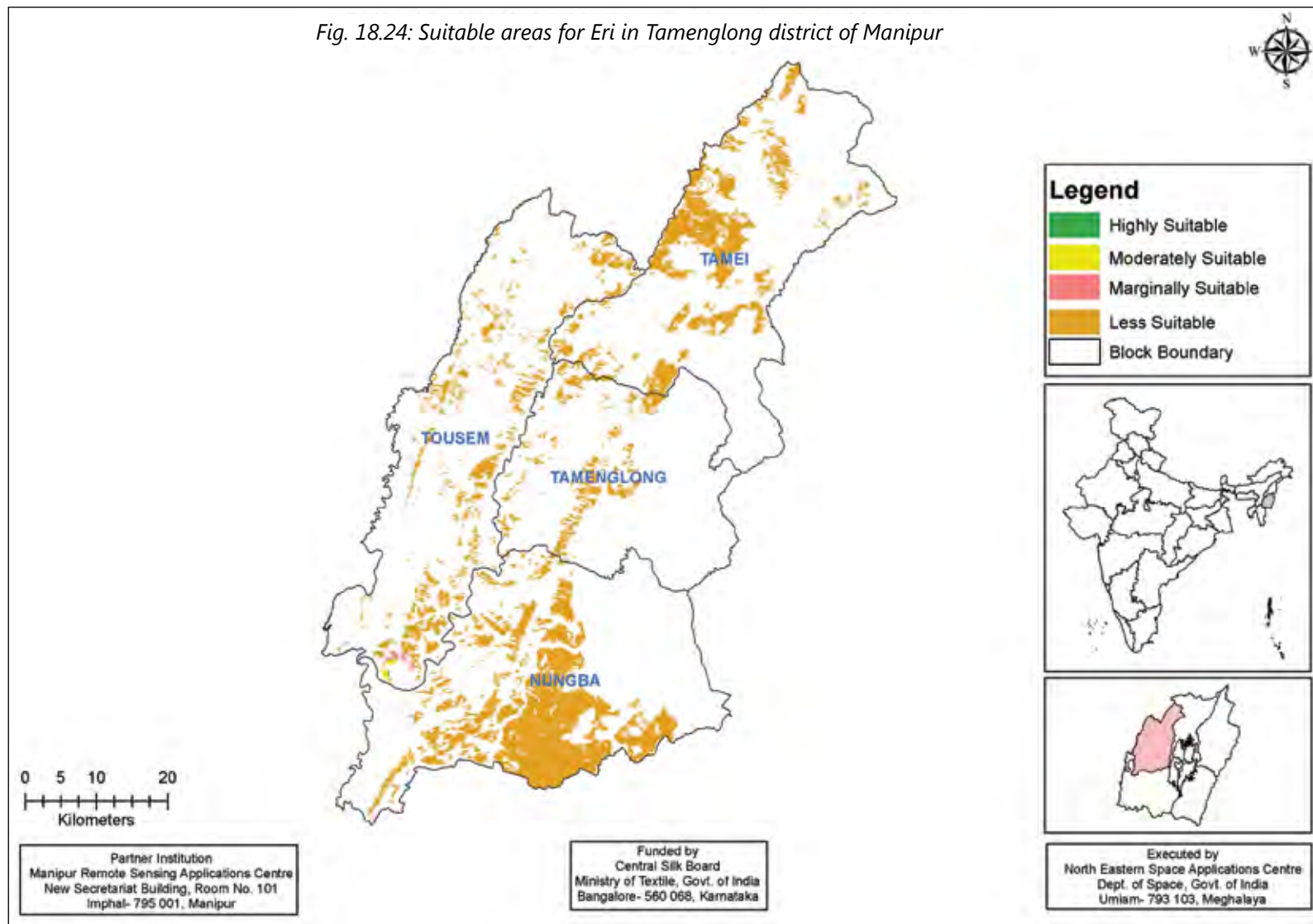


Fig. 18.24: Suitable areas for Eri in Tamenglong district of Manipur



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Fig. 18.25: Suitable areas for Muga in Tamenglong district of Manipur

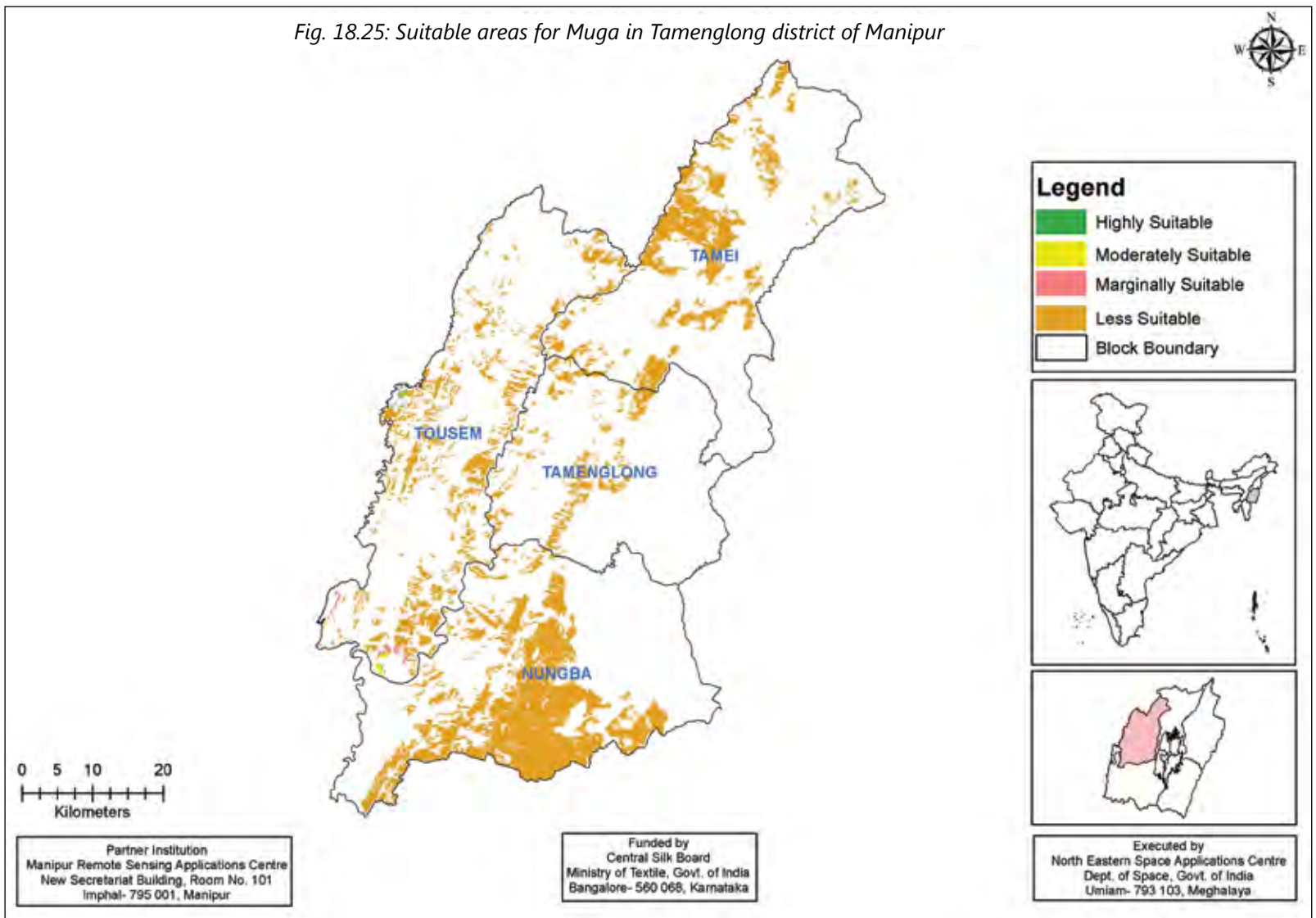
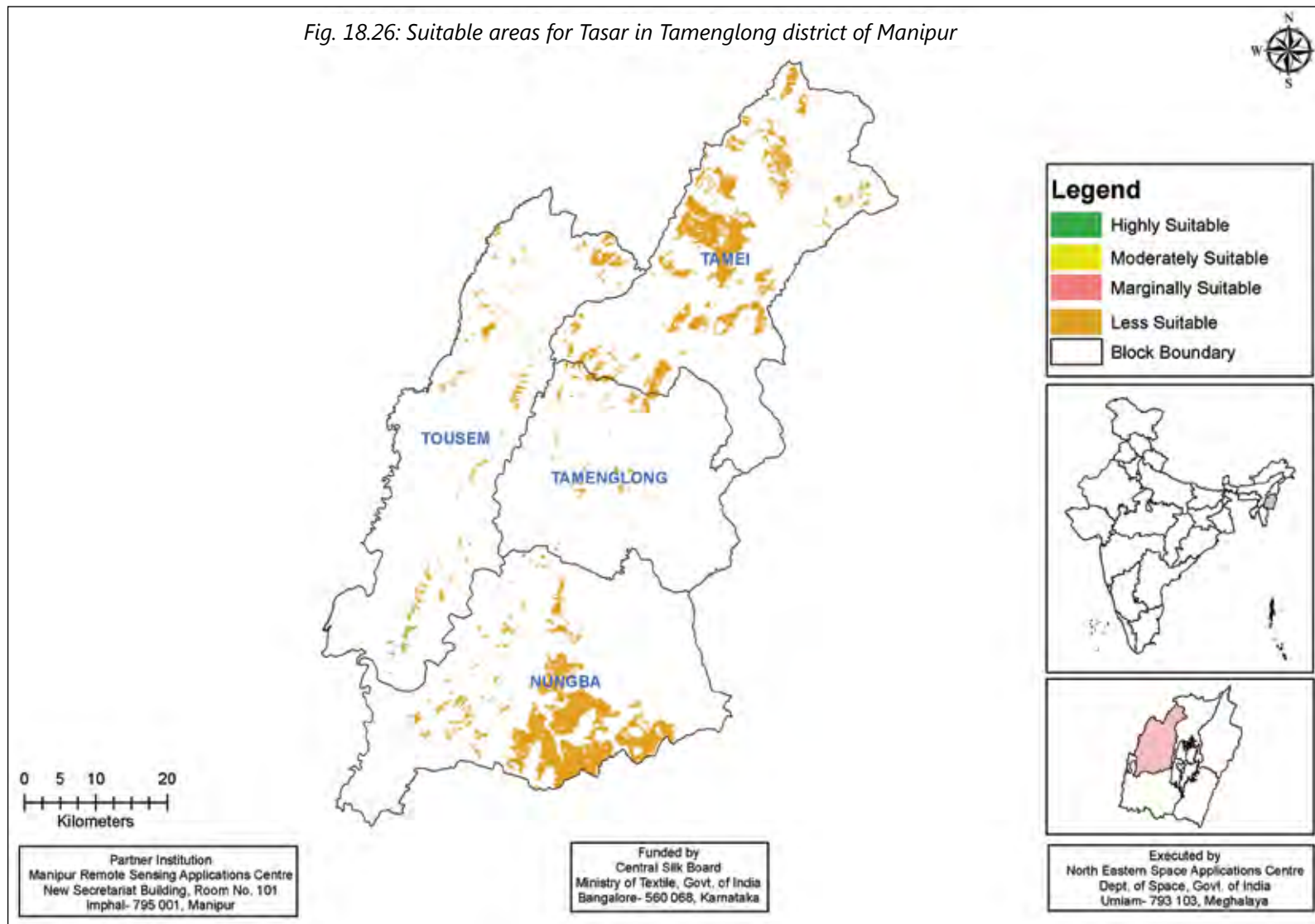


Fig. 18.26: Suitable areas for Tasar in Tamenglong district of Manipur



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Tables 19.27-19.30: Suitable Areas for Mulberry, Eri, Muga & Tasar in Thoubal District of Manipur

Table 19.27

| Block    | Suitable Areas for Mulberry (ha) |          |          |        |
|----------|----------------------------------|----------|----------|--------|
|          | High                             | Moderate | Marginal | Total  |
| Kakching | 166.38                           | 149.77   | 551.64   | 867.78 |
| Thoubal  | 9.19                             | 2.44     | 32.49    | 44.12  |
| Total    | 175.57                           | 152.21   | 584.13   | 911.90 |

Table 19.28

| Block    | Suitable Areas for Eri (ha) |          |          |          |
|----------|-----------------------------|----------|----------|----------|
|          | High                        | Moderate | Marginal | Total    |
| Kakching | 734.06                      | 979.56   | 2609.09  | 4322.72  |
| Lilong   | 351.07                      | 456.80   | 1060.84  | 1868.71  |
| Thoubal  | 1117.02                     | 1133.73  | 2023.28  | 4274.03  |
| Total    | 2202.15                     | 2570.09  | 5693.22  | 10465.46 |

Table 19.29

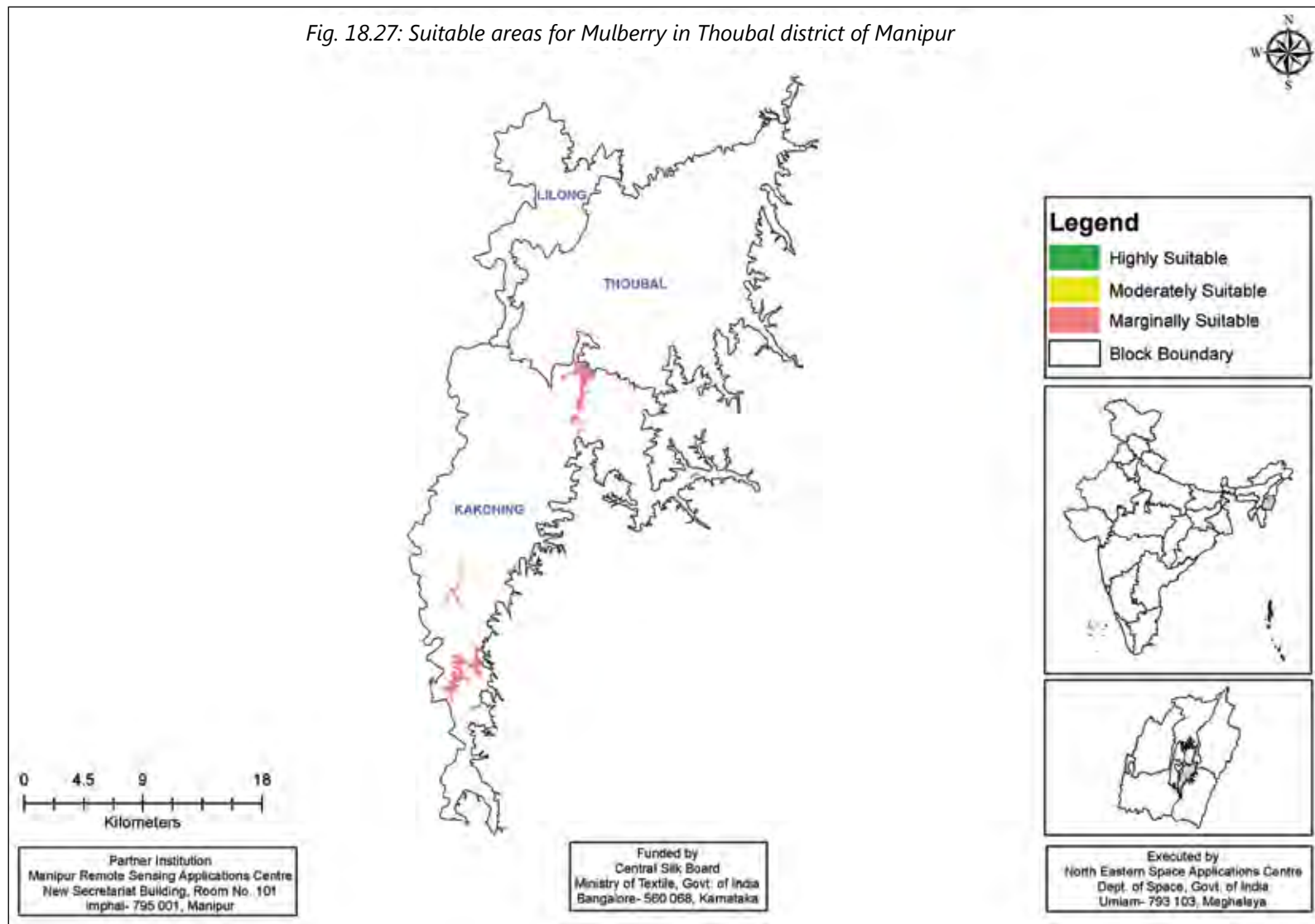
| Block    | Suitable Areas for Muga (ha) |          |          |          |
|----------|------------------------------|----------|----------|----------|
|          | High                         | Moderate | Marginal | Total    |
| Kakching | 734.06                       | 979.63   | 2609.09  | 4322.79  |
| Lilong   | 351.18                       | 456.82   | 1060.84  | 1868.83  |
| Thoubal  | 1117.01                      | 1135.28  | 2023.88  | 4276.17  |
| Total    | 2202.26                      | 2571.73  | 5693.81  | 10467.79 |

Table 19.30

| Block    | Suitable Areas for Tasar (ha) |          |          |          |
|----------|-------------------------------|----------|----------|----------|
|          | High                          | Moderate | Marginal | Total    |
| Kakching | 734.06                        | 979.83   | 2611.07  | 4324.97  |
| Lilong   | 351.18                        | 456.82   | 1060.84  | 1868.83  |
| Thoubal  | 1117.14                       | 1135.28  | 2024.61  | 4277.03  |
| Total    | 2202.38                       | 2571.92  | 5696.52  | 10470.83 |



Fig. 18.27: Suitable areas for Mulberry in Thoubal district of Manipur



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Fig. 18.28: Suitable areas for Eri in Thoubal district of Manipur

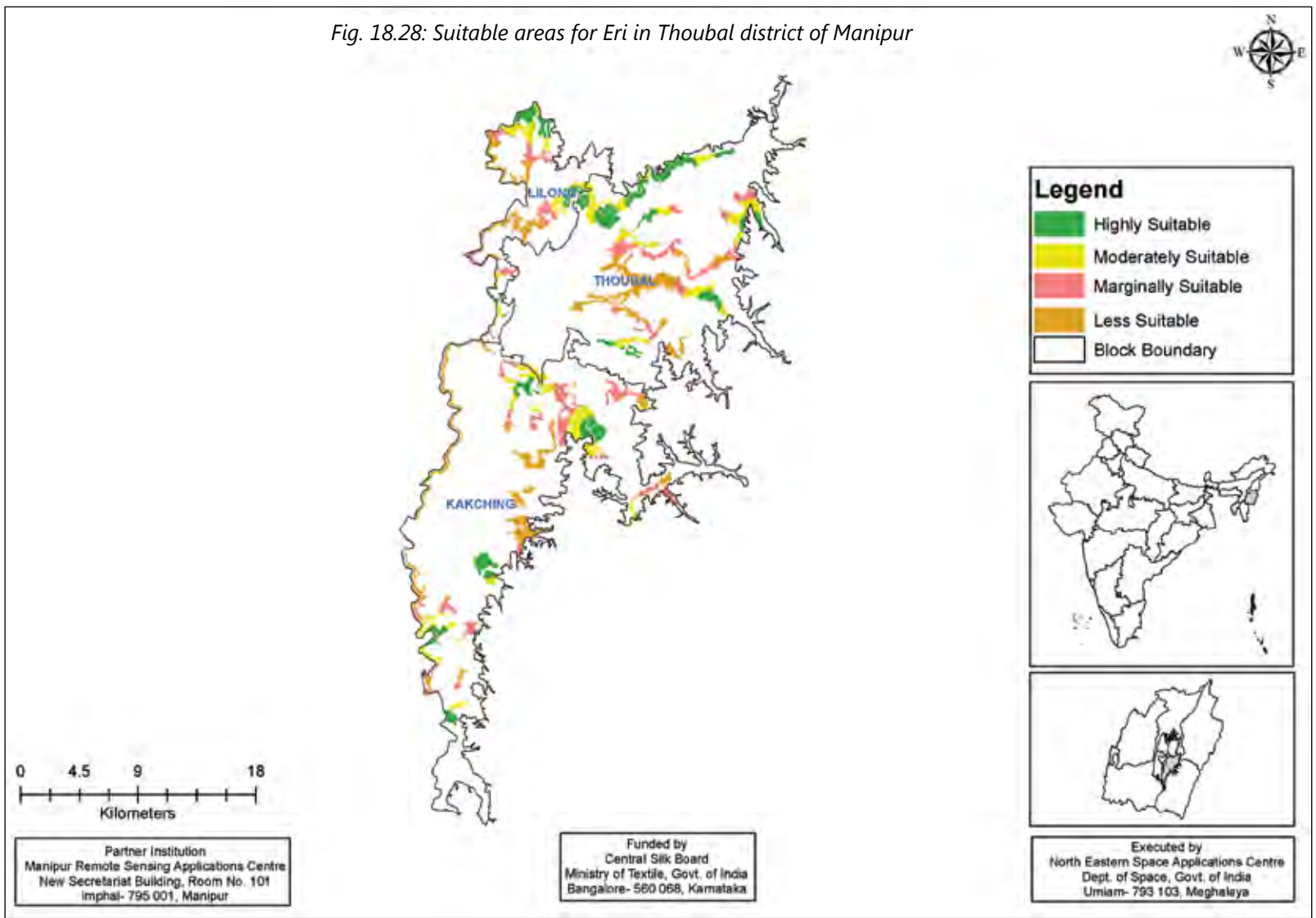
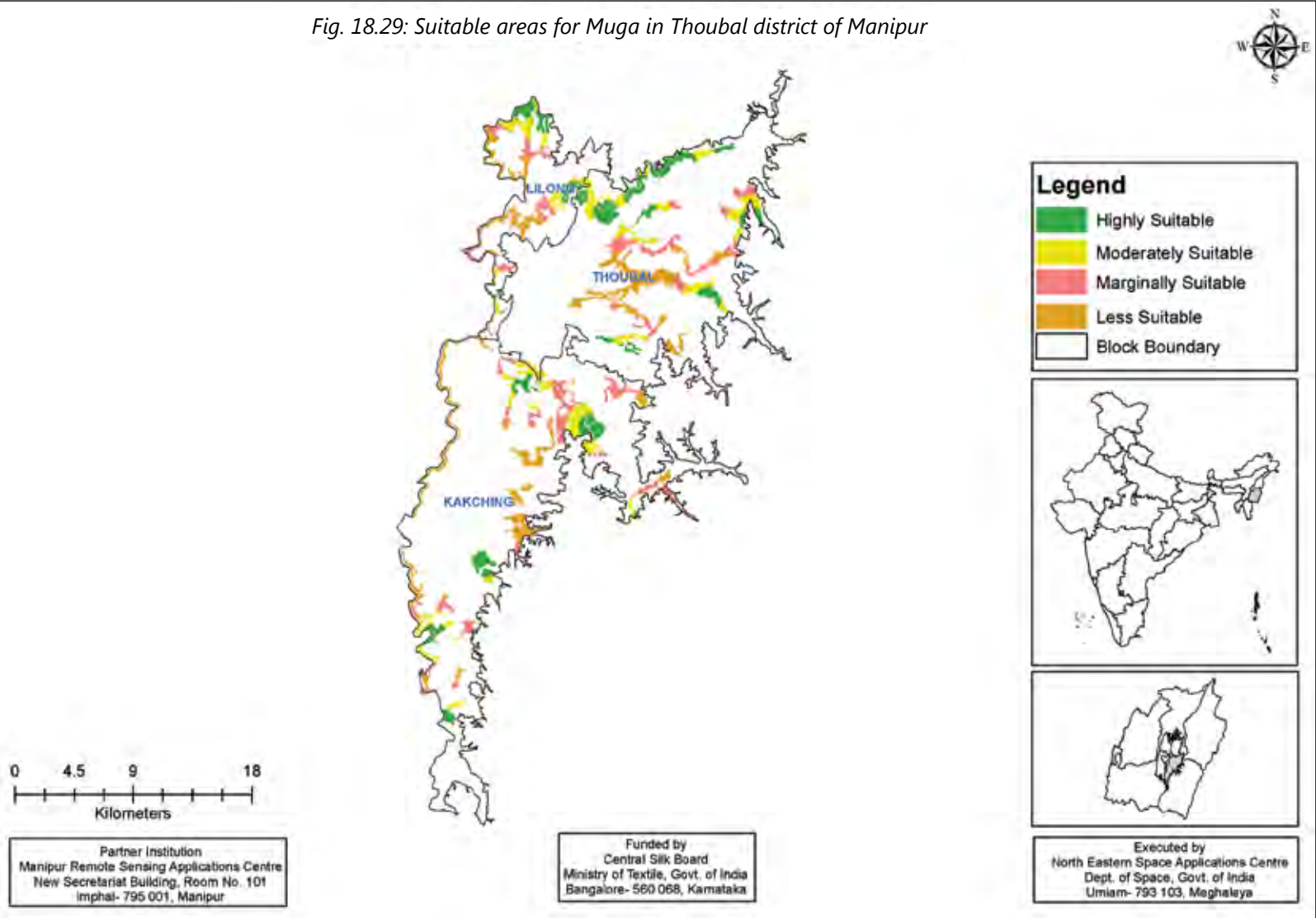


Fig. 18.29: Suitable areas for Muga in Thoubal district of Manipur

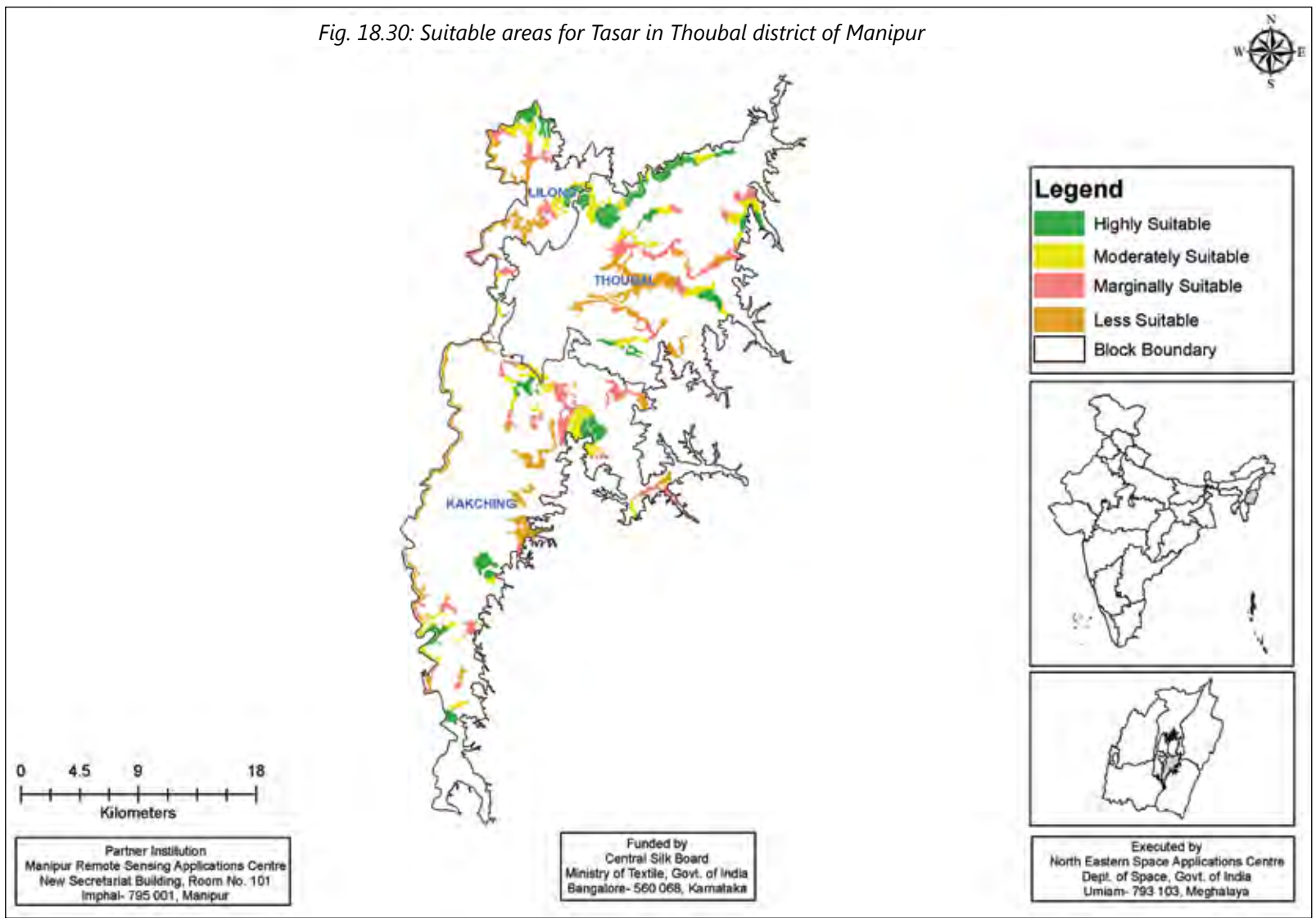


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Fig. 18.30: Suitable areas for Tasar in Thoubal district of Manipur



Tables 19.31-19.34: Suitable Areas for Mulberry, Eri, Muga & Tasar in Ukhrul District of Manipur

Table 19.31

| Block        | Suitable Areas for Mulberry (ha) |          |          |          |
|--------------|----------------------------------|----------|----------|----------|
|              | High                             | Moderate | Marginal | Total    |
| Chingai      | 246.34                           | 2415.32  | 4496.75  | 7158.41  |
| Kamjong      | 211.18                           | 197.61   | 1588.20  | 1996.99  |
| Kasomkhullen | 7.09                             | 29.56    | 936.60   | 973.25   |
| Phungyar     | 155.98                           | 93.38    | 1212.57  | 1461.93  |
| Ukhrul       | 416.31                           | 2173.57  | 3963.09  | 6552.98  |
| Total        | 1036.90                          | 4909.44  | 12197.20 | 18143.54 |

Table 19.32

| Block        | Suitable Areas for Eri (ha) |          |           |           |
|--------------|-----------------------------|----------|-----------|-----------|
|              | High                        | Moderate | Marginal  | Total     |
| Chingai      | -                           | -        | 7618.44   | 7618.44   |
| Kamjong      | 210.69                      | 464.64   | 79896.25  | 80571.59  |
| KasomKhullen | -                           | -        | 43179.76  | 43179.76  |
| Phungyar     | -                           | 3.39     | 36498.88  | 36502.27  |
| Ukhrul       | 127.64                      | 1056.90  | 39217.66  | 40402.20  |
| Total        | 338.34                      | 1524.93  | 206410.99 | 208274.25 |

Table 19.33

| Block        | Suitable Areas for Muga (ha) |          |           |           |
|--------------|------------------------------|----------|-----------|-----------|
|              | High                         | Moderate | Marginal  | Total     |
| Chingai      | -                            | -        | 7591.82   | 7591.82   |
| Kamjong      | 210.69                       | 471.91   | 84403.76  | 85086.36  |
| KasomKhullen | -                            | -        | 44103.96  | 44103.96  |
| Phungyar     | -                            | 3.39     | 36482.83  | 36486.22  |
| Ukhrul       | 256.17                       | 1355.50  | 42402.62  | 44014.29  |
| Total        | 466.86                       | 1830.81  | 214984.99 | 217282.66 |

Table 19.34

| Block        | Suitable Areas for Tasar (ha) |          |           |           |
|--------------|-------------------------------|----------|-----------|-----------|
|              | High                          | Moderate | Marginal  | Total     |
| Chingai      | -                             | -        | 7205.86   | 7205.86   |
| Kamjong      | 210.69                        | 464.64   | 50263.10  | 50938.44  |
| KasomKhullen | -                             | -        | 26418.37  | 26418.37  |
| Phungyar     | -                             | 3.39     | 29566.93  | 29570.32  |
| Ukhrul       | 121.90                        | 958.26   | 37119.77  | 38199.92  |
| Total        | 332.59                        | 1426.29  | 150574.03 | 152332.91 |

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Fig. 18.31: Suitable areas for Mulberry in Ukhrul district of Manipur

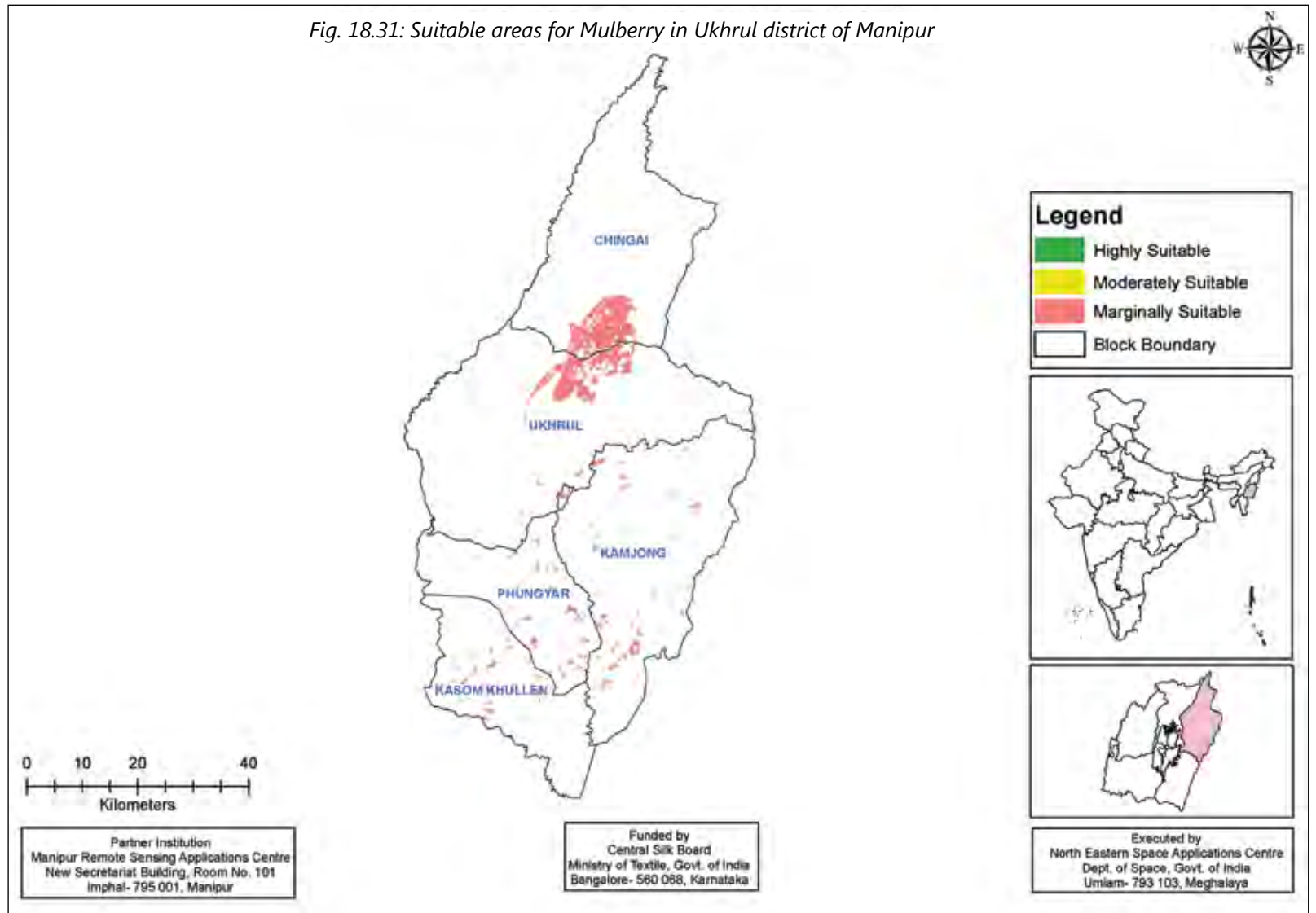
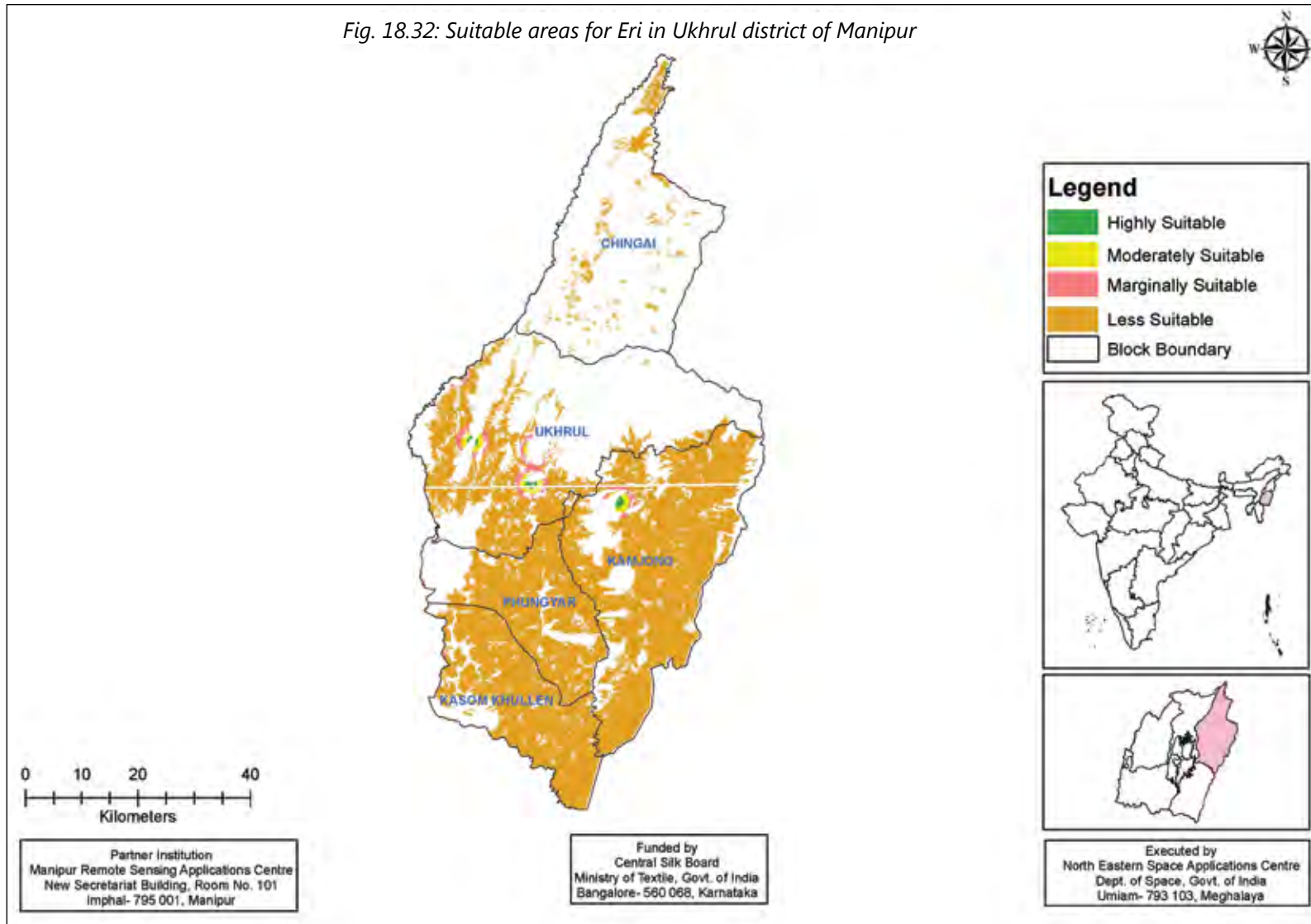


Fig. 18.32: Suitable areas for Eri in Ukhrul district of Manipur



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Fig. 18.33: Suitable areas for Muga in Ukhrul district of Manipur

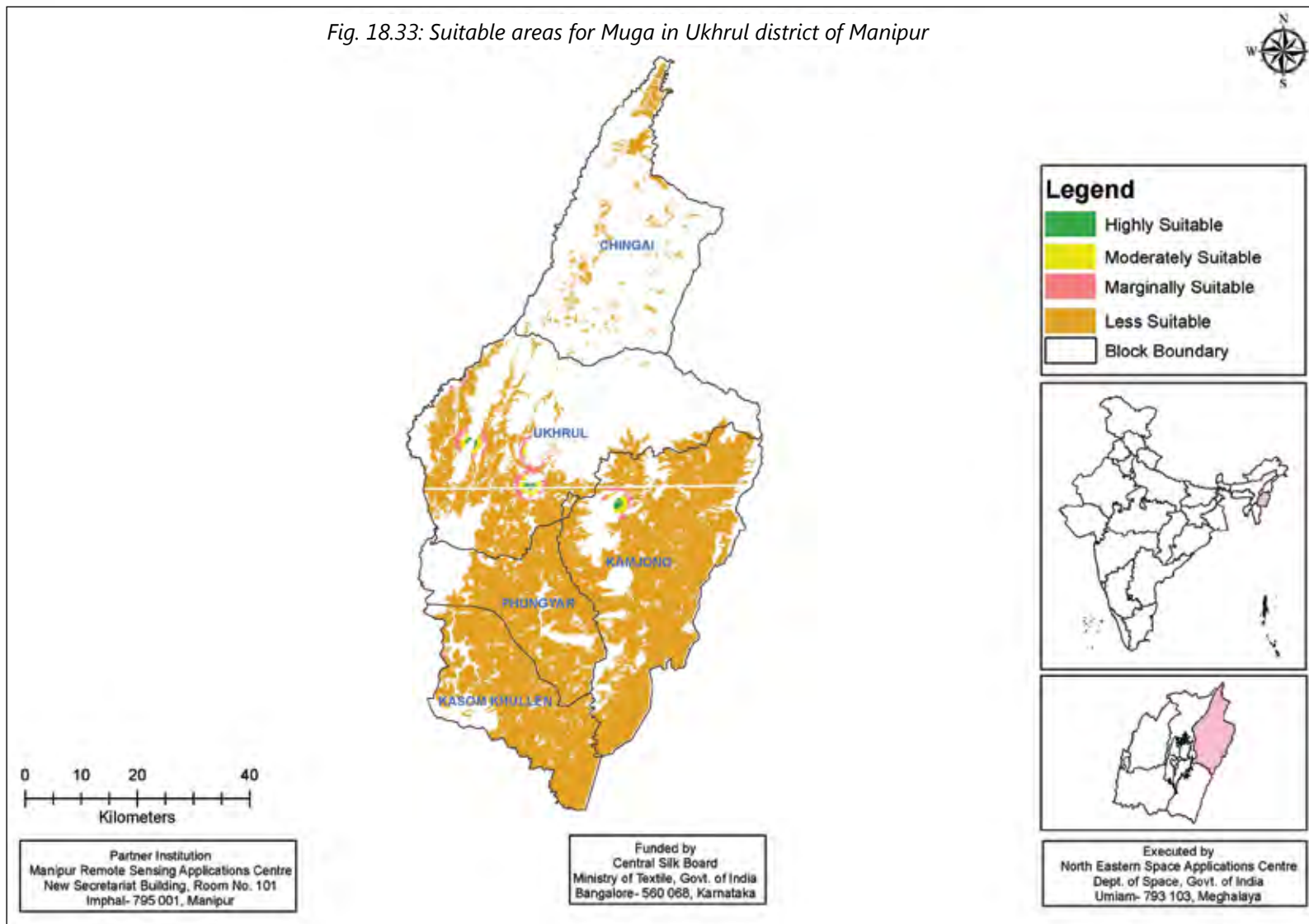
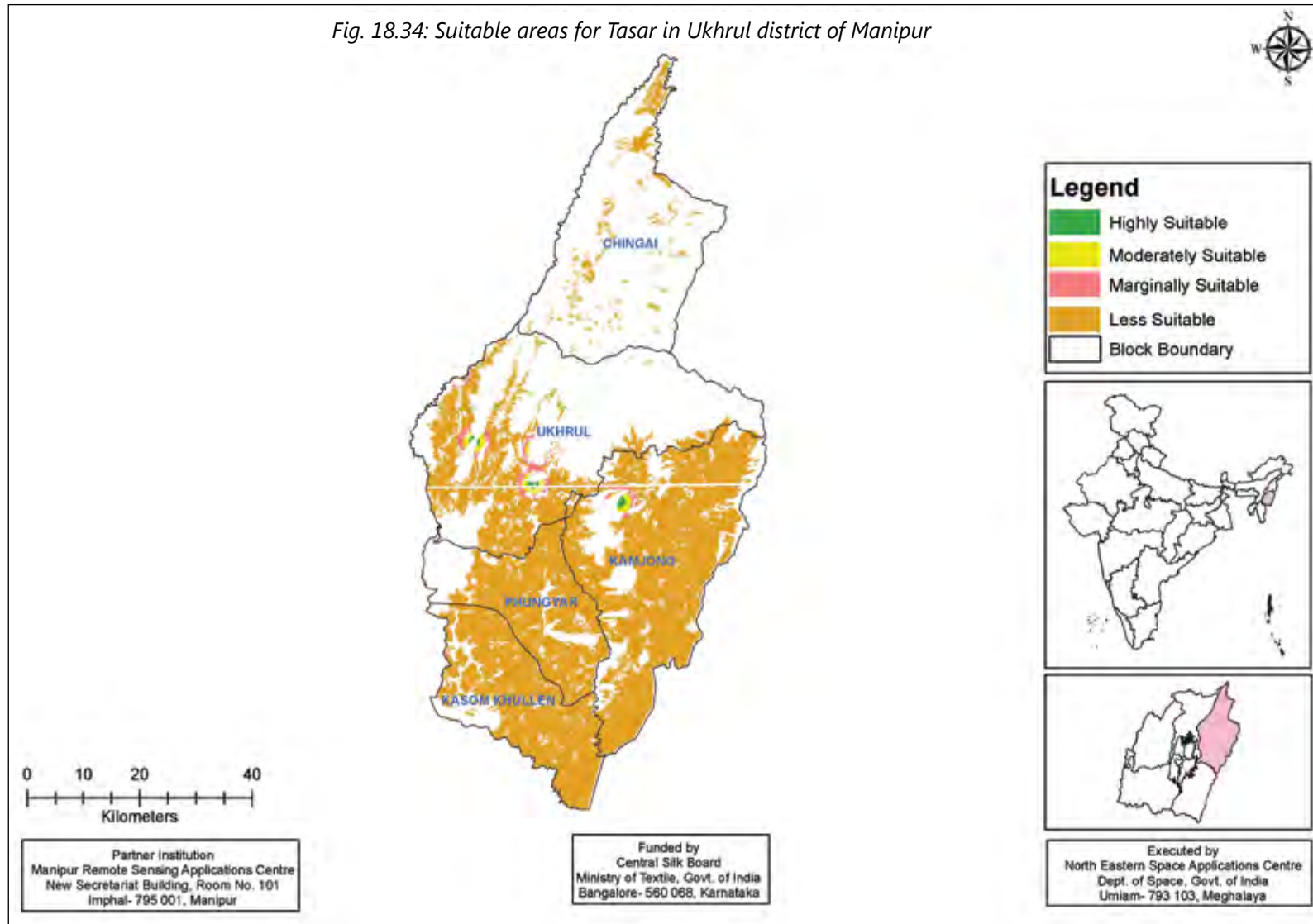


Fig. 18.34: Suitable areas for Tasar in Ukhrul district of Manipur



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## MEGHALAYA

Meghalaya is a southern state in north eastern region of the country that covers an area of approximately 22,430 square kilometers with a population of 2,964,007 as per 2011 census. This state is bounded to the south by the districts of greater Mymensingh and the Division of Sylhet and the west by the Division of Rangpur of the Bangladesh and the north and the east by Assam state. The capital is Shillong, known as the "Scotland of the East". The state is the wettest region of India, recording an average of 1200 cm of rains a year. About 70% of the state is forested. Meghalaya has predominantly an agrarian economy with a significant commercial forestry industry. The important crops are potatoes, rice, maize, pineapples, bananas, papayas, spices, etc. Besides agriculture, a small part of the economy is occupied in small-scale industries such as sericulture & weaving, animal husbandry and dairy farming, carpentry & bamboo-working, brick-making, etc. Mining is another important industry. The state has fairly large reserves of coal, limestone and clay.

Sericulture and weaving in Meghalaya are the two most important cottage based, eco-friendly industries in the rural areas. These twin industries portray the cultural ethos and rich heritage of the people of the State. In the absence of a textile industry, Sericulture and weaving can play an important role for the production of silk fabrics and hand woven fabrics of ethnic designs.

Sericulture and weaving play a very important role in providing self employment opportunities and additional earning especially for the rural women. The climate in Meghalaya is conducive for rearing of Eri, Muga and Mulberry silkworms. Rearing of Eri, Muga and Mulberry is being practiced by the rural people of the state, mostly by women. At present there are around 28,000 Sericultural farmers and 23,000 weavers in the state. Meghalaya stands second in production of Eri and Muga silk yarn i.e. next to Assam. In Meghalaya, there are 12 seed farms, 6 for mulberry, 3 for Eri and 2 for Muga. There are 9 mulberry and 3 Muga nurseries to rear planting materials in different Districts. Two districts viz, east Garo Hills and Ri Bhoi were selected for mapping of potential areas for Mulberry, Eri and Muga.

### **East Garo Hills**

The district was upgraded from a sub-division to a full fledged district in 1976, which covers an area of 2603 Sq.km and lies from 25° to 26° North latitudes and 89° to 91° East longitudes. The district headquarters are located at Williamnagar. The District is bounded by South Garo Hills on the south, West Garo Hills on the west, East Khasi Hills on the East and the state of Assam on the north.



## Ri Bhoi

The district came into existence in 1992 when it was carved out from the erstwhile East Khasi Hills District and lies between North Latitudes 25° 15' and 26° 15' and between East Longitudes 91° 45' and 92° 15'. The District is bounded on the North by the Kamrup, Morigoan and Nagoan Districts of Assam, on the East by the Karbi Anglong District of Assam, on the South by East Khasi Hills & West Khasi Hills Districts and on the West by the West Khasi District. Nongpoh is the district headquarters. RiBhoi District covers an area of 2448 Sq.Km.

Tables 20.1-20.4: Suitable Areas for Mulberry, Eri, Muga&Tasarin East Garo District of Meghalaya

Table 20.1

| Block         | Suitable Areas for Mulberry (ha) |          |          |          |
|---------------|----------------------------------|----------|----------|----------|
|               | High                             | Moderate | Marginal | Total    |
| DamboRongjeng | -                                | 5482.72  | 5934.00  | 11416.72 |
| Resubelpara   | -                                | 1668.64  | 12190.80 | 13859.44 |
| Samanda       | -                                | 3564.09  | 3930.10  | 7494.19  |
| Sonngsak      | -                                | 5998.20  | 3681.56  | 9679.76  |
| Total         | -                                | 16713.65 | 25736.46 | 42450.11 |

Table 20.2

| Block         | Suitable Areas for Eri (ha) |          |          |          |
|---------------|-----------------------------|----------|----------|----------|
|               | High                        | Moderate | Marginal | Total    |
| DamboRongjeng | 1562.67                     | 2359.37  | 31630.1  | 35552.14 |
| Resubelpara   | 13.62                       | 112.24   | 1660.99  | 1786.85  |
| Samanda       | 321.64                      | 657.26   | 2539.77  | 3518.66  |
| Sonngsak      | 27.96                       | 247.68   | 3414.29  | 3689.93  |
| Total         | 1925.89                     | 3376.54  | 39245.15 | 44547.58 |

Table 20.3

| Block         | Suitable Areas for Muga (ha) |          |          |          |
|---------------|------------------------------|----------|----------|----------|
|               | High                         | Moderate | Marginal | Total    |
| DamboRongjeng | 431.36                       | 1204.86  | 46303.59 | 47939.81 |
| Resubelpara   | 872.55                       | 2311.41  | 21098.6  | 24282.56 |
| Samanda       | 407.87                       | 802.64   | 3146.85  | 4357.36  |
| Sonngsak      | 25.70                        | 209.77   | 11108.8  | 11344.28 |
| Total         | 1737.49                      | 4528.68  | 81657.84 | 87924.01 |



Table 20.4

| Block         | Suitable Areas for Tasar (ha) |         |
|---------------|-------------------------------|---------|
|               | Suitable                      | Tasar   |
| DamboRongjeng | 1461.55                       | 1461.55 |
| Resubelpara   | -                             | -       |
| Samanda       | 8508.15                       | 8508.15 |
| Sonngsak      | -                             | -       |
| Total         | 9969.70                       | 9969.70 |

Fig. 19.1: Suitable areas for Mulberry in East Garo Hills district of Meghalaya

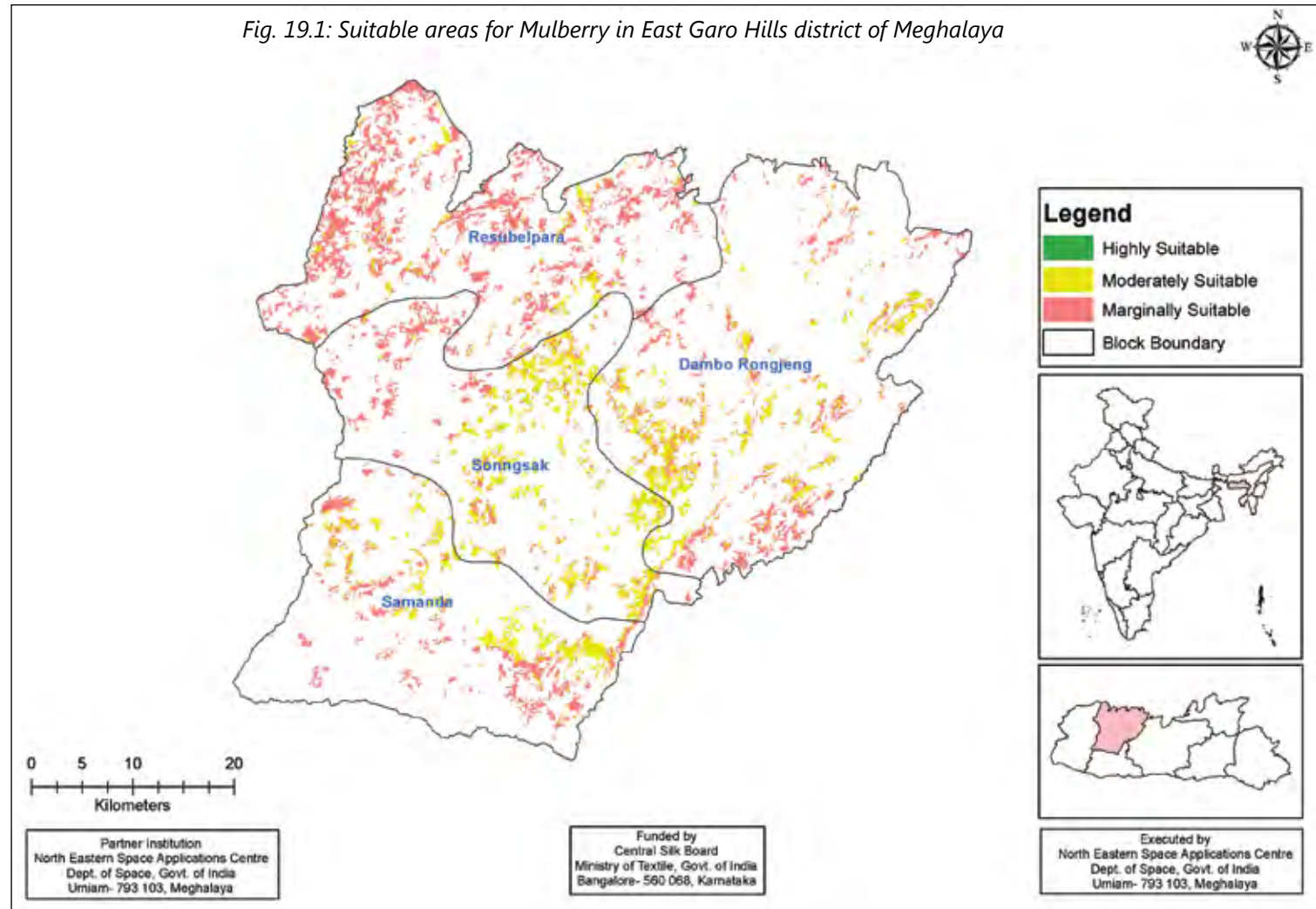
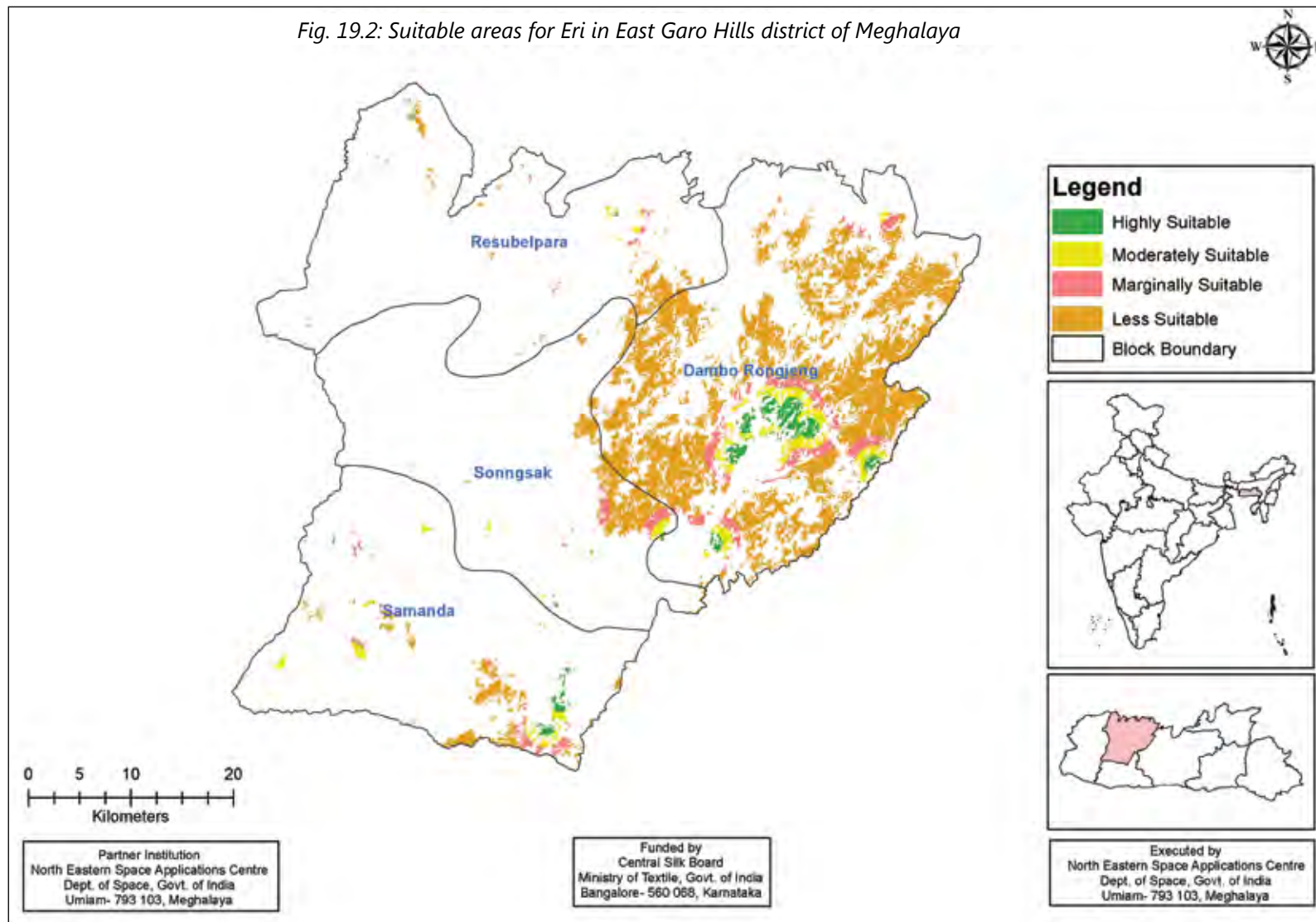


Fig. 19.2: Suitable areas for Eri in East Garo Hills district of Meghalaya



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Fig. 19.3: Suitable areas for Muga in East Garo Hills district of Meghalaya

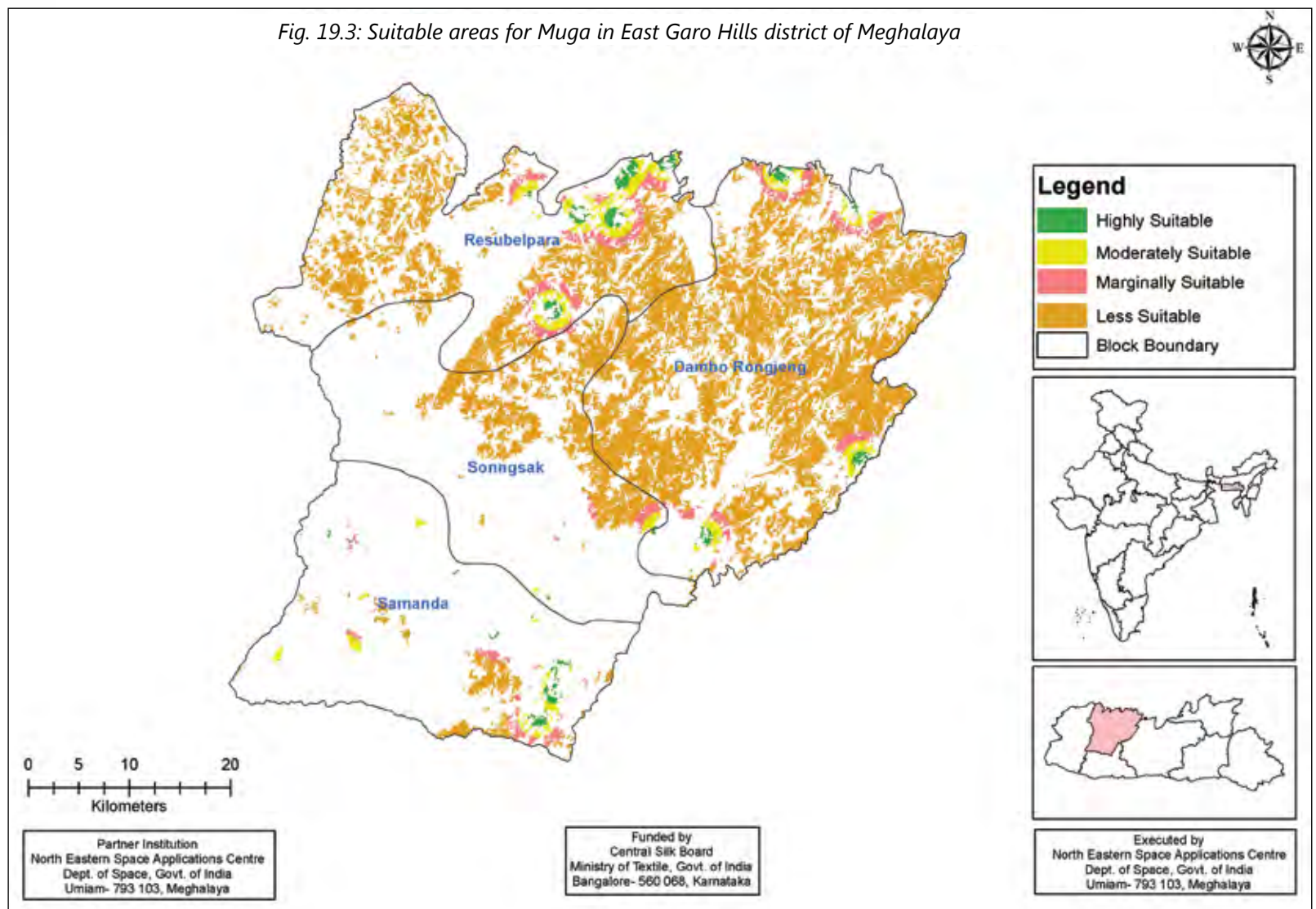
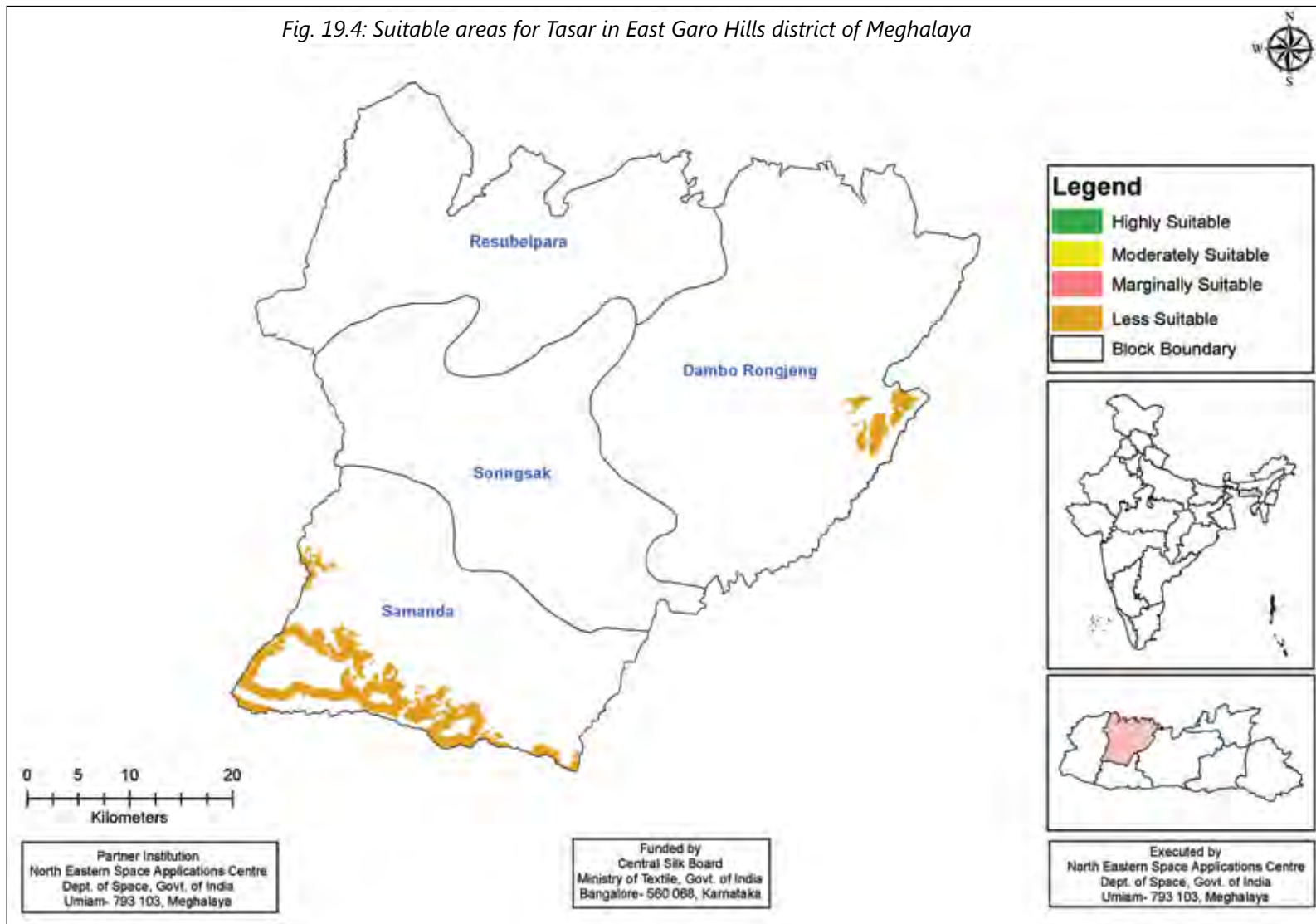


Fig. 19.4: Suitable areas for Tasar in East Garo Hills district of Meghalaya



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Tables 20.5-20.7: Suitable Areas for Mulberry, Eri, & Muga in RiBhoi District of Meghalaya

Table 20.5

| Block         | Suitable Areas for Mulberry (ha) |          |          |          |
|---------------|----------------------------------|----------|----------|----------|
|               | High                             | Moderate | Marginal | Total    |
| Jirang Block  | 6680.13                          | 6640.00  | -        | 13320.14 |
| Umling Block  | 3011.20                          | 7161.32  | 793.79   | 10966.31 |
| Umsning Block | 4236.18                          | 1879.39  | 6916.55  | 13032.12 |
| Total         | 13927.51                         | 15680.72 | 7710.34  | 37318.57 |

Table 20.6

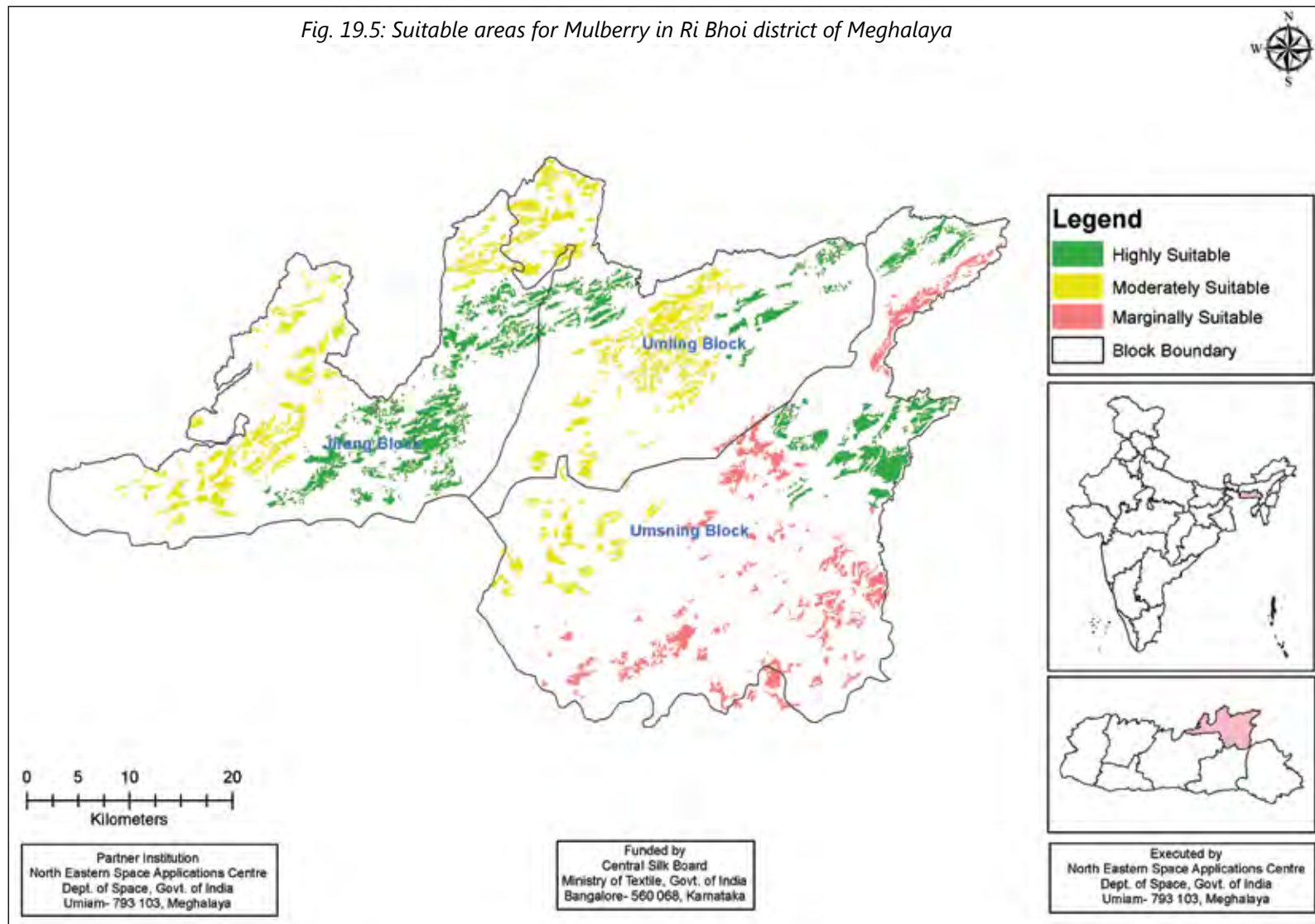
| Block         | Suitable Areas for Eri (ha) |          |          |         |
|---------------|-----------------------------|----------|----------|---------|
|               | High                        | Moderate | Marginal | Total   |
| Jirang Block  | 927.91                      | 999.31   | 542.71   | 2469.94 |
| Umling Block  | 500.06                      | 453.94   | 53.82    | 1007.82 |
| Umsning Block | 764.37                      | 651.87   | 85.53    | 1501.78 |
| Total         | 2192.34                     | 2105.13  | 682.07   | 4979.54 |

Table 20.7

| Block         | Suitable Areas for Muga (ha) |          |          |          |
|---------------|------------------------------|----------|----------|----------|
|               | High                         | Moderate | Marginal | Total    |
| Jirang Block  | 1996.17                      | 3234.62  | 15102.61 | 20333.39 |
| Umling Block  | 323.82                       | 742.00   | 11065.73 | 12131.55 |
| Umsning Block | 687.42                       | 2329.85  | 20049.53 | 23066.80 |
| Total         | 3007.41                      | 6306.46  | 46217.88 | 55531.75 |



Fig. 19.5: Suitable areas for Mulberry in Ri Bhoi district of Meghalaya



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Fig. 19.6: Suitable areas for Eri in Ri Bhoi district of Meghalaya

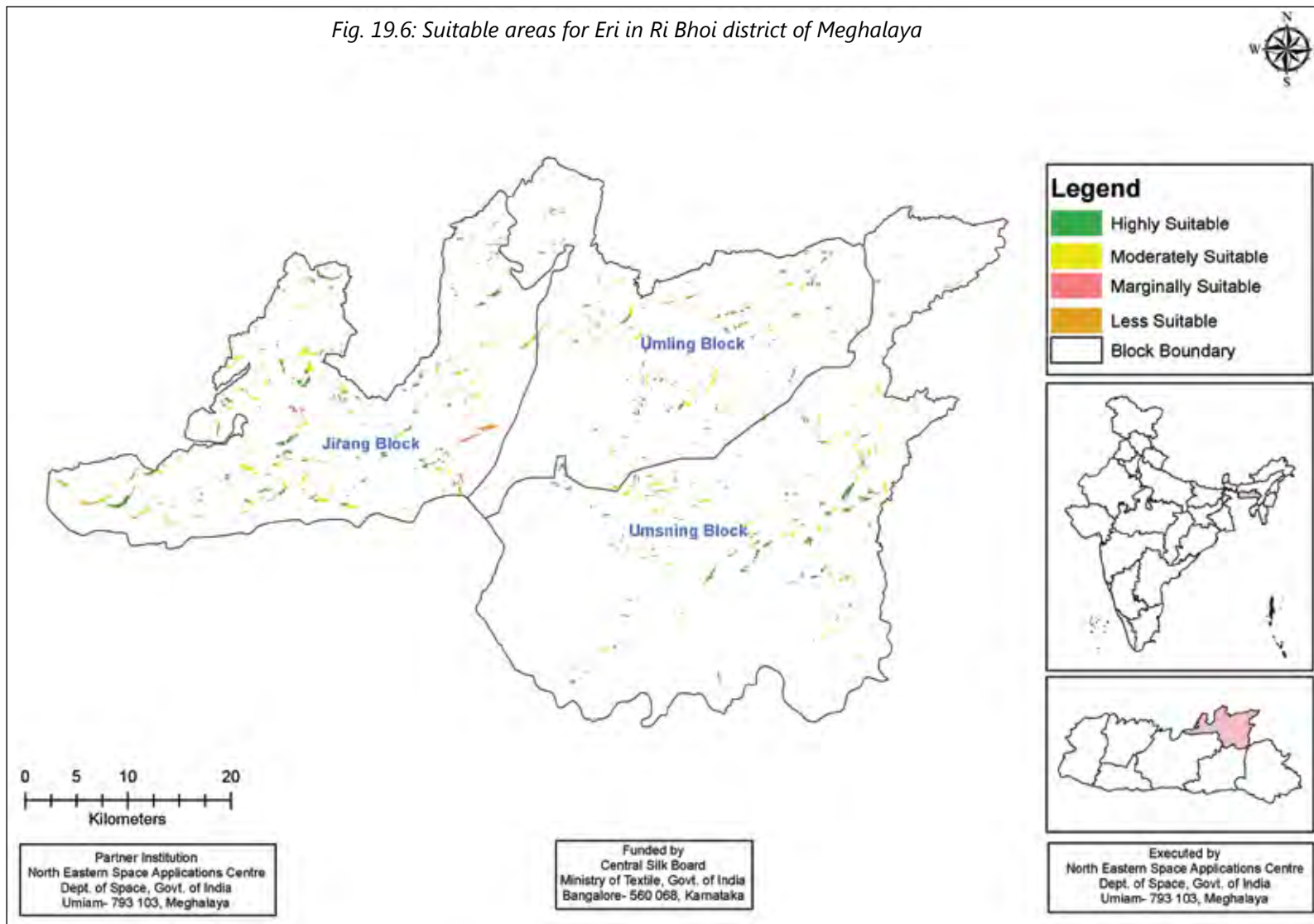
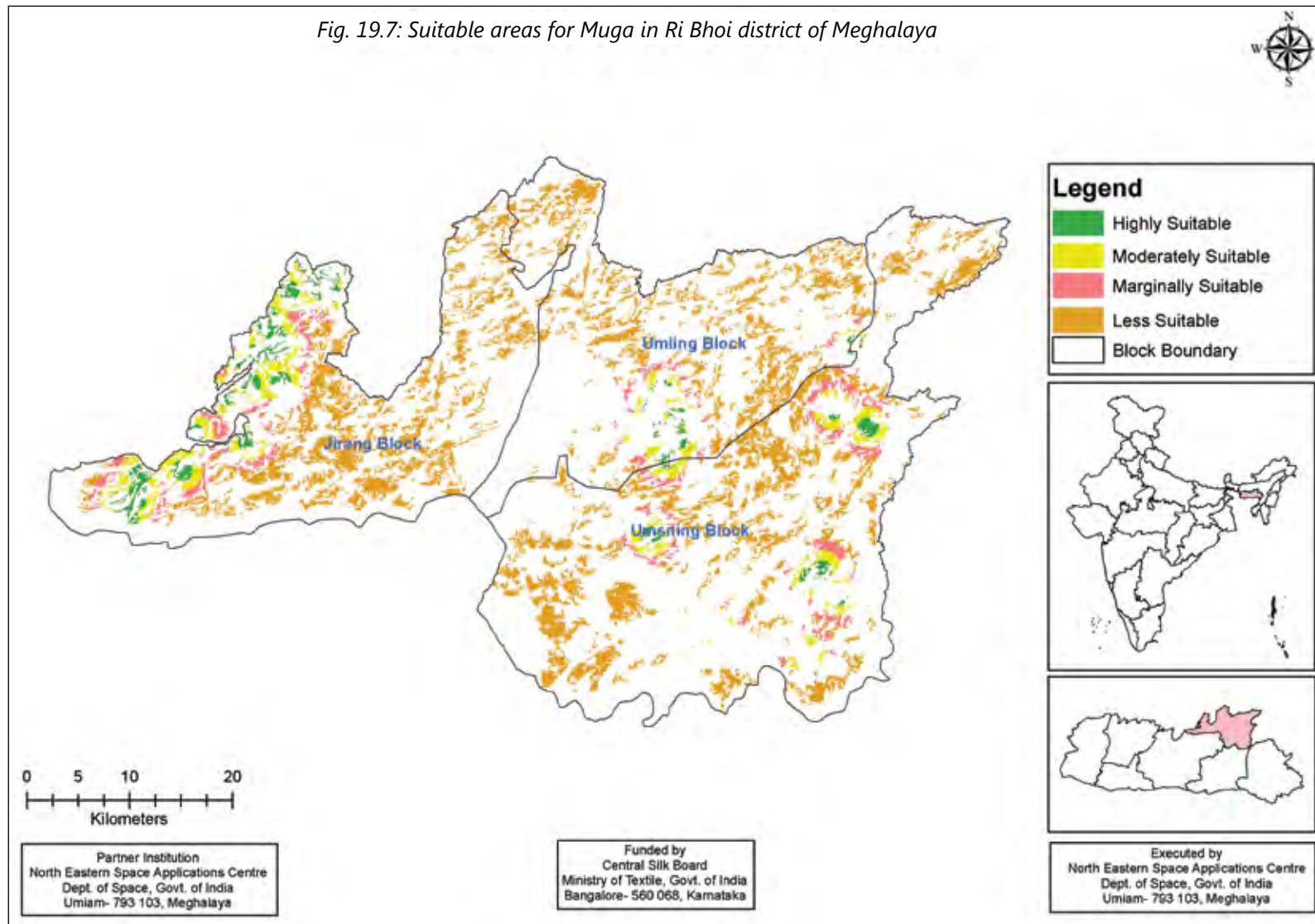


Fig. 19.7: Suitable areas for Muga in Ri Bhoi district of Meghalaya



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## MIZORAM

Mizoram is one of the seven sister states in north eastern India, sharing borders with the states of Tripura, Assam, Manipur and with the neighboring countries of Bangladesh and Burma. It is the 2nd least populous state in the country with the population of 1,091,014, according to 2011 census. Mizoram covers an area of approximately 21,087 square kilometers; about 91% of the state is forested. Mizoram is a highly literate agrarian economy, but suffers from jhum or shifting cultivation, and poor crop yields. In recent years, the jhum farming practices are steadily being replaced with a significant horticulture and bamboo products industry. Mizoram has a large area of wastelands mostly due to the shifting cultivation. A significant portion of the cultivable wastelands can be brought under silkworm host plants thereby expanding the areas under sericulture activities. Mizoram has a mild climate, relatively cool in summer 20 to 29 °C and winter temperatures range from 7 to 22 °C, which is conducive for all the four types of sericulture viz., Eri, Muga, Mulberry and Tasar. Six districts were selected for mapping of potential areas for sericulture development in the state.

### Aizawl

Aizawl district is situated between Tlawng River in the west and Tuirial River in the East. It is located between 24° 25' and 23° 18' North latitude; and 92° 37' and 93° 11' East longitude. The total geographical area of the district is 3576.31 sq. km.

### Mamit

Mamit district is an administrative district of Mizoram with headquarters at Mamit town. It is located between 23° 15' and 24° 15' North latitude; and 92° 15' and 92° 40' East longitude. The total geographical area of the district is 3025.75 sq. km.

### Champhai

Champhai district lies in the eastern most part of the state of Mizoram and the district bordered with Myanmar republic in the east. The town also serves as a gateway of all business activities between the two nations India and Myanmar. It is located between 24° 05' and 23° 00' North latitude; and 93° 00' and 93° 26' East longitude with a total geographical area of 3185.83 sq. km.

### Lunglei

Lunglei district is the largest district of the state with an area of 4538 sq. km. The district is located at the south central part of Mizoram bordering Bangladesh in the west, Aizawl and Serchhip districts in the north and Lawngtlai district in the south. It is located between 23° 24' and 22° 29' North latitude; and 92° 20' and 93° 10' East longitude.



## Lawngtlai

Lawngtlai district is the southernmost district of Mizoram having international borders with Bangladesh in the west and south, and Myanmar in the east. The location extent of the district is between 22° 47' and 22° 26' North latitude; and 92° 31' and 92° 58' East longitude with a total geographical area of 2557.10 sq. km.

## Saiha

Saiha district is situated on the south-eastern fringe of the state and is surrounded by Myanmar on the east as well as on the south and Lawngtlai district on the west as well as on the north. It is located between 23° 38' and 21° 56' North latitude and 92° 49' and 93° 12' East longitude occupying a total geographical area of 1399.90 sq. km. The administrative seat is located at Saiha town and it is also the Headquarters of the Mara Autonomous District Council (MADC) of Mizoram.

Table 21.1-21.4: Suitable Areas for Mulberry, Eri, Muga & Tasar in Aizawl District of Mizoram

Table 21.1

| Block          | Suitable areas for Mulberry (ha) |          |          |          |
|----------------|----------------------------------|----------|----------|----------|
|                | High                             | Moderate | Marginal | Total    |
| Aibawlr        | 2701.14                          | 8124.60  | 2114.80  | 12940.54 |
| Darlawn        | 6907.76                          | 12827.79 | 4800.68  | 24536.23 |
| Phullen        | 3685.43                          | 6144.99  | 2136.56  | 11966.98 |
| Thingsulthliah | 4727.81                          | 13391.40 | 3685.90  | 21805.11 |
| Tlangnuam      | 3227.20                          | 8639.08  | 1602.02  | 13468.31 |
| Total          | 21249.34                         | 49127.86 | 14339.97 | 84717.16 |

Table 21.2

| Block          | Suitable areas for Mulberry (ha) |          |          |         |
|----------------|----------------------------------|----------|----------|---------|
|                | High                             | Moderate | Marginal | Total   |
| Aibawlr        | 227.22                           | 62.01    | 2559.62  | 2848.84 |
| Darlawn        | 173.75                           | 95.27    | 1936.94  | 2205.95 |
| Phullen        | 96.13                            | 36.65    | 1897.27  | 2030.05 |
| Thingsulthliah | 92.29                            | 38.36    | 1463.21  | 1593.86 |
| Tlangnuam      | 42.83                            | 0.16     | 1040.64  | 1083.62 |
| Total          | 632.20                           | 232.45   | 8897.67  | 9762.33 |



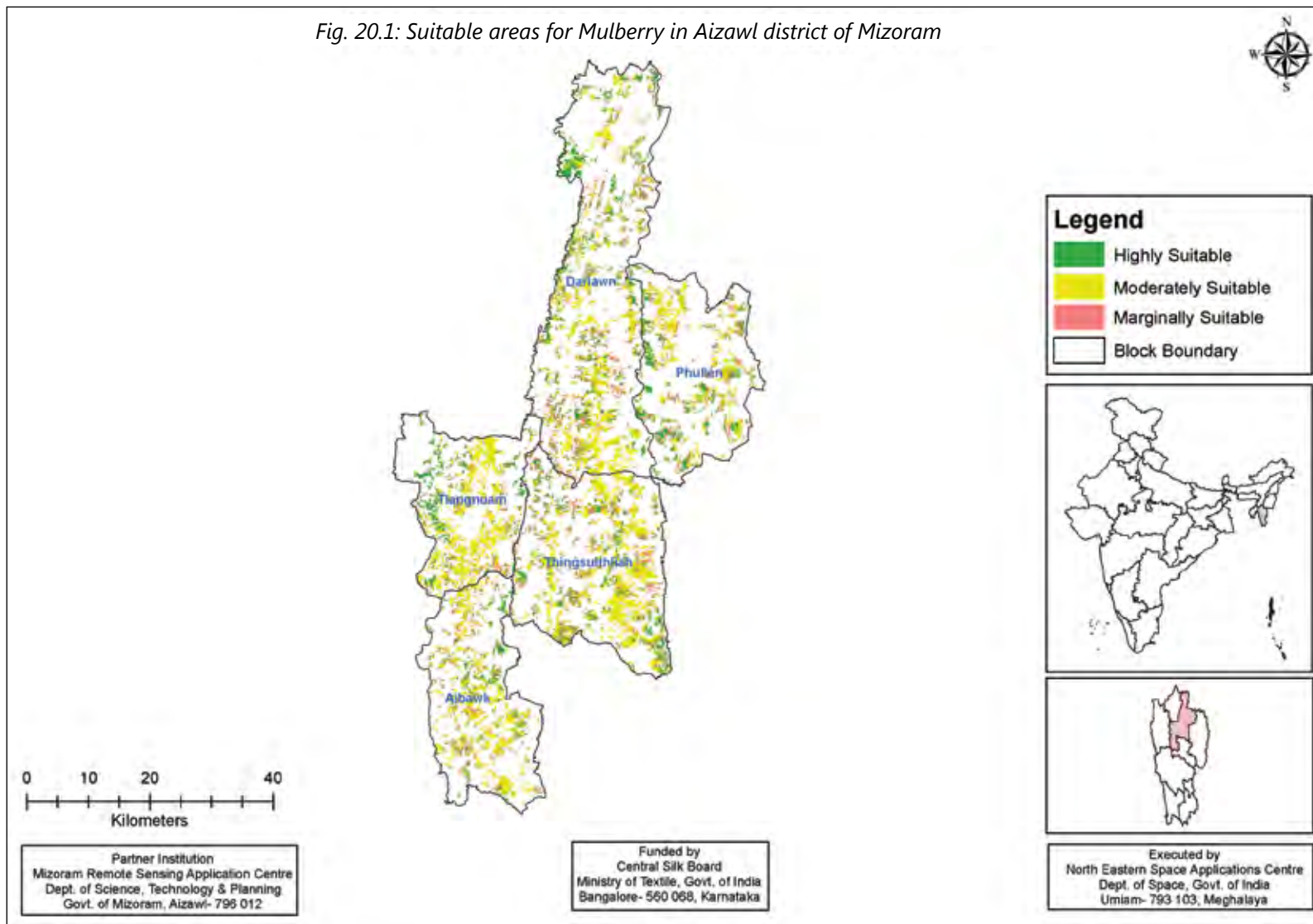
Table 21.3

| Block          | Suitable areas for Muga (ha) |          |          |         |
|----------------|------------------------------|----------|----------|---------|
|                | High                         | Moderate | Marginal | Total   |
| Aibawk         | 990.48                       | 771.29   | 4817.44  | 6579.21 |
| Darlawn        | 642.80                       | 456.97   | 8642.43  | 9742.21 |
| Phullen        | 878.54                       | 369.75   | 4445.11  | 5693.40 |
| Thingsulthliah | 699.00                       | 295.91   | 3110.87  | 4105.78 |
| Tlangnuam      | 354.17                       | 452.68   | 3599.25  | 4406.10 |
| Total          | 3564.98                      | 2346.60  | 24615.11 | 8511.88 |

Table 21.4

| Block          | Suitable areas for Tasar (ha) |          |          |          |
|----------------|-------------------------------|----------|----------|----------|
|                | High                          | Moderate | Marginal | Total    |
| Aibawk         | 1095.28                       | 511.17   | 2121.48  | 3727.93  |
| Darlawn        | 328.19                        | 201.19   | 1168.35  | 1697.73  |
| Phullen        | 788.96                        | 332.40   | 1193.95  | 2315.31  |
| Thingsulthliah | 751.86                        | 278.92   | 1549.62  | 2580.41  |
| Tlangnuam      | 148.93                        | 106.97   | 420.35   | 676.25   |
| Total          | 3113.23                       | 1430.65  | 6453.75  | 10997.63 |

Fig. 20.1: Suitable areas for Mulberry in Aizawl district of Mizoram



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Fig. 20.2: Suitable areas for Eri in Aizawl district of Mizoram

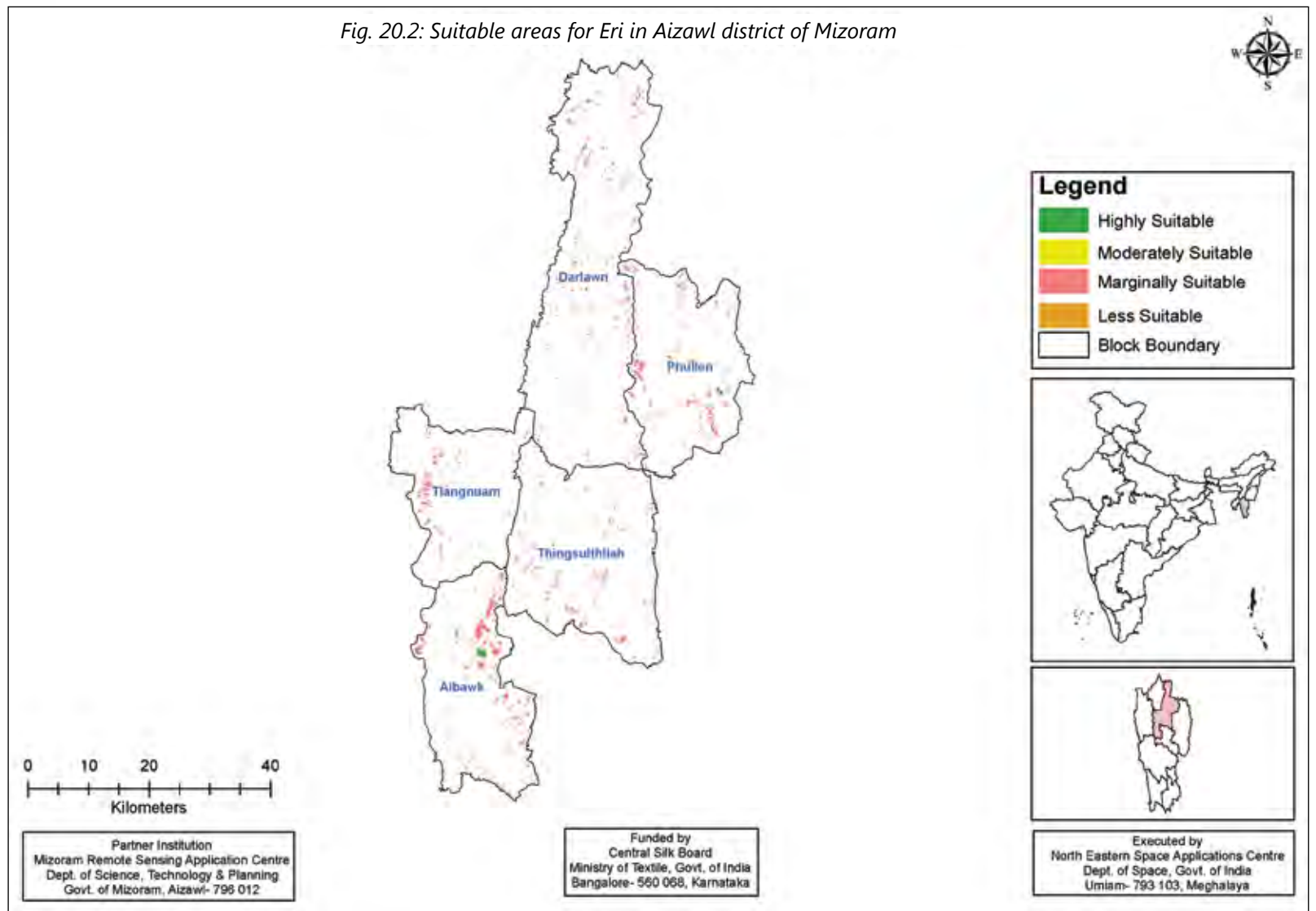
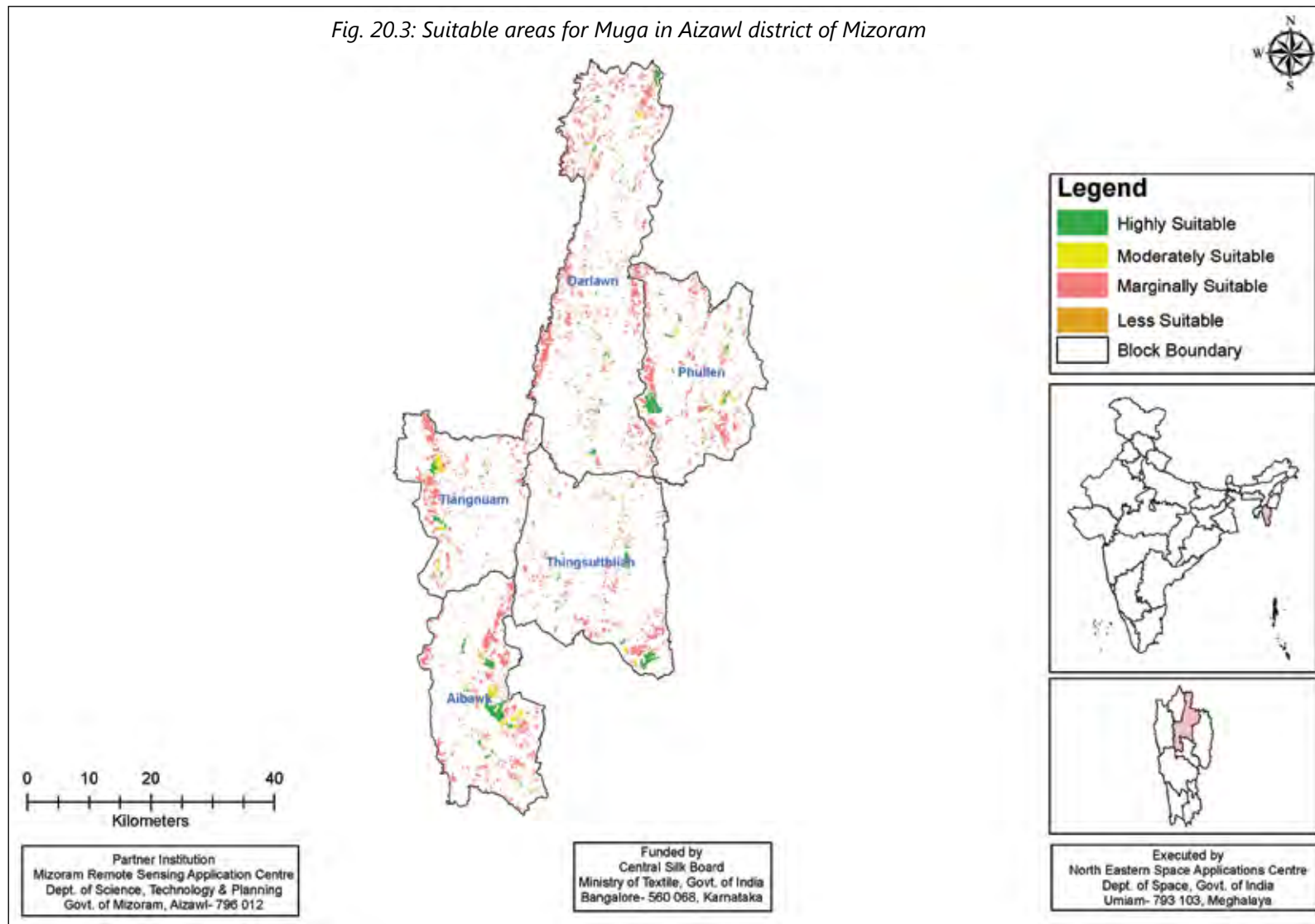


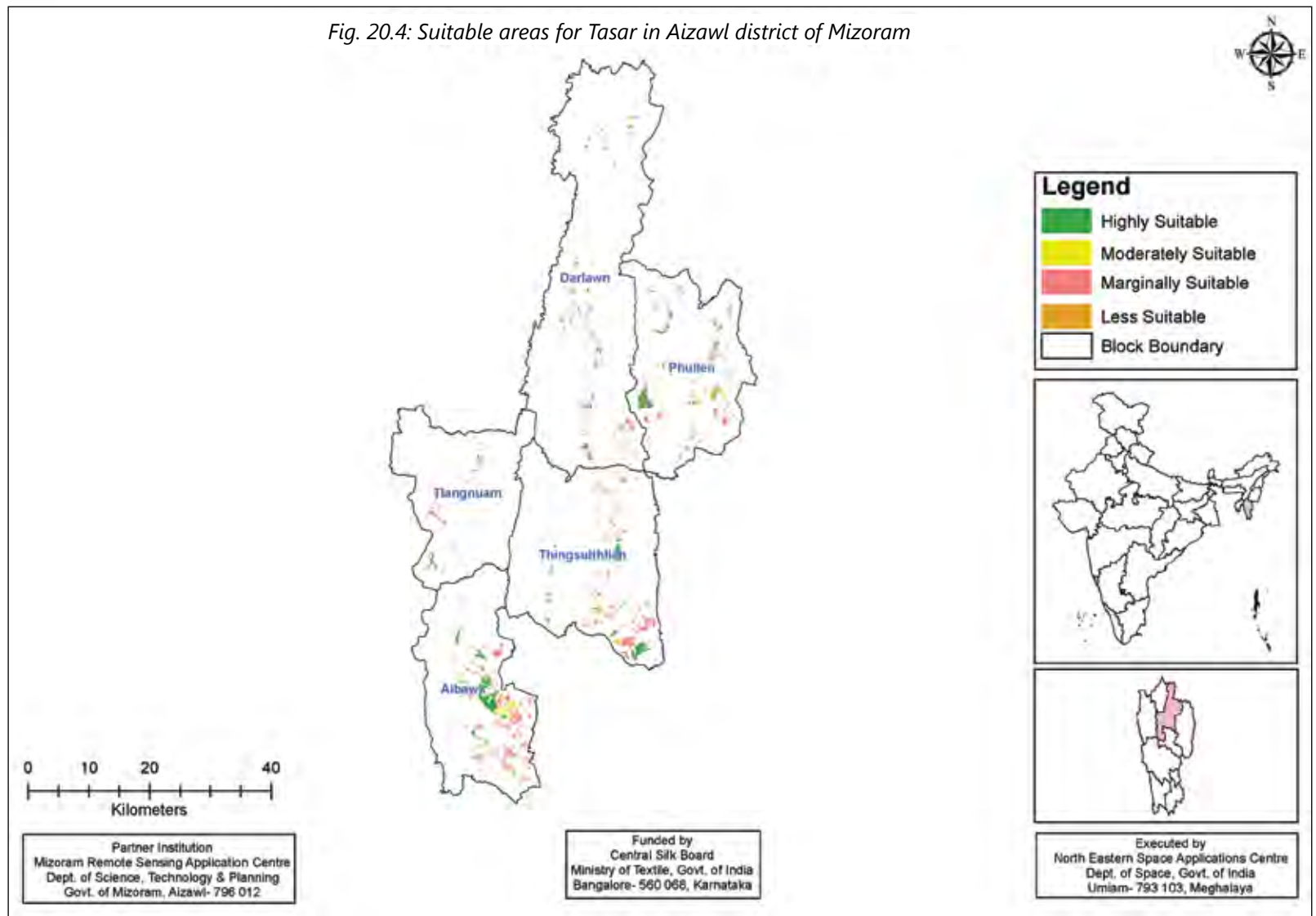
Fig. 20.3: Suitable areas for Muga in Aizawl district of Mizoram



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Fig. 20.4: Suitable areas for Tasar in Aizawl district of Mizoram



Tables 21.5-21.8: Suitable Areas for Mulberry, Eri, Muga & Tasar in Champai District of Mizoram

Table 21.5

| Block    | Suitable Areas for Mulberry (ha) |          |          |           |
|----------|----------------------------------|----------|----------|-----------|
|          | High                             | Moderate | Marginal | Total     |
| Champhai | 6150.84                          | 10277.50 | 10240.59 | 26668.93  |
| Khawbung | 8572.13                          | 9838.33  | 11229.05 | 29639.51  |
| Khawzawl | 16789.54                         | 11914.43 | 19979.40 | 48683.36  |
| Ngopa    | 9533.16                          | 8283.52  | 13652.38 | 31469.06  |
| Total    | 41045.67                         | 40313.78 | 55101.41 | 136460.86 |

Table 21.6

| Block    | Suitable Areas for Eri (ha) |          |          |         |
|----------|-----------------------------|----------|----------|---------|
|          | High                        | Moderate | Marginal | Total   |
| Champhai | 14.46                       | 0.09     | 253.40   | 267.95  |
| Khawbung | 19.82                       | 34.64    | 1782.88  | 1837.34 |
| Khawzawl | 24.86                       | 7.63     | 4579.01  | 4611.50 |
| Ngopa    | -                           | -        | 2161.29  | 2161.29 |
| Total    | 59.15                       | 42.36    | 8776.57  | 8878.08 |

Table 21.7

| Block    | Suitable Areas for Muga (ha) |          |          |          |
|----------|------------------------------|----------|----------|----------|
|          | High                         | Moderate | Marginal | Total    |
| Champhai | 269.47                       | 390.84   | 8155.99  | 8816.30  |
| Khawbung | 445.19                       | 629.70   | 8538.01  | 9612.91  |
| Khawzawl | 384.90                       | 546.23   | 16015.03 | 16946.16 |
| Ngopa    | 512.90                       | 498.74   | 9845.67  | 10857.31 |
| Total    | 1612.46                      | 2065.51  | 42554.71 | 46232.69 |

Table 21.8

| Block    | Suitable Areas for Tasar (ha) |          |          |          |
|----------|-------------------------------|----------|----------|----------|
|          | High                          | Moderate | Marginal | Total    |
| Champhai | 19.21                         | 0.71     | 2119.22  | 2139.13  |
| Khawbung | 17.23                         | 27.58    | 2820.44  | 2865.25  |
| Khawzawl | -                             | -        | 3459.96  | 3459.96  |
| Ngopa    | -                             | -        | 5028.43  | 5028.43  |
| Total    | 36.43                         | 28.28    | 13428.05 | 13492.77 |





Fig. 20.5: Suitable areas for Mulberry in Champhai district of Mizoram

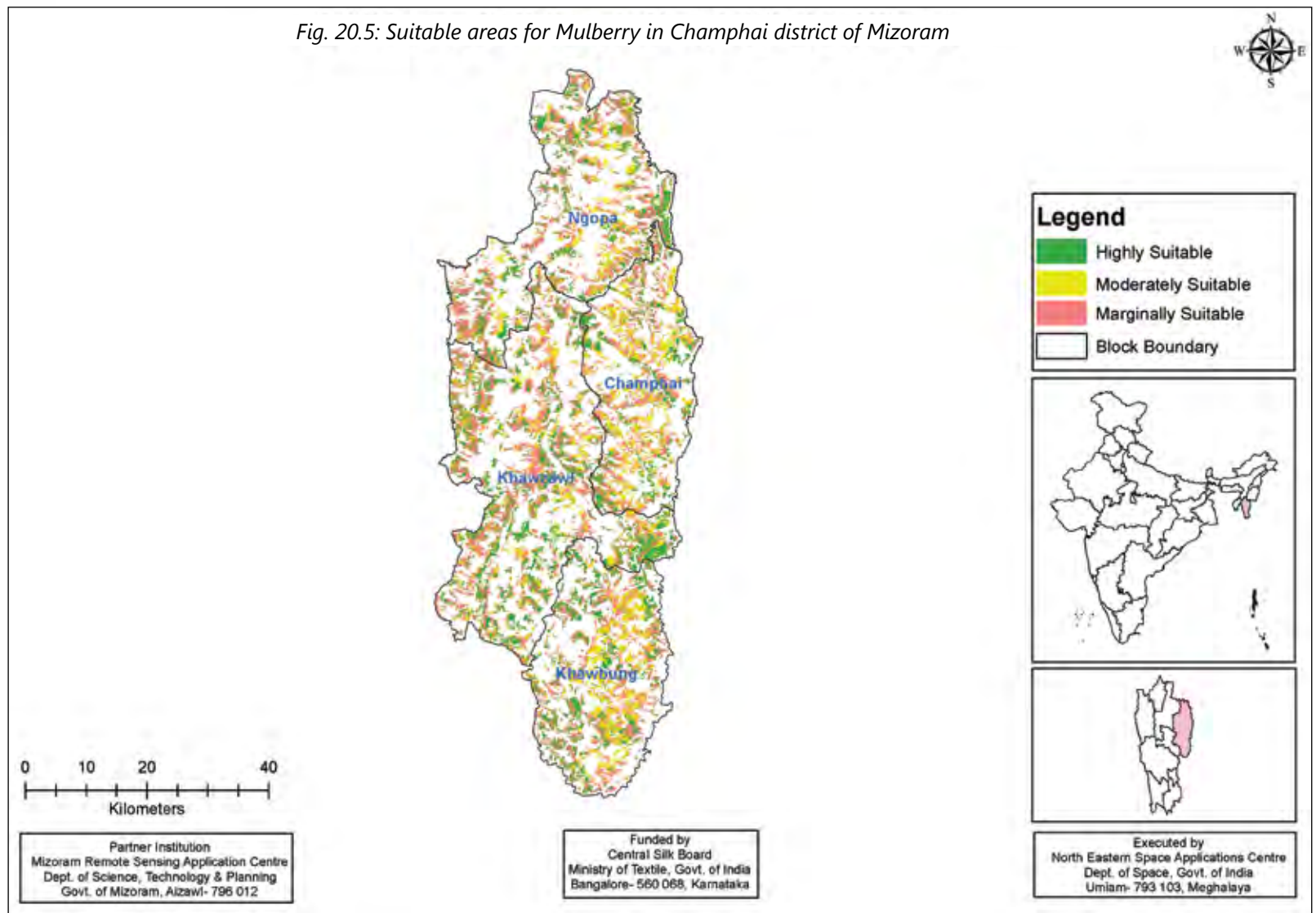
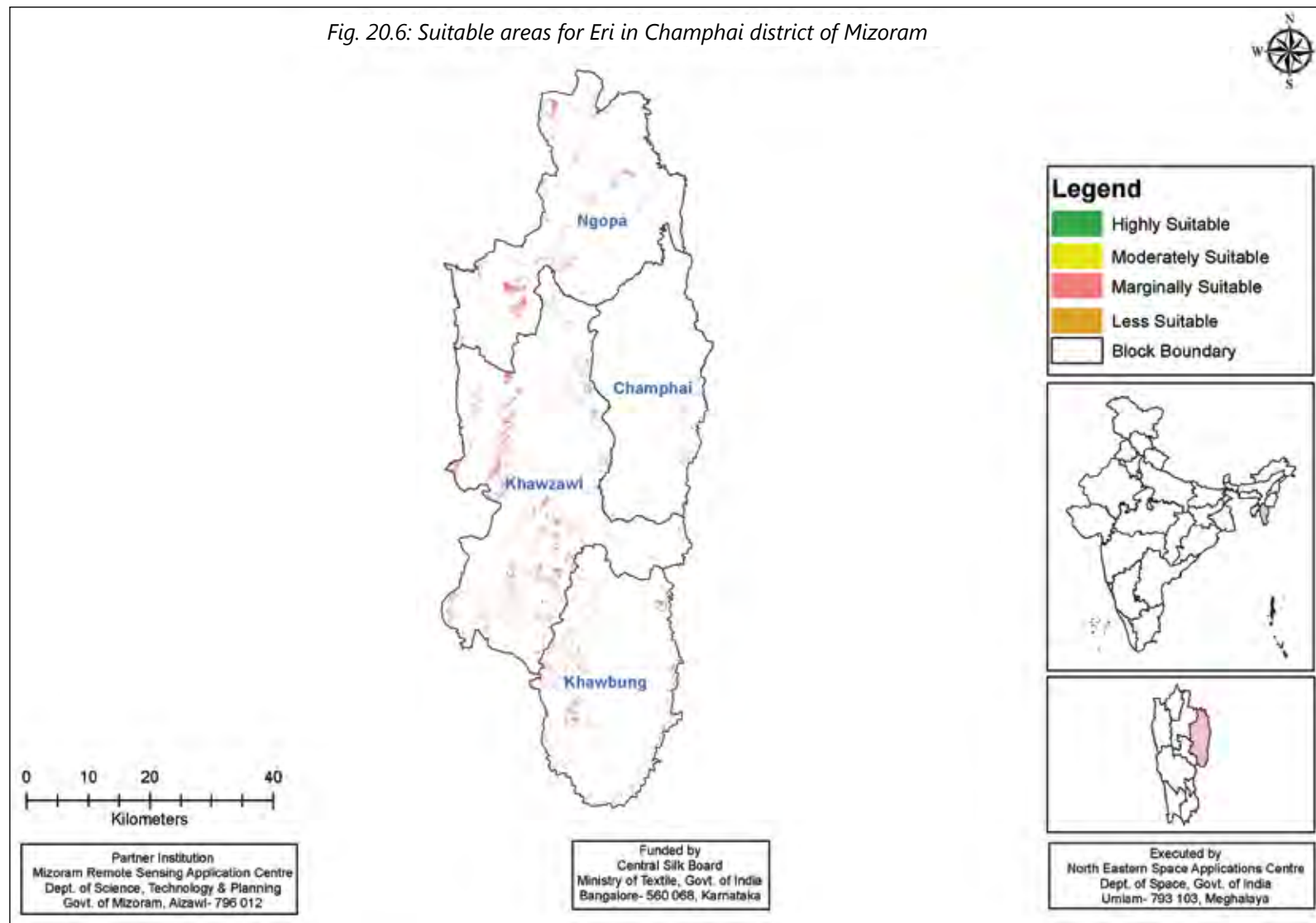


Fig. 20.6: Suitable areas for Eri in Champhai district of Mizoram



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Fig. 20.7: Suitable areas for Muga in Champhai district of Mizoram

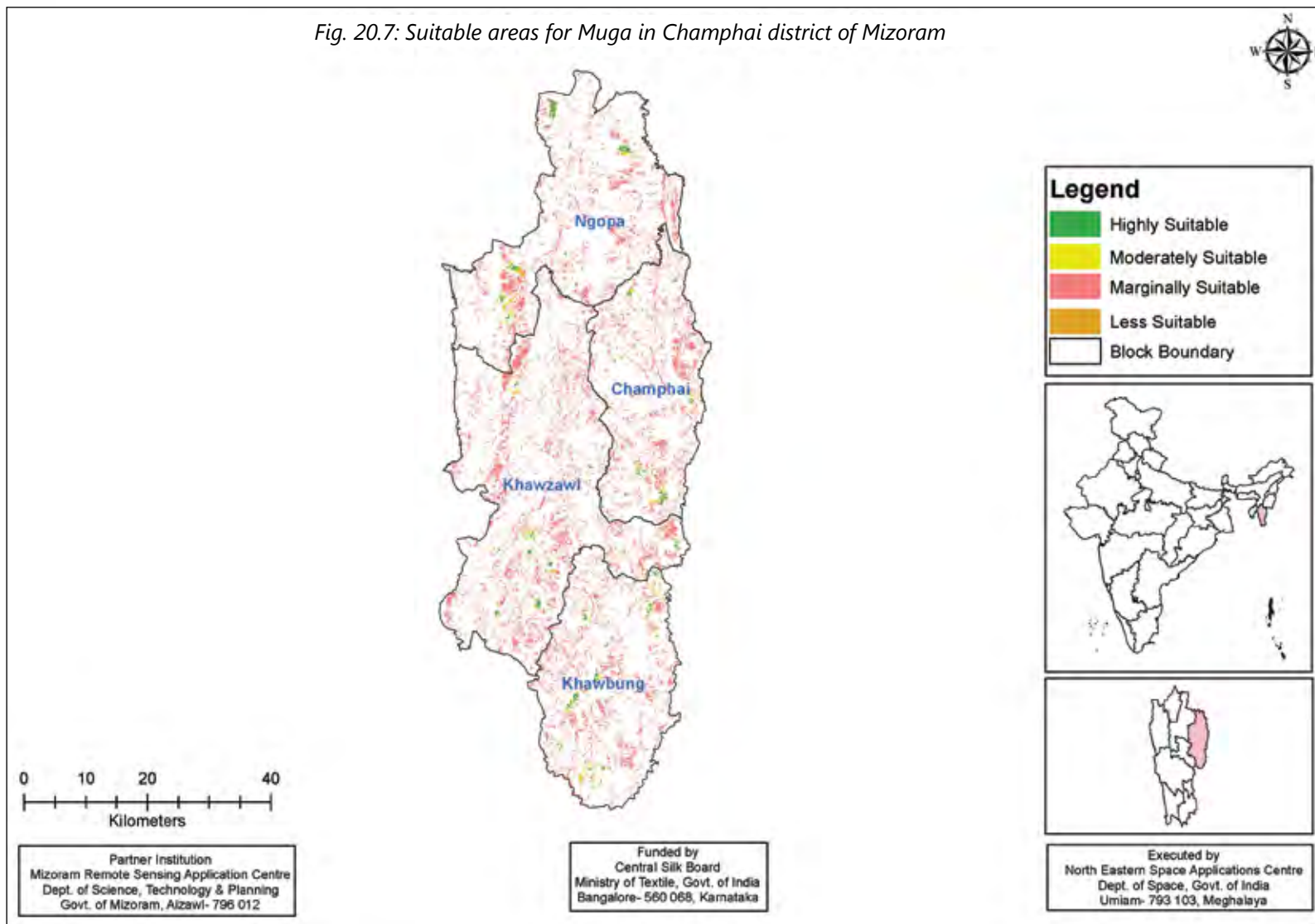
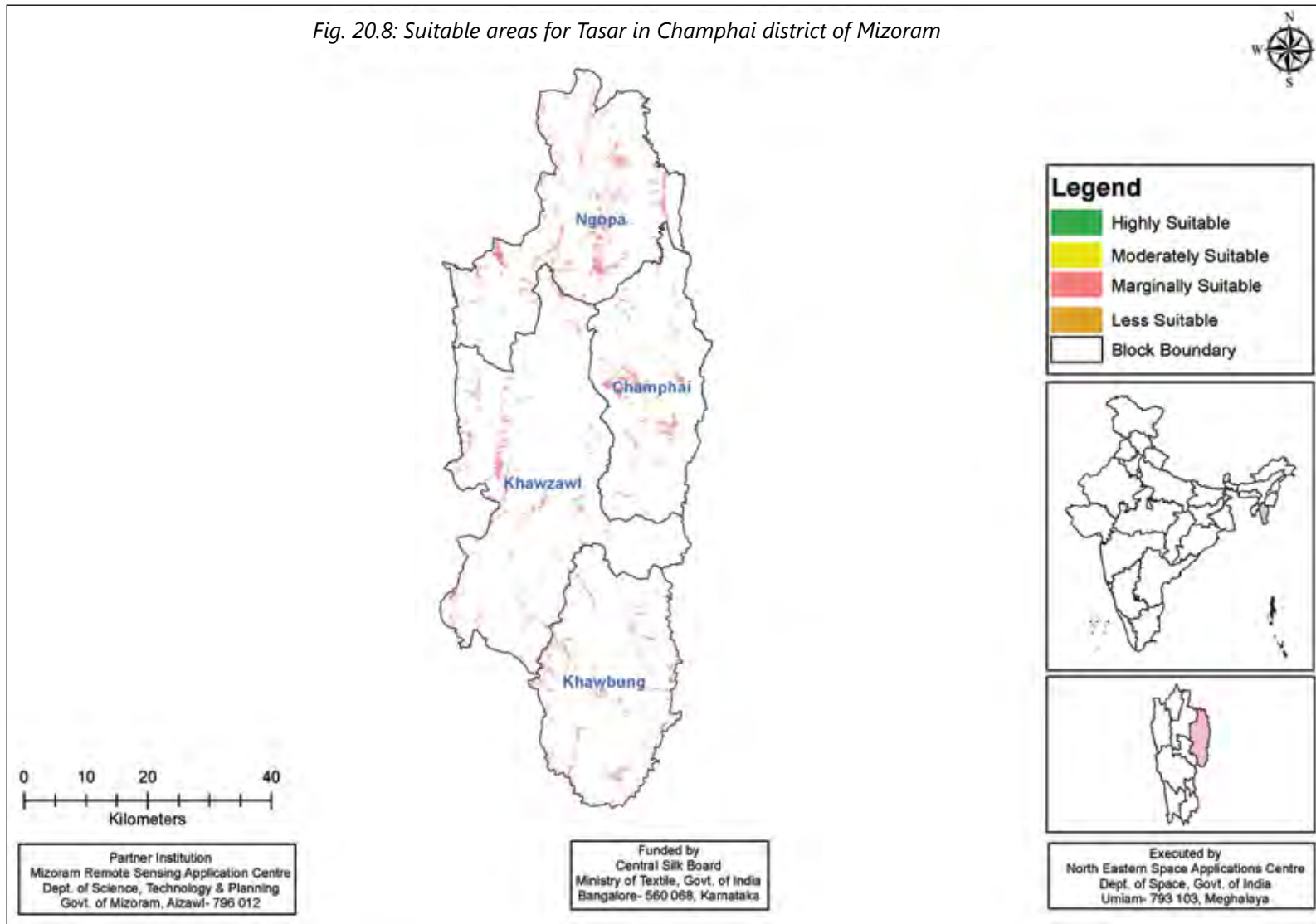


Fig. 20.8: Suitable areas for Tasar in Champhai district of Mizoram



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Tables 21.9-21.12: Suitable Areas for Mulberry, Eri, Muga & Tasar in Lawngtlai District of Mizoram

Table 21.9

| Block       | Suitable Areas for Mulberry (ha) |          |          |          |
|-------------|----------------------------------|----------|----------|----------|
|             | High                             | Moderate | Marginal | Total    |
| Chawngte    | 16550.11                         | 6336.67  | -        | 22886.78 |
| Lawngtlai   | 8294.82                          | 7338.23  | -        | 15633.05 |
| S Bungtlang | 7670.92                          | 3376.67  | -        | 11047.60 |
| Sangau      | 4427.78                          | 11492.56 | -        | 15920.33 |
| Total       | 36943.63                         | 28544.13 | -        | 65487.76 |

Table 21.10

| Block       | Suitable Areas for Eri (ha) |          |          |         |
|-------------|-----------------------------|----------|----------|---------|
|             | High                        | Moderate | Marginal | Total   |
| Chawngte    | 47.11                       | 17.93    | 1101.23  | 1166.27 |
| Lawngtlai   | 127.99                      | 152.36   | 4307.32  | 4587.67 |
| S Bungtlang | 8.46                        | 6.88     | 1148.23  | 1163.58 |
| Sangau      | -                           | -        | 1443.71  | 1443.71 |
| Total       | 183.56                      | 177.17   | 8000.50  | 8361.22 |

Table 21.11

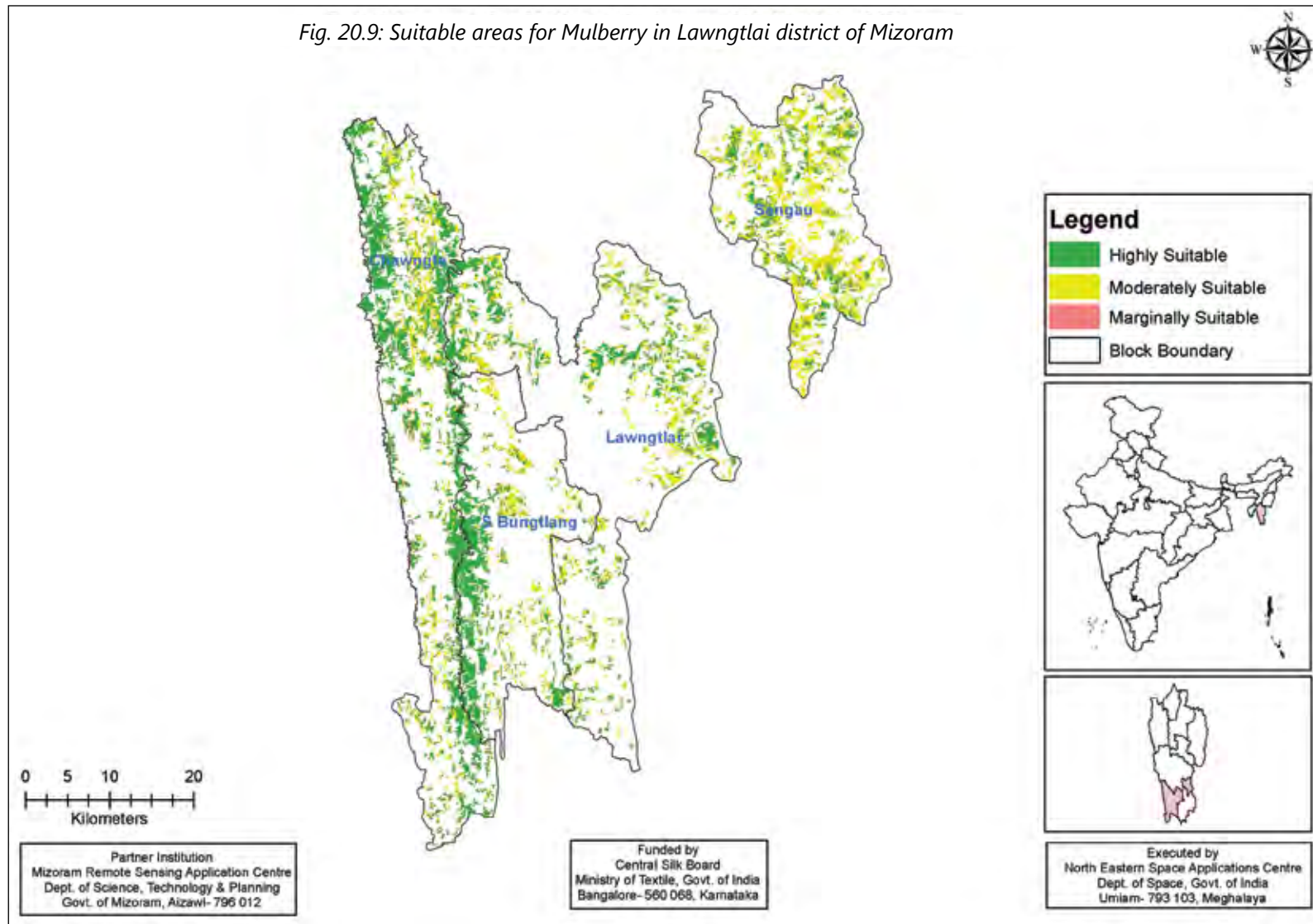
| Block       | Suitable Areas for Muga (ha) |          |          |          |
|-------------|------------------------------|----------|----------|----------|
|             | High                         | Moderate | Marginal | Total    |
| Chawngte    | 10348.62                     | 2194.38  | 8579.34  | 21122.34 |
| Lawngtlai   | 2304.37                      | 1507.41  | 17572.16 | 21383.94 |
| S Bungtlang | 4740.42                      | 1644.69  | 7746.34  | 14131.45 |
| Sangau      | 326.51                       | 342.14   | 4922.07  | 5590.72  |
| Total       | 17719.91                     | 5688.63  | 38819.91 | 62228.45 |

Table 21.12

| Block       | Suitable Areas for Tasar (ha) |          |          |         |
|-------------|-------------------------------|----------|----------|---------|
|             | High                          | Moderate | Marginal | Total   |
| Chawngte    | -                             | -        | 12.78    | 12.78   |
| Lawngtlai   | 50.75                         | 20.79    | 2533.65  | 2605.19 |
| S Bungtlang | -                             | -        | 258.87   | 258.87  |
| Sangau      | 323.51                        | 333.65   | 2921.66  | 3578.83 |
| Total       | 374.26                        | 354.44   | 5726.96  | 6455.67 |



Fig. 20.9: Suitable areas for Mulberry in Lawngtlai district of Mizoram



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Fig. 20.10: Suitable areas for Eri in Lawngtlai district of Mizoram

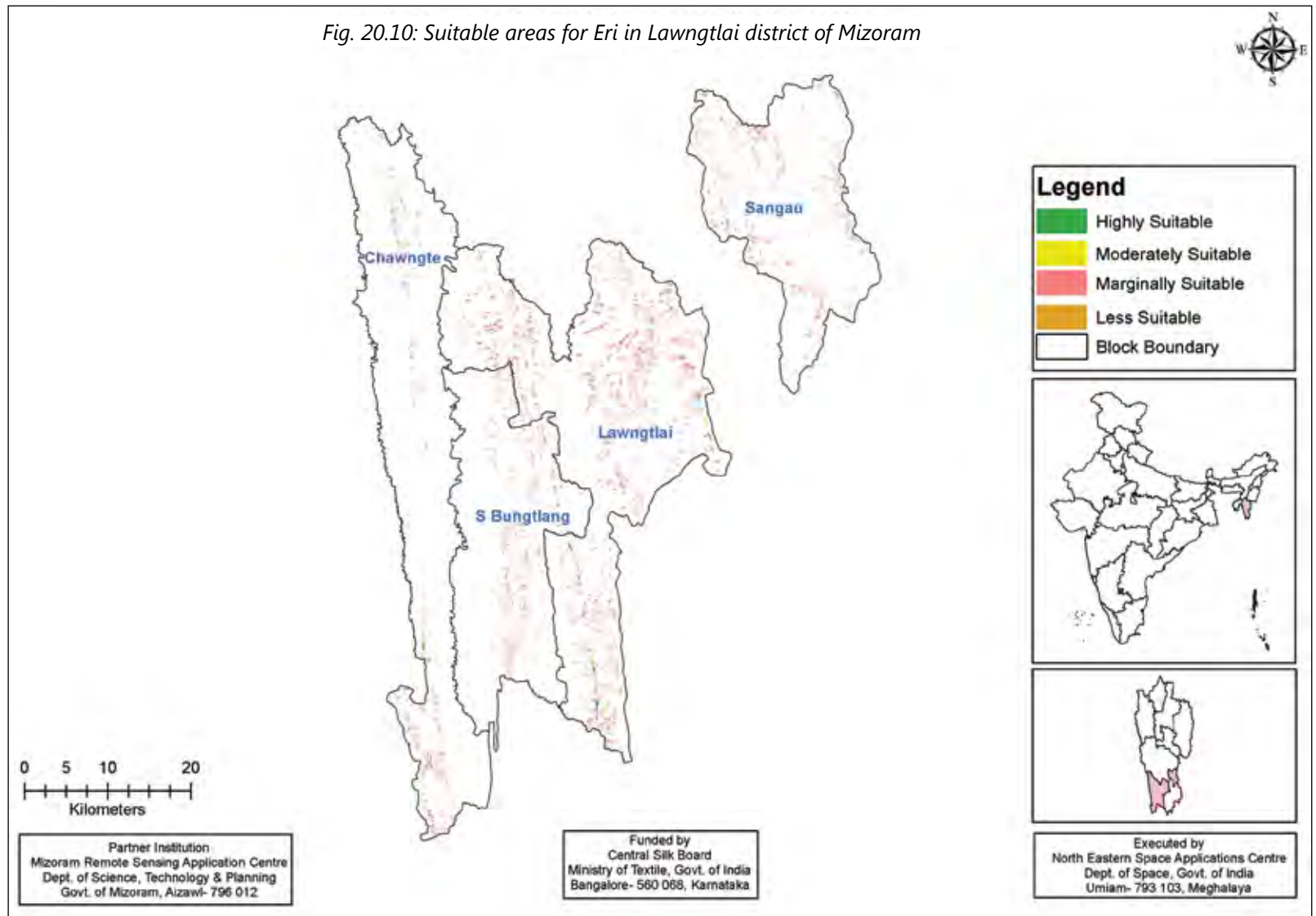
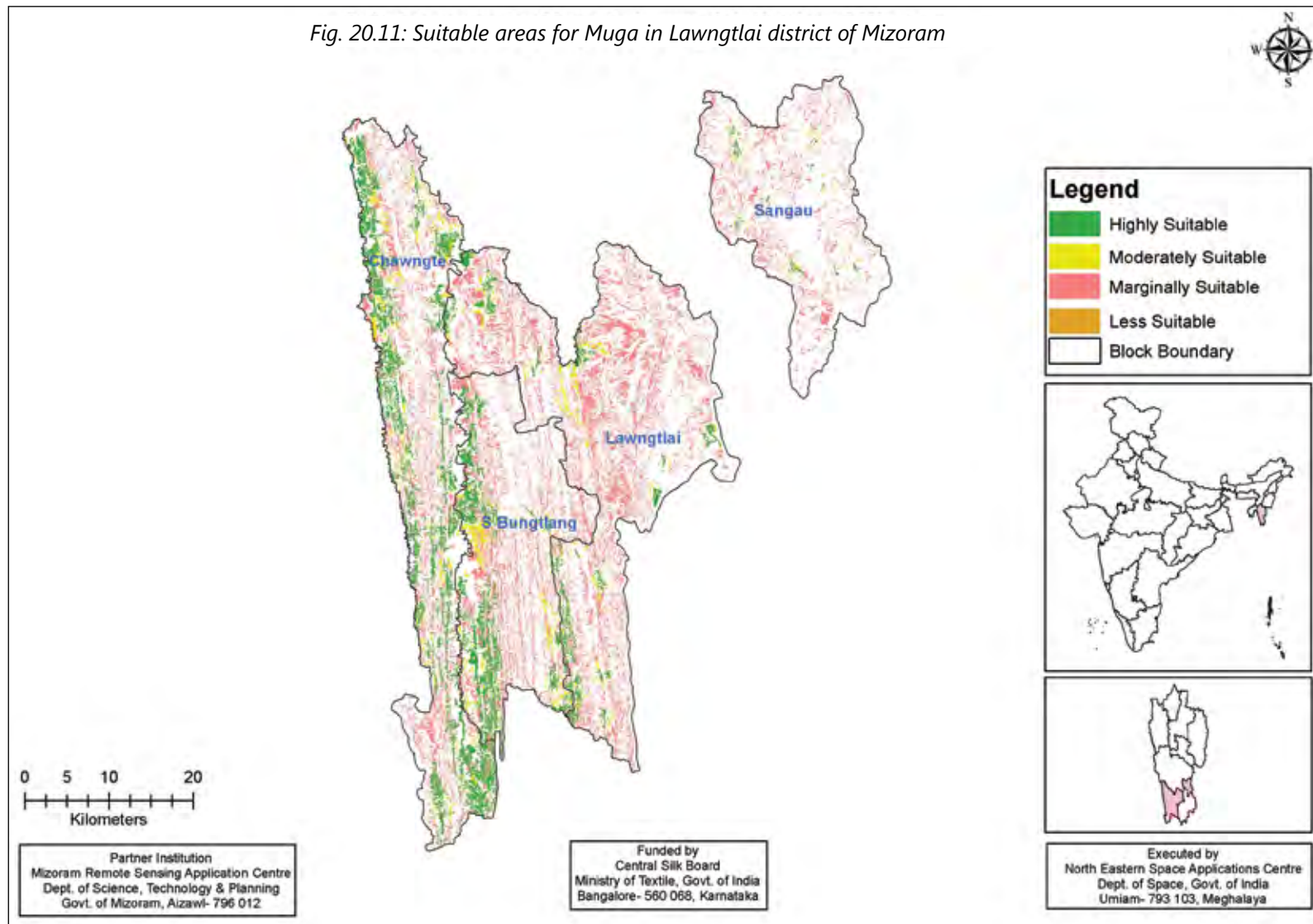


Fig. 20.11: Suitable areas for Muga in Lawngtlai district of Mizoram

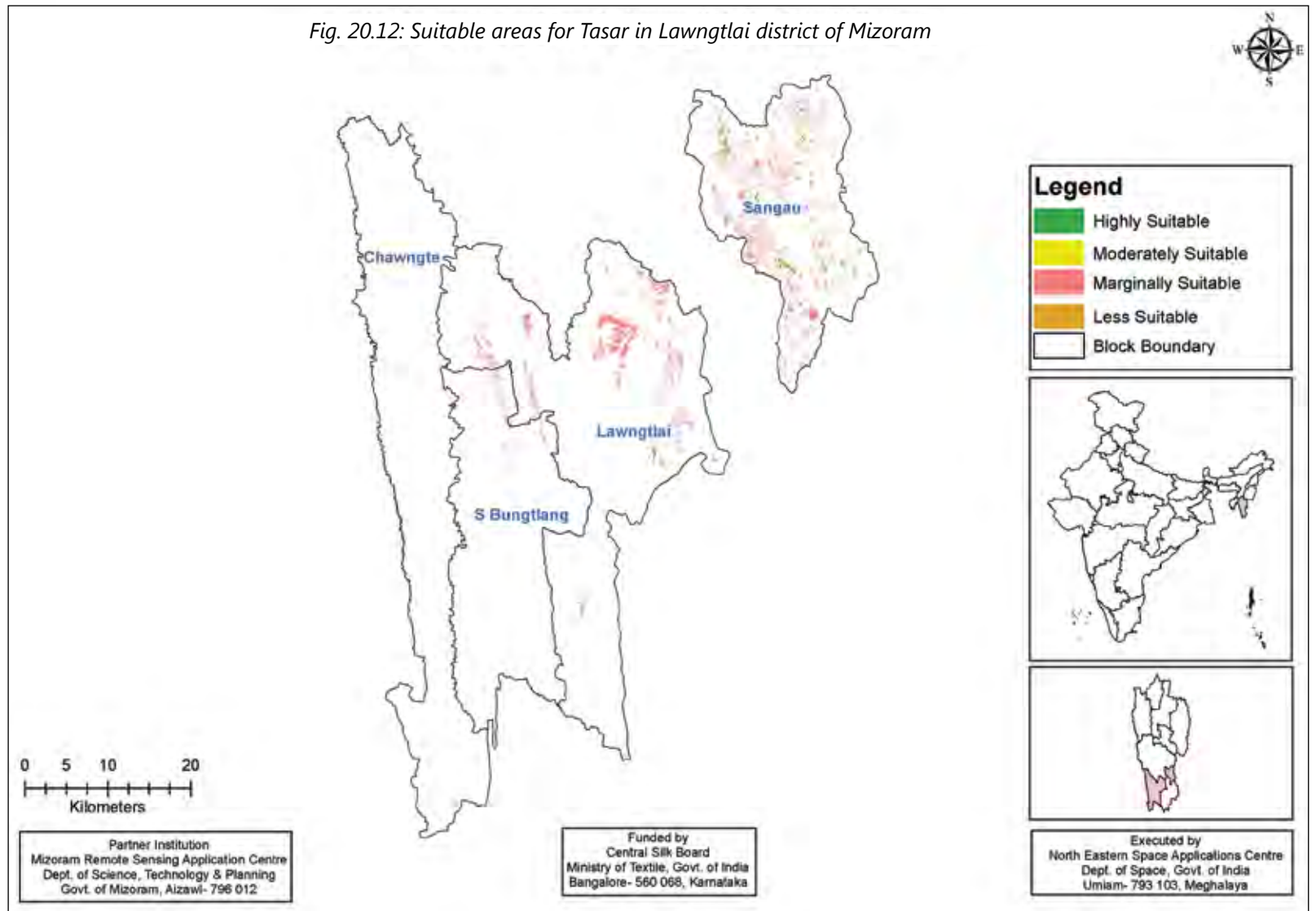


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Fig. 20.12: Suitable areas for Tasar in Lawngtlai district of Mizoram



Tables 21.13-21.16: Suitable Areas for Mulberry, Eri, Muga & Tasar in Lunglei District of Mizoram

Table 21.13

| Block     | Suitable Areas for Mulberry (ha) |          |          |           |
|-----------|----------------------------------|----------|----------|-----------|
|           | High                             | Moderate | Marginal | Total     |
| Bunghmun  | 11354.69                         | 5548.51  | 287.83   | 17191.02  |
| Hnahthial | 9556.24                          | 14150.75 | 254.81   | 23961.80  |
| Lunglei   | 13968.50                         | 13038.98 | 443.38   | 27450.85  |
| Lungsen   | 25519.65                         | 6721.88  | 644.32   | 32885.86  |
| Total     | 60399.08                         | 39460.12 | 1630.34  | 101489.54 |

Table 21.14

| Block     | Suitable Areas for Eri (ha) |          |          |          |
|-----------|-----------------------------|----------|----------|----------|
|           | High                        | Moderate | Marginal | Total    |
| Bunghmun  | 50.86                       | 10.20    | 6467.76  | 6528.83  |
| Hnahthial | 15.93                       | 19.57    | 4631.77  | 4667.27  |
| Lunglei   | 121.70                      | 205.39   | 8486.19  | 8813.28  |
| Lungsen   | 652.51                      | 255.88   | 4998.27  | 5906.66  |
| Total     | 841.01                      | 491.04   | 24584.00 | 25916.05 |

Table 21.15

| Block     | Suitable Areas for Muga (ha) |          |          |           |
|-----------|------------------------------|----------|----------|-----------|
|           | High                         | Moderate | Marginal | Total     |
| Bunghmun  | 6496.13                      | 2464.87  | 22226.99 | 31187.99  |
| Hnahthial | 118.16                       | 218.79   | 11853.76 | 12190.71  |
| Lunglei   | 932.63                       | 620.21   | 18101.97 | 19654.81  |
| Lungsen   | 16221.77                     | 3988.81  | 23380.17 | 43590.75  |
| Total     | 23768.69                     | 7292.67  | 75562.89 | 106624.25 |

Table 21.16

| Block     | Suitable Areas for Tasar (ha) |          |          |          |
|-----------|-------------------------------|----------|----------|----------|
|           | High                          | Moderate | Marginal | Total    |
| Bunghmun  | 152.14                        | 52.64    | 1608.96  | 1813.74  |
| Hnahthial | 94.84                         | 142.38   | 4125.80  | 4363.02  |
| Lunglei   | 580.34                        | 303.56   | 6515.87  | 7399.77  |
| Lungsen   | -                             | -        | 179.88   | 179.88   |
| Total     | 827.32                        | 498.57   | 12430.51 | 13756.40 |

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Fig. 20.13: Suitable areas for Mulberry in Lunglei district of Mizoram

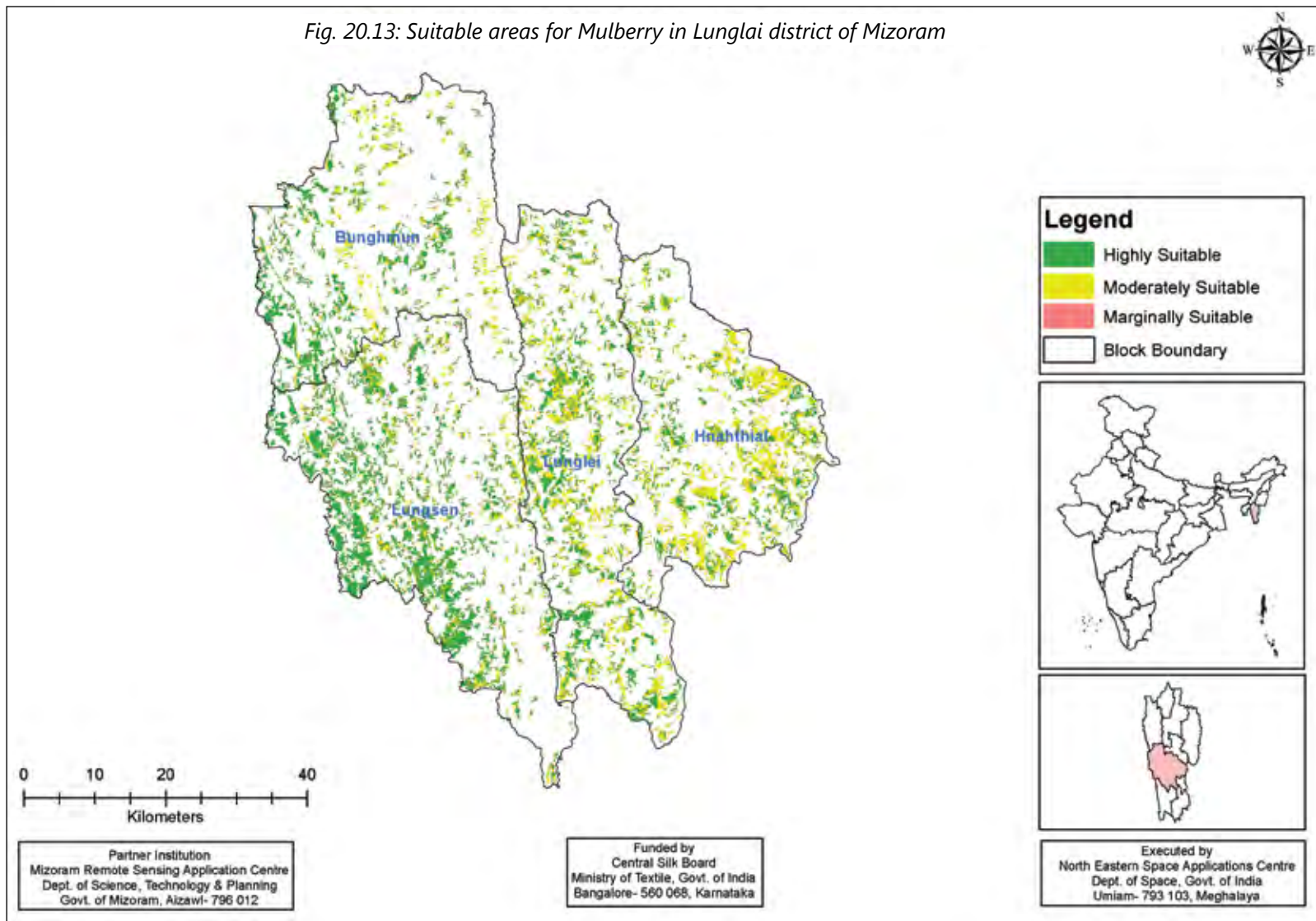
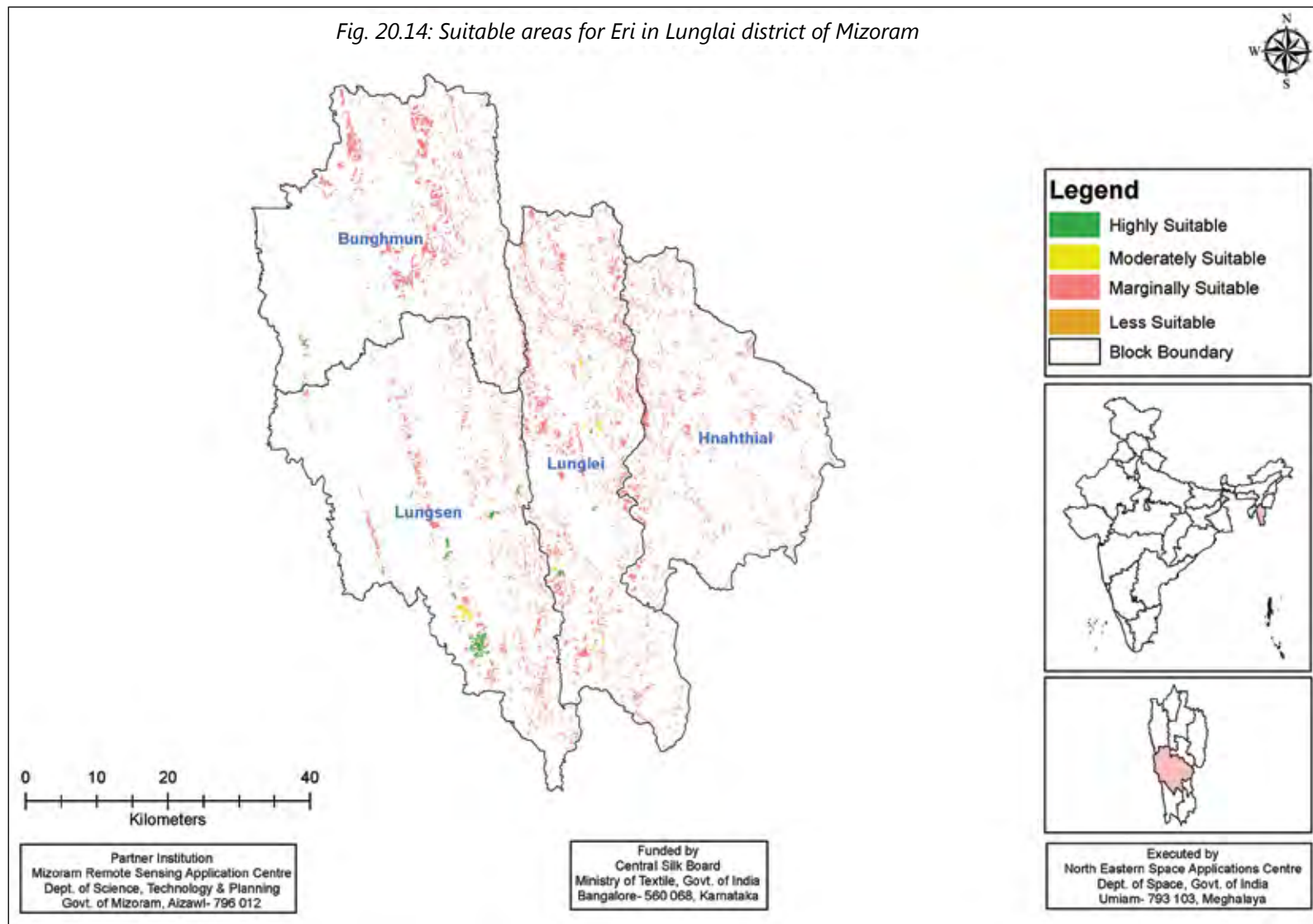


Fig. 20.14: Suitable areas for Eri in Lunglei district of Mizoram



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Fig. 20.15: Suitable areas for Muga in Lunglai district of Mizoram

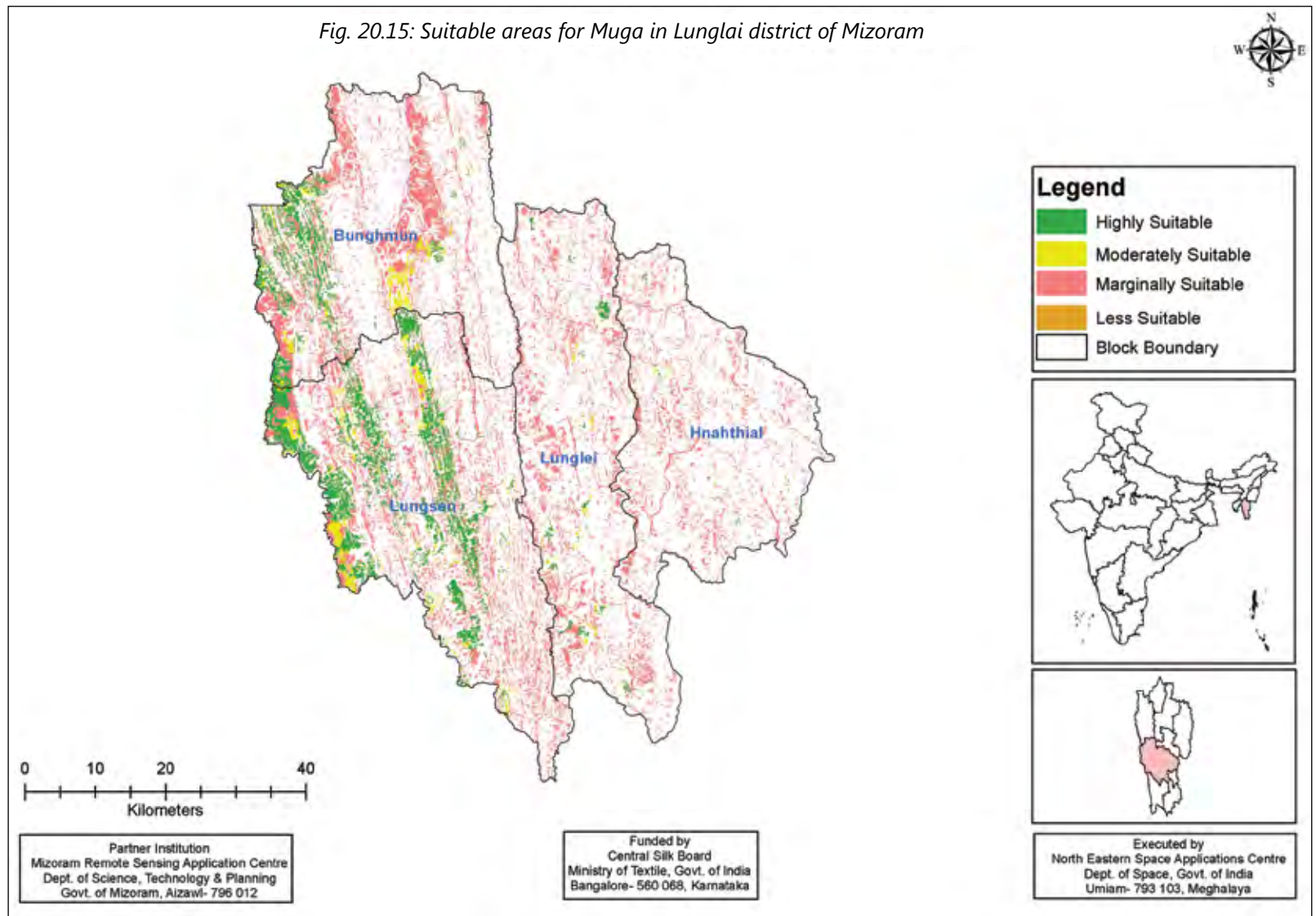
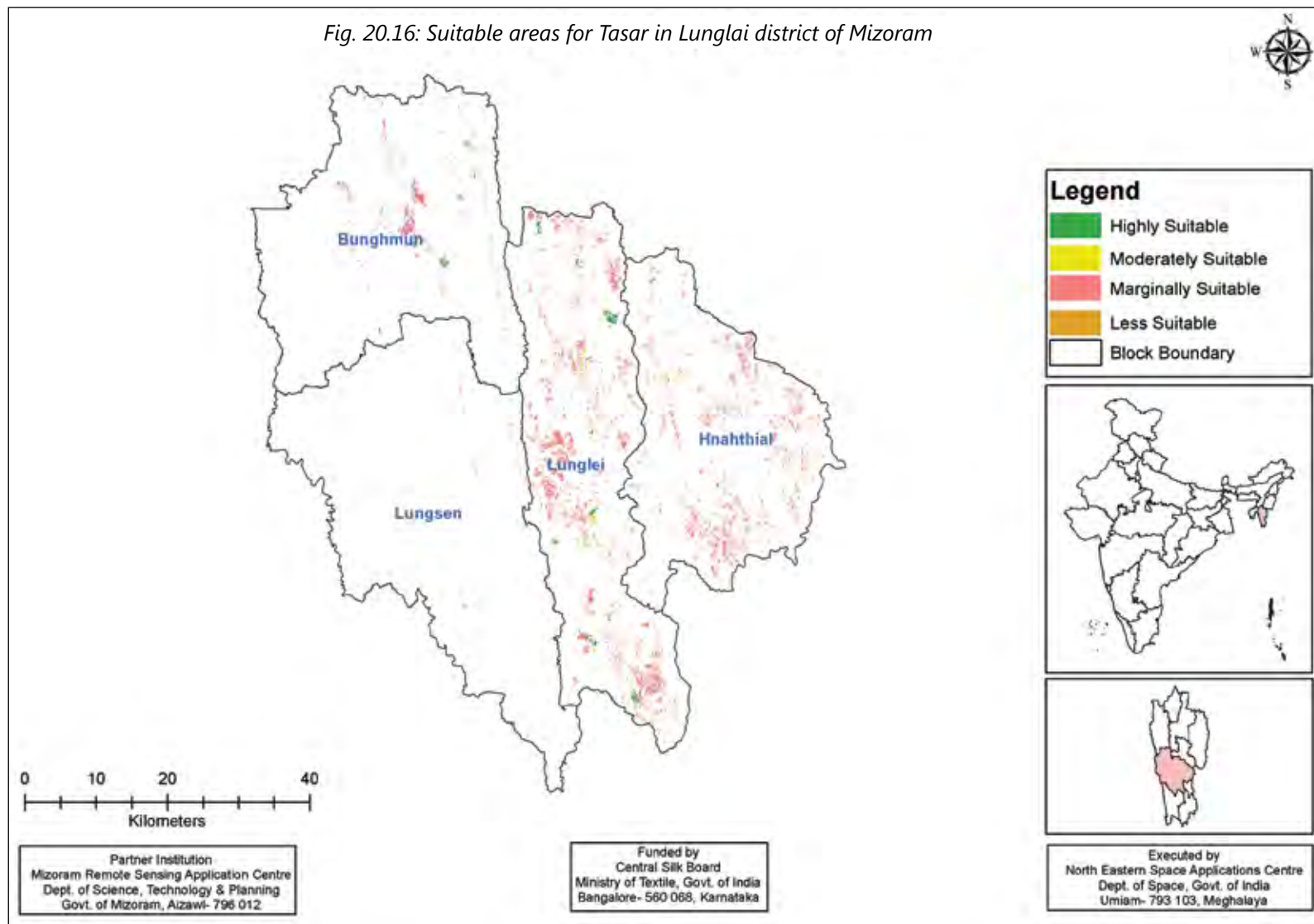


Fig. 20.16: Suitable areas for Tasar in Lunglei district of Mizoram



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Tables 21.17-21.20: Suitable Areas for Mulberry, Eri, Muga & Tasar in Mamit District of Mizoram

Table 21.17

| Block      | Suitable Areas for Mulberry (ha) |          |          |          |
|------------|----------------------------------|----------|----------|----------|
|            | High                             | Moderate | Marginal | Total    |
| Reiek      | 5538.01                          | 10155.05 | 2158.19  | 17851.25 |
| W.Phaileng | 7826.68                          | 7421.94  | 1447.15  | 16695.77 |
| Zawlnuam   | 18275.26                         | 9515.20  | 1682.61  | 29473.07 |
| Total      | 31639.96                         | 27092.19 | 5287.95  | 64020.09 |

Table 21.18

| Block      | Suitable Areas for Eri (ha) |          |          |          |
|------------|-----------------------------|----------|----------|----------|
|            | High                        | Moderate | Marginal | Total    |
| Reiek      | 4617.44                     | -        | 801.68   | 5419.12  |
| W.Phaileng | 2740.45                     | -        | 2343.44  | 5083.90  |
| Zawlnuam   | 320.71                      | -        | 1985.26  | 2305.97  |
| Total      | 7678.60                     | -        | 5130.38  | 12808.98 |

Table 21.19

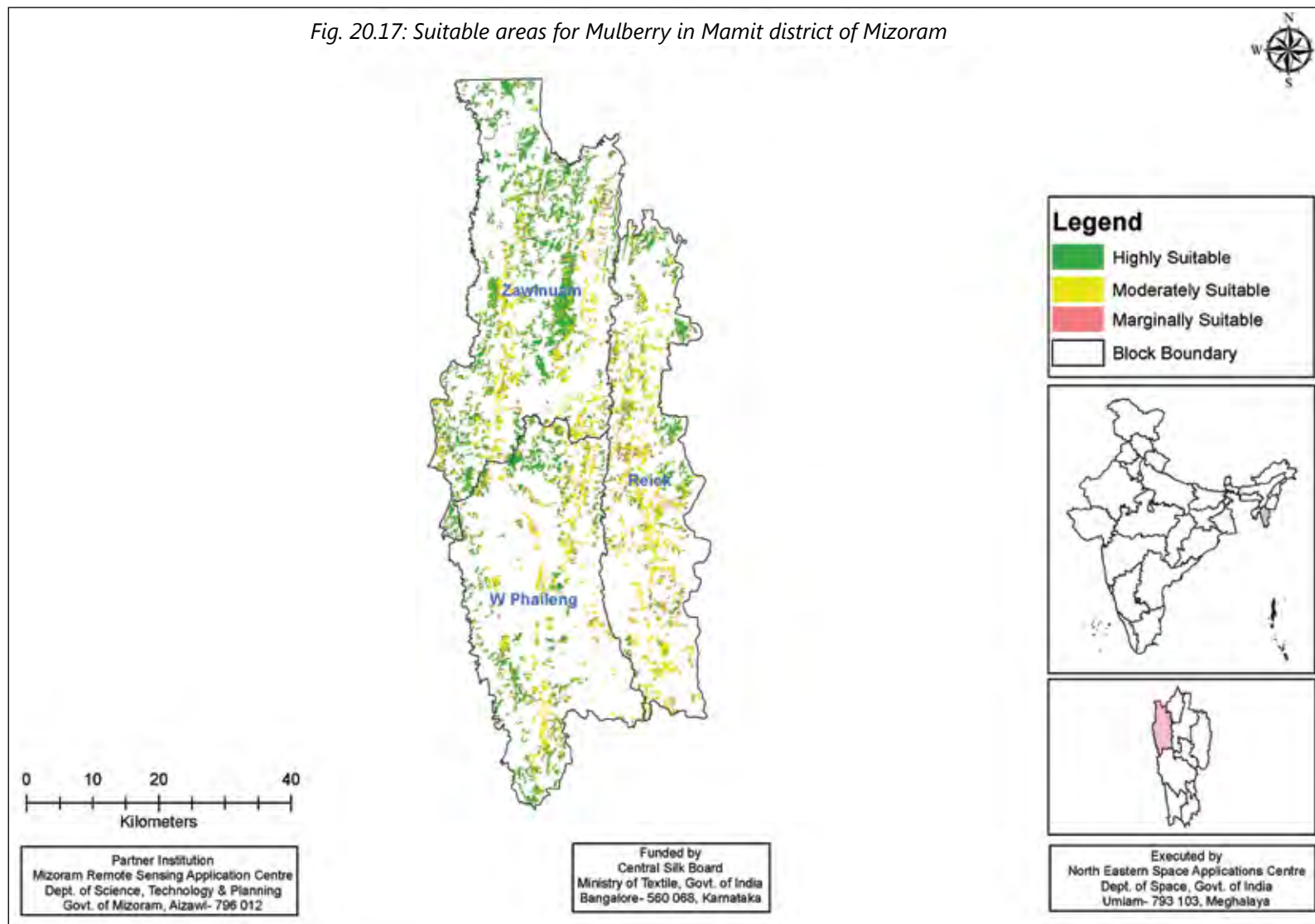
| Block      | Suitable Areas for Muga (ha) |          |          |          |
|------------|------------------------------|----------|----------|----------|
|            | High                         | Moderate | Marginal | Total    |
| Reiek      | 8623.16                      | 2213.44  | 6514.80  | 17351.41 |
| W.Phaileng | 22985.94                     | 278.50   | 7393.43  | 30657.87 |
| Zawlnuam   | 32218.72                     | 3012.54  | 13301.05 | 48532.30 |
| Total      | 63827.82                     | 5504.48  | 27209.28 | 96541.59 |

Table 21.20

| Block      | Suitable Areas for Tasar (ha) |          |          |         |
|------------|-------------------------------|----------|----------|---------|
|            | High                          | Moderate | Marginal | Total   |
| Reiek      | 1600.59                       | 97.96    | 1022.51  | 2721.06 |
| W.Phaileng | -                             | -        | 1980.08  | 1980.08 |
| Zawlnuam   | -                             | -        | 1783.52  | 1783.52 |
| Total      | 1600.59                       | 97.96    | 4786.11  | 6484.66 |



Fig. 20.17: Suitable areas for Mulberry in Mamit district of Mizoram



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Fig. 20.18: Suitable areas for Eri in Mamit district of Mizoram

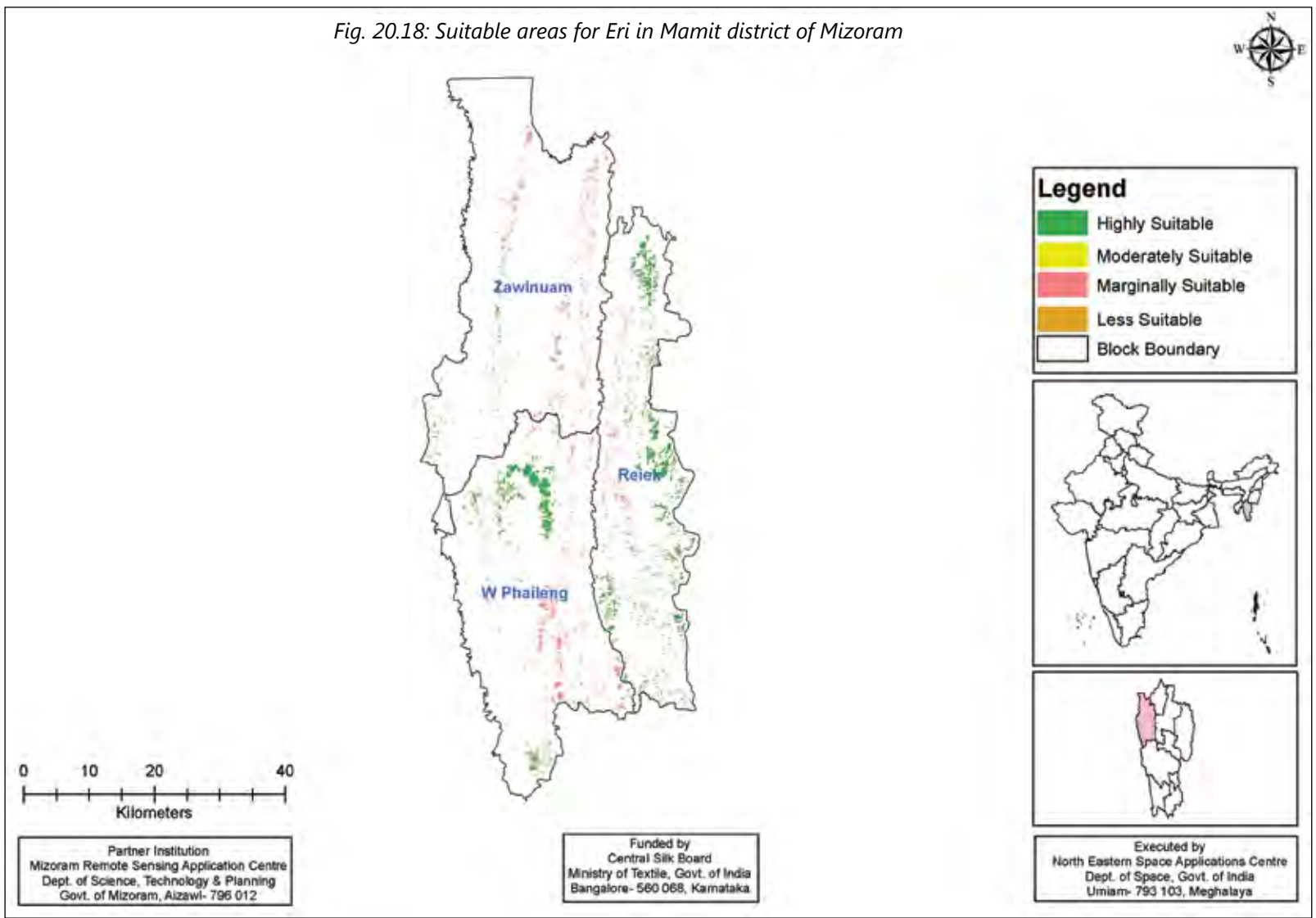
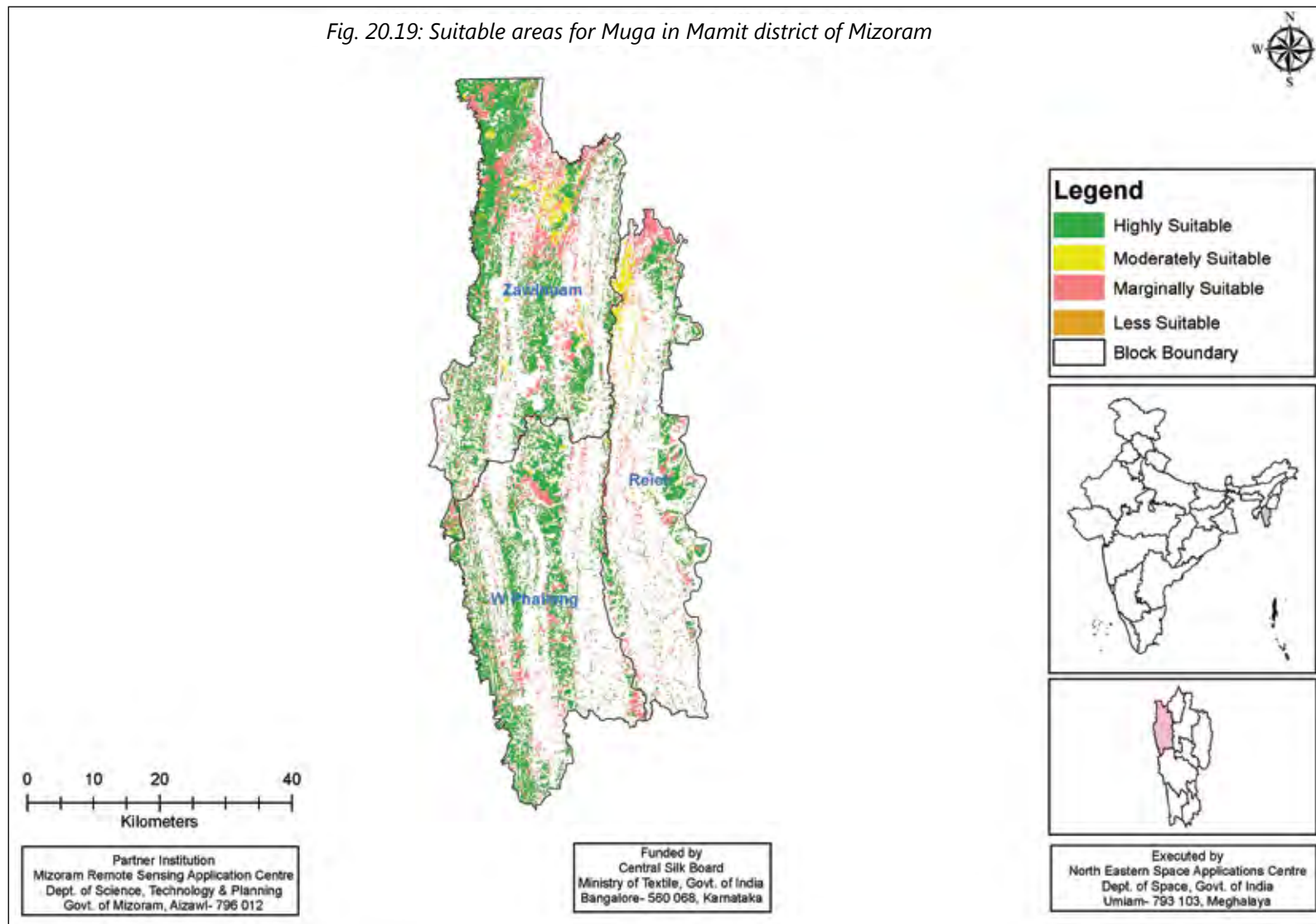


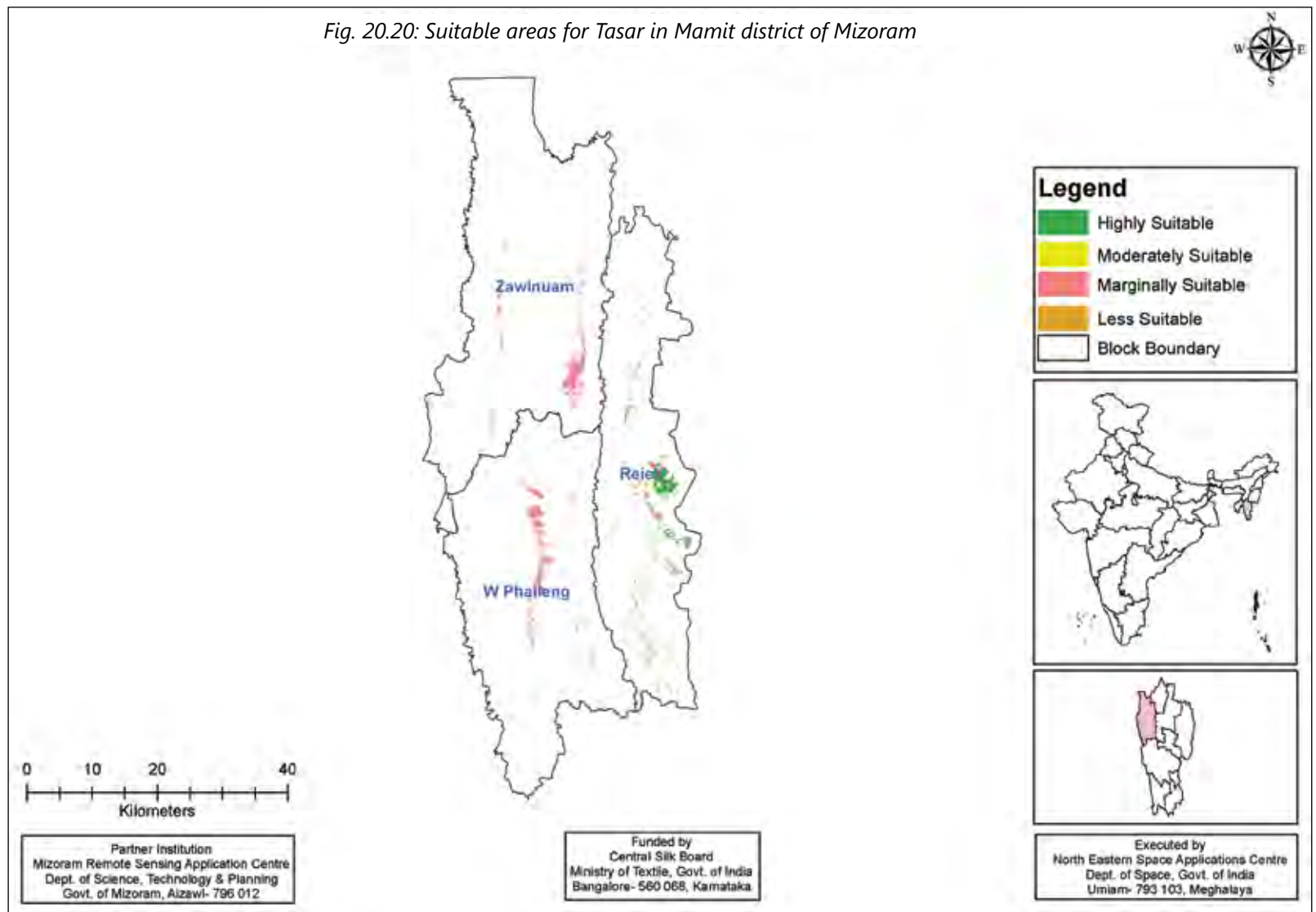
Fig. 20.19: Suitable areas for Muga in Mamit district of Mizoram



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Fig. 20.20: Suitable areas for Tasar in Mamit district of Mizoram



Tables 21.21-21.24: Suitable Areas for Mulberry, Eri, Muga & Tasar in Saiha District of Mizoram

Table 21.21

| Block   | Suitable Areas for Mulberry (ha) |          |          |          |
|---------|----------------------------------|----------|----------|----------|
|         | High                             | Moderate | Marginal | Total    |
| Saiha   | 4672.57                          | 11838.43 | 57.63    | 16568.62 |
| Tuipang | 7826.58                          | 12464.28 | 104.24   | 20395.10 |
| Total   | 12499.15                         | 24302.71 | 161.87   | 36963.72 |

Table 21.22

| Block   | Suitable Areas for Eri (ha) |          |          |         |
|---------|-----------------------------|----------|----------|---------|
|         | High                        | Moderate | Marginal | Total   |
| Saiha   | 87.20                       | 54.62    | 1003.83  | 1145.65 |
| Tuipang | 82.40                       | 117.82   | 4778.20  | 4978.42 |
| Total   | 169.61                      | 172.43   | 5782.03  | 6124.07 |

Table 21.23

| Block   | Suitable Areas for Muga (ha) |          |          |          |
|---------|------------------------------|----------|----------|----------|
|         | High                         | Moderate | Marginal | Total    |
| Saiha   | 254.83                       | 371.44   | 5127.34  | 5753.61  |
| Tuipang | 3452.71                      | 995.22   | 16516.40 | 20964.33 |
| Total   | 3707.54                      | 1366.66  | 21643.74 | 26717.95 |

Table 21.24

| Block   | Suitable Areas for Tasar (ha) |          |          |          |
|---------|-------------------------------|----------|----------|----------|
|         | High                          | Moderate | Marginal | Total    |
| Saiha   | 179.46                        | 227.33   | 3219.09  | 3625.89  |
| Tuipang | 597.31                        | 506.36   | 5400.51  | 6504.18  |
| Total   | 776.77                        | 733.69   | 8619.60  | 10130.07 |

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Fig. 20.21: Suitable areas for Mulberry in Saiha district of Mizoram

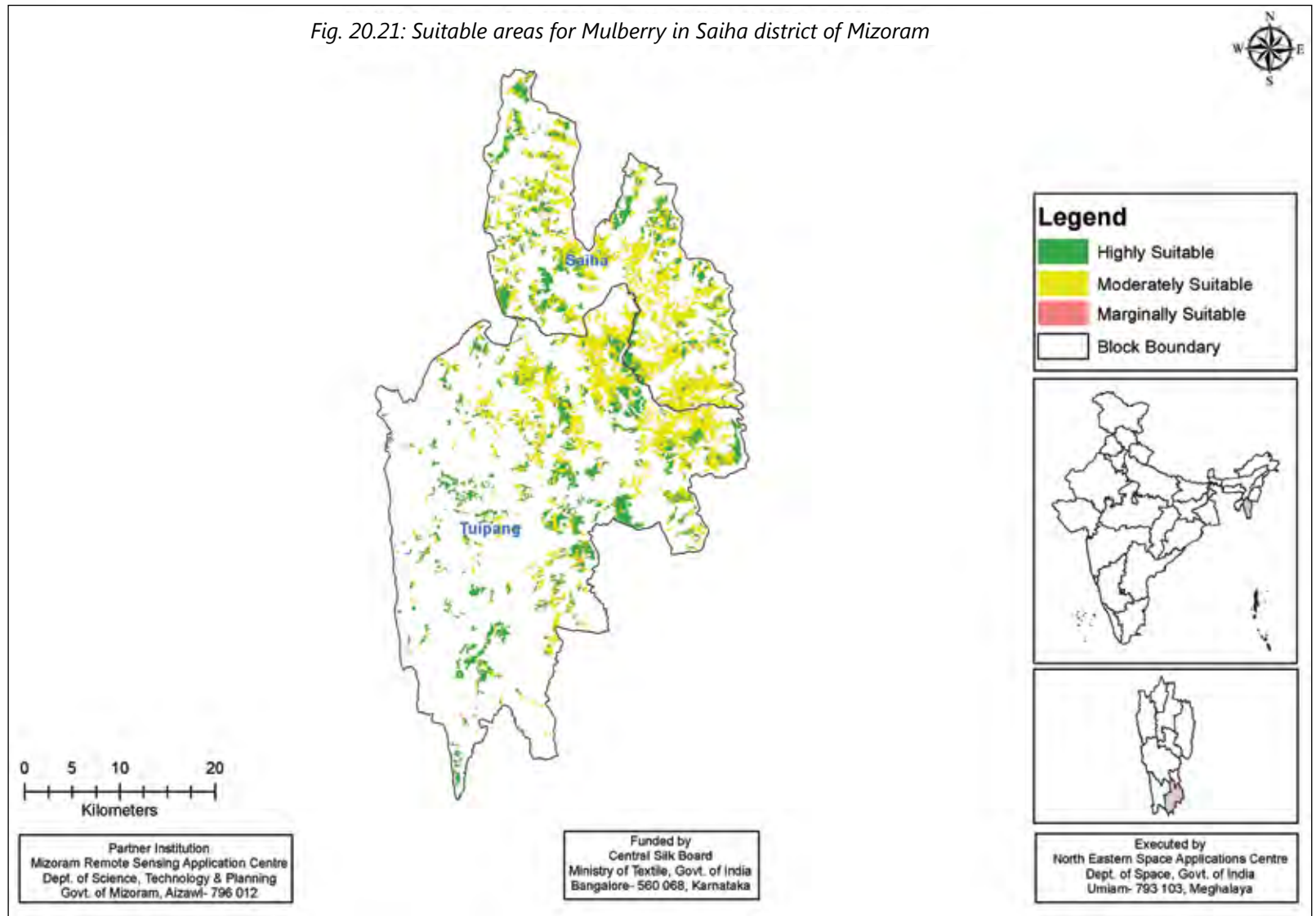
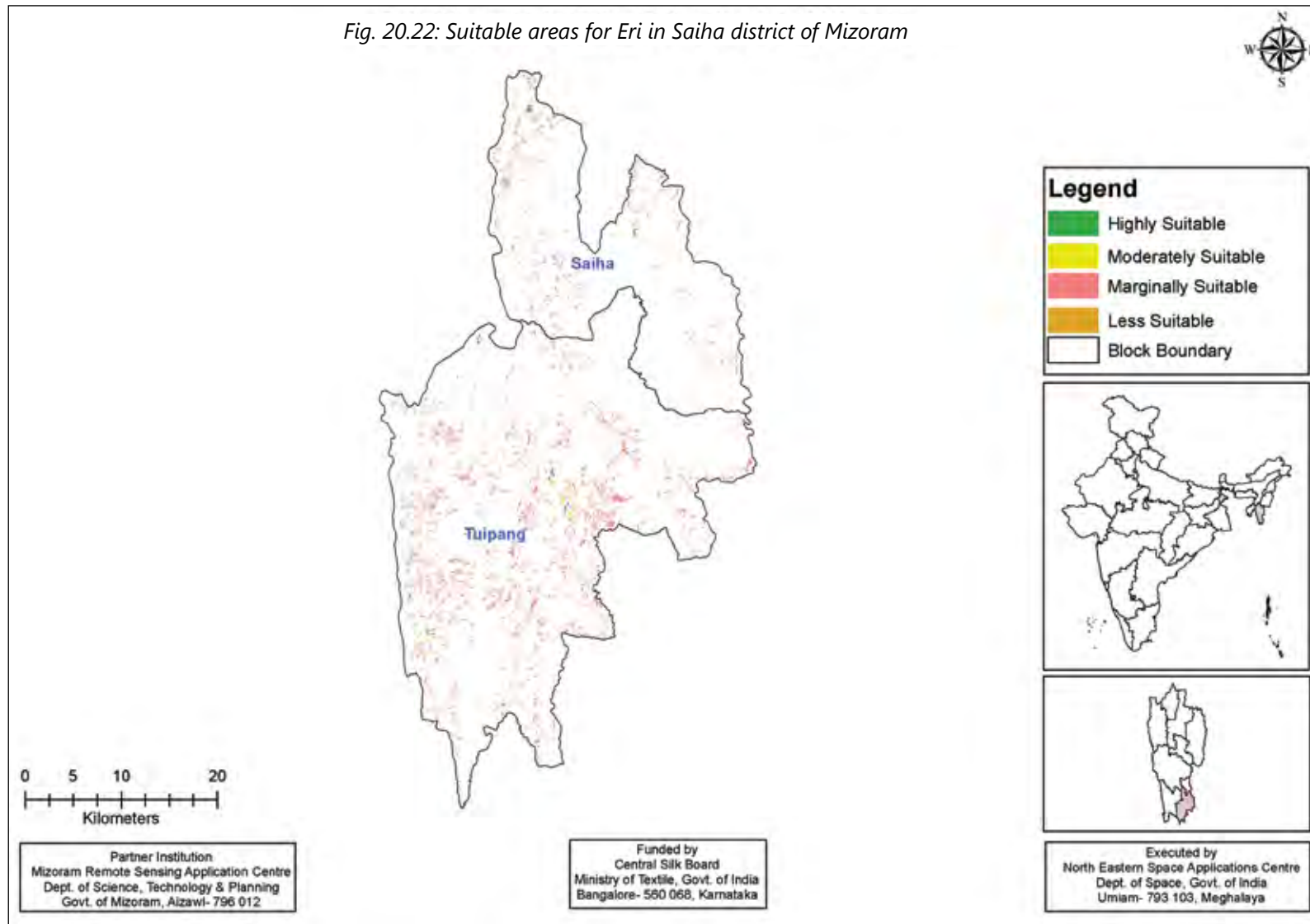


Fig. 20.22: Suitable areas for Eri in Saiha district of Mizoram



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Fig. 20.23: Suitable areas for Muga in Saiha district of Mizoram

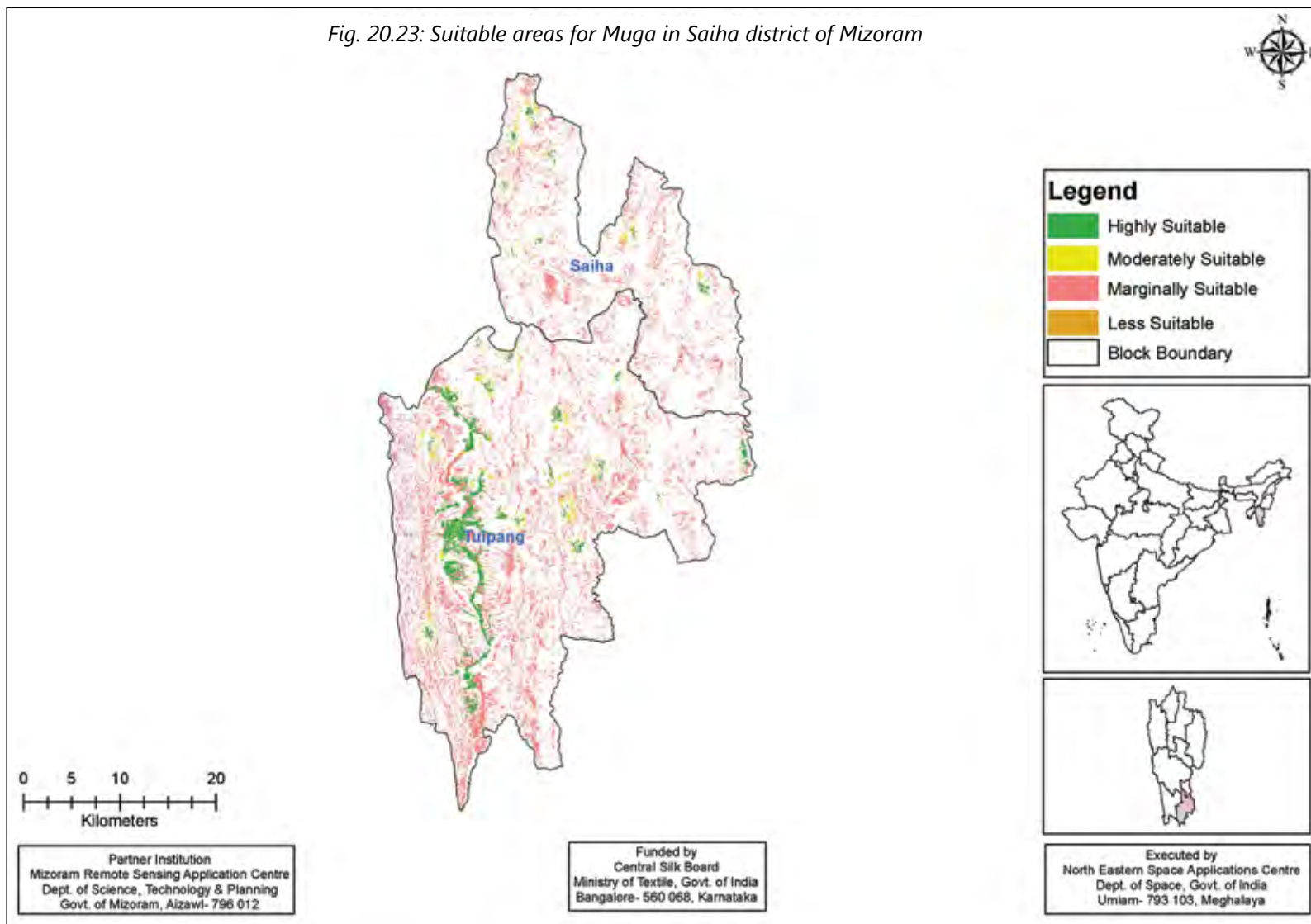
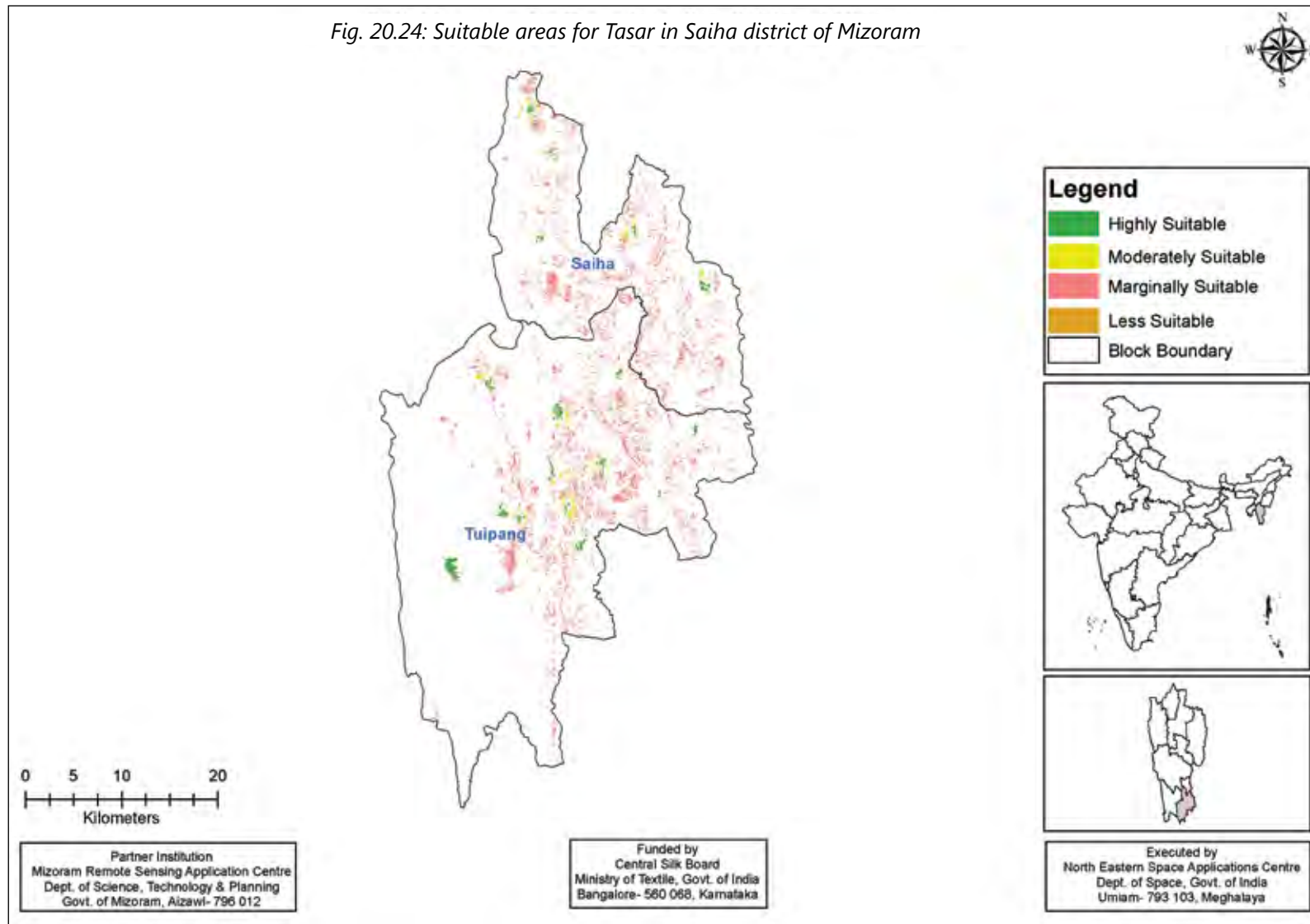


Fig. 20.24: Suitable areas for Tasar in Saiha district of Mizoram



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## NAGALAND

Nagaland is located in the extreme north eastern end of India and lies between 980 and 960 East Longitude and 26.60 and 27.40 North Latitude,. The state is bounded by Myanmar in the East; Assam in the West; Arunachal Pradesh and a part of Assam in the North with Manipur in the south. The state capital is Kohima, and the largest city is Dimapur. It has an area of 16,579 km<sup>2</sup> with a population of 1,980,602 as per census of 2011. Nagaland is largely a mountainous state and has a largely monsoon climate with high humidity levels.

The population mostly consists of Agriculturalist and around 75% of the population lives in the rural areas. In Nagaland, sericulture cultivation deals with all four types of silkworms that feed on different host plants to produce various qualities of silk, viz. *Bombyx mori* (Mulberry silkworm) feeds on Mulberry leaves, *Philosomia ricini* (Eri silkworm) on Castor leaves, *Anthraea assama* (Muga silkworm) on Som and Soalu leaves and *Anthraea proylei* (Temperate/ Oak Tasar silkworm) on Oak leaves. As per government statistics, Nagaland currently produces only about 1100 kgs of mulberry silks in the state. In order to boost the production of mulberry silks government is taking initiatives to increase the rearing activities in the state. The Central Silk Board is helping the farmers for involving sericulture development also the board ready to make sericulture as thriving industry. Five districts were selected for mapping of potential areas for further expansion of sericulture activities in the state.

### **Kiphire**

Kiphire is the newly formed ninth district of Nagaland which was carved out of Tuensang District. It is bounded by Tuensang district on the North, Phek district on the South, Myanmar on the East and Zunheboto district in the West. Kiphire is at an altitude of 896 m above sea level. The total area of the District is 1255 sq. kms. The district has a population of 74,033 as per 2011 census.

### **Mokokchung**

Mokokchung District is bounded by the state of Assam to its north, Tuensang to its east, Zunheboto to its south and Wokha and Assam to its west, and lies between 930 53' N and 940 53' N longitude and 250 56' E Latitude. The district is agriculturally and industrially among the most progressive districts in the state, along with Dimapur and Kohima.

### **Phek**

Phek is a district in the South-eastern part of Nagaland, bounded by Myanmar in the East, Zunheboto and Tuensang districts in the North, Manipur state in the South and Kohima district in the West. It covers an area of 2026 sq km. As



per the 2001 census the population was 1,46,483. In this district, agriculture is the main occupation with 80.84 % of the population engaged in agriculture.

### Tuensang

Tuensang lies in the easternmost part of Nagaland. This district is bounded by Mon in the north east, Longleng in the North, Mokokchung and Zunheboto in the West and Kiphire in the South. The district has approximately 180 Kms of international border with Myanmar. It has a total population of 4,14,801 having a population density of 98 per sq.km as per 2001 census.

### Zunheboto

Zunheboto is situated in the heart of Nagaland and is bounded by Mokokchung district in the East and Wokha district in the West. As of 2001 India census Zunheboto had a population of 22,809. It is a hilly place, Zunheboto is covered by evergreen forests and surrounded by small streams and rivers. Agriculture is the main occupation of the people.

Tables 22.1-22.4: Suitable Areas for Mulberry, Eri, Muga & Tasar in Kiphire District of Nagaland

Table 22.1

| Block        | Suitable Areas for Mulberry (ha) |          |          |         |
|--------------|----------------------------------|----------|----------|---------|
|              | High                             | Moderate | Marginal | Total   |
| Amahator     | 2.61                             | 9.69     | 232.24   | 244.53  |
| KiphireSadar | 6.49                             | 32.88    | 348.59   | 387.95  |
| Kiusam       | 229.97                           | 36.90    | 173.06   | 439.93  |
| Longmatra    | 6.81                             | 1.56     | 25.84    | 34.21   |
| Pungro       | 231.66                           | 98.85    | 1469.67  | 1800.18 |
| Seyochung    | 6.94                             | 40.12    | 601.02   | 648.09  |
| Simiti       | 1.17                             | 5.67     | 84.58    | 91.42   |
| Tsurungtho   | 4.47                             | 8.45     | 78.26    | 91.18   |
| Total        | 490.10                           | 234.12   | 3013.26  | 3737.48 |

Table 22.2

| Block        | Suitable areas for Eri (ha) |          |          |         |
|--------------|-----------------------------|----------|----------|---------|
|              | High                        | Moderate | Marginal | Total   |
| Amahator     | 83.79                       | 244.42   | 155.63   | 483.84  |
| KiphireSadar | 205.57                      | 594.41   | 363.9    | 1163.89 |
| Kiusam       | 219.14                      | 654.77   | 305.53   | 1179.44 |
| Longmatra    | 755.85                      | 890.97   | 221.14   | 1867.95 |
| Pungro       | 150.08                      | 675.20   | 736.28   | 1561.56 |
| Seyochung    | 109.62                      | 317.09   | 335.34   | 762.04  |
| Simiti       | 249.37                      | 647.09   | 203.19   | 1099.64 |
| Tsurungtho   | 330.96                      | 316.50   | 457.55   | 1105.01 |
| Total        | 2104.37                     | 4340.44  | 2778.55  | 9223.36 |

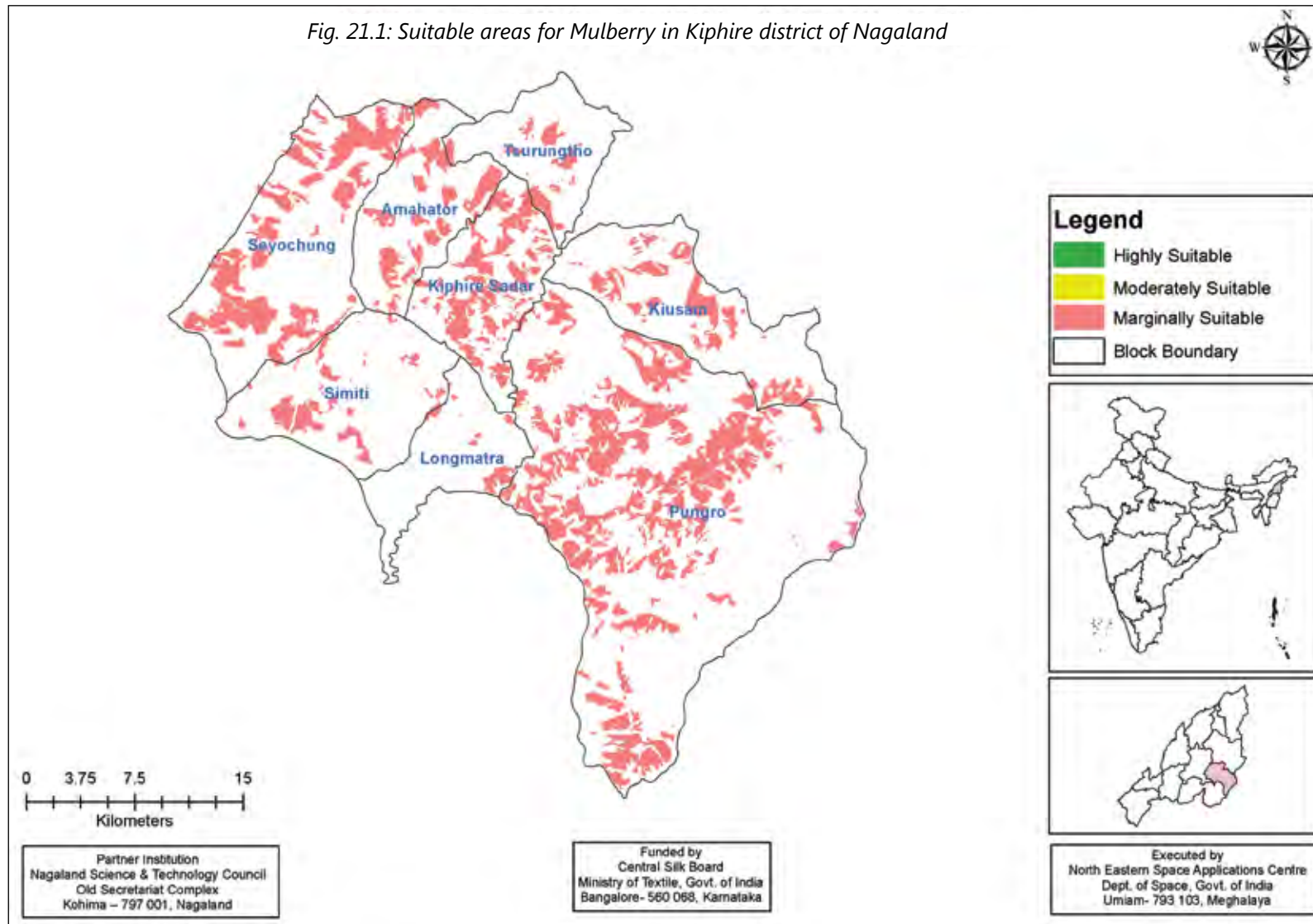
Table 22.3

| Block        | Suitable areas for Muga (ha) |          |          |         |
|--------------|------------------------------|----------|----------|---------|
|              | High                         | Moderate | Marginal | Total   |
| Amahator     | 83.79                        | 245.00   | 155.6    | 484.38  |
| KiphireSadar | 205.57                       | 594.41   | 363.9    | 1163.89 |
| Kiusam       | 219.14                       | 654.77   | 306.18   | 1180.09 |
| Longmatra    | 755.85                       | 890.97   | 221.14   | 1867.95 |
| Pungro       | 150.08                       | 675.20   | 736.83   | 1562.11 |
| Seyochung    | 109.47                       | 318.12   | 335.52   | 763.11  |
| Simiti       | 249.40                       | 647.07   | 203.19   | 1099.66 |
| Tsurungtho   | 330.96                       | 316.50   | 457.55   | 1105.01 |
| Total        | 2104.27                      | 4342.03  | 2779.9   | 9226.20 |

Table 22.4

| Block        | Suitable areas for Tasar (ha) |          |          |         |
|--------------|-------------------------------|----------|----------|---------|
|              | High                          | Moderate | Marginal | Total   |
| Amahator     | 83.79                         | 245.00   | 155.6    | 484.38  |
| KiphireSadar | 198.13                        | 344.46   | 149.92   | 692.50  |
| Kiusam       | 219.14                        | 642.65   | 238.13   | 1099.93 |
| Longmatra    | 477.94                        | 441.89   | 52.53    | 972.36  |
| Pungro       | 149.95                        | 620.68   | 521.37   | 1292.01 |
| Seyochung    | 109.47                        | 318.12   | 335.52   | 763.11  |
| Simiti       | 246.57                        | 559.13   | 198.96   | 1004.66 |
| Tsurungtho   | 330.97                        | 316.51   | 232.5    | 879.97  |
| Total        | 1815.96                       | 3488.45  | 1884.52  | 7188.93 |

Fig. 21.1: Suitable areas for Mulberry in Kiphire district of Nagaland



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Fig. 21.2: Suitable areas for Eri in Kiphire district of Nagaland

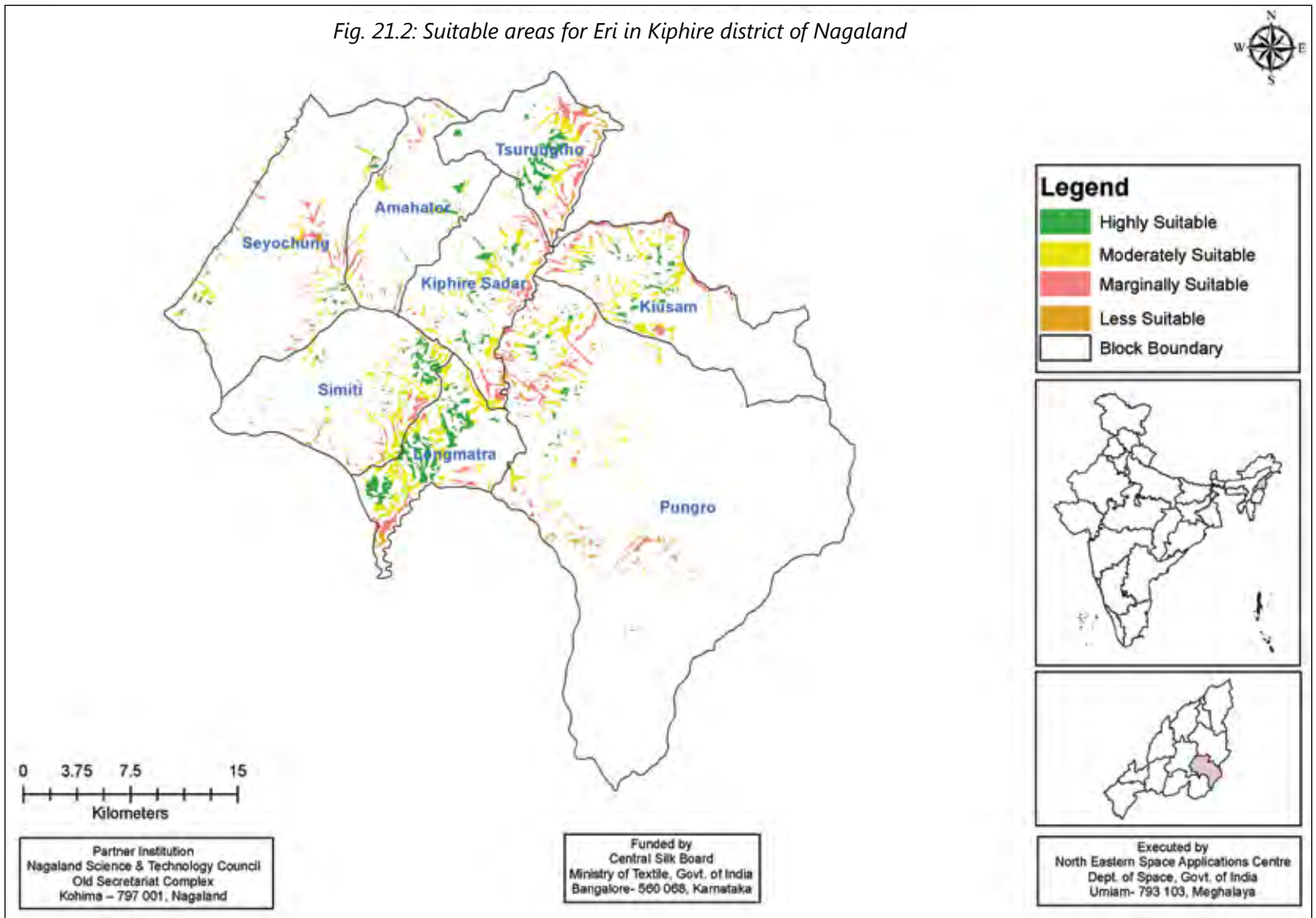
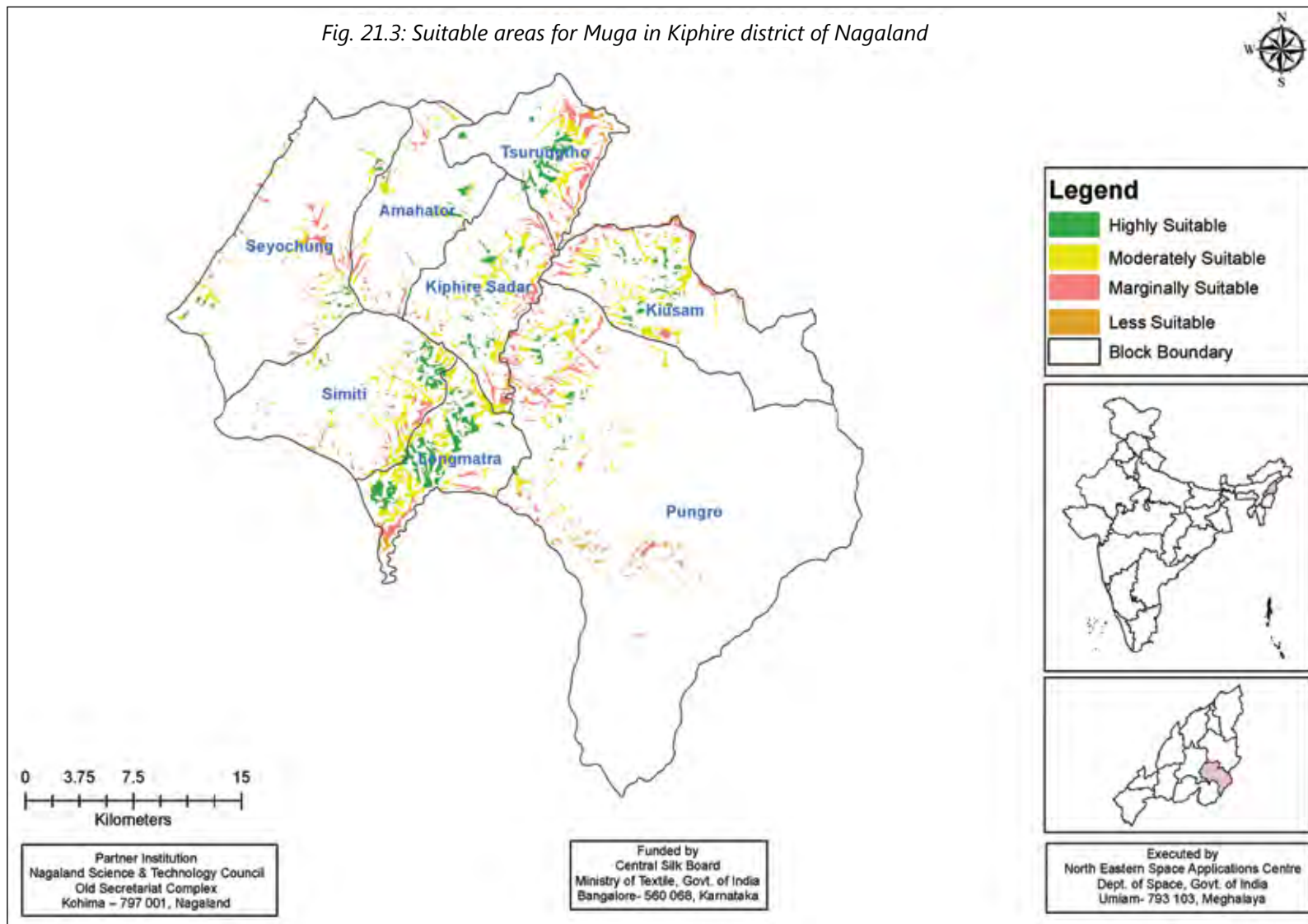


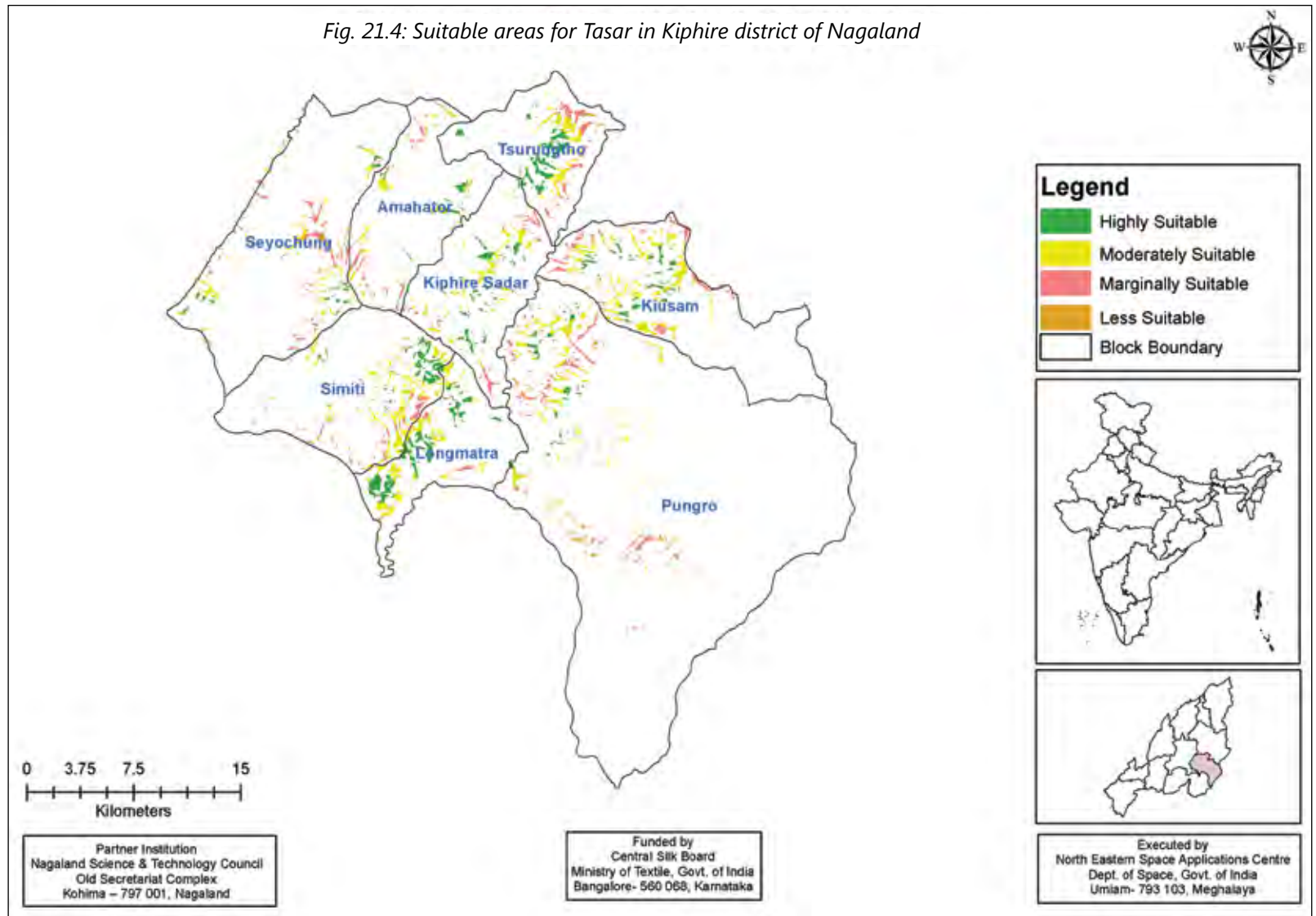
Fig. 21.3: Suitable areas for Muga in Kiphire district of Nagaland



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Fig. 21.4: Suitable areas for Tasar in Kiphire district of Nagaland



Tables 22.5-22.8: Suitable Areas for Mulberry, Eri, Muga & Tasar in Mokokchung District of Nagaland

Table 22.5

| Block         | Suitable Areas for Mulberry (ha) |          |          |          |
|---------------|----------------------------------|----------|----------|----------|
|               | High                             | Moderate | Marginal | Total    |
| Alongkima     | 174.55                           | 362.70   | 1270.30  | 1807.55  |
| Changtongya   | 87.51                            | 535.81   | 3241.14  | 3864.46  |
| Chuchuyimlang | 128.26                           | 648.03   | 4390.31  | 5166.60  |
| Kupolong      | 34.12                            | 184.41   | 1085.81  | 1304.34  |
| Longchem      | 20.04                            | 24.07    | 121.72   | 165.84   |
| Mangkolemba   | 125.75                           | 37.92    | 149.80   | 313.47   |
| Ongpangkong   | 204.67                           | 1535.60  | 9917.55  | 11657.83 |
| Tuli          | 239.94                           | 541.55   | 2225.26  | 3006.75  |
| Total         | 1014.84                          | 3870.10  | 22401.90 | 27286.83 |

Table 22.6

| Block         | Suitable Areas for Eri (ha) |          |          |          |
|---------------|-----------------------------|----------|----------|----------|
|               | High                        | Moderate | Marginal | Total    |
| Alongkima     | 415.58                      | 748.47   | 1519.93  | 2683.98  |
| Changtongya   | 381.72                      | 712.58   | 1202.99  | 2297.29  |
| Chuchuyimlang | 141.77                      | 514.16   | 1140.86  | 1796.78  |
| Kupolong      | 418.38                      | 953.77   | 979.83   | 2351.99  |
| Longchem      | 541.99                      | 897.20   | 303.97   | 1743.17  |
| Mangkolemba   | 1147.45                     | 2322.73  | 2078.23  | 5548.41  |
| Ongpangkong   | 882.37                      | 3362.79  | 4355.03  | 8600.19  |
| Tuli          | 135.02                      | 393.00   | 586.83   | 1114.84  |
| Total         | 4064.28                     | 9904.70  | 12167.66 | 26136.65 |

Table 22.7

| Block         | Suitable Areas for Muga (ha) |          |          |          |
|---------------|------------------------------|----------|----------|----------|
|               | High                         | Moderate | Marginal | Total    |
| Alongkima     | 426.78                       | 1001.81  | 4185.1   | 5613.69  |
| Changtongya   | 384.97                       | 940.68   | 1778.16  | 3103.81  |
| Chuchuyimlang | 141.77                       | 518.78   | 1290.25  | 1950.79  |
| Kupolong      | 418.38                       | 953.73   | 994.72   | 2366.84  |
| Longchem      | 813.73                       | 2311.47  | 3103.34  | 6228.53  |
| Mangkolemba   | 1431.79                      | 3892.78  | 3435.9   | 8760.47  |
| Ongpangkong   | 882.37                       | 3362.79  | 4355.03  | 8600.19  |
| Tuli          | 279.06                       | 874.39   | 2311.95  | 3465.40  |
| Total         | 4778.85                      | 13856.42 | 21454.45 | 40089.72 |

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Table 22.8

| Block         | Suitable Areas for Tasar (ha) |          |          |         |
|---------------|-------------------------------|----------|----------|---------|
|               | High                          | Moderate | Marginal | Total   |
| Alongkima     | 323.29                        | 231.13   | 40.73    | 595.15  |
| Changtongya   | 105.59                        | 18.91    | -        | 124.50  |
| Chuchuyimlang | 125.79                        | 327.90   | 153.66   | 607.35  |
| Kupolong      | 219.50                        | 387.35   | 115.23   | 722.08  |
| Longchem      | 3.00                          | 2.49     | -        | 5.49    |
| Mangkolemba   | 135.27                        | 137.78   | 84.32    | 357.37  |
| Ongpangkong   | 786.75                        | 2846.11  | 3118.25  | 6751.11 |
| Tuli          | 17.30                         | 2.13     | 0.05     | 19.49   |
| Total         | 1716.48                       | 3953.81  | 3512.24  | 9182.53 |

Fig. 21.5: Suitable areas for Mulberry in Mokokchung district of Nagaland

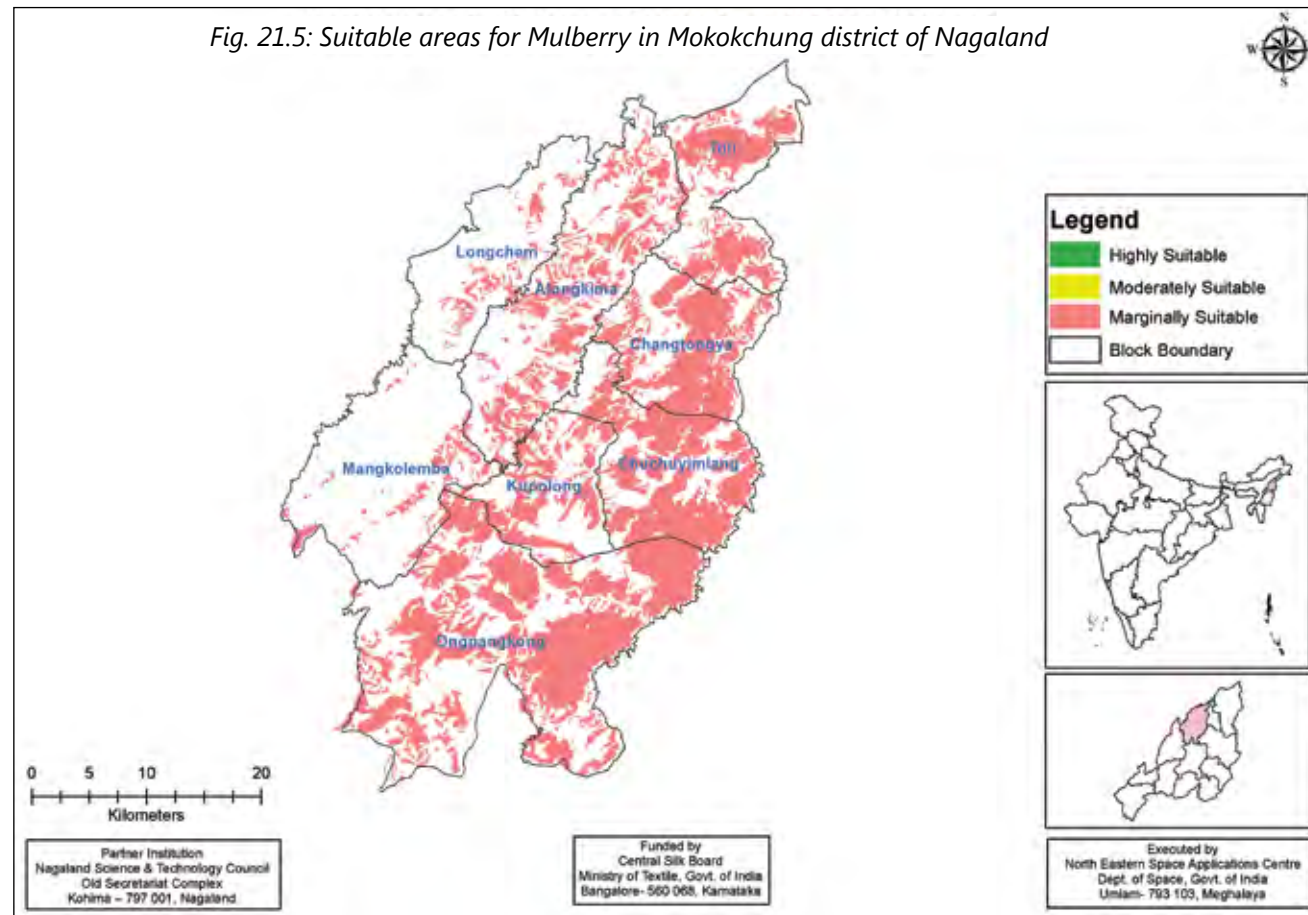
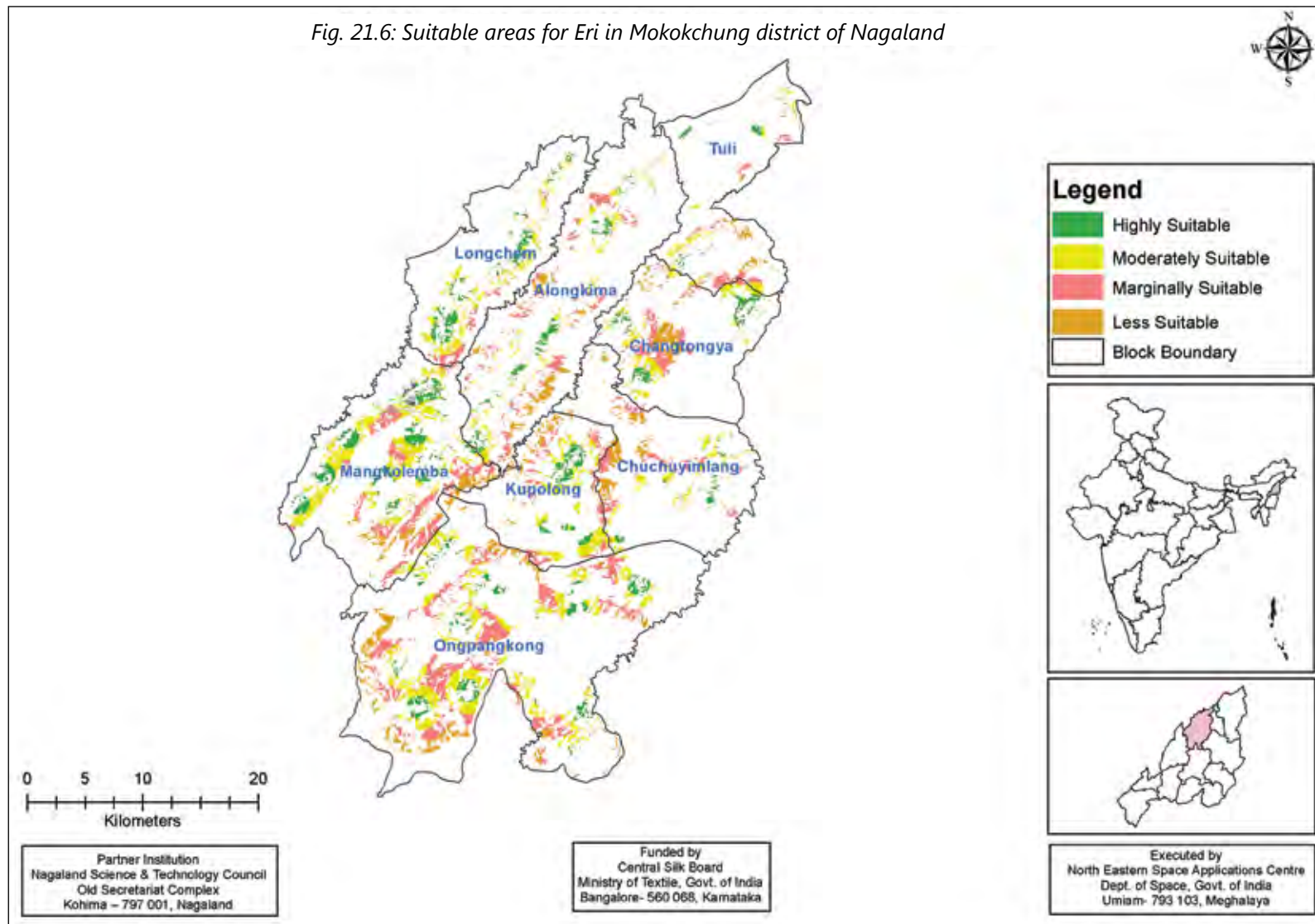


Fig. 21.6: Suitable areas for Eri in Mokokchung district of Nagaland



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Fig. 21.7: Suitable areas for Muga in Mokokchung district of Nagaland

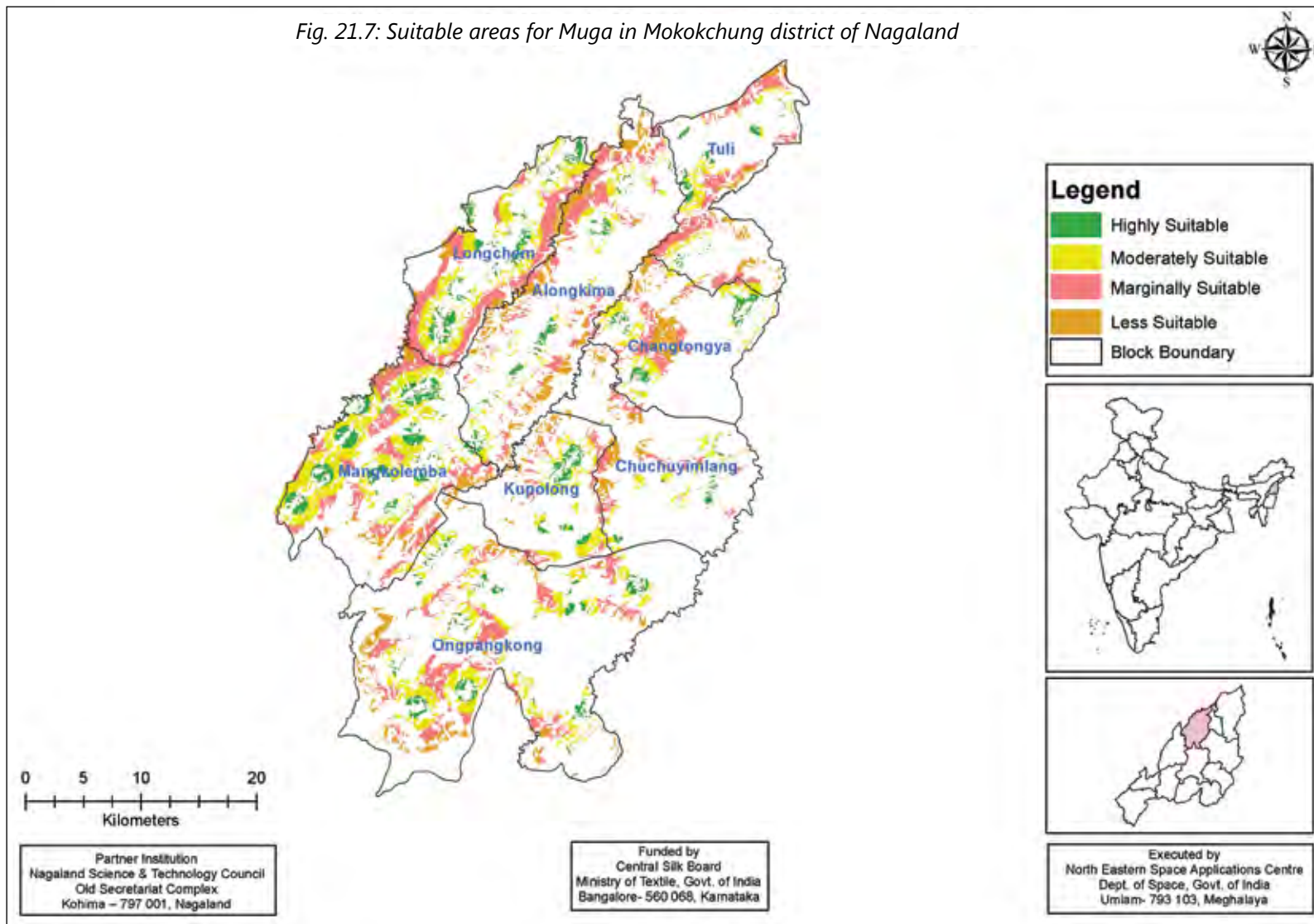
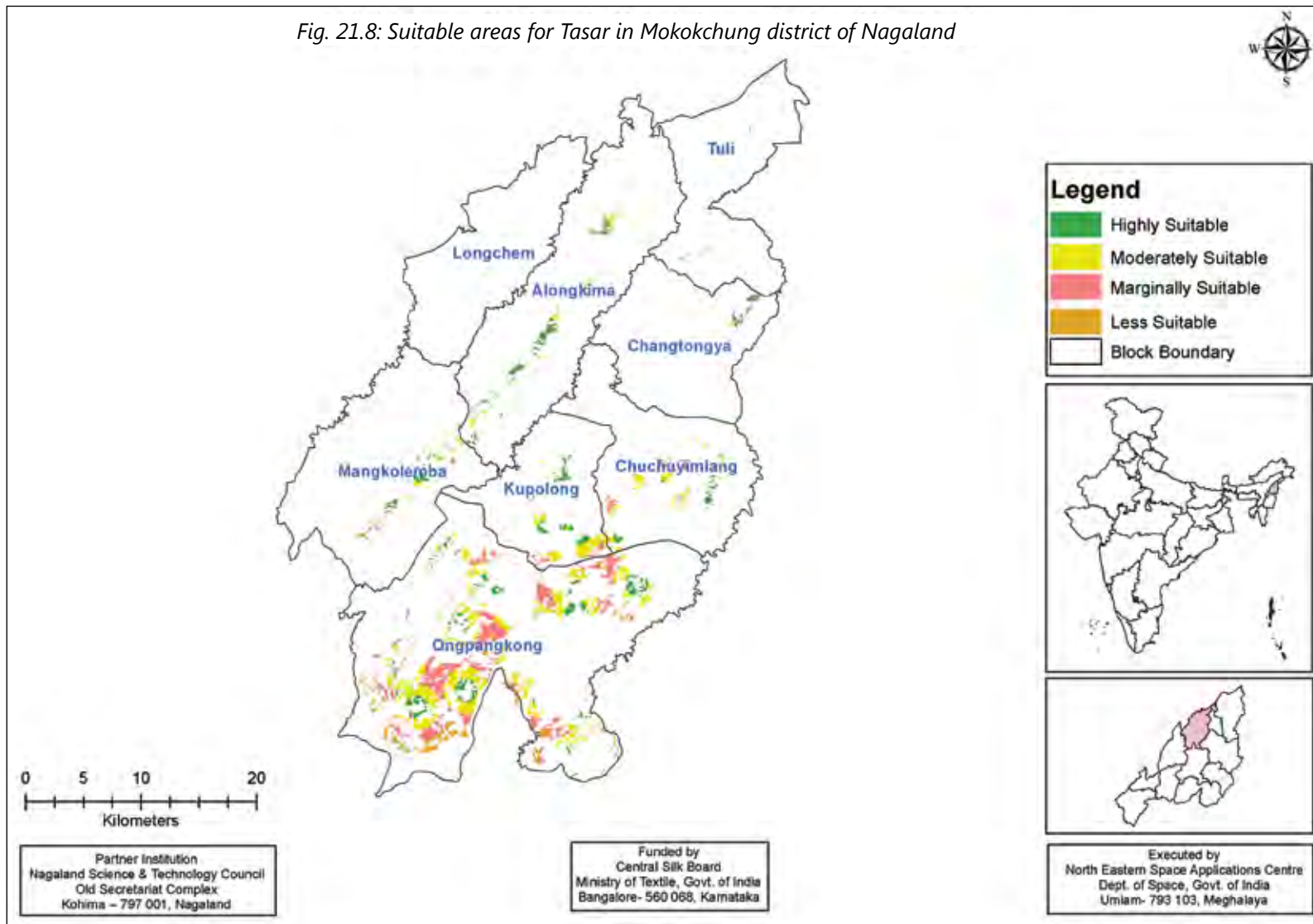


Fig. 21.8: Suitable areas for Tasar in Mokokchung district of Nagaland



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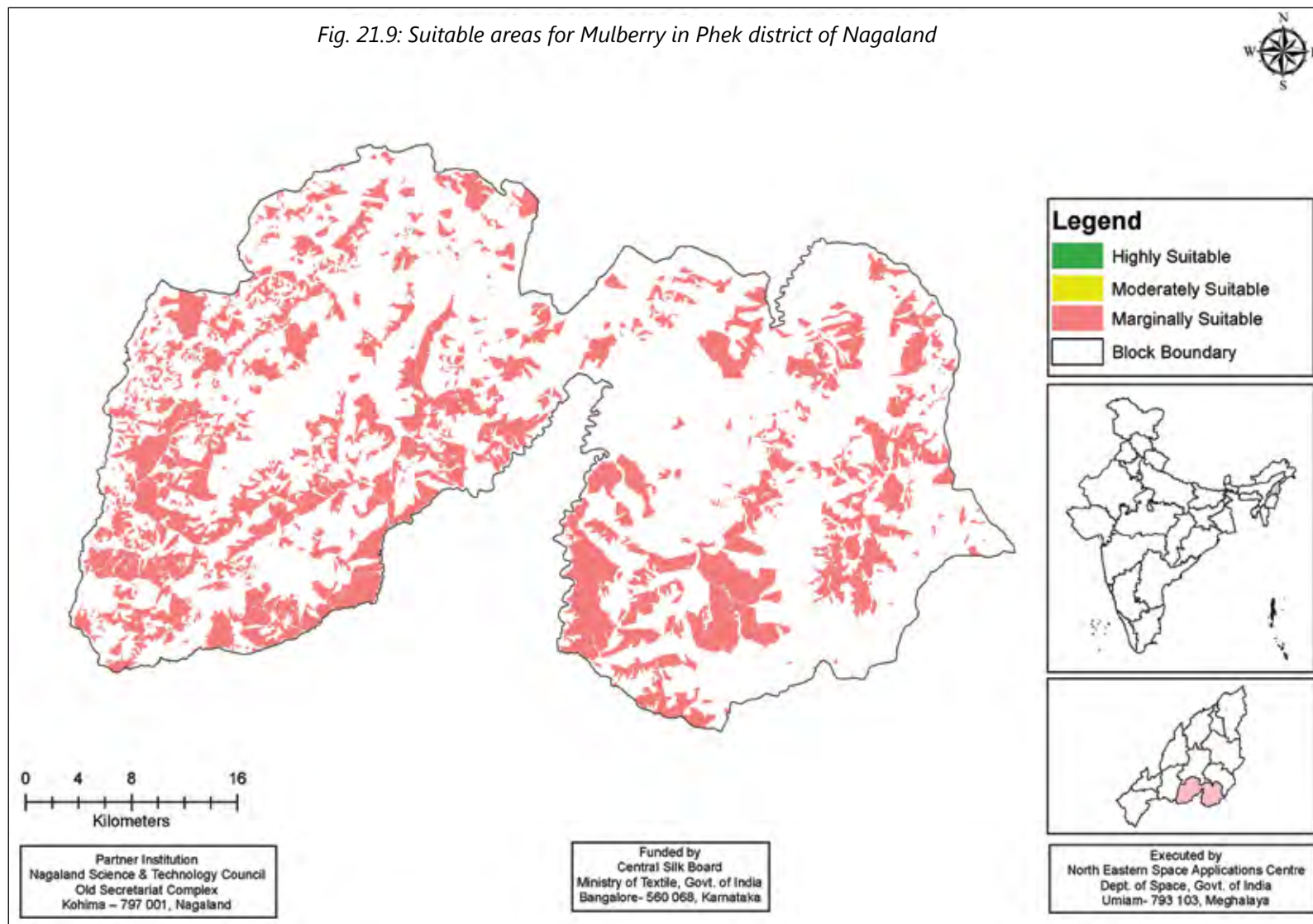
Table 22.9: Suitable Areas for Mulberry in Phek District of Nagaland

| Block      | Suitable Areas for Mulberry (ha) |          |          |         |
|------------|----------------------------------|----------|----------|---------|
|            | High                             | Moderate | Marginal | Total   |
| Chetheba   | 15.90                            | 57.93    | 422.52   | 496.35  |
| Chizami    | 9.26                             | 55.36    | 675.36   | 739.97  |
| Chozuba    | 9.22                             | 47.51    | 484.06   | 540.79  |
| Khezhakeno | 18.70                            | 55.91    | 138.39   | 213.00  |
| Meluri     | 18.79                            | 163.76   | 2119.23  | 2301.78 |
| Pfutsero   | 17.80                            | 97.82    | 891.42   | 1007.03 |
| PhekSadar  | 11.28                            | 66.13    | 792.24   | 869.66  |
| Phokhungri | 32.57                            | 133.38   | 1175.15  | 1341.10 |
| Sakraba    | 1.79                             | 18.61    | 212.65   | 233.05  |
| Sekruzu    | 7.85                             | 9.47     | 137.50   | 154.82  |
| Total      | 143.16                           | 705.88   | 7048.52  | 7897.55 |

Table 22.10: Suitable Areas for Eri, Muga and Tasar in Phek District of Nagaland

| Suitability Class | Eri      | Muga     | Tasar    |
|-------------------|----------|----------|----------|
| High              | 2056.66  | 2056.66  | 2045.23  |
| Moderate          | 4941.63  | 4941.63  | 4709.69  |
| Marginal          | 4932.56  | 4932.56  | 4110.02  |
| Less              | 3166.50  | 3166.50  | 2329.43  |
| Total             | 15097.35 | 15097.35 | 13194.37 |

Fig. 21.9: Suitable areas for Mulberry in Phek district of Nagaland



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Fig. 21.10: Suitable areas for Eri in Phek district of Nagaland

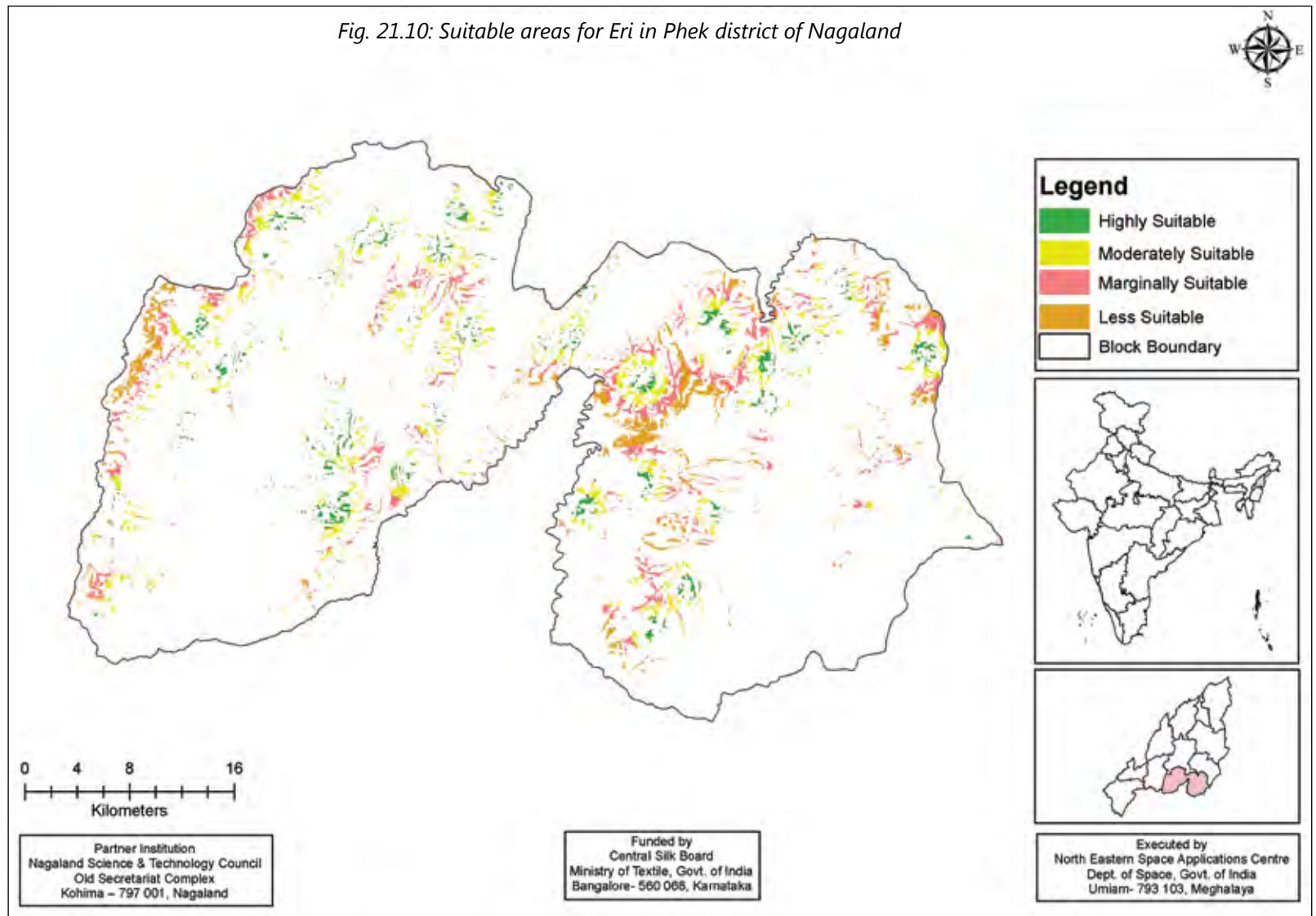
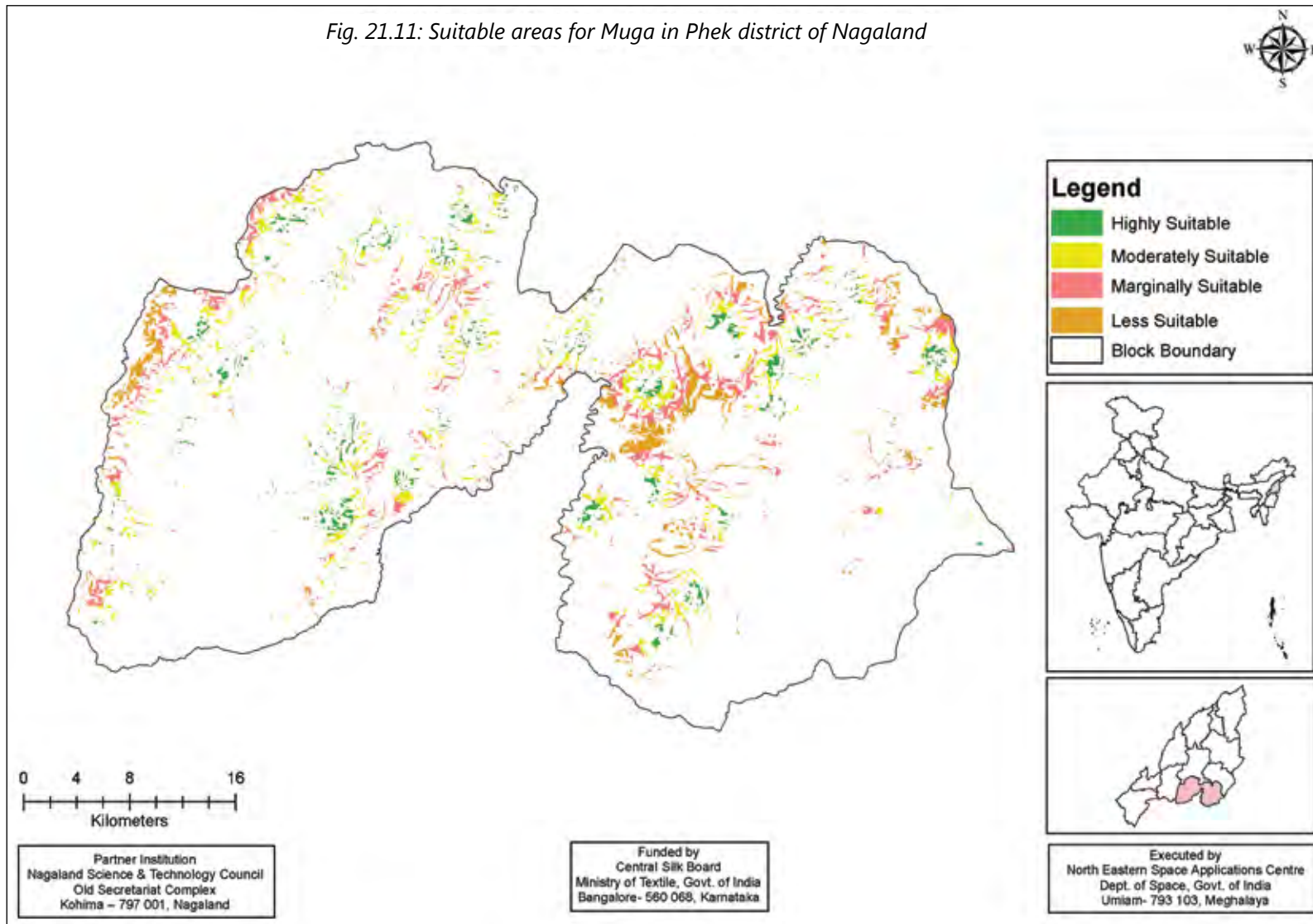


Fig. 21.11: Suitable areas for Muga in Phek district of Nagaland



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Fig. 21.12: Suitable areas for Tasar in Phek district of Nagaland

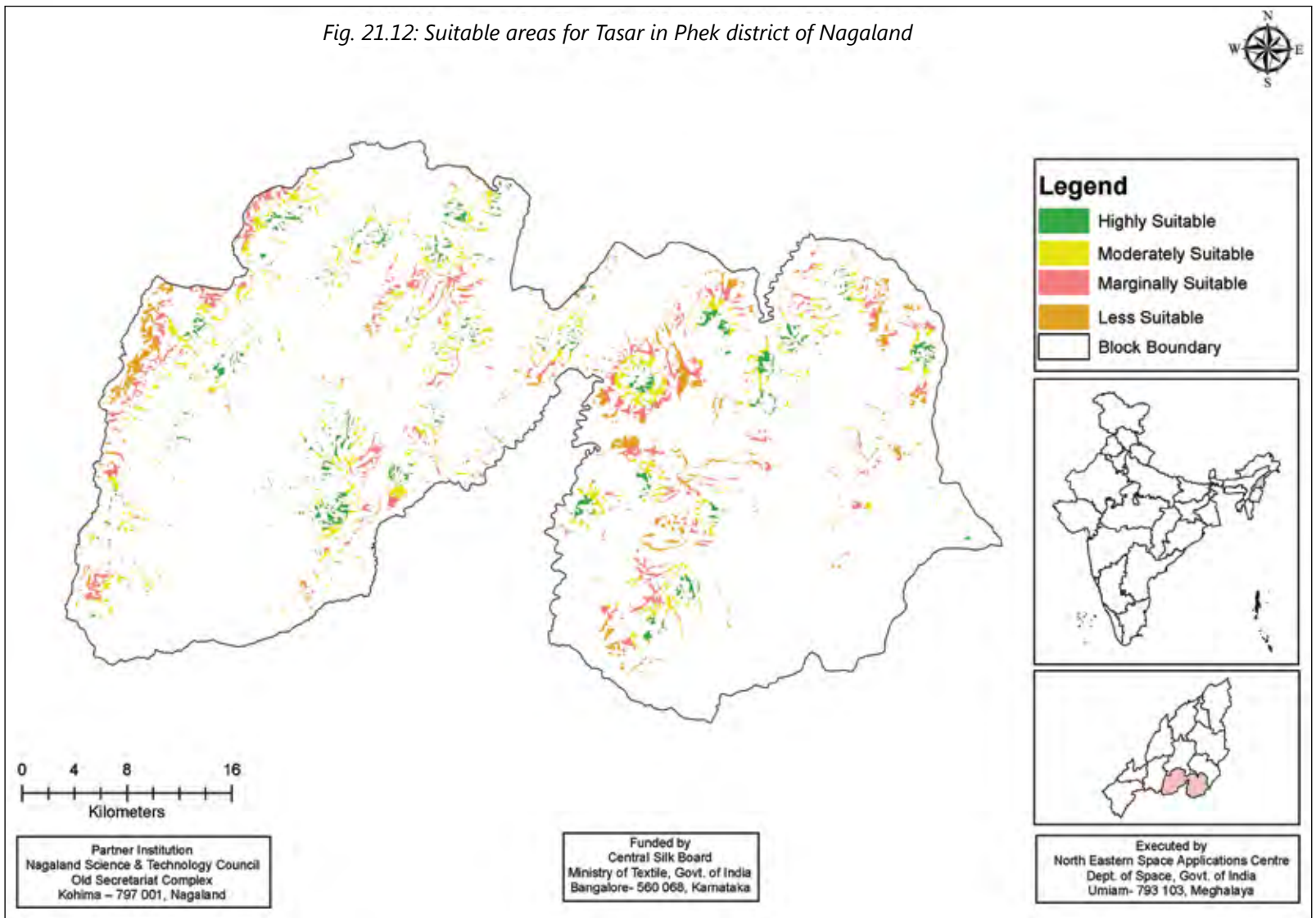


Table 22.11-22.14: Suitable Areas for Mulberry, Eri, Muga & Tasar in Tuensang District of Nagaland

Table 22.11

| Block         | Suitable Areas for Mulberry (ha) |          |          |         |
|---------------|----------------------------------|----------|----------|---------|
|               | High                             | Moderate | Marginal | Total   |
| Chare         | 12.72                            | 71.99    | 708.16   | 792.88  |
| Chessore      | 5.31                             | 28.69    | 420.73   | 454.74  |
| Longkhim      | 3.09                             | 16.43    | 386.79   | 406.31  |
| Noklak        | 456.06                           | 35.30    | 584.91   | 1076.27 |
| Noksen        | 22.51                            | 97.33    | 1106.75  | 1226.59 |
| Panso         | 408.62                           | 34.14    | 736.72   | 1179.48 |
| Shamator      | 1.71                             | 21.64    | 600.86   | 624.22  |
| Thonoknyu     | 1408.74                          | 35.14    | 572.73   | 2016.61 |
| TuensangSadar | 20.67                            | 122.15   | 1529.83  | 1672.65 |
| Total         | 2339.43                          | 462.82   | 6647.49  | 9449.74 |

Table 22.12

| Block         | Suitable Areas for Eri (ha) |          |          |          |
|---------------|-----------------------------|----------|----------|----------|
|               | High                        | Moderate | Marginal | Total    |
| Chare         | 346.51                      | 601.34   | 625.8    | 1573.65  |
| Chessore      | 124.43                      | 334.30   | 512.28   | 971.02   |
| Longkhim      | 157.17                      | 484.67   | 385.54   | 1027.38  |
| Noklak        | 484.41                      | 1395.80  | 1678.06  | 3558.26  |
| Noksen        | 322.44                      | 1257.71  | 1576.4   | 3156.55  |
| Panso         | 422.77                      | 546.39   | 648.97   | 1618.13  |
| Shamator      | 315.79                      | 677.87   | 658.79   | 1652.45  |
| Thonoknyu     | 305.13                      | 1249.12  | 1649.56  | 3203.80  |
| TuensangSadar | 759.85                      | 1486.66  | 1201.37  | 3447.88  |
| Total         | 3238.50                     | 8033.85  | 8936.77  | 20209.12 |

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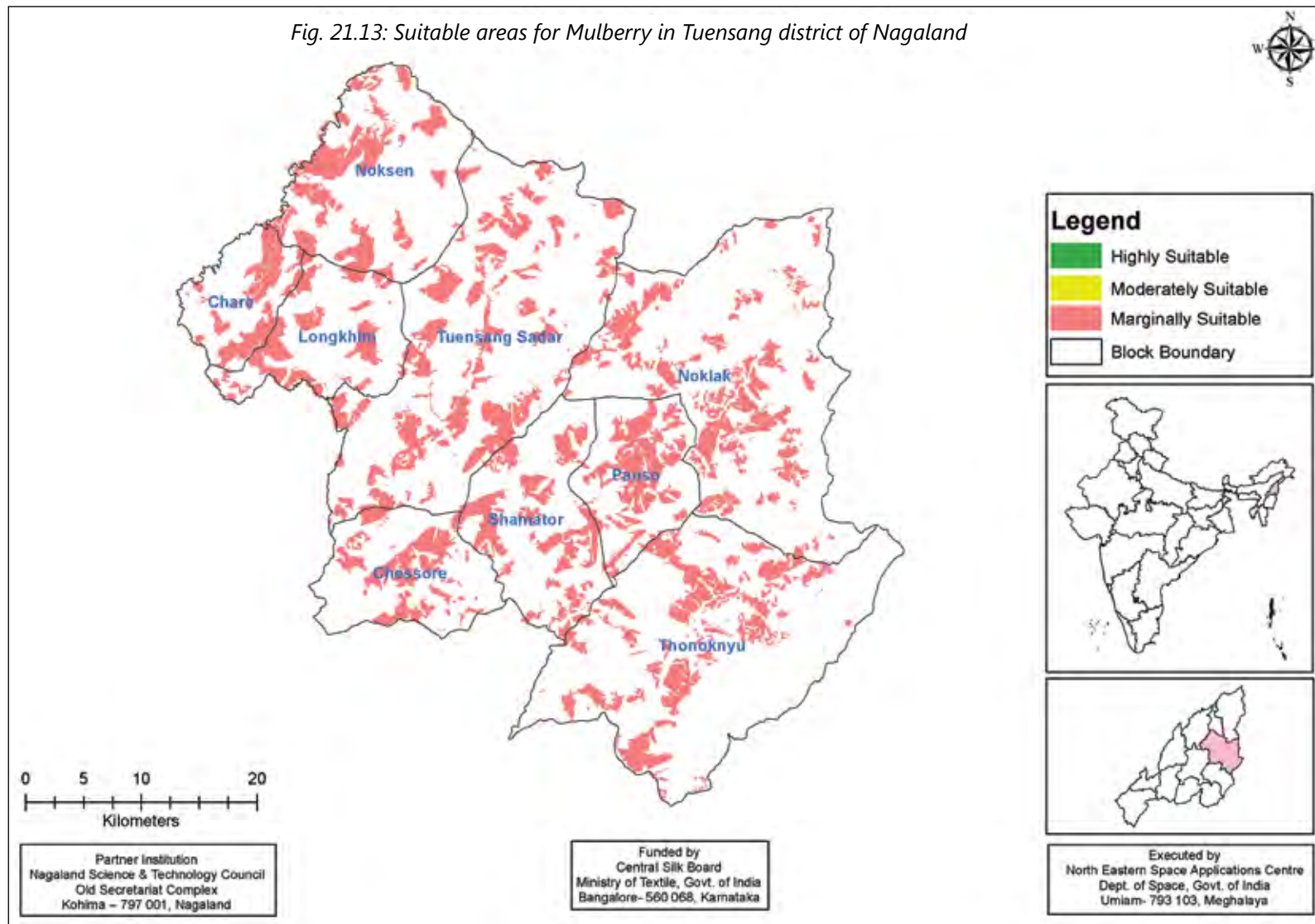
Table 22.13

| Block         | Suitable Areas for Muga (ha) |          |          |          |
|---------------|------------------------------|----------|----------|----------|
|               | High                         | Moderate | Marginal | Total    |
| Chare         | 346.51                       | 601.34   | 625.8    | 1573.65  |
| Chessore      | 124.43                       | 334.30   | 512.28   | 971.02   |
| Longkhim      | 157.17                       | 484.67   | 385.54   | 1027.38  |
| Noklak        | 484.41                       | 1395.80  | 1678.06  | 3558.26  |
| Noksen        | 322.61                       | 1257.64  | 1576.63  | 3156.88  |
| Panso         | 423.13                       | 548.07   | 651.53   | 1622.72  |
| Shamator      | 315.79                       | 677.87   | 658.79   | 1652.45  |
| Thonoknyu     | 311.92                       | 1285.75  | 1720.6   | 3318.26  |
| TuensangSadar | 759.85                       | 1486.66  | 1201.37  | 3447.88  |
| Total         | 3245.81                      | 8072.09  | 9010.59  | 20328.49 |

Table 22.14

| Block         | Suitable Areas for Tasar (ha) |          |          |          |
|---------------|-------------------------------|----------|----------|----------|
|               | High                          | Moderate | Marginal | Total    |
| Chare         | 338.62                        | 411.49   | 356.16   | 1106.27  |
| Chessore      | 124.45                        | 334.29   | 502.28   | 961.02   |
| Longkhim      | 157.18                        | 484.66   | 385.57   | 1027.41  |
| Noklak        | 484.40                        | 1395.82  | 1678.08  | 3558.30  |
| Noksen        | 309.03                        | 954.02   | 787.07   | 2050.12  |
| Panso         | 422.85                        | 544.09   | 645.78   | 1612.72  |
| Shamator      | 315.85                        | 638.06   | 599.47   | 1553.38  |
| Thonoknyu     | 311.91                        | 1268.23  | 1692.43  | 3272.57  |
| TuensangSadar | 746.18                        | 1243.68  | 1170.01  | 3159.87  |
| Total         | 3210.47                       | 7274.34  | 7816.85  | 18301.66 |

Fig. 21.13: Suitable areas for Mulberry in Tuensang district of Nagaland



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Fig. 21.14: Suitable areas for Eri in Tuensang district of Nagaland

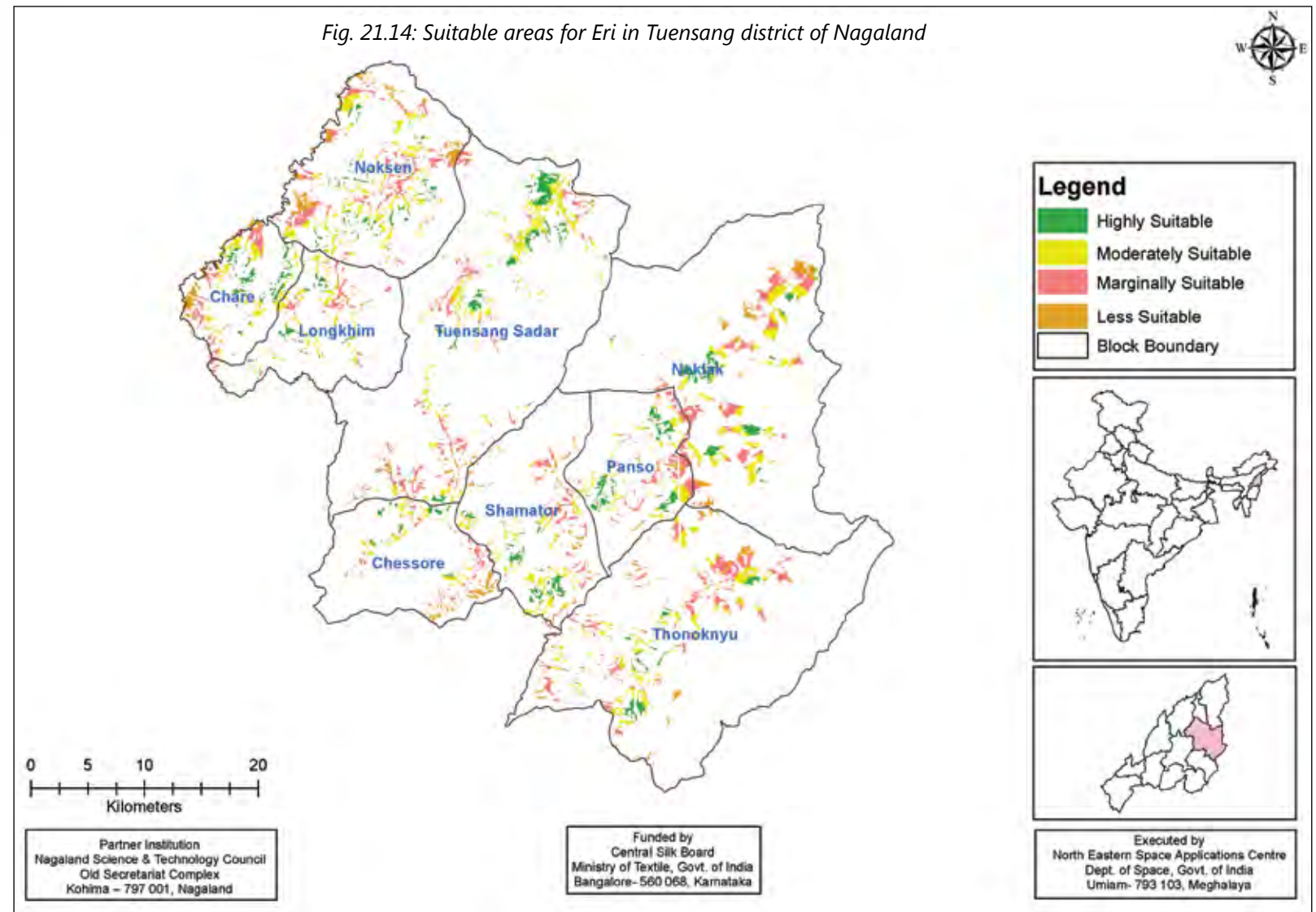
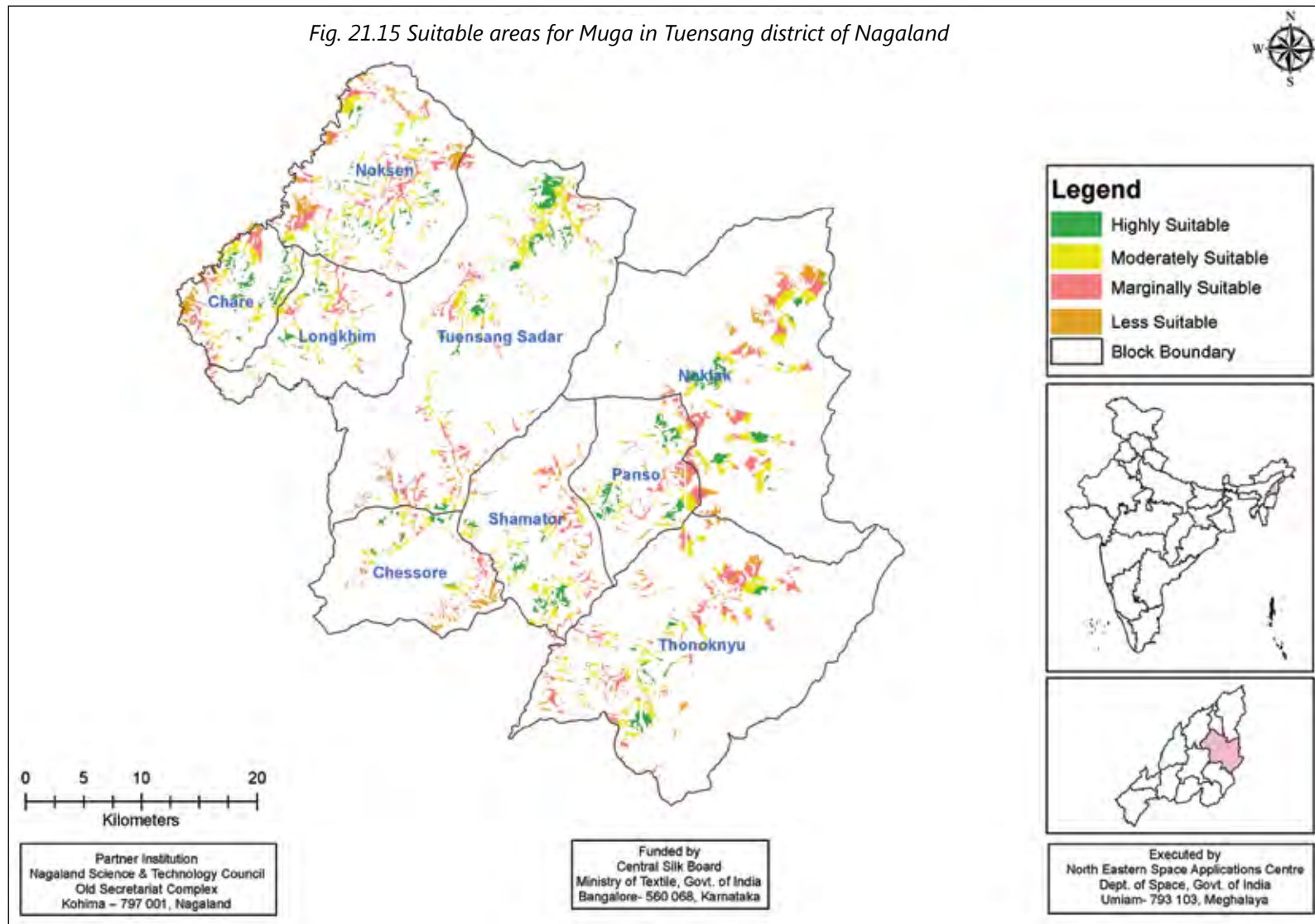


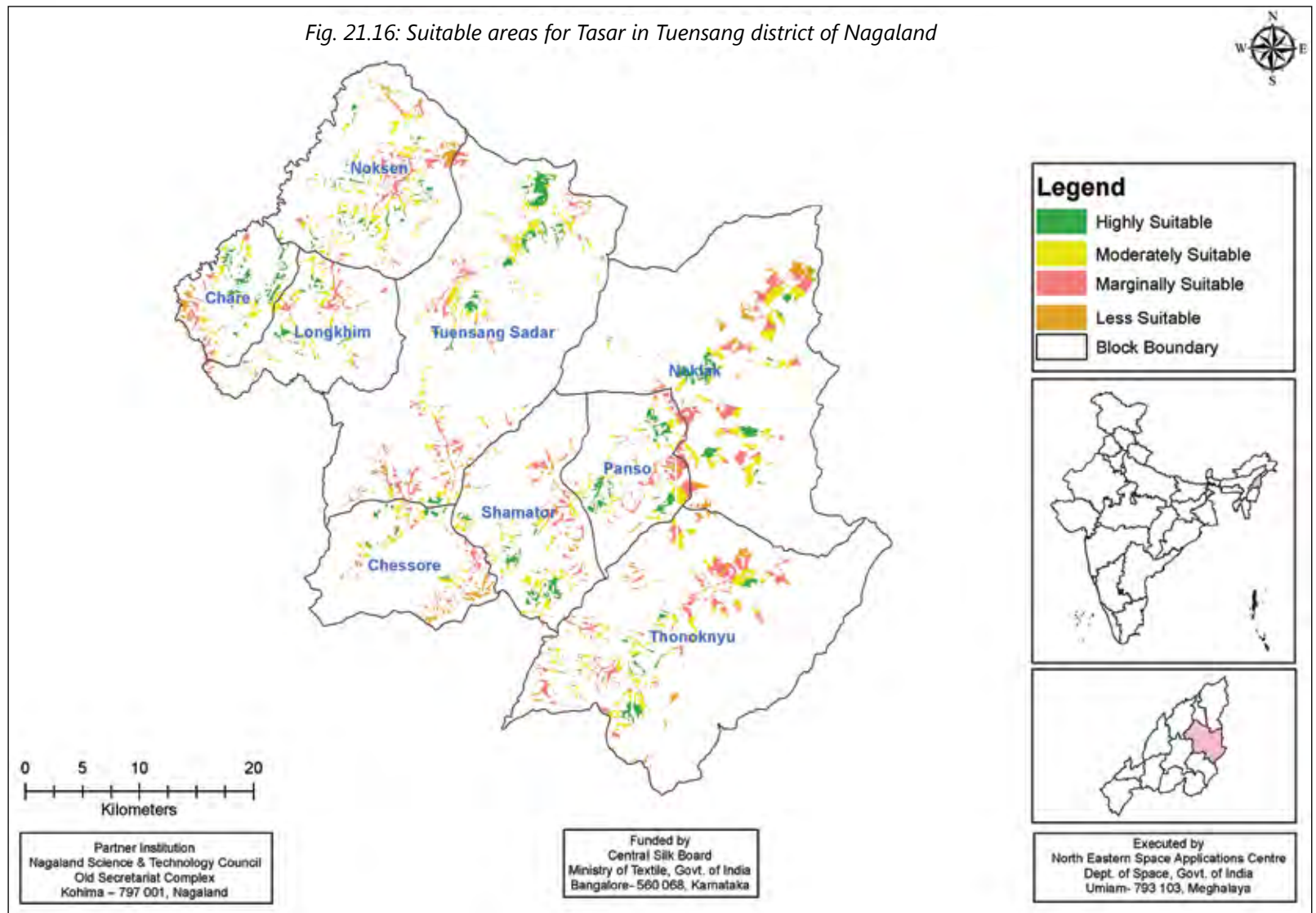
Fig. 21.15 Suitable areas for Muga in Tuensang district of Nagaland



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Fig. 21.16: Suitable areas for Tasar in Tuensang district of Nagaland



Tables 22.15-22.18: Suitable Areas for Mulberry, Eri, Muga & Tasar in Zuneheboto District of Nagaland

Table 22.15

| Block          | Suitable Areas for Mulberry (ha) |          |          |         |
|----------------|----------------------------------|----------|----------|---------|
|                | High                             | Moderate | Marginal | Total   |
| Aghunato       | 7.67                             | 37.79    | 547.72   | 593.17  |
| Akuluto        | 19.33                            | 117.46   | 597.66   | 734.45  |
| Asuto          | 6.90                             | 21.18    | 389.98   | 418.05  |
| Atoizu         | 27.68                            | 122.36   | 1010.88  | 1160.92 |
| Ghathashi      | 13.31                            | 56.06    | 417.96   | 487.34  |
| Pughoboto      | 20.07                            | 100.43   | 759.78   | 880.27  |
| Satakha        | 25.40                            | 91.14    | 620.05   | 736.59  |
| Satoi          | 6.21                             | 8.15     | 137.90   | 152.27  |
| Suruhoto       | 8.79                             | 38.90    | 417.12   | 464.81  |
| V.K.           | 15.10                            | 54.58    | 352.63   | 422.31  |
| ZunhebotoSadar | 6.52                             | 26.05    | 274.91   | 307.48  |
| Total          | 156.98                           | 674.10   | 5526.60  | 6357.67 |

Table 22.16

| Block          | Suitable Areas for Eri (ha) |          |          |          |
|----------------|-----------------------------|----------|----------|----------|
|                | High                        | Moderate | Marginal | Total    |
| Aghunato       | 281.73                      | 327.84   | 326.99   | 936.57   |
| Akuluto        | 480.46                      | 1384.12  | 2362.98  | 4227.56  |
| Asuto          | 43.97                       | 126.71   | 54.46    | 225.14   |
| Atoizu         | 483.70                      | 1025.84  | 1035.5   | 2545.04  |
| Ghathashi      | 869.84                      | 1965.93  | 2084.38  | 4920.15  |
| Pughoboto      | 210.81                      | 1072.19  | 1724.61  | 3007.61  |
| Satakha        | 686.76                      | 1743.24  | 1107.48  | 3537.49  |
| Satoi          | 85.69                       | 371.05   | 240.41   | 697.14   |
| Suruhoto       | 118.72                      | 617.67   | 451.43   | 1187.82  |
| V.K.           | 475.31                      | 1406.05  | 1959.67  | 3841.03  |
| ZunhebotoSadar | 262.42                      | 802.81   | 385.59   | 1450.82  |
| Total          | 3999.40                     | 10843.47 | 11733.49 | 26576.37 |

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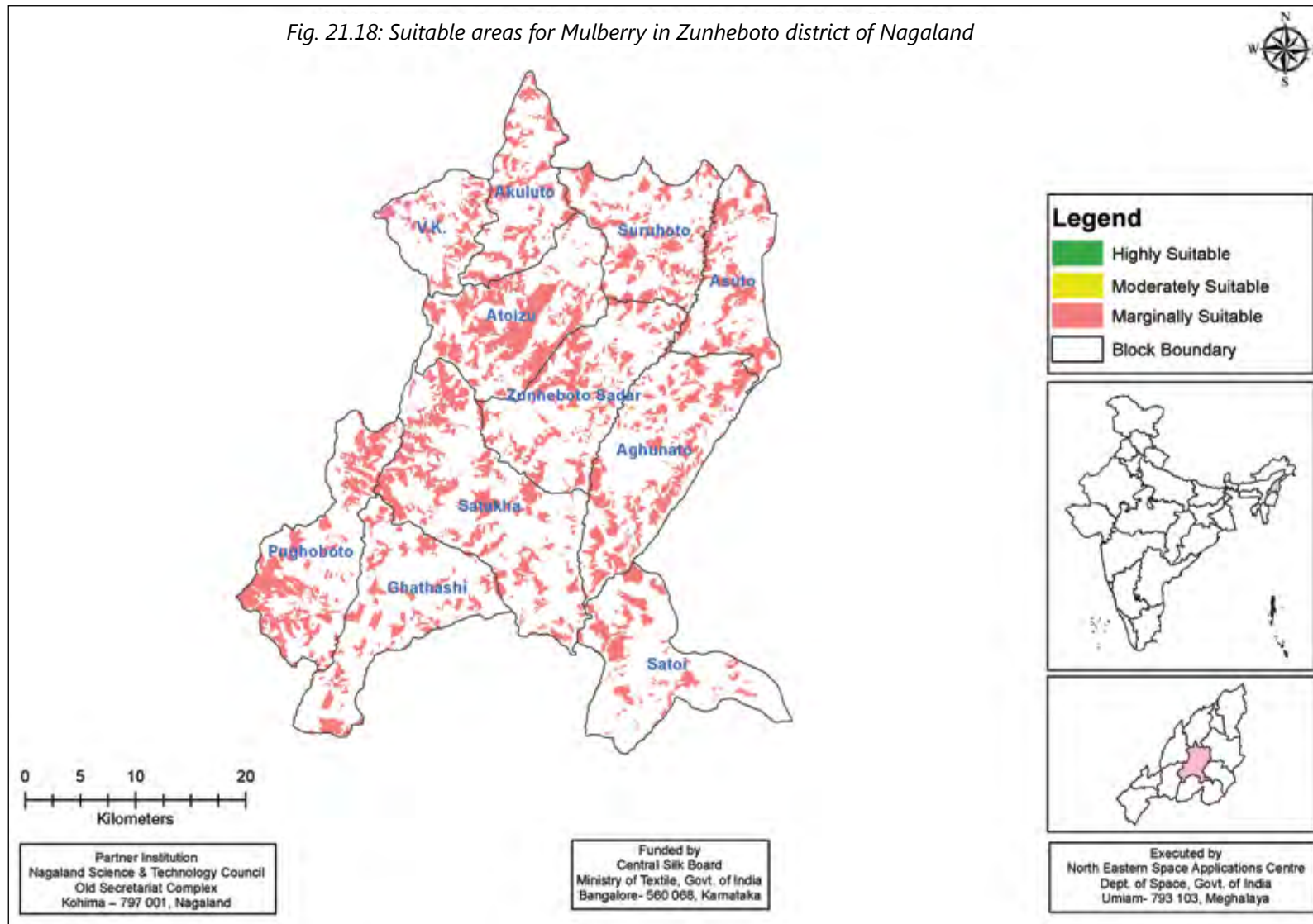
Table 22.17

| Block          | Suitable Areas for Muga (ha) |          |          |          |
|----------------|------------------------------|----------|----------|----------|
|                | High                         | Moderate | Marginal | Total    |
| Aghunato       | 273.77                       | 316.89   | 320.96   | 911.61   |
| Akuluto        | 478.66                       | 1379.04  | 2358.27  | 4215.96  |
| Asuto          | 43.62                        | 121.79   | 53.97    | 219.37   |
| Atoizu         | 478.93                       | 1018.10  | 1022.48  | 2519.51  |
| Ghathashi      | 850.70                       | 1941.00  | 2066.88  | 4858.58  |
| Pughoboto      | 205.49                       | 1054.81  | 1691.41  | 2951.72  |
| Satakha        | 669.12                       | 1710.22  | 1089.65  | 3468.99  |
| Satoi          | 80.69                        | 352.07   | 229.31   | 662.08   |
| Suruhoto       | 116.47                       | 607.34   | 433.27   | 1157.09  |
| V.K.           | 474.26                       | 1405.80  | 1953.42  | 3833.47  |
| ZunhebotoSadar | 252.31                       | 788.65   | 371.86   | 1412.82  |
| Total          | 3924.02                      | 10695.71 | 11591.48 | 26211.20 |

Table 22.18

| Block          | Suitable Areas for Tasar (ha) |          |          |          |
|----------------|-------------------------------|----------|----------|----------|
|                | High                          | Moderate | Marginal | Total    |
| Aghunato       | 273.78                        | 316.98   | 320.95   | 911.71   |
| Akuluto        | 472.69                        | 1276.27  | 1543.18  | 3292.14  |
| Asuto          | 43.61                         | 121.81   | 53.96    | 219.38   |
| Atoizu         | 430.64                        | 519.11   | 272.08   | 1221.83  |
| Ghathashi      | 723.57                        | 1232.04  | 1522.36  | 3477.97  |
| Pughoboto      | 188.35                        | 555.25   | 1007.47  | 1751.07  |
| Satakha        | 648.94                        | 1246.65  | 519.56   | 2415.15  |
| Satoi          | 80.71                         | 342.98   | 212.36   | 636.05   |
| Suruhoto       | 116.50                        | 607.39   | 433.27   | 1157.16  |
| V.K.           | 386.61                        | 608.90   | 290.68   | 1286.19  |
| ZunhebotoSadar | 252.31                        | 732.42   | 355.23   | 1339.96  |
| Total          | 3617.71                       | 7559.80  | 6531.1   | 17708.61 |

Fig. 21.18: Suitable areas for Mulberry in Zunheboto district of Nagaland



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Fig. 21.19: Suitable areas for Eri in Zunheboto district of Nagaland

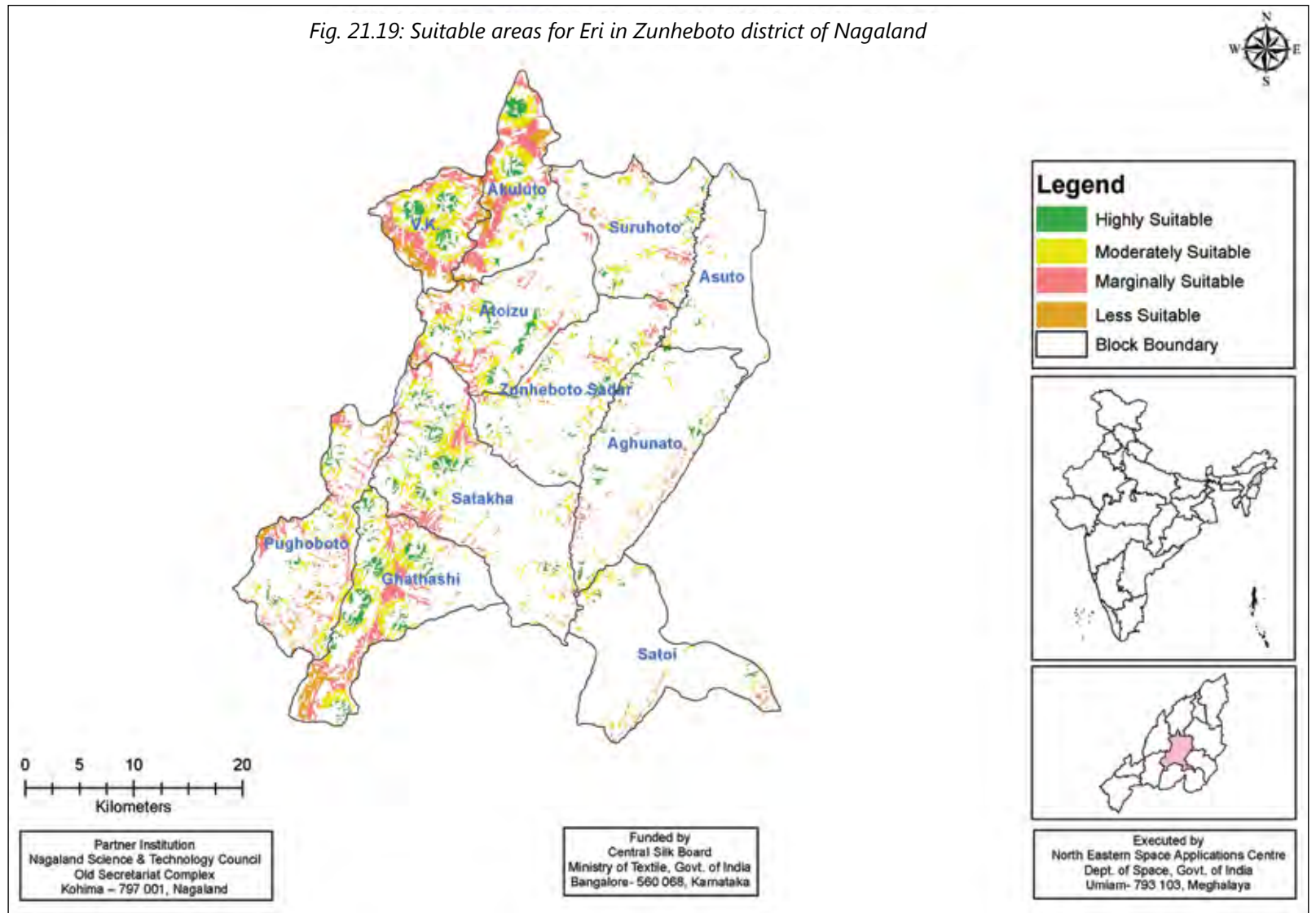
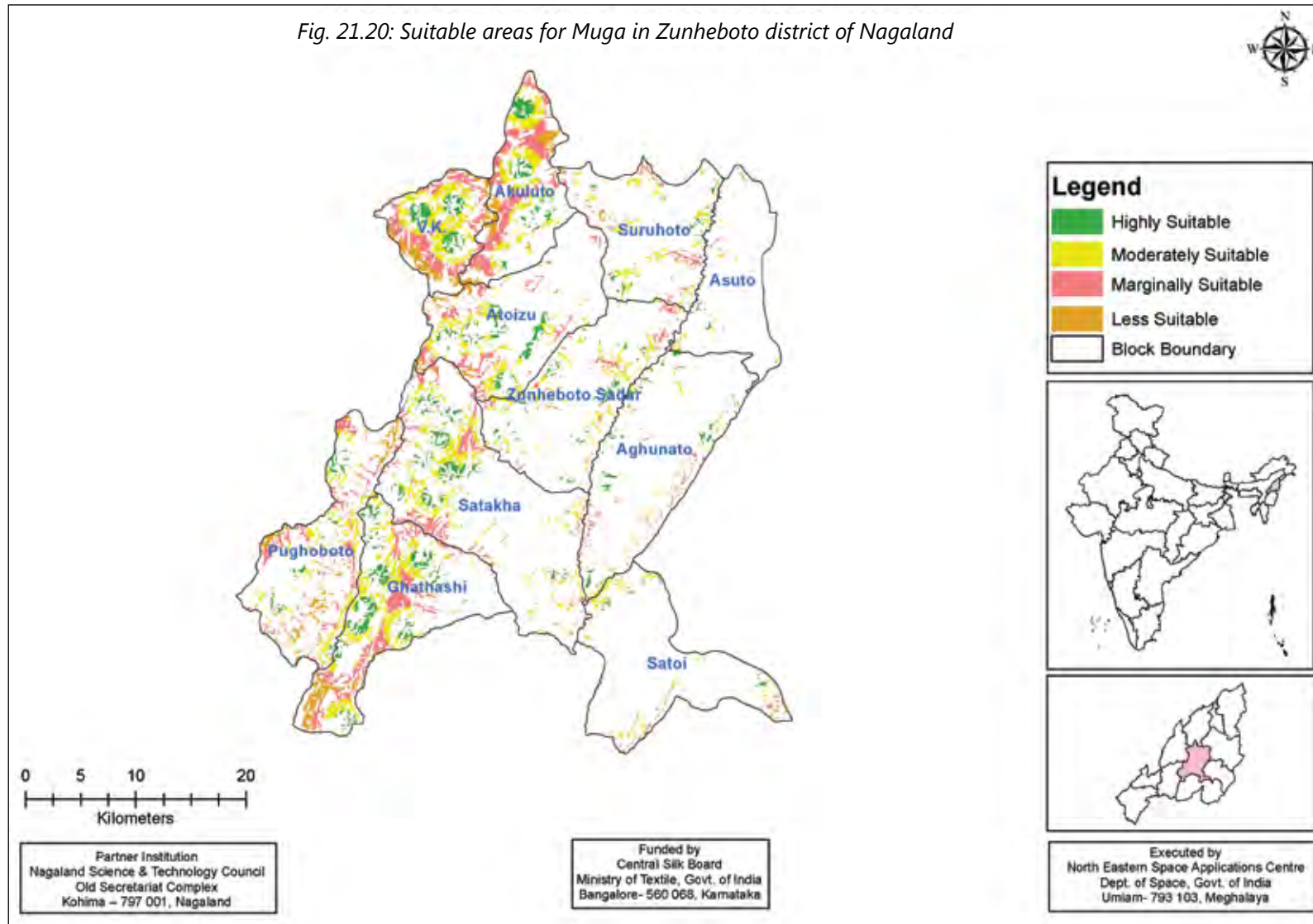


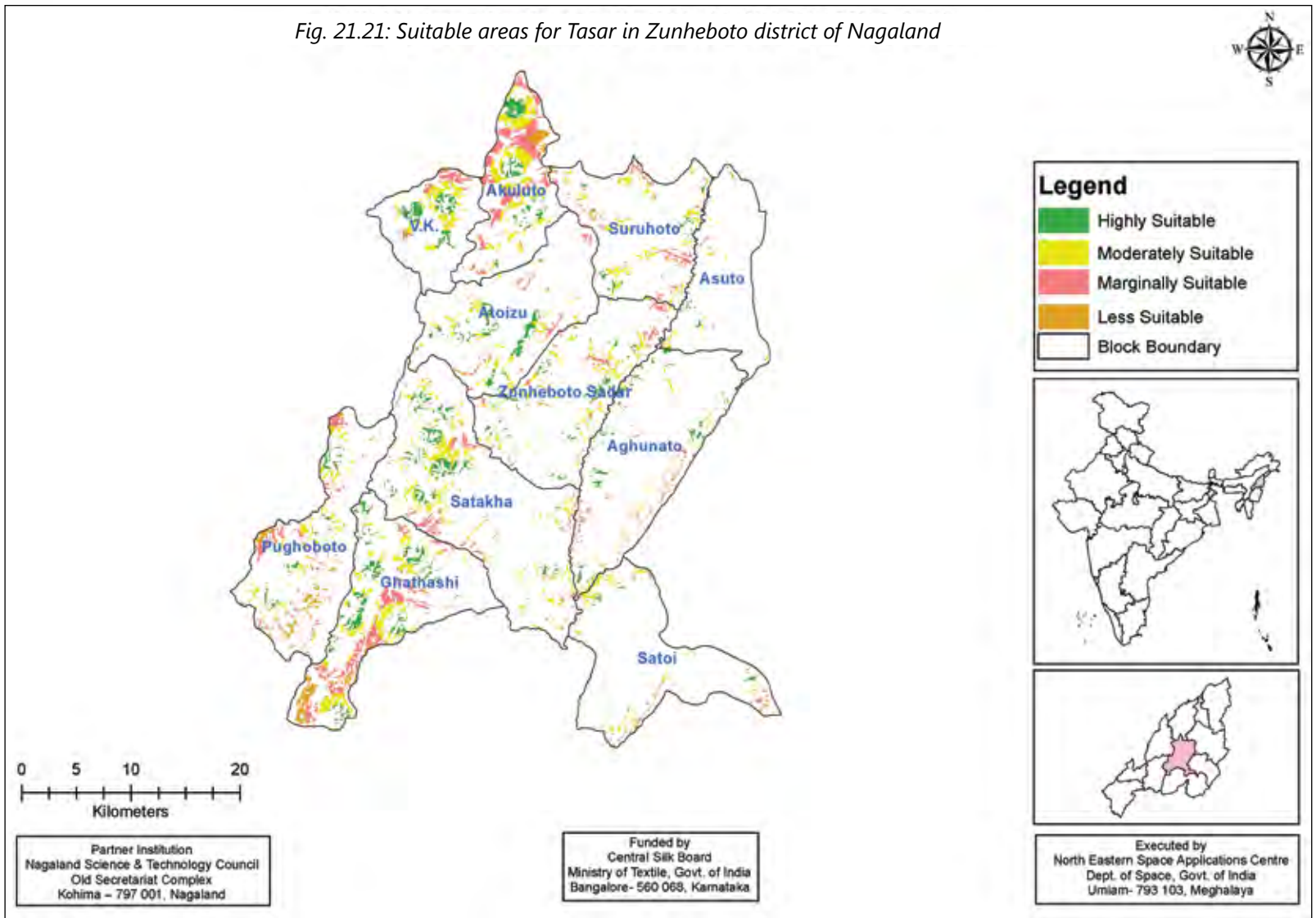
Fig. 21.20: Suitable areas for Muga in Zunheboto district of Nagaland



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Fig. 21.21: Suitable areas for Tasar in Zunheboto district of Nagaland



## ODISHA

Odisha is situated in the eastern part of the country with its capital at Bhubaneswar. It is surrounded by West Bengal to the north-east and in the east, Jharkhand to the north, Chattisgarh to the west and north-west and Andhra Pradesh to the south. Covering an area of 1,55,820 km<sup>2</sup> it extends from 17.49°N latitude to 22.34°N latitude and from 81.27°E longitude to 87.29°E longitude. Odisha's topography comprises fertile plains along the coast and forested highlands towards the interior.

Sericulture is one of the important activities in rural and semi-rural sectors in the state. It has emerged as a highly employment oriented industry which is playing an important role in poverty alleviation. Since the demand for silk fabrics among the urban as well as rural people has increased at the rate of 7 per cent per year, the marginal farmers as well as the unemployed youths have taken up this industry at a large scale to bring up a suitable production of mulberry silk.

Mapping and identification of potential areas for development of silkworm food plants (mulberry and non-mulberry) in 4 selected districts has been taken up on a scale of 1:50,000. Keonjhar, Mayurbhanja, Deogarh and Gajapati districts are covered under this study.

### Deogarh

Deogarh District, also known as Deogarh District, is located in the northern part of the state. Deogarh is lying between 21° 31' 53" N latitude and 84° 43' 2" E longitude with Deogarh as the district headquarters. The total Geographical area is 2781.66 Sq km.

### Gajapati

This district is lying between 18.46 degree North to 19.39 degree North Latitude and 83.48 degree East to 84.00 degree East Longitude. The area is bounded by Andhra Pradesh towards South, Ganjam district on the East, Rayagada district on the West, Ganjam and Phulbani districts on the North. Total geographical area is 3,850 Sq. km.

### Keonjhar

The District is bounded by Mayurbhanj District and Bhadrak District to the east, Jajpur District to the south, Dhenkanal District and Sundargarh District to the west and West Singhbhum district of Jharkhand State to the north. Covering a geographical area of 8240 sq kms, the Keonjhar District lies between 21° 1' N to 22° 10' N latitude and 85° 11' E to 86° 22' E longitude.

## Mayurbhanj

Mayurbhanj is a land-locked district with a total geographical area of 10,418 Sq.Km. and is situated in the Northern boundary of the state with district Head quarters at Baripada. The district lies between 21 16' and 22 34' North latitude and 85 40' and 87 11' East longitudes. The district is bounded in the North East by Midnapore district of West Benagal, Singbhum district of Jharkhand in the North West, Balasore district in the South East and by Keonjhar district in the South West.

Tables 23.1-23.2: Suitable areas for Mulberry and Tasar in Deogarh District of Orissa

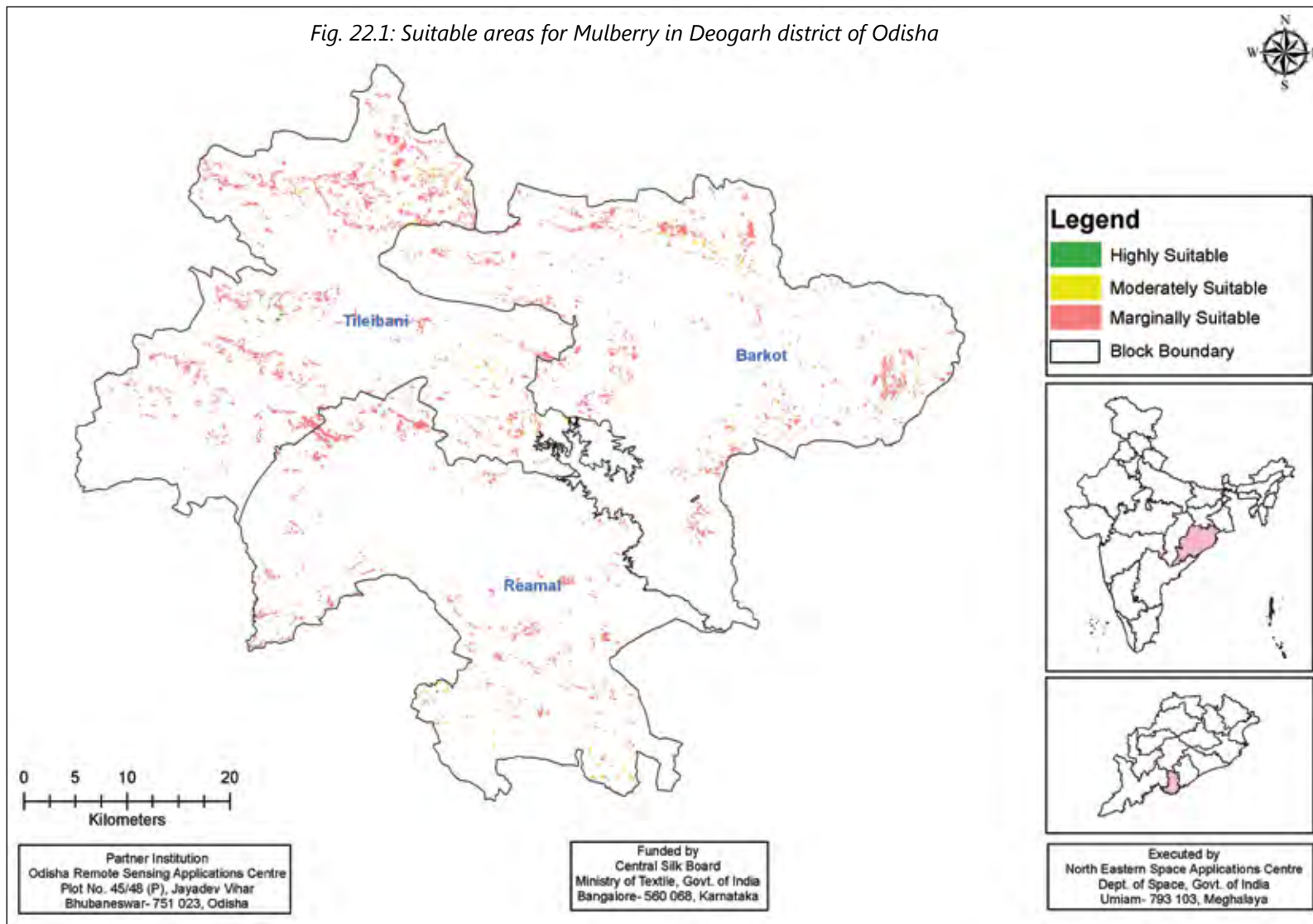
Table 23.1

| Block     | Suitable areas for Mulberry (ha) |          |          |          |
|-----------|----------------------------------|----------|----------|----------|
|           | High                             | Moderate | Marginal | Total    |
| Barkot    | 2.40                             | 204.76   | 3155.06  | 3362.22  |
| Reamal    | 4.84                             | 124.88   | 2340.03  | 2469.75  |
| Tileibani | 37.69                            | 356.90   | 4799.01  | 5193.60  |
| Total     | 44.93                            | 686.54   | 10294.10 | 11025.57 |

Table 23.2

| Block     | Suitable areas for Tasar (ha) |          |          |          |
|-----------|-------------------------------|----------|----------|----------|
|           | High                          | Moderate | Marginal | Total    |
| Barkot    | 18812.00                      | 8642.53  | 3565.14  | 31019.67 |
| Reamal    | 9965.70                       | 7440.09  | 1788.25  | 19194.04 |
| Tileibani | 24391.08                      | 14172.21 | 3972.60  | 42535.89 |
| Total     | 53168.77                      | 30254.83 | 9326.00  | 92749.60 |

Fig. 22.1: Suitable areas for Mulberry in Deogarh district of Odisha

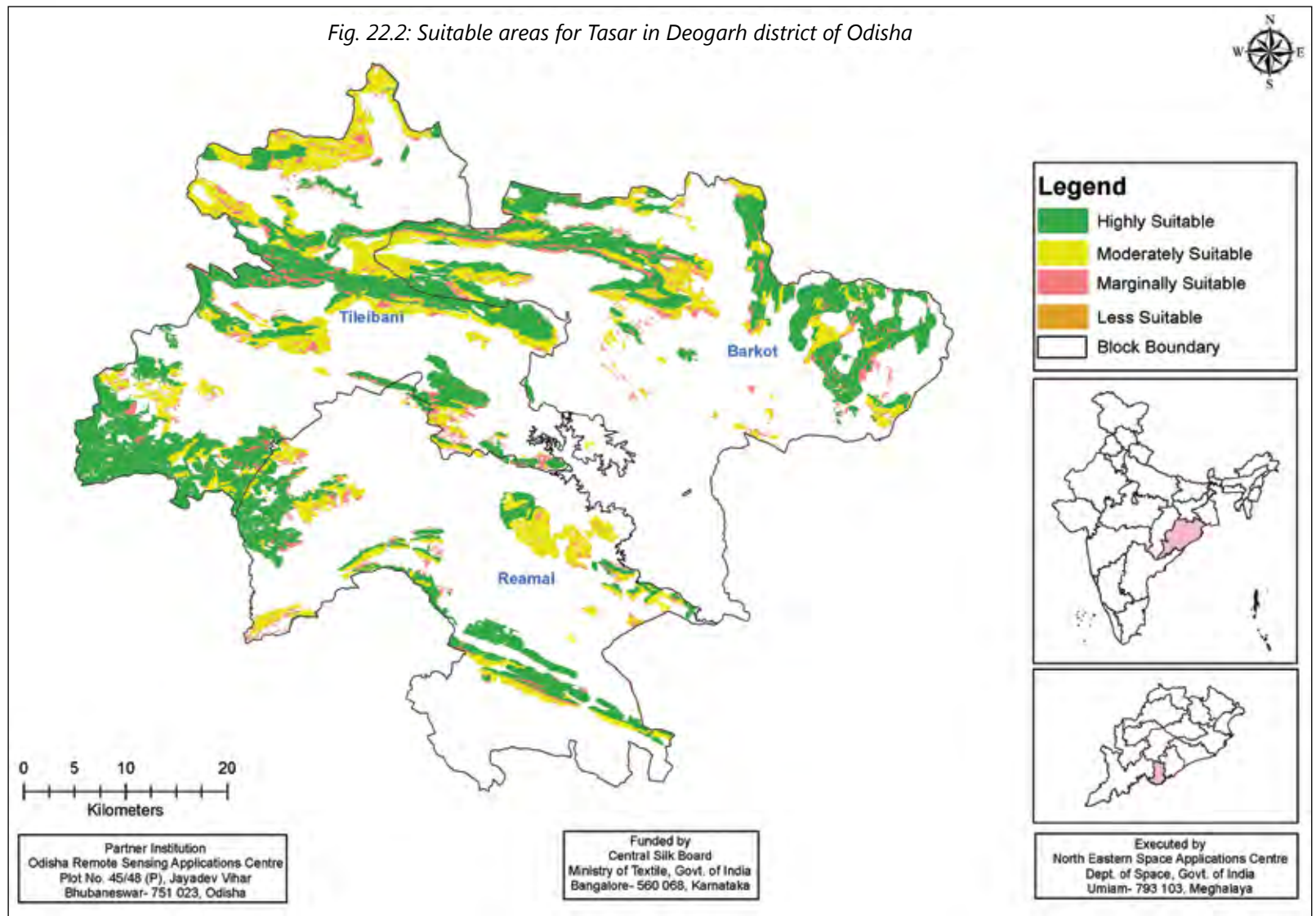


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Fig. 22.2: Suitable areas for Tasar in Deogarh district of Odisha



Tables 23.3-23.4: Suitable areas for Mulberry and Tasar in Gajapati District of Orissa

Table 23.3

| Block          | Suitable areas for Mulberry (ha) |          |          |         |
|----------------|----------------------------------|----------|----------|---------|
|                | High                             | Moderate | Marginal | Total   |
| Gumma          | -                                | 15.09    | 366.38   | 381.47  |
| Kasinagar      | -                                | 1.30     | 143.80   | 145.10  |
| Mohana         | -                                | 96.91    | 595.61   | 692.52  |
| Nuagada        | -                                | 39.82    | 143.55   | 183.36  |
| Paralakhemundi | -                                | -        | 203.22   | 203.22  |
| Patrapur       | -                                | -        | -        | -       |
| R. Udaygiri    | -                                | 13.74    | 120.54   | 134.28  |
| Rayagada       | -                                | 30.04    | 346.53   | 376.56  |
| Total          | -                                | 196.90   | 1919.62  | 2116.52 |

Table 23.4

| Block          | Suitable areas for Tasar (ha) |          |          |          |
|----------------|-------------------------------|----------|----------|----------|
|                | High                          | Moderate | Marginal | Total    |
| Gumma          | 1414.11                       | 2521.94  | 3617.18  | 7553.22  |
| Kasinagar      | 428.68                        | 540.94   | 1132.85  | 2102.46  |
| Mohana         | 2909.04                       | 2458.56  | 8511.75  | 13879.35 |
| Nuagada        | 22.19                         | 161.96   | 133.63   | 317.79   |
| Paralakhemundi | 994.03                        | 1203.71  | 1015.52  | 3213.26  |
| Patrapur       | 5816.69                       | 3075.28  | 2237.35  | 11129.31 |
| R. Udaygiri    | 1386.44                       | 737.29   | 3493.26  | 5616.99  |
| Rayagada       | 1705.54                       | 2526.46  | 2531.69  | 6763.70  |
| Total          | 14676.71                      | 13226.15 | 22673.22 | 50576.08 |

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Fig. 22.3: Suitable areas for Mulberry in Gajapati district of Odisha

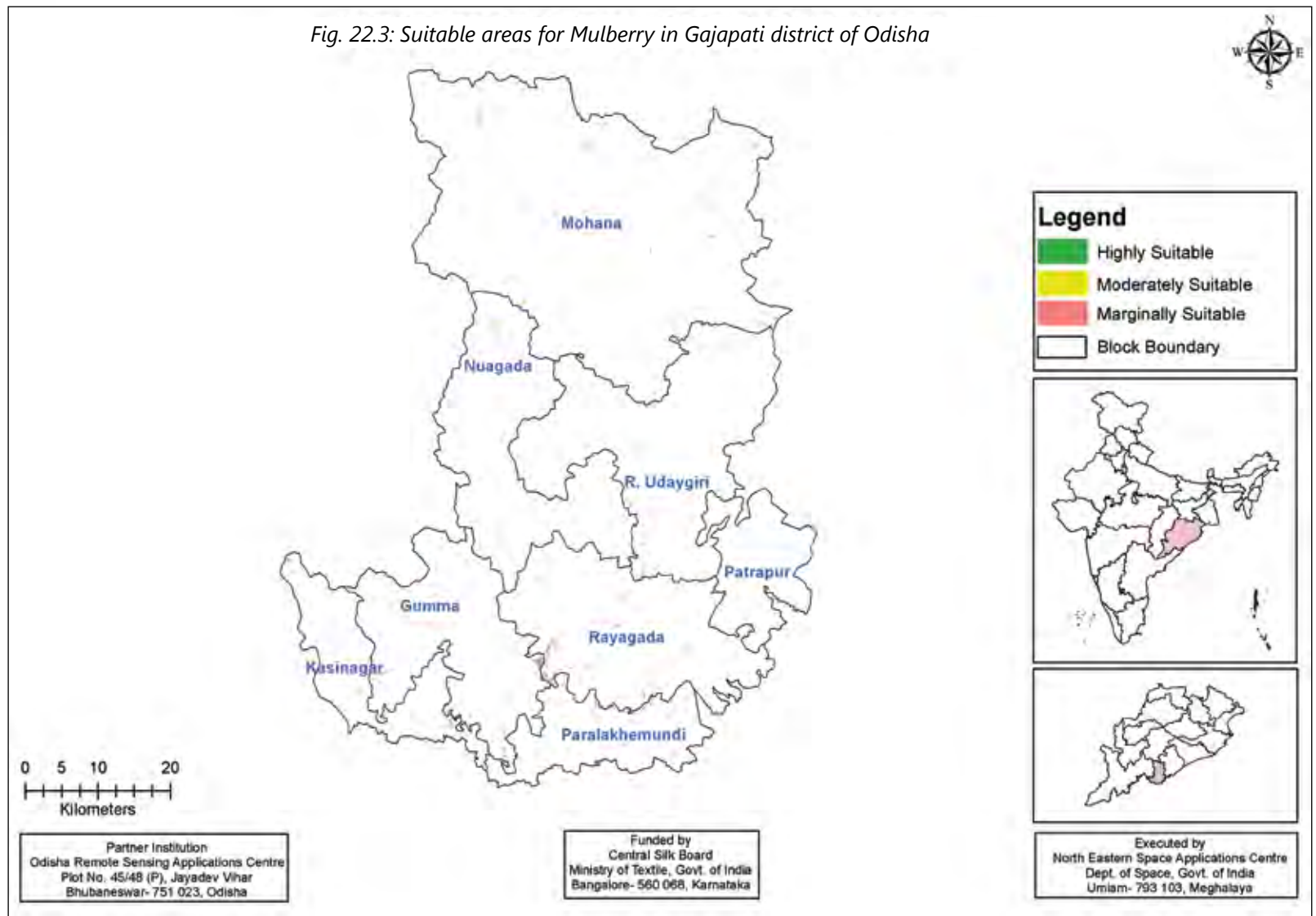
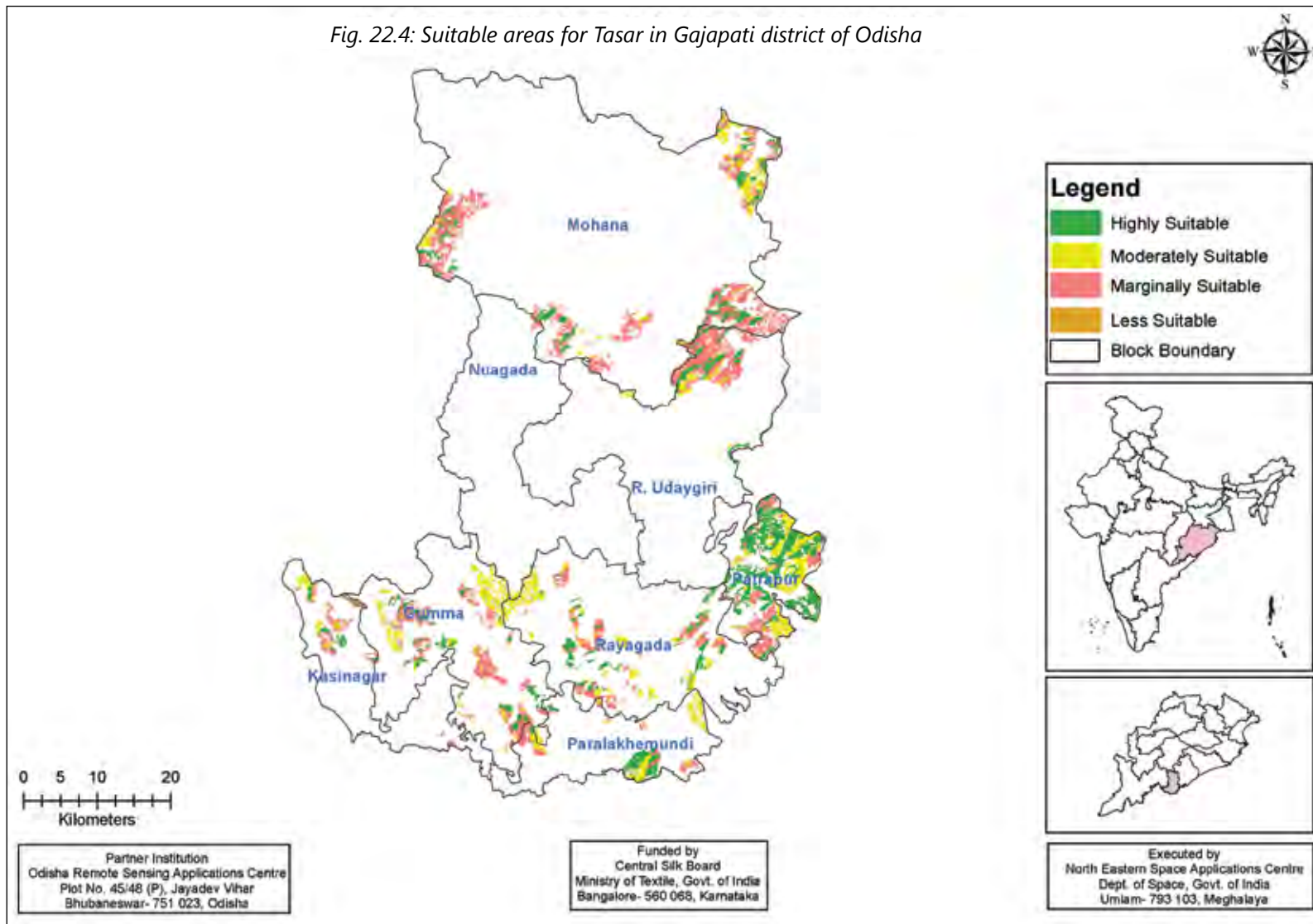


Fig. 22.4: Suitable areas for Tasar in Gajapati district of Odisha



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Tables 23.5-23.6: Suitable areas for Mulberry & Tassar in Keonjhar District of Orissa

Table 23.5

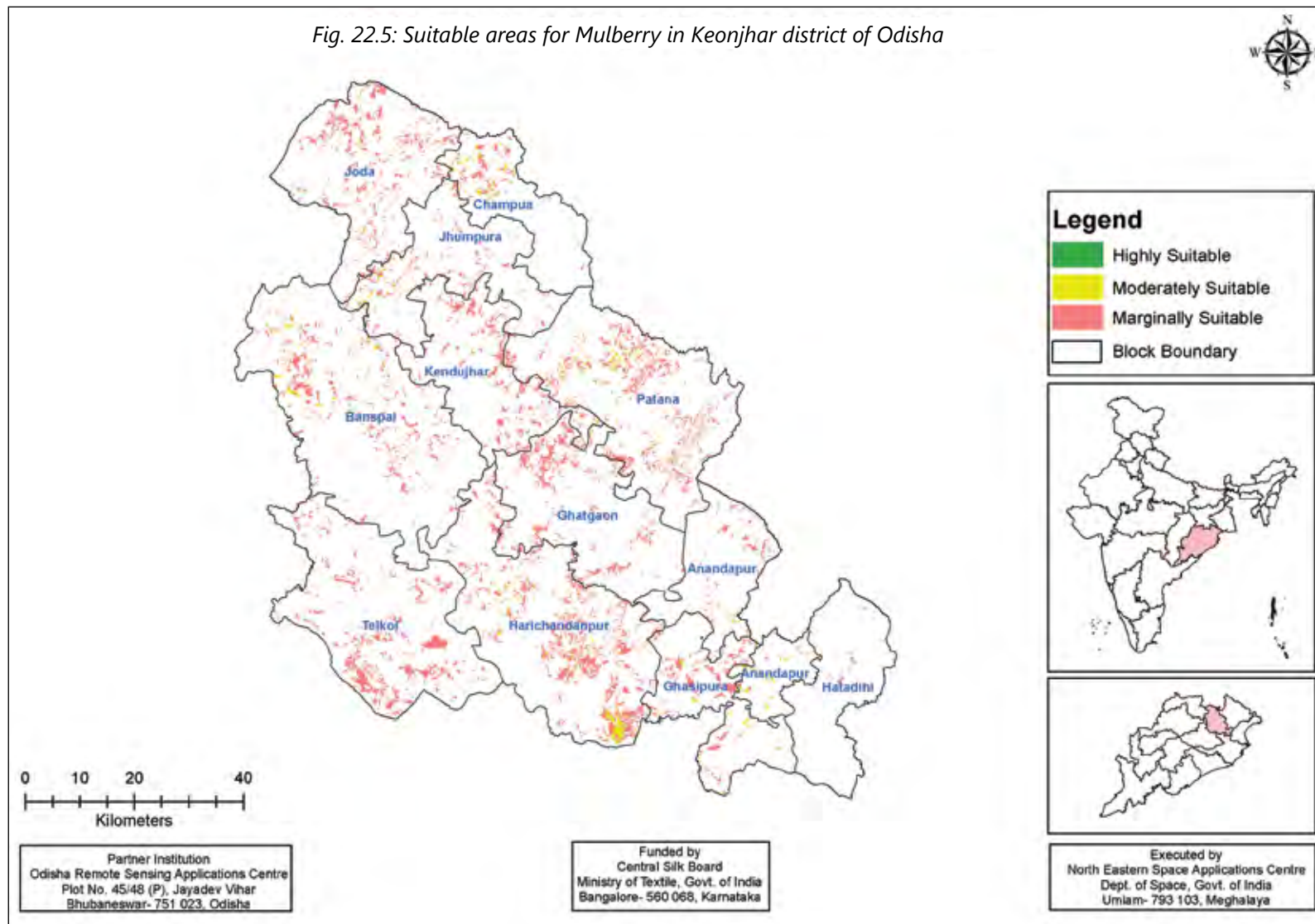
| Block          | Suitable areas for Mulberry (ha) |          |          |          |
|----------------|----------------------------------|----------|----------|----------|
|                | High                             | Moderate | Marginal | Total    |
| Anandapur      | -                                | 628.16   | 1566.63  | 2194.79  |
| Banspal        | -                                | 818.40   | 5969.28  | 6787.67  |
| Champua        | -                                | 679.41   | 1509.27  | 2188.68  |
| Ghasipura      | -                                | 448.35   | 3094.14  | 3542.49  |
| Ghatgaon       | -                                | 67.31    | 5375.01  | 5442.33  |
| Harichandanpur | -                                | 1679.46  | 10967.41 | 12646.88 |
| Hatadihi       | -                                | 24.08    | 319.41   | 343.50   |
| Jhumpura       | -                                | 381.86   | 2335.31  | 2717.17  |
| Joda           | -                                | 241.85   | 5873.04  | 6114.88  |
| Kendujhar      | 17.08                            | 124.11   | 4517.99  | 4659.19  |
| Patana         | 5.80                             | 532.59   | 3404.37  | 3942.76  |
| Telkoi         | -                                | 159.71   | 7533.51  | 7693.22  |
| Total          | 22.88                            | 5785.30  | 52465.38 | 58273.56 |

Table 23.6

| Block          | Suitable areas for Tassar (ha) |          |          |           |
|----------------|--------------------------------|----------|----------|-----------|
|                | High                           | Moderate | Marginal | Total     |
| Anandapur      | 7078.19                        | 5873.06  | 5311.01  | 18262.25  |
| Banspal        | 2022.92                        | 3843.27  | 4409.89  | 10276.08  |
| Champua        | 352.91                         | 777.69   | 1386.70  | 2517.29   |
| Ghasipura      | 2029.40                        | 1389.36  | 4099.95  | 7518.71   |
| Ghatgaon       | 2659.07                        | 8497.89  | 9238.16  | 20395.13  |
| Harichandanpur | 12053.21                       | 11707.17 | 17933.21 | 41693.60  |
| Hatadihi       | 2074.06                        | 3414.19  | 3969.45  | 9457.70   |
| Jhumpura       | 767.97                         | 2122.42  | 2001.75  | 4892.14   |
| Joda           | 5644.78                        | 8882.00  | 6422.49  | 20949.28  |
| Kendujhar      | 8.07                           | 1619.27  | 4708.27  | 6335.61   |
| Patana         | 2776.42                        | 2906.35  | 1885.29  | 7568.06   |
| Telkoi         | 14542.28                       | 11218.08 | 9727.24  | 35487.61  |
| Total          | 52009.28                       | 62250.75 | 71093.42 | 185353.45 |



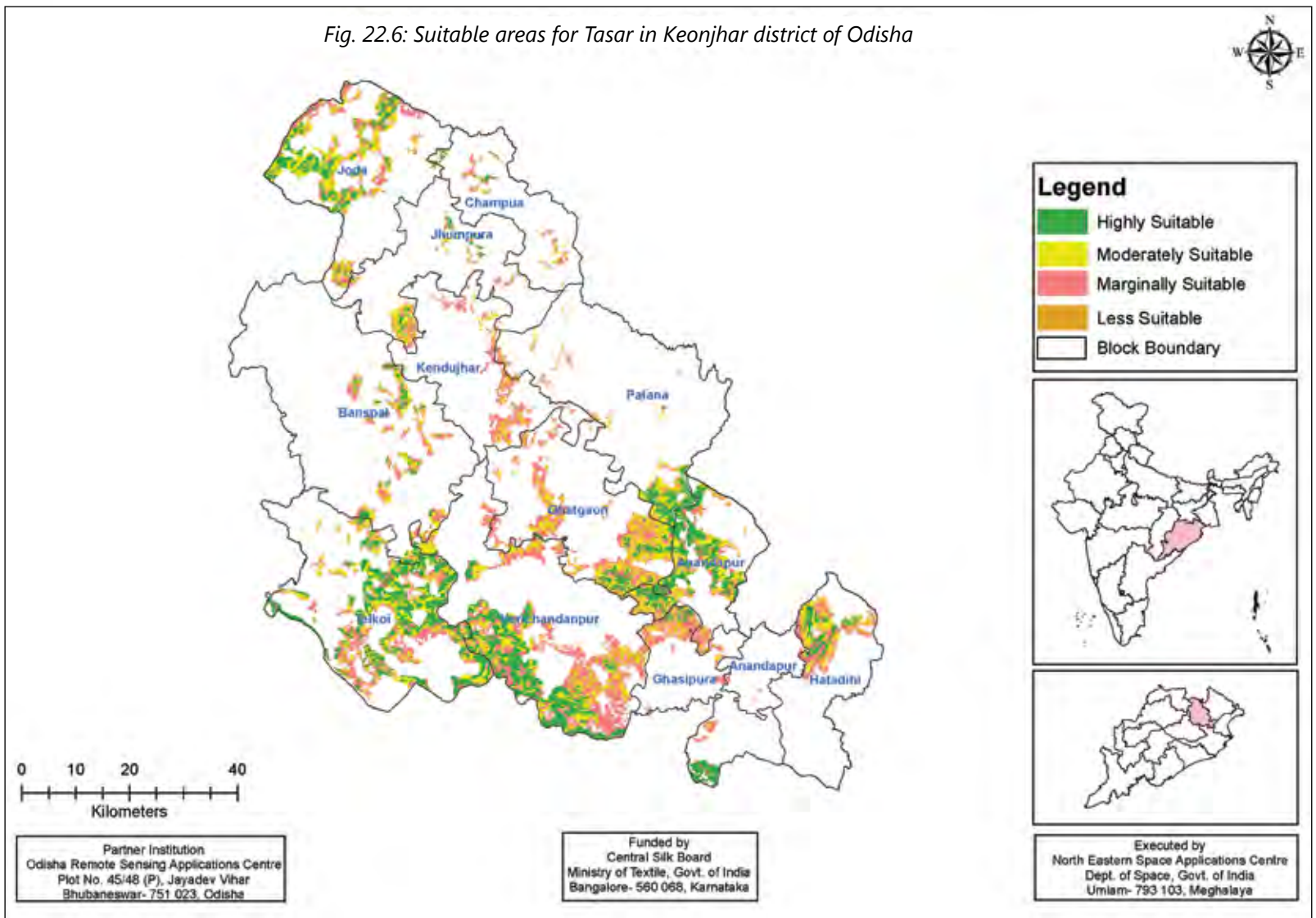
Fig. 22.5: Suitable areas for Mulberry in Keonjhar district of Odisha



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Fig. 22.6: Suitable areas for *Tasar* in Keonjhar district of Odisha



Tables 23.7-23.8: Suitable areas for Mulberry & Tasar in Mayurbhanj district of Orissa

Table 23.7

| Block           | Suitable areas for Mulberry (ha) |          |          |          |
|-----------------|----------------------------------|----------|----------|----------|
|                 | High                             | Moderate | Marginal | Total    |
| Bahalda         | -                                | 45.04    | 171.67   | 216.71   |
| Bangiriposhi    | -                                | 99.33    | 1055.26  | 1154.59  |
| Baripada        | -                                | -        | 1286.80  | 1286.80  |
| Barsahi         | 43.45                            | 115.05   | 665.46   | 823.96   |
| Betanati        | 122.81                           | 36.45    | 228.85   | 388.10   |
| Bijatola        | -                                | 73.88    | 662.51   | 736.40   |
| Bisoi           | -                                | 31.78    | 560.13   | 591.91   |
| Gopabandhunagar | 1.51                             | 89.04    | 272.95   | 363.51   |
| Jamda           | -                                | 10.87    | 194.77   | 205.63   |
| Jashipur        | -                                | 178.91   | 1448.53  | 1627.44  |
| Kaptipada       | -                                | 24.69    | 5361.70  | 5386.39  |
| Karanjia        | -                                | 26.47    | 1074.93  | 1101.40  |
| Khunta          | -                                | 149.25   | 442.04   | 591.29   |
| Kuliana         | -                                | 81.39    | 823.57   | 904.96   |
| Kusumi          | -                                | 68.55    | 740.92   | 809.47   |
| Muruda          | -                                | 25.10    | 276.23   | 301.34   |
| Rairangpur      | -                                | 27.73    | 370.21   | 397.94   |
| Raruan          | -                                | 1.09     | 403.88   | 404.97   |
| Rasagovindpur   | -                                | -        | 77.40    | 77.40    |
| Saraskana       | -                                | 48.94    | 879.06   | 928.00   |
| Shamakhunta     | -                                | 0.36     | 1148.03  | 1148.39  |
| Sukruli         | -                                | -        | 37.66    | 37.66    |
| Suliapada       | -                                | 52.43    | 675.28   | 727.71   |
| Thakurmunda     | 1.45                             | 40.68    | 4162.69  | 4204.83  |
| Tiring          | -                                | 53.67    | 120.76   | 174.42   |
| Udala           | 1.13                             | 26.81    | 396.33   | 424.28   |
| Total           | 170.35                           | 1307.51  | 23537.63 | 25015.48 |

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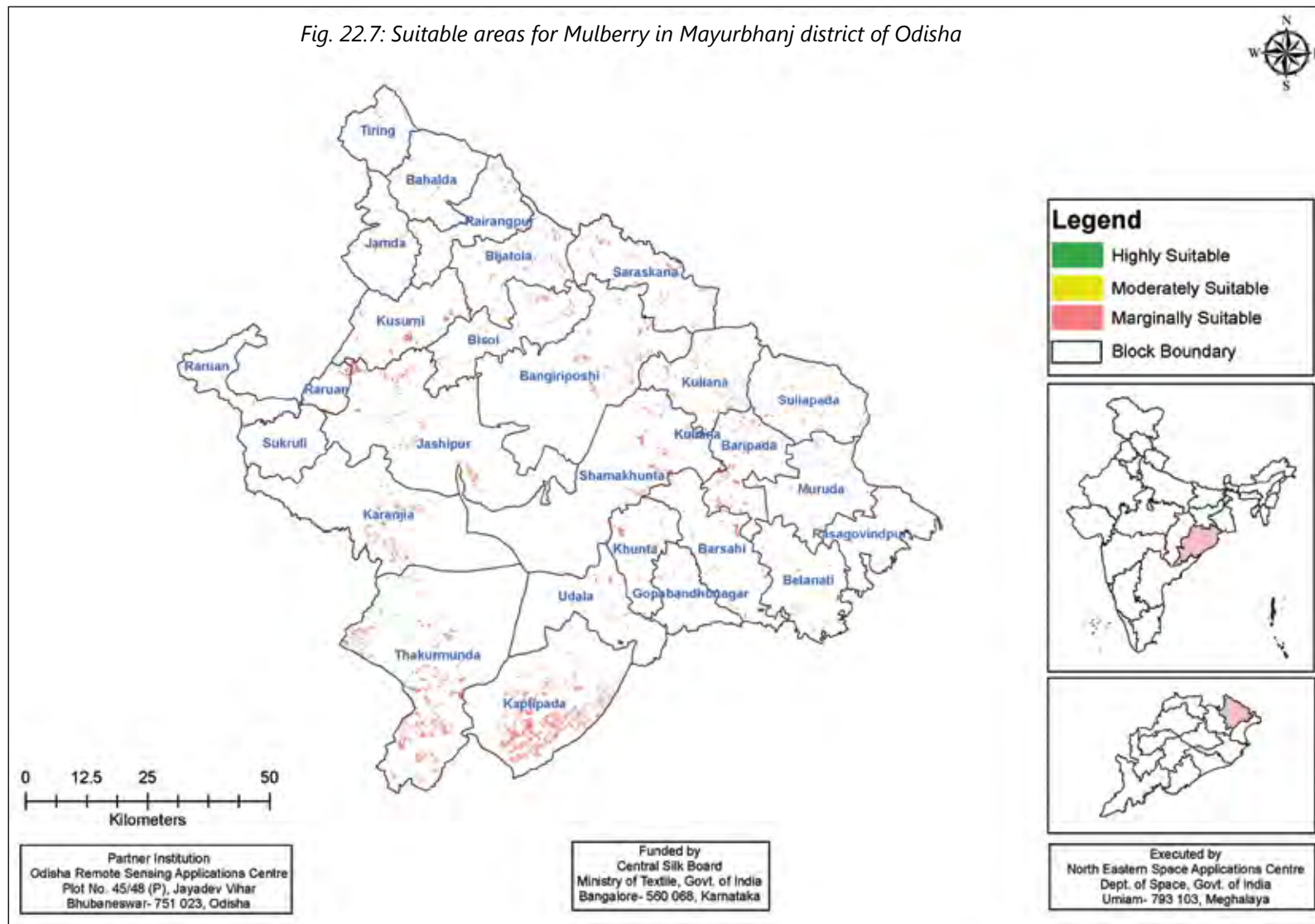


Table 23.8

| Block           | Suitable areas for Tasar(ha) |          |          |           |
|-----------------|------------------------------|----------|----------|-----------|
|                 | High                         | Moderate | Marginal | Total     |
| Bahalda         | 1445.74                      | 1591.11  | 1316.15  | 4353.00   |
| Bangiriposhi    | 39970.75                     | 5024.14  | 2821.96  | 47816.85  |
| Baripada        | 1029.16                      | 867.27   | 499.83   | 2396.26   |
| Barsahi         | 38.20                        | 433.11   | 1492.50  | 1963.81   |
| Betanati        | 48.00                        | 358.75   | 375.01   | 781.75    |
| Bijatola        | 2873.32                      | 4105.07  | 4269.77  | 11248.16  |
| Bisoi           | 3002.94                      | 1451.98  | 1446.58  | 5901.50   |
| Gopabandhunagar | 26.57                        | 565.02   | 874.85   | 1466.43   |
| Jamda           | 494.44                       | 1042.02  | 583.63   | 2120.09   |
| Jashipur        | 40369.29                     | 4202.12  | 2759.13  | 47330.54  |
| Kaptipada       | 6348.62                      | 1184.47  | 1983.76  | 9516.86   |
| Karanjia        | 29471.58                     | 1968.03  | 1776.98  | 33216.59  |
| Khunta          | 1.55                         | 179.77   | 92.21    | 273.53    |
| Kuliana         | 468.00                       | 1112.26  | 159.20   | 1739.46   |
| Kusumi          | 800.67                       | 872.15   | 580.42   | 2253.24   |
| Muruda          | 1058.19                      | 48.97    | 66.38    | 1173.54   |
| Rairangpur      | 3039.43                      | 2396.96  | 1882.36  | 7318.75   |
| Raruan          | 273.13                       | 347.52   | 1108.97  | 1729.61   |
| Rasagovindpur   | 931.23                       | 1208.20  | 737.78   | 2877.21   |
| Saraskana       | 277.57                       | 2382.53  | 2509.97  | 5170.06   |
| Shamakhunta     | 50710.47                     | 5703.22  | 1971.62  | 58385.30  |
| Sukruli         | 606.81                       | 521.51   | 513.61   | 1641.93   |
| Suliapada       | 917.47                       | 3064.64  | 1926.12  | 5908.23   |
| Thakurmunda     | 41646.31                     | 5270.76  | 3350.32  | 50267.38  |
| Tiring          | 173.18                       | 325.80   | 329.72   | 828.69    |
| Udala           | 13757.35                     | 1050.10  | 236.36   | 15043.81  |
| Total           | 239779.96                    | 47277.47 | 35665.20 | 322722.62 |



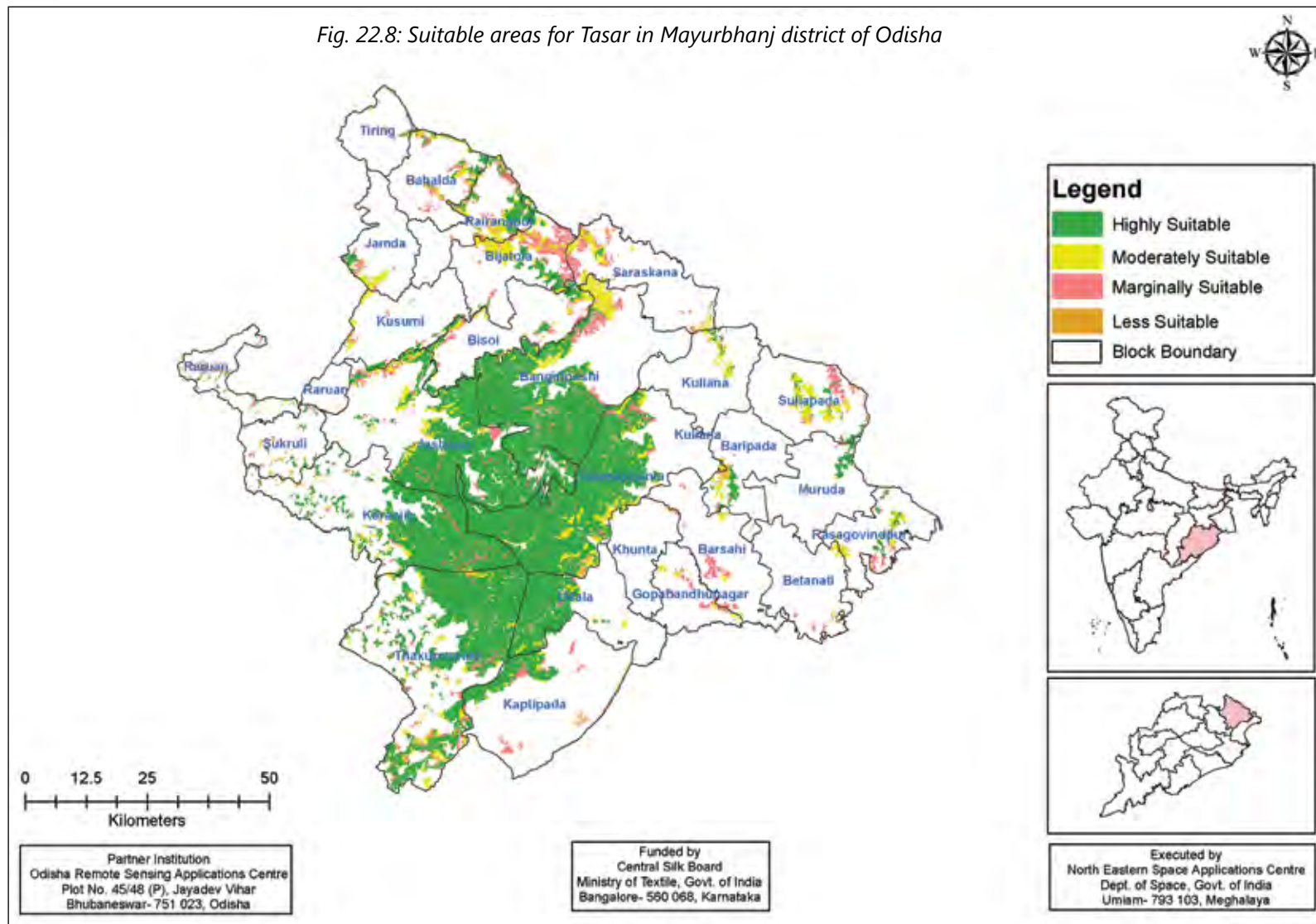
Fig. 22.7: Suitable areas for Mulberry in Mayurbhanj district of Odisha



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Fig. 22.8: Suitable areas for *Tasar* in Mayurbhanj district of Odisha



## PUNJAB

Punjab is located in northwestern India, and has an area of 50,362 km<sup>2</sup>. It extends from the latitudes 29.30° North to 32.32° North and longitudes 73.55° East to 76.50° East. The state is bordered by the Indian Himachal Pradesh to the east, Haryana to the south and southeast and Rajasthan to the southwest as well as the Pakistani province of Punjab to the west. It is also bounded to the north by the state of Jammu and Kashmir. The state capital is located in Chandigarh, which is a Union Territory and also the capital of the neighboring state of Haryana.

Most of the Punjab lies in a fertile plain, alluvial plain with many rivers and an extensive irrigation canal system. Agriculture is the largest industry in Punjab; it is the largest single producer of wheat in India. The southwest of the state is semiarid, eventually merging into the Thar Desert. Punjab's climate is characterised by extreme hot and extreme cold conditions. The northeast area lying near the foothills of the Himalayas receives heavy rainfall, whereas the area lying further south and west receives less rainfall and experiences higher temperatures.

In Punjab, Sericulture industry could not flourish well in the past because of the poor return and cultivation of other remunerative crops like wheat, rice, maize, cotton, sugarcane etc. Secondly, due to religious sentiments, most of the people hesitate or rather resist to rear silk worms. All these lead to poor response to this industry. Despite these constraints, the government is making efforts to promote sericulture in the State by providing schemes and grants and other facilities based on information received from Directorate of Horticulture. Through Government Chawki Rearing Centres, silk worm seeds are hatched and then after 2nd moult of larva, these are distributed among the rearers. Rearers use Mulberry shoot rearing on rearing stand and floor rearing techniques also. Pests like stem borer, white ant and beetles are common in the state. Two districts viz., Hoshiarpur and Nawan shahar were selected for mapping of potential areas for expanding sericulture activities.

### Hoshiarpur

Hoshiarpur district is located in the north-east part of the State. It falls in the Jalandhar Revenue Division and is situated in the Bist Doab, Doaba region of the State. The district is submountainous and stretches of river Beas in the north-west. It lies between north latitude 30° 9' and 32° 05' and east longitude 75° 32' and 76° 12'. It shares common boundaries with Kangra and Una districts of Himachal Pradesh in the north east, Jalandhar and Kapurthala districts (interspersed) in south-west and Gurdaspur district in the north-west. It has a total geographic area of 3386 Sq. Kms.

## Nawanshahr

Nawanshahr district, which has now renamed as Shaheed Bhagat Singh Nagar district consists of two Sub -Divisions viz., Nawanshahr and Balachaur. It situated in 31.80 N and 76.70 E part of Punjab on the right bank of mighty river Sutlej. The district is surrounded by four districts. The west border of the district touches Jalandhar, east border touches with RoopNagar (Ropar) district, the northern border of the district meets with district Hoshiarpur and in south it touches with Ludhiana (known as the Manchester of India) and Kapurthala District. Nawanshahr District occupies an area of approximately 1258 Sq. Kms.

Tables 24.1-24.2: Suitable Areas for Mulberry in Punjab

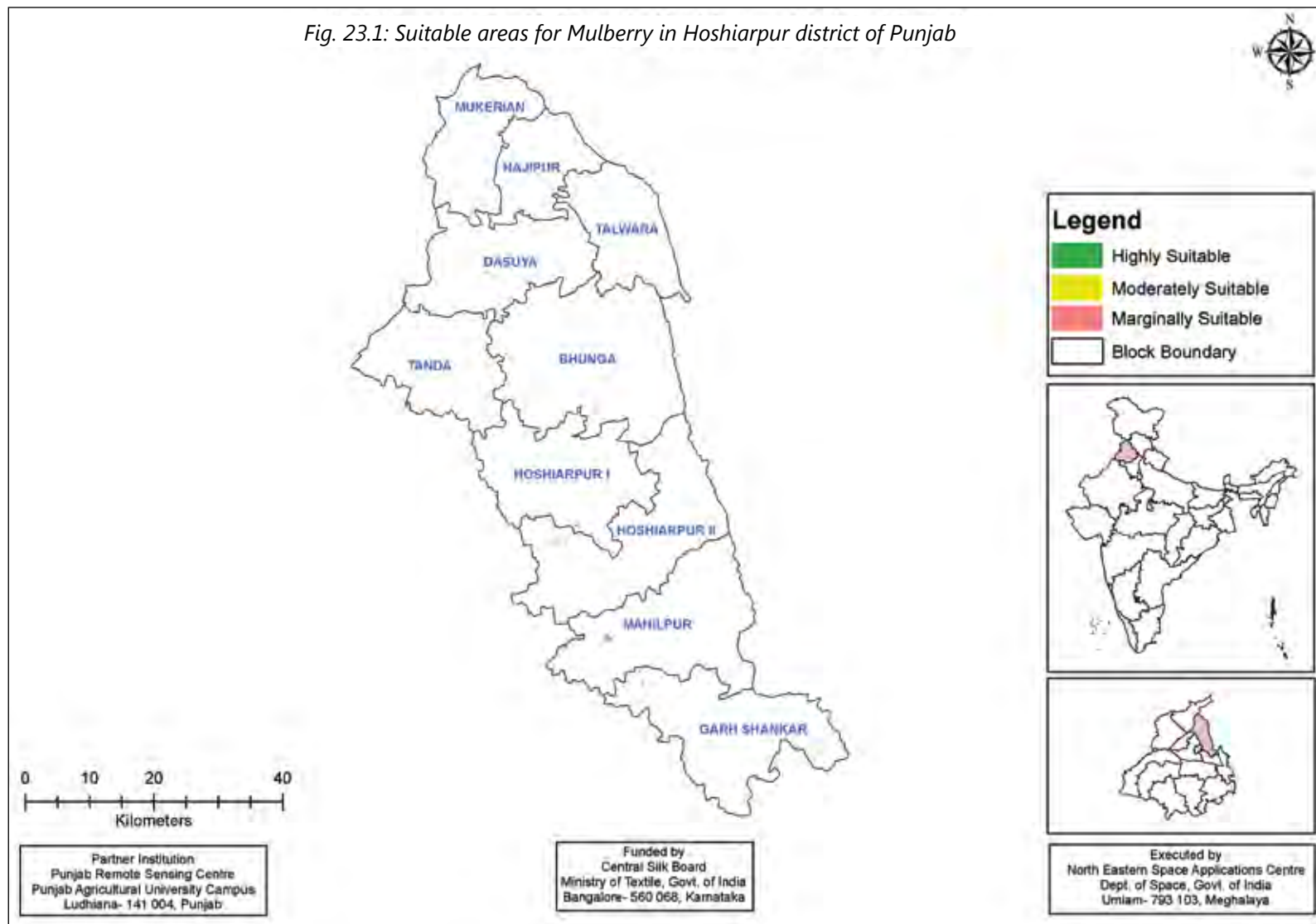
Table 24.1

| Block         | Suitable Areas for Mulberry in Hoshiarpur (ha) |          |          |        |
|---------------|--|----------|----------|--------|
|               | High   | Moderate | Marginal | Total  |
| Bhunga        | -  | -        | 38.72    | 38.72  |
| Dasuya        | -  | -        | 71.70    | 71.70  |
| Garh Shankar  | -  | -        | 61.38    | 61.38  |
| hajipur       | -  | -        | 3.19     | 3.19   |
| Hoshiarpur I  | -  | -        | 50.26    | 50.26  |
| Hoshiarpur II | -  | -        | 63.44    | 63.44  |
| Mahilpur      | -  | -        | 108.66   | 108.66 |
| Mukerian      | -  | -        | 4.84     | 4.84   |
| Talwara       | -  | -        | -        | -      |
| Tanda         | -  | -        | 34.26    | 34.26  |
| Total         | -  | -        | 436.44   | 436.44 |

Table 24.2

| Block       | Suitable Areas for Mulberry in Nawanshehar (ha) |          |          |       |
|-------------|---|----------|----------|-------|
|             | High  | Moderate | Marginal | Total |
| Aur         | -   | -        | 25.97    | 25.97 |
| Balachaur   | -   | -        | 35.36    | 35.36 |
| Nawanshehar | -   | -        | 12.53    | 12.53 |
| Saroya      | -   | -        | 10.47    | 10.47 |
| Total       | -   | -        | 84.34    | 84.34 |

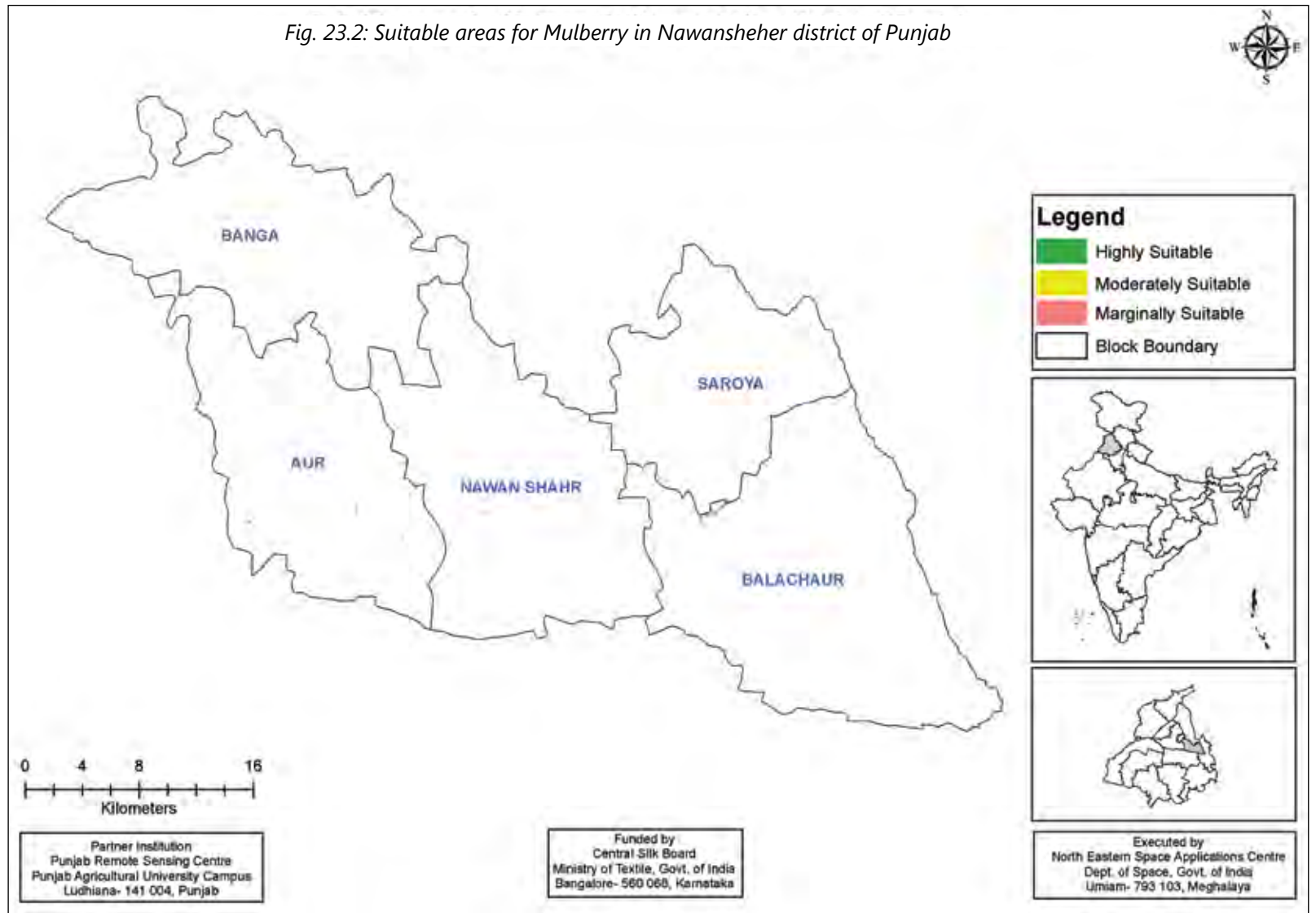
Fig. 23.1: Suitable areas for Mulberry in Hoshiarpur district of Punjab



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Fig. 23.2: Suitable areas for Mulberry in Nawansheher district of Punjab



## SIKKIM

Sikkim, the tiny Himalayan state with a total geographical area of 7098 sq.km, comprised of four districts viz. East, North, South and West having their headquarters in Gangtok, Mangan, Namchi and Geyzing respectively. Gangtok, the capital of Sikkim is located in the East District. Most of the population of Sikkim lives in the East and South Districts. The rivers and mountains are the main physical features that define the boundaries of the state of Sikkim with its neighbouring countries. This state is bordered by the Nepal in the west, Bhutan in the east, Tibet in the north and West Bengal in the south. The summit of Kangchenjunga the world's third-highest peak is the state's highest point, situated on the border between Sikkim and Nepal.

The tropical and tundra climate is found in Sikkim. Some of the parts in the northern, eastern and western borders of Sikkim are covered with snow almost throughout the year because of high altitudes. For the most part, the land is unfit for agriculture because of the rocky, precipitous slopes. However, some hill slopes have been converted into terrace farms.

Sikkim is bestowed upon with congenial climate for the sericulture and enjoys practicing three types of sericulture viz. mulberry, eri and muga culture in parallel. State Directorate of sericulture is making consistent efforts in exploring sericulture potential through extension and developmental activities in potential villages across the state. South Sikkim district was selected for mapping of potential areas for Mulberry, Eri and Muga.

### South Sikkim

South Sikkim, with its district head quarters at Namchi is gifted with tremendous natural beauty. South Sikkim lies at an altitude of 400 to 2000 metres and hence enjoys a temperate climate for most of the year. According to the 2011 census South Sikkim district has a population of 146,742. It is the most industrialised district in the state, owing to the availability of flat land. The district is also famous for its Sikkim Tea, which is grown near Namchi.

South district of Sikkim stands first based on sericulture potentiality and given top most priority in expansion through implementation of CAP. Lands are fertile and productive in agriculture practices and sericulture is no exception to it. Till date, more than fourteen villages are covered comprising four cluster SDCs and practices three types of sericulture as per government statistics.



Table 25: Suitable Areas for Mulberry, Eri and Muga in South Sikkim District of Sikkim (in Ha)

| Suitability Class | Mulberry | Eri   | Muga   |
|-------------------|----------|-------|--------|
| High              | -        | 7.36  | 5.81   |
| Moderate          | 5095.49  | 29.18 | 71.57  |
| Marginal          | 826.77   | 28.00 | 388.51 |
| Total             | 5922.26  | 64.54 | 465.89 |

Fig. 24.1: Suitable areas for Mulberry in South Sikkim district

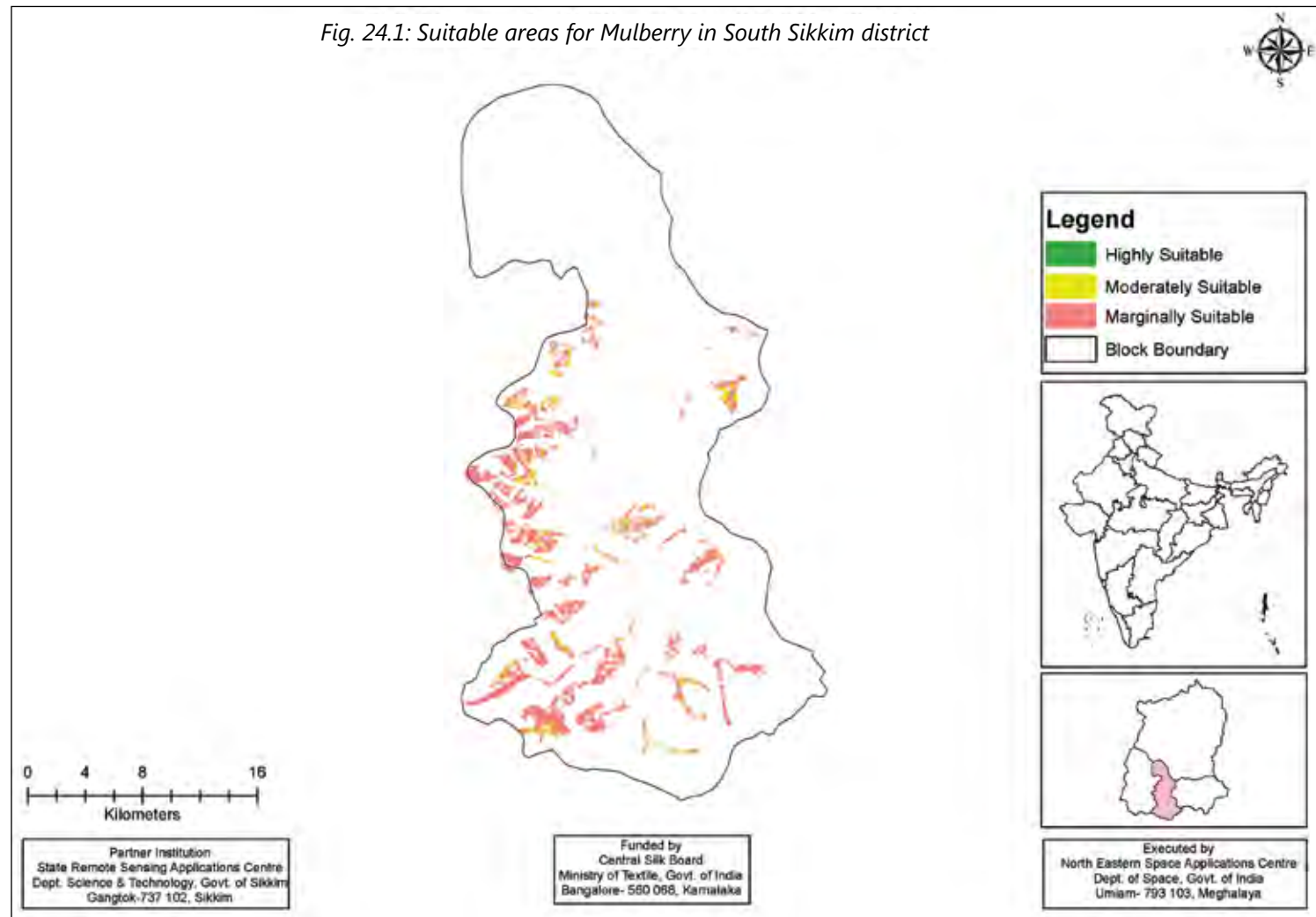
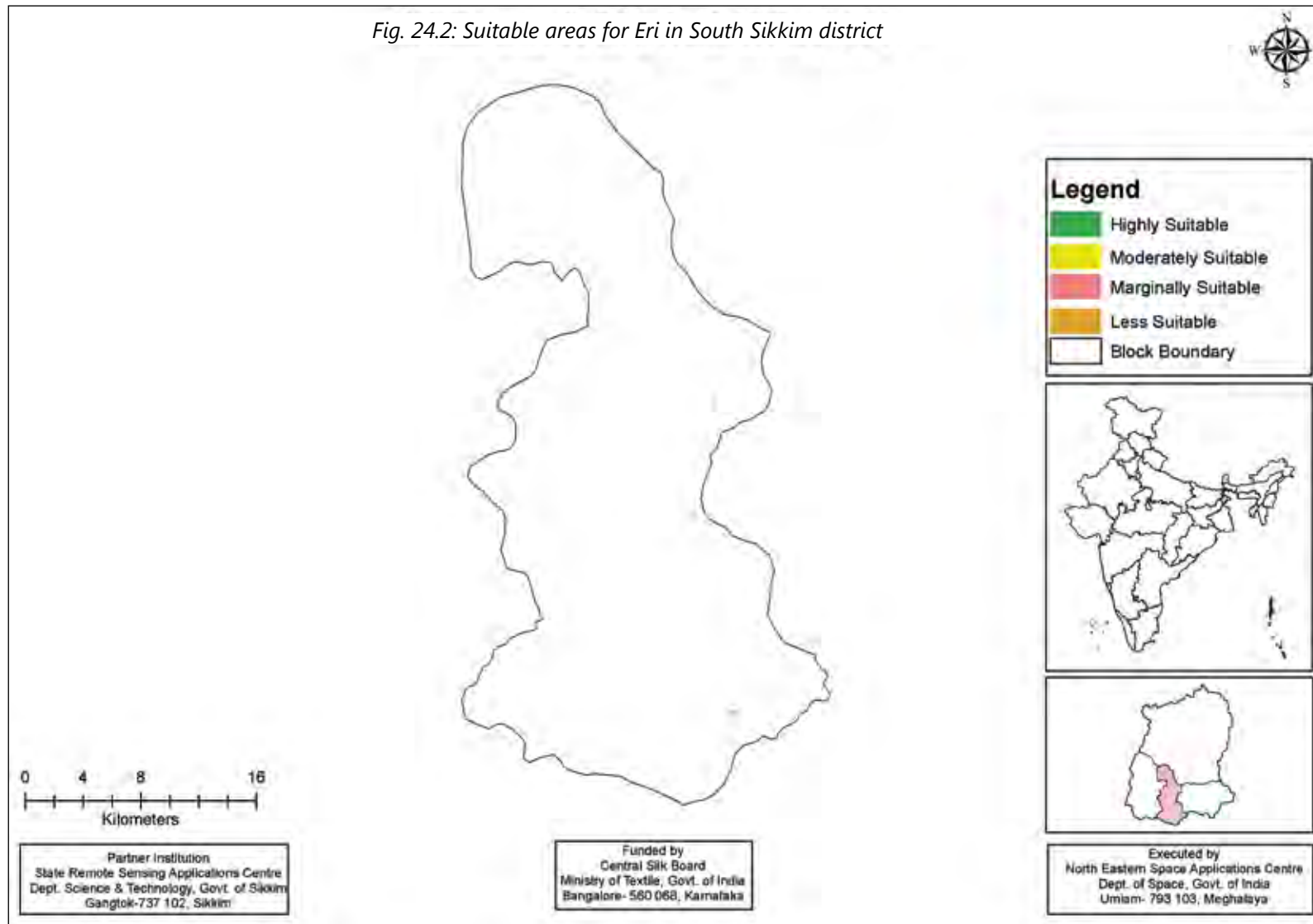


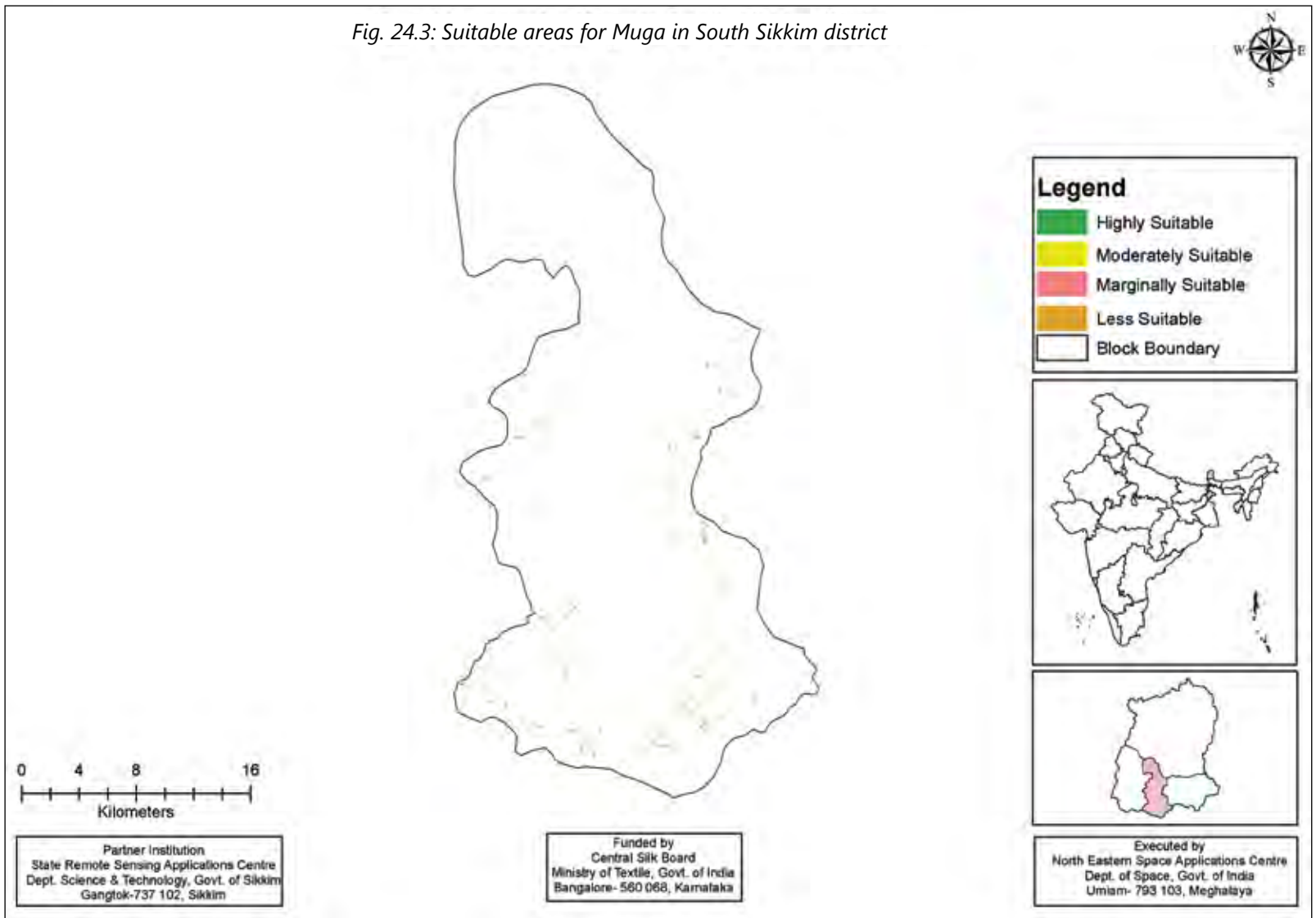
Fig. 24.2: Suitable areas for Eri in South Sikkim district



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Fig. 24.3: Suitable areas for Muga in South Sikkim district



## TAMIL NADU

Tamil Nadu lies in the southernmost part of the Indian Peninsula and is bordered by the union territory of Puducherry, and the states of Kerala, Karnataka, and Andhra Pradesh. It is bound by the Eastern Ghats in the north, the Nilgiri, the Anamalai Hills, and Kerala on the west, by the Bay of Bengal in the east, the Gulf of Mannar, the Palk Strait in the south east, and by the Indian Ocean in the south. It covers an area of 1,30,058 km<sup>2</sup>.

Although Sericulture is considered as a subsidiary occupation in the state, technological innovation has made it possible to take it up on an intensive scale capable of generating adequate income. It is playing an important role in anti poverty programme and prevents migration of rural people to urban area in search of employment. Tamil Nadu occupies fourth position in silk production and is well known for its traditional silk sarees and dhoties woven on handlooms. Tamil Nadu occupies fourth position in the country in silk production. The annual silk production in Tamil Nadu is around 1400 Metric Tons. To encourage development of the activity in the State, the Government upgraded the Sericulture wing functioning under the Department of Industries and Commerce to function as a separate Department of Sericulture. As per government statistics, about 24000 farmers are practicing Sericulture in Tamil Nadu, cultivating 36,482 acres of mulberry. 6 Private grainages are functioning in the State to supply silkworm seed material to the Sericulturists and 22 Private Chawkie rearing centres are functioning in the state for supplying chawkie silkworm to the Sericulturists. About 1252 private silk reeling devices are functioning in the State. Four districts were selected for mapping of potential areas under the study.

### Erode

Erode District (previously known as Periyar District) is located in the western part of the state. The headquarters of the district is Erode and it is divided into two revenue divisions namely Erode and Gobichettipalayam. The district is bounded by Chamarajanagar district of Karnataka to the north, and by Kaveri River to the east. Across the river lies Salem, Namakkal and Karur districts. Tirupur District lies immediately to the south, and Coimbatore and the Nilgiris district lie to the west. Erode District is landlocked and is situated at between 10°36' and 11°58' north latitude and between 76°49' and 77°58' east longitude. The total geographical area covers 5,692 sq km.

### Thirunelveli

The district is located in the southern part of Tamil Nadu and lies between 8°05' and 9°30' north latitude and 77°05' and 78°25' east longitude and covers an area of 6,823 sq km. It is surrounded by Virudhunagar District in the north, the Western Ghats in the west, Kanyakumari District in the south and Thoothukudi District in the east.

## Theni

Theni district is in the Southern part of the state and it lies between 9°30' and 10°30' north latitude and 77° 00' and 78° 30' East Longitude. The district covers an area of 3242.30 sq km with the city of Theni as the district headquarters. The district is bounded by Dindigul District to the north, Madurai District to the east, Virudhunagar District to the southwest, and Idukki district of the Kerala State to the west. This district is surrounded by the Western Ghats, with its green stretches of cultivated lands and tea gardens. Silk cotton, soft towels, coffee seeds, cardamom, mango, are the main produce of the district.

## Vellore

Vellore district lies between 12° 15' to 13° 15' North latitudes and 78° 20' to 79° 50' East longitudes. The district is bounded on the northeast by Tiruvallur District, on the southeast by Kanchipuram District, on the south by Tiruvannamalai District, on the southwest by Krishnagiri District, and on the northwest and north by Andhra Pradesh state. The geographical area of this district covers 6077 sq. km.

Tables 26.1-26.2: Suitable Areas for Mulberry in Erode & Tirunelveli district of Tamil Nadu

Table 26.1

| Block            | Suitable Areas for Mulberry in Erode (ha) |          |          |          |
|------------------|---|----------|----------|----------|
|                  | High                                      | Moderate | Marginal | Total    |
| Ammapettai       | 86.66                                     | 154.70   | 34.79    | 276.15   |
| Anthiyur         | 151.29                                    | 382.27   | 73.25    | 606.80   |
| Bhavani          | 22.22                                     | 138.42   | 28.56    | 189.20   |
| Bhavanisagar     | 727.76                                    | 2706.91  | 655.11   | 4089.78  |
| Chennimalai      | 3360.27                                   | 1029.90  | 93.76    | 4483.93  |
| Dharapuram       | 13041.82                                  | 4144.43  | 12.49    | 17198.74 |
| Erode            | 27.75                                     | 84.62    | 70.40    | 182.78   |
| Gobichetipalayam | 14.04                                     | 98.15    | 26.89    | 139.08   |
| Kangayam         | 11568.48                                  | 4371.38  | 123.44   | 16063.30 |
| Kodumudi         | 26.19                                     | 31.34    | 19.79    | 77.32    |
| Kundadam         | 7643.29                                   | 5770.91  | 53.88    | 13468.08 |
| Modakkurichi     | 68.85                                     | 406.27   | 38.89    | 514.02   |
| Mulanur          | 18947.59                                  | 4962.05  | 118.86   | 24028.50 |
| Nambiyur         | 68.21                                     | 569.79   | 89.11    | 727.10   |

|                |          |          |         |           |
|----------------|----------|----------|---------|-----------|
| Perundurai     | 1776.24  | 1067.75  | 19.25   | 2863.24   |
| Sathyamangalam | 450.57   | 1539.57  | 588.41  | 2578.55   |
| T.N.Palayam    | 59.82    | 326.08   | 90.69   | 476.59    |
| Talavadi       | 1320.34  | 7326.13  | 3309.96 | 11956.43  |
| Uthukuli       | 261.09   | 214.21   | 19.85   | 495.15    |
| Vellakovil     | 11144.32 | 5264.40  | 23.38   | 16432.10  |
| Total          | 70766.80 | 40589.28 | 5490.76 | 116846.84 |

Table 26.2

| Block                   | Suitable Areas for Mulberry in Tirunelveli (ha) |          |          |          |
|-------------------------|---|----------|----------|----------|
|                         | High  | Moderate | Marginal | Total    |
| Alangulam               | 729.48  | 493.18   | 145.82   | 1368.48  |
| Ambasamudram            | 771.50  | 874.82   | 94.26    | 1740.59  |
| Cheranmadevi            | 1597.39   | 656.68   | 139.52   | 2393.60  |
| Kadayam                 | 200.57  | 432.14   | 68.46    | 701.17   |
| Kadayanallur            | 221.70  | 385.80   | 95.12    | 702.61   |
| Kalakkad                | 2158.06   | 826.48   | 172.28   | 3156.82  |
| Keezhapavur             | 104.84  | 124.49   | 38.01    | 267.35   |
| Kurivikulam             | 444.92  | 228.85   | 28.27    | 702.05   |
| Manur                   | 4183.03   | 1365.84  | 173.00   | 5721.86  |
| Melaneelithanallur      | 734.63  | 142.62   | 40.16    | 917.41   |
| Nanguneri               | 3097.75   | 232.76   | 5.89     | 3336.39  |
| Palayamkottai           | 2412.72   | 395.91   | 59.76    | 2868.39  |
| Pappakudi               | 355.92  | 19.47    | 0.16     | 375.54   |
| Radhapuram              | 1224.36   | 145.27   | 48.42    | 1418.04  |
| Sankarankoil            | 329.05  | 62.55    | 0.00     | 391.61   |
| Shenkottai              | 3.33  | 23.86    | 1.68     | 28.87    |
| Tenkasi                 | 32.46   | 121.86   | 7.62     | 161.94   |
| Tirunelveli Corporation | 292.11  | 58.02    | 11.36    | 361.49   |
| Valliyur                | 1102.72   | 510.21   | 66.19    | 1679.12  |
| Vasudevanallur          | 361.15  | 426.58   | 45.11    | 832.84   |
| Total                   | 20357.69  | 7527.39  | 1241.08  | 29126.16 |

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Fig. 25.1: Suitable areas for Mulberry cultivation in Erode district of Tamil Nadu

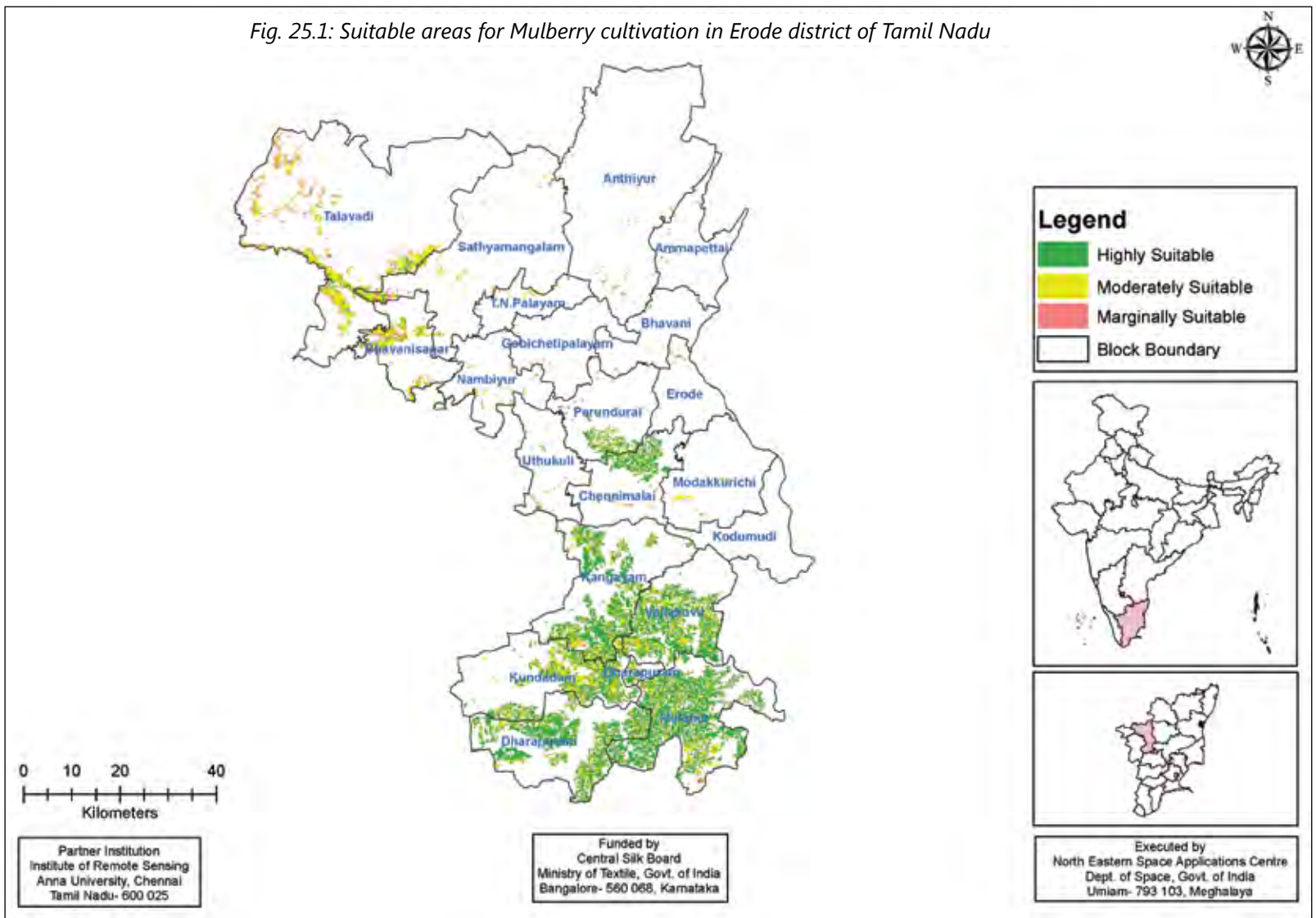
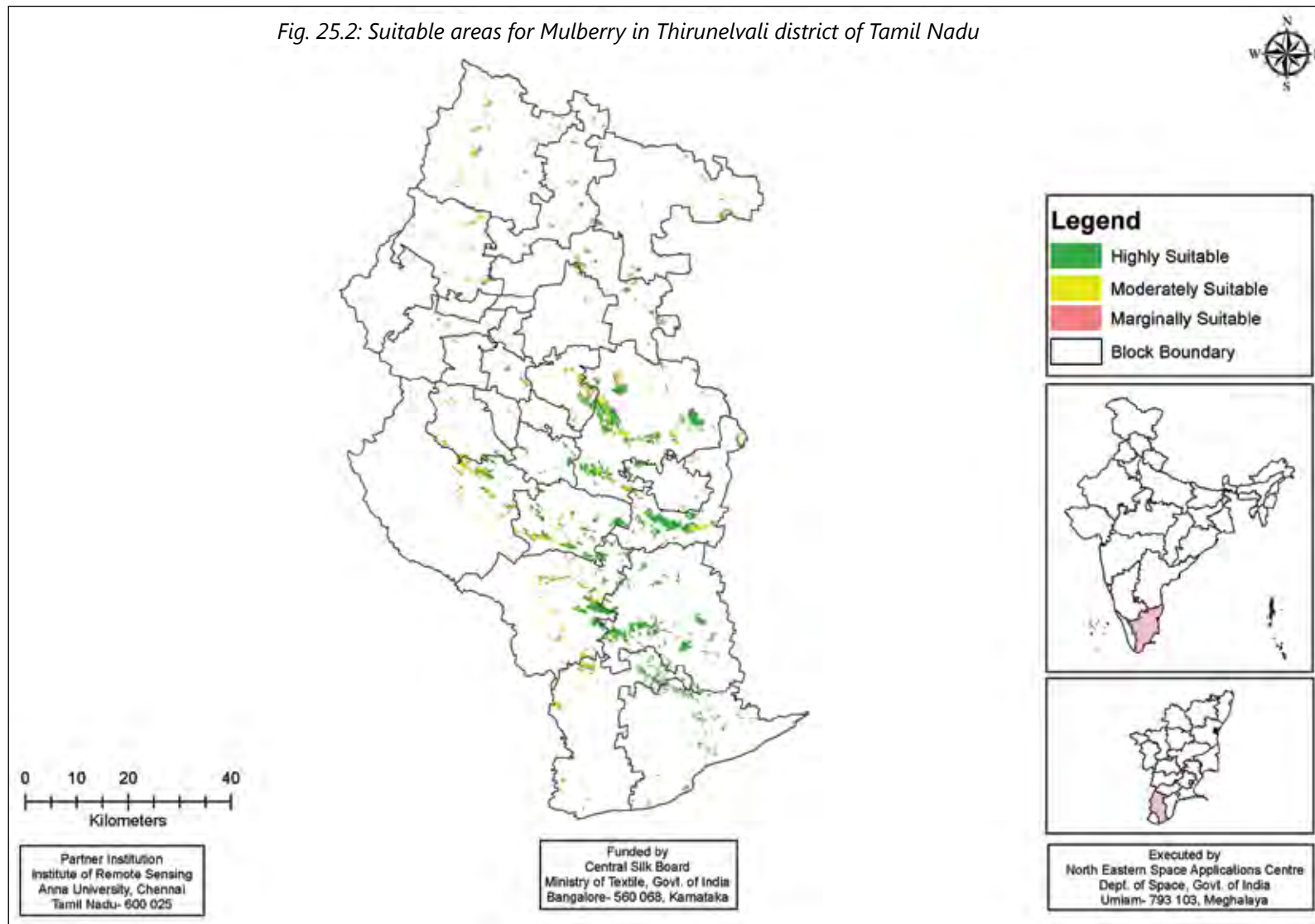


Fig. 25.2: Suitable areas for Mulberry in Thirunelveli district of Tamil Nadu



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Tables 26.3-26.4: Suitable Areas for Mulberry in Theni & Vellore district of Tamil Nadu

Table 26.3

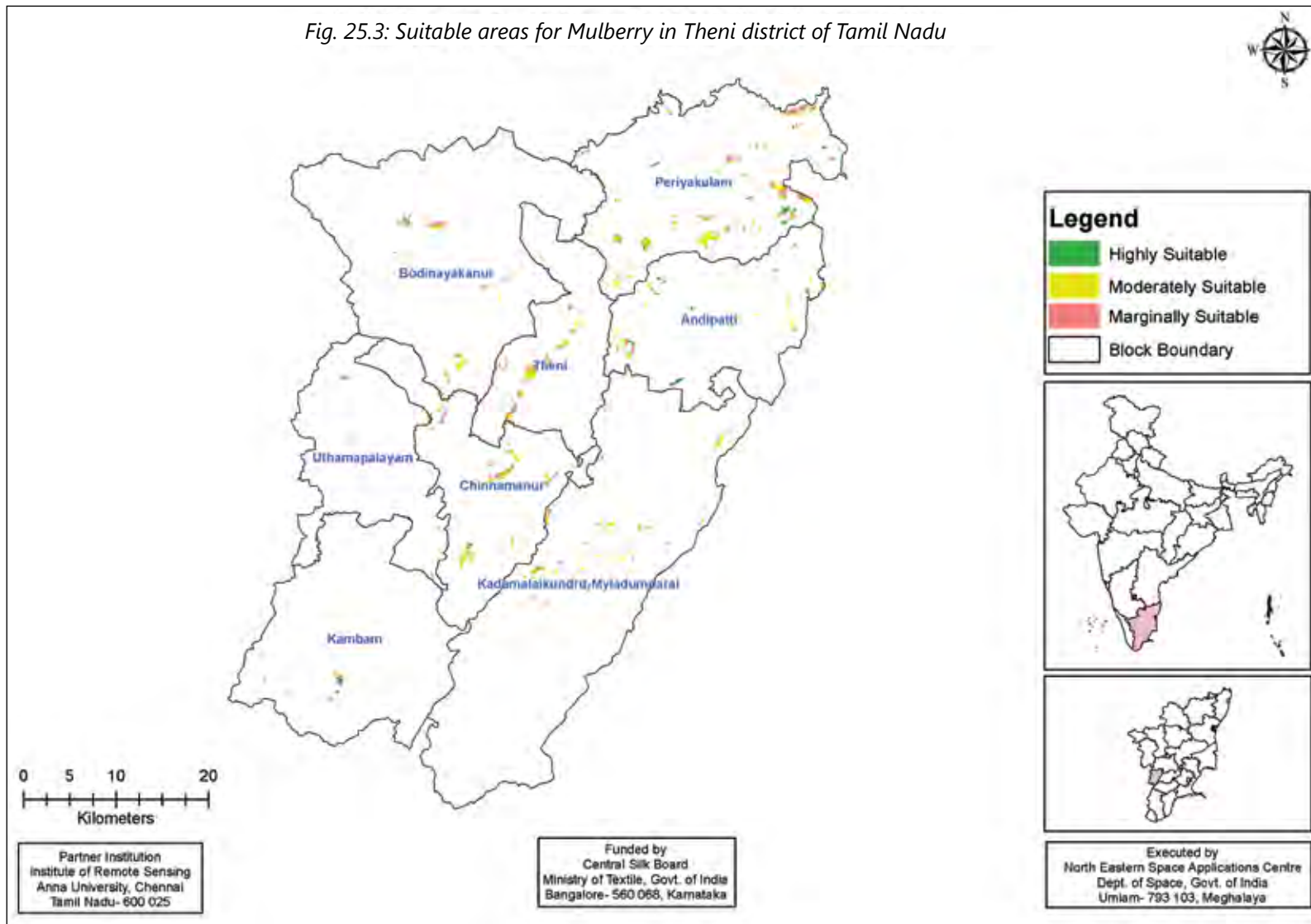
| Block                        | Suitable Areas for Mulberry in Theni (ha) |          |          |         |
|------------------------------|---|----------|----------|---------|
|                              | High                                      | Moderate | Marginal | Total   |
| Andipatti                    | 126.10                                    | 248.10   | 99.67    | 473.88  |
| Bodinayakanur                | 16.53                                     | 223.82   | 235.20   | 475.55  |
| Chinnamanur                  | 29.96                                     | 392.25   | 250.88   | 673.09  |
| Kadamalaikundru-Myladumparai | 52.42                                     | 498.47   | 162.27   | 713.16  |
| Kambam                       | 54.06                                     | 67.52    | 33.97    | 155.56  |
| Periyakulam                  | 236.78                                    | 734.74   | 476.66   | 1448.18 |
| Theni                        | 11.76                                     | 299.11   | 294.69   | 605.56  |
| Uthamapalayam                | 0.01                                      | 80.14    | 69.99    | 150.13  |
| Total                        | 527.62                                    | 2544.15  | 1623.33  | 4695.10 |

Table 26.4

| Block        | Suitable Areas for Mulberry in Vellore (ha) |          |          |          |
|--------------|---|----------|----------|----------|
|              | High  | Moderate | Marginal | Total    |
| Alangayam    | 67.41                                       | 689.09   | 401.46   | 1157.96  |
| Anikut       | 154.54                                      | 937.03   | 174.86   | 1266.43  |
| Arakonam     | 425.20                                      | 432.53   | 11.14    | 868.88   |
| Arcot        | 187.85                                      | 104.20   | 75.68    | 367.73   |
| Gudiyatham   | 312.25                                      | 959.40   | 206.09   | 1477.74  |
| Jolarpet     | 51.47                                       | 199.11   | 75.39    | 325.97   |
| K.V.Kuppam   | 46.91                                       | 310.32   | 20.76    | 377.99   |
| Kandili      | 109.74                                      | 60.29    | 7.85     | 177.88   |
| Kaniyambadi  | 93.32                                       | 378.31   | 24.82    | 496.46   |
| Katpadi      | 101.42                                      | 169.94   | -        | 271.36   |
| Kaveripakkam | 476.61                                      | 54.99    | -        | 531.59   |
| Madhanur     | 163.41                                      | 762.27   | 241.58   | 1167.25  |
| Natrampalli  | 165.42                                      | 447.02   | 294.28   | 906.72   |
| Nemili       | 208.20                                      | 33.98    | -        | 242.18   |
| Pernambut    | 332.28                                      | 1650.07  | 388.70   | 2371.05  |
| Sholingur    | 213.38                                      | 489.01   | 27.94    | 730.32   |
| Thimiri      | 121.85                                      | 241.62   | 43.02    | 406.49   |
| Tirupattur   | 46.65                                       | 90.18    | 4.22     | 141.06   |
| Vellore      | 71.32                                       | 159.45   | 58.27    | 289.03   |
| Wallajah     | 324.07                                      | 618.94   | 34.81    | 977.82   |
| Total        | 3673.31                                     | 8787.73  | 2090.88  | 14551.92 |



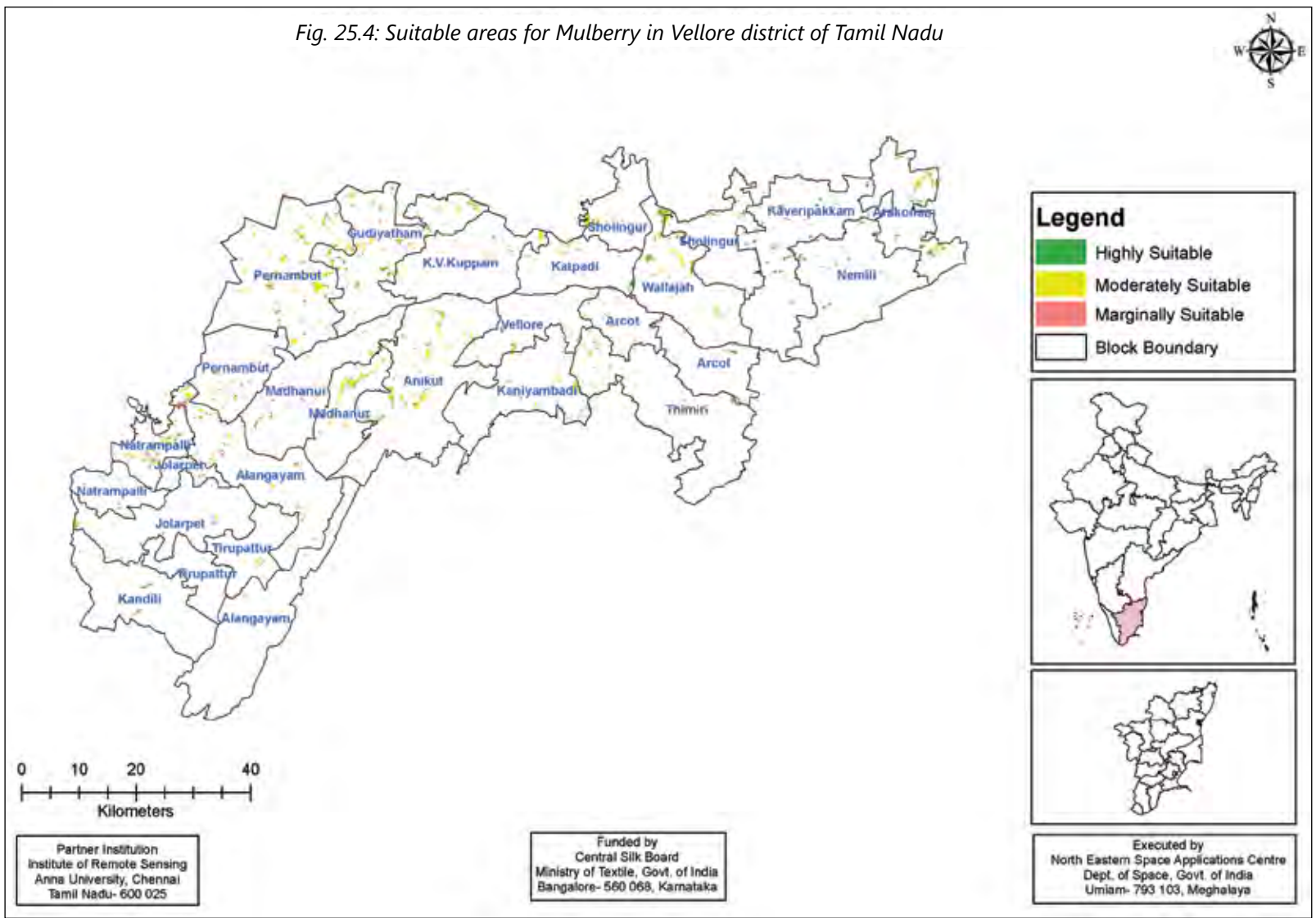
Fig. 25.3: Suitable areas for Mulberry in Theni district of Tamil Nadu



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Fig. 25.4: Suitable areas for Mulberry in Vellore district of Tamil Nadu



## TRIPURA

Covering a total geographical area of 10,491.69 km<sup>2</sup>, Tripura is the third-smallest among the 28 states in the country, behind Goa and Sikkim. It extends from 22°56'N to 24°32'N latitude, and 91°09'E to 92°20'E longitude. It is bordered by Bangladesh to the north, south, and west, and the Indian states of Assam and Mizoram to the east. The state has a tropical savanna climate, and receives seasonal heavy rains from the south west monsoon. The physiography is characterised by hill ranges, valleys and plains.

In Tripura, sericulture as one of the agricultural pursuits is emerging gradually as a premier enterprise. It is projected that sericulture industry is capable of generating substantial and gainful employment in rural areas of the state through mulberry cultivation, silk worm rearing, reeling, twisting and weaving. The Sericulture Department of Government of Tripura has shipped certified silkworm seeds from Bangalore and West Bengal for providing good quality and high yielding strains of Mulberry silkworm. In Tripura, in earlier days Nistari, a multivoltine strain of silkworm were used to be brought from West Bengal but now-a-days crossbreed strain of Bivoltine and Multivoltine are reared in the state. Two districts viz. Dhalai and North Tripura were selected for mapping of potential areas for mulberry and Muga in the state.

### Dhalai

Dhalai district located in northern part of the state with the district headquarter is located at Ambassa. The district covers an area of 2523 km<sup>2</sup>. According to the 2011 census Dhalai district has a population of 377,988.

### North Tripura

The district occupies an area of 2821 sq km and lies between 24 ° 36' N and 92 ° 19' E. The district headquarters are located at Kailasahar. Dhalai district is bounded by Bangladesh in the north and south, West Tripura in west, South Tripura in South west, The district has a total geographical area of 2523 sq.km. and is divided into three sub-divisions, namely, Dharmanagar, Kanchanpur and Panisagar.

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Tables 27.1-27.4: Suitable areas for Mulberry & Muga in Dhalai & North Tripura District of Tripura

Table 27.1

| Block       | Suitable areas for Mulberry (ha) |          |          |          |
|-------------|----------------------------------|----------|----------|----------|
|             | High                             | Moderate | Marginal | Total    |
| Ambasa      | -                                | 5595.60  | 1668.05  | 7263.65  |
| Chhamanu    | -                                | 383.11   | 1287.64  | 1670.75  |
| Damburnagar | -                                | 1316.15  | 928.84   | 2244.98  |
| Manu        | 2.03                             | 1600.16  | 3411.32  | 5013.51  |
| Salema      | 45.43                            | 914.97   | 1153.83  | 2114.22  |
| Total       | 47.46                            | 9809.98  | 8449.66  | 18307.11 |

Table 27.2

| Block       | Suitable areas for Muga(ha) |         |
|-------------|-----------------------------|---------|
|             | Suitable                    | Total   |
| Ambasa      | 1461.96                     | 1461.96 |
| Chhamanu    | 49.12                       | 49.12   |
| Damburnagar | 663.24                      | 663.24  |
| Manu        | 644.63                      | 644.63  |
| Salema      | 1086.54                     | 1086.54 |
| Total       | 3905.49                     | 3905.49 |

Table 27.3

| Block       | Suitable Area for Mulberry (ha) |          |          |          |
|-------------|---------------------------------|----------|----------|----------|
|             | High                            | Moderate | Marginal | Total    |
| Damchhera   | 23.37                           | 329.06   | 375.26   | 727.69   |
| Dasda       | 92.06                           | 2838.39  | 1562.90  | 4493.36  |
| Gournagar   | 12.00                           | 971.02   | 822.89   | 1805.90  |
| Jampui Hill | 1.34                            | 262.23   | 567.03   | 830.61   |
| Kadamtala   | -                               | 998.20   | 1321.57  | 2319.77  |
| Kumarghat   | 15.52                           | 425.05   | 835.57   | 1276.13  |
| Panisagar   | 13.91                           | 1440.10  | 567.71   | 2021.71  |
| Pencharthal | 13.40                           | 314.17   | 242.58   | 570.15   |
| Total       | 171.60                          | 7578.22  | 6295.52  | 14045.33 |



Table 27.4

| Block       | Suitable Area for Muga (ha) |         |
|-------------|-----------------------------|---------|
|             | Suitable                    | Total   |
| Damchhera   | 469.83                      | 469.83  |
| Dasda       | 595.48                      | 595.48  |
| Gournagar   | 1067.30                     | 1067.30 |
| Jampui Hill | -                           | -       |
| Kadamtala   | 2649.17                     | 2649.17 |
| Kumarghat   | 499.77                      | 499.77  |
| Panisagar   | 1492.95                     | 1492.95 |
| Pencharthal | 83.37                       | 83.37   |
| Total       | 6857.86                     | 6857.86 |

Fig. 26.1: Suitable areas for Mulberry in Dhalai district of Tripura

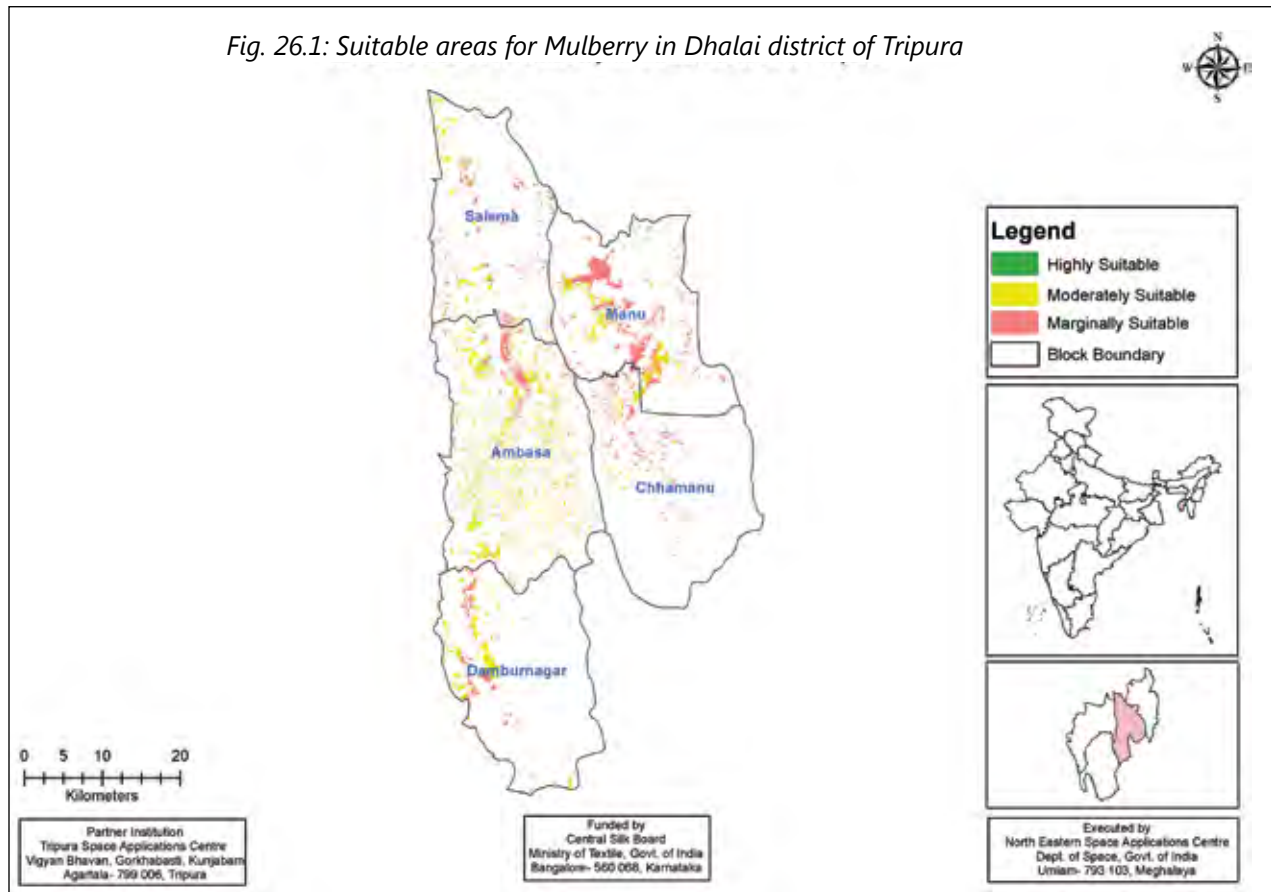




Fig. 26.2: Suitable areas for Muga in Dhalai district of Tripura

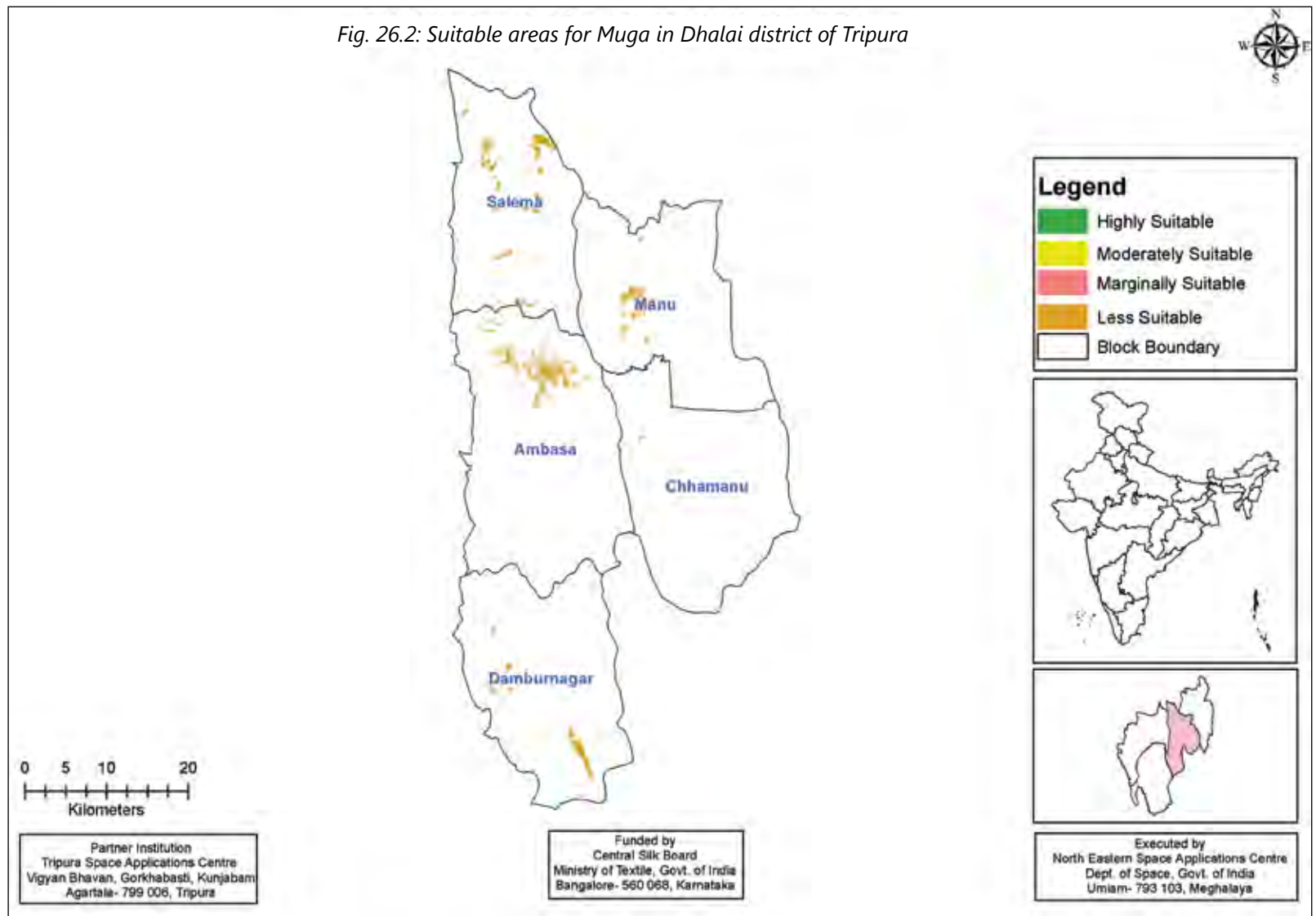
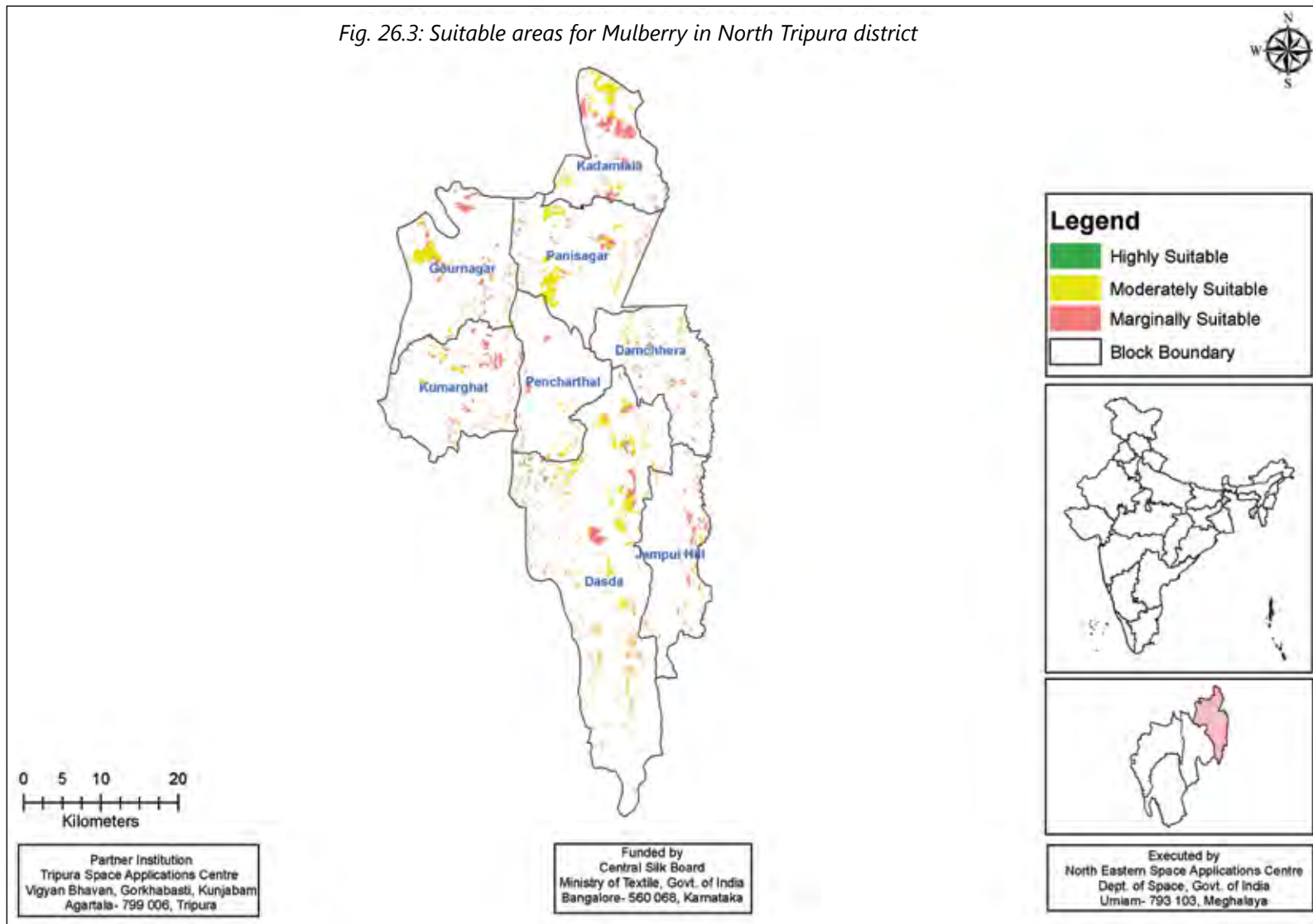


Fig. 26.3: Suitable areas for Mulberry in North Tripura district

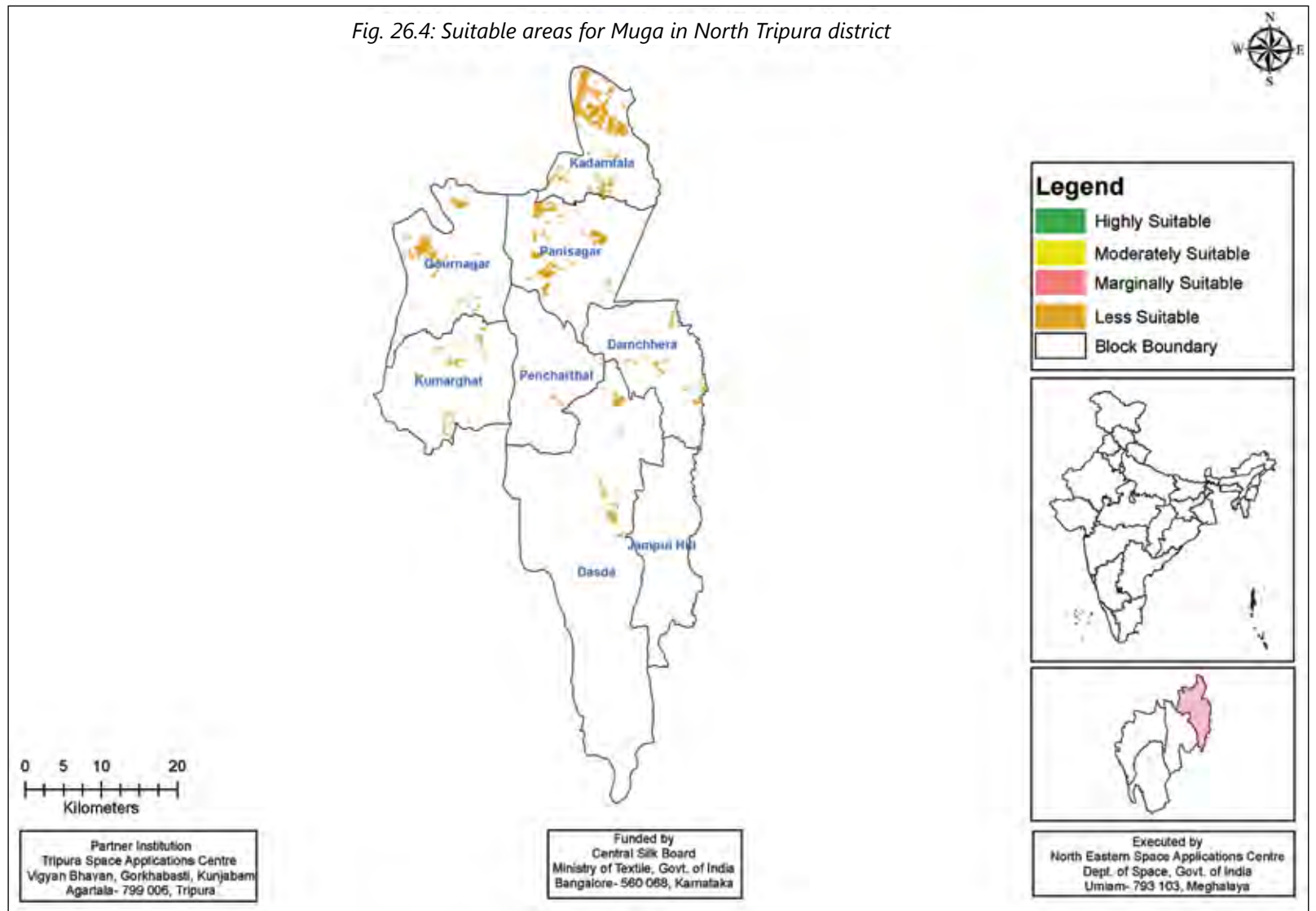


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Fig. 26.4: Suitable areas for Muga in North Tripura district



## UTTAR PRADESH

Uttar Pradesh is India's fifth largest and most populous state, located in the north-central part of the country. It is bounded by Nepal on the North, Uttarakhand on the north-east, Himachal Pradesh on the north-west, Haryana on the west, Rajasthan on the south-west, Madhya Pradesh on the south and south-west, Chhattisgarh and Jharkhand on south and Bihar on the east. It lies between 23°52'N and 31°28'N latitudes and 77°3' and 84°39'E longitudes covering an area of 243,290 km<sup>2</sup>. The climate of Uttar Pradesh also vary widely, with temperatures as high as 47 °C in summer, and as low as -1 °C in winter. The valley areas have fertile and rich soil. There is intensive cultivation on terraced hill slopes, but irrigation facilities are deficient.

Uttar Pradesh occupies a minor position in sericulture but it is famous for centuries for silk clothes and silk Sarees. Up to 1955 A.D., the state exports silk yarn to other states of the country and abroad. But at present the position has changed considerably and the state is not in a position to fulfill its local demand. Sericulture in the state has made long strides since the first efforts in the end of 19th century by the British Administrations in Dehradun, Sitapur and Pratapgarh. After independence, State Government in 1948 to started sericulture development programmes in the state. The Tarai Sericulture Development Programme was introduced in 1978-79. The most important aspect of this scheme is that, it seeks to extend its limits from department to a private planter and rearer. Till the introduction of the Tarai Project the entire activity were confined at government centre of the Sericulture Department. Currently state government has been taking a number of initiatives to increase both quantity and quality of silks in the state. Six districts were selected for mapping of potential areas of mulberry and Tasar under the present study, three districts viz., Balia, Gonda and Pilbhit for Mulberry and Jhansi, Lalitpur and Mahoba for Tasar.

### Balia

Ballia district is the easternmost part of the state and borders on Bihar State. It is bounded on the west by Azamgarh, on the north by Deoria, on the north-east and south-east by Bihar and on the south-west by Ghazipur. The district lies between the parallels of 25 33' and 26 11' North latitudes and 83 38' and 84 39' East longitudes.

### Gonda

The district lies between 26° 47' and 27° 20' north latitude and 81° 30' and 82° 46' east longitude, which covers a total geographical area of 4448 sq km.. Gonda is bounded by Shrawasti district to the north, Balrampur and Siddharthnagar districts to the northeast, Basti district to the east, Faizabad district to the south, Bara Banki district to the southwest, and Bahraich district to the northwest.

### **Jhansi**

The districts covers a total geographical area of 5024 sq km with Jhansi town as the district headquarters. The district is bordered on the north by Jalaun District, to the east by Hamirpur and Mahoba districts, to the south by Tikamgarh District of Madhya Pradesh state, to the southwest by Lalitpur District, which is joined to Jhansi District by a narrow corridor, and on the east by the Datia and Bhind districts of Madhya Pradesh.

### **Lalitpur**

Lalitpur District is a part of Jhansi Division that lies between 24°11' and 25°14' North latitude and 78°10' and 79°0' East longitude. The district is bounded by district Jhansi in the north, districts Sagar and Tikamgarh of Madhya Pradesh state in the east and Guna district of Madhya Pradesh separated by river Betwa in the west. The geographical area of the district is 5,039 sq. km.

### **Pilibhit**

The district of Pilibhit is the north-eastern most district of Rohilkhand division which is situated in the sub Himalayan belt on the boundary of Nepal. It lies between the parallels of 28°06' and 28°53' north latitude and the meridians of 79°57' and 80°27' east longitude. On the north are the district Udham Singh Nagar and the territory of Nepal, on the south lies the Shahjahanpur district, on the east the district is flanked for a short distance by district Kheri and for the remaining distance by the Shahjahanpur district and on the west the district of Bareilly.

### **Mahoba**

Mahoba district is a part of Chitrakoot Division that occupies an area of 2884 km . Mahoba town is the district headquarters and the district has four development blocks viz., Charkhari, Jyutpur, Kabrai Mahoba and Panwari . Population Census of Mahoba District has a population of 875958 as per 2011 census



Tables 28.1-28.2: Suitable Areas for Mulberry in Balia & Gonda district of Uttar Pradesh

Table 28.1

| Block        | Suitable Areas for Mulberry in Balia (ha) |          |          |         |
|--------------|---|----------|----------|---------|
|              | High                                      | Moderate | Marginal | Total   |
| Bairiya      | -   | -        | 75.26    | 75.26   |
| Bansdih      | -   | 36.65    | 266.73   | 303.37  |
| Belhari      | -   | -        | 767.31   | 767.31  |
| Chilkahar    | -   | 3.62     | -        | 3.62    |
| Dubhar       | -   | -        | 161.39   | 161.39  |
| Garhwar      | -   | 2.64     | -        | 2.64    |
| hanumanganj  | -   | 20.08    | 376.42   | 396.50  |
| Maniyar      | -   | 36.67    | 970.97   | 1007.65 |
| MurliChhapra | -   | -        | 214.92   | 214.92  |
| Nagra        | -   | 97.04    | -        | 97.04   |
| Nawa Nagar   | -   | 52.07    | 86.90    | 138.96  |
| Pandah       | -   | 160.55   | -        | 160.55  |
| Rasra        | -   | -        | -        | -       |
| Rewati       | -   | -        | 1417.02  | 1417.02 |
| Siar         | -   | 8.69     | -        | 8.69    |
| Sohaon       | -   | -        | 95.91    | 95.91   |
| Total        | -   | 418.01   | 4432.83  | 4850.84 |

Table 28.2

| Block        | Suitable Areas for Mulberry in Gonda (ha) |          |          |          |
|--------------|---|----------|----------|----------|
|              | High                                      | Moderate | Marginal | Total    |
| Babhanjot    | -   | 621.09   | 377.25   | 998.34   |
| Belsar       | -   | 49.98    | 185.86   | 235.84   |
| Chhapia      | -   | 551.69   | 481.54   | 1033.23  |
| Colonelganj  | -   | 280.63   | 696.62   | 977.25   |
| haldharmau   | -   | 134.93   | 167.02   | 301.95   |
| Itiathok     | -   | 393.58   | 303.06   | 696.64   |
| Jhanjhari    | -   | 382.89   | 170.62   | 553.51   |
| Katra Bazar  | -   | 292.01   | 335.26   | 627.27   |
| Mankapur     | -   | 617.08   | 758.45   | 1375.53  |
| Mujhana      | -   | 1118.53  | 536.54   | 1655.07  |
| Nawabganj    | -   | 71.95    | 144.63   | 216.58   |
| PandriKirpal | -   | 124.93   | 56.93    | 181.86   |
| Paraspur     | -   | 211.98   | 595.83   | 807.81   |
| Rupaidiha    | -   | -        | 25.25    | 25.25    |
| Tarabganj    | -   | 42.73    | 101.48   | 144.21   |
| Wazirganj    | -   | 74.11    | 130.62   | 204.74   |
| Total        | -   | 4968.11  | 5066.96  | 10035.07 |

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Fig. 27.1: Suitable areas for Mulberry in Balia district of Uttar Pradesh

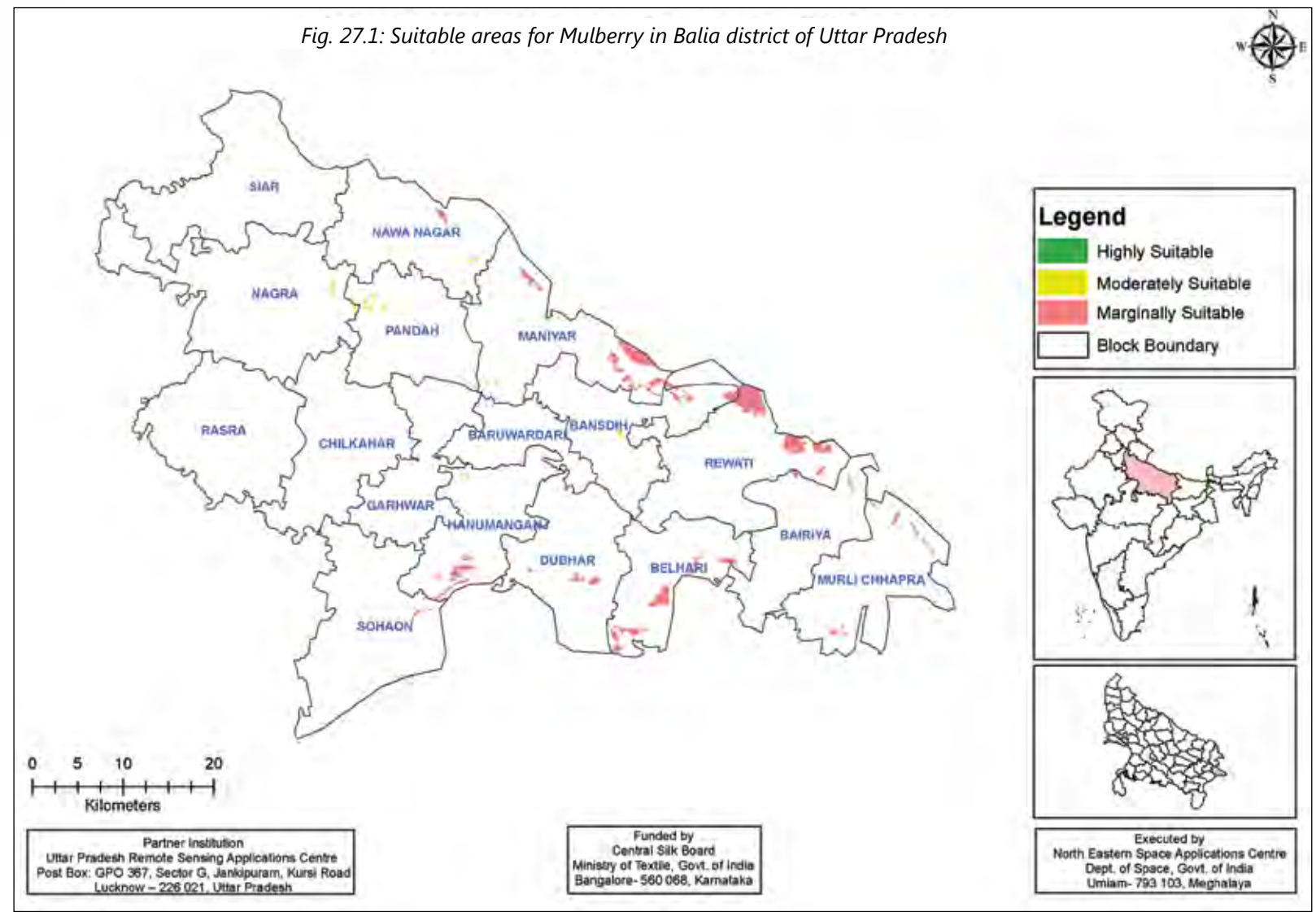
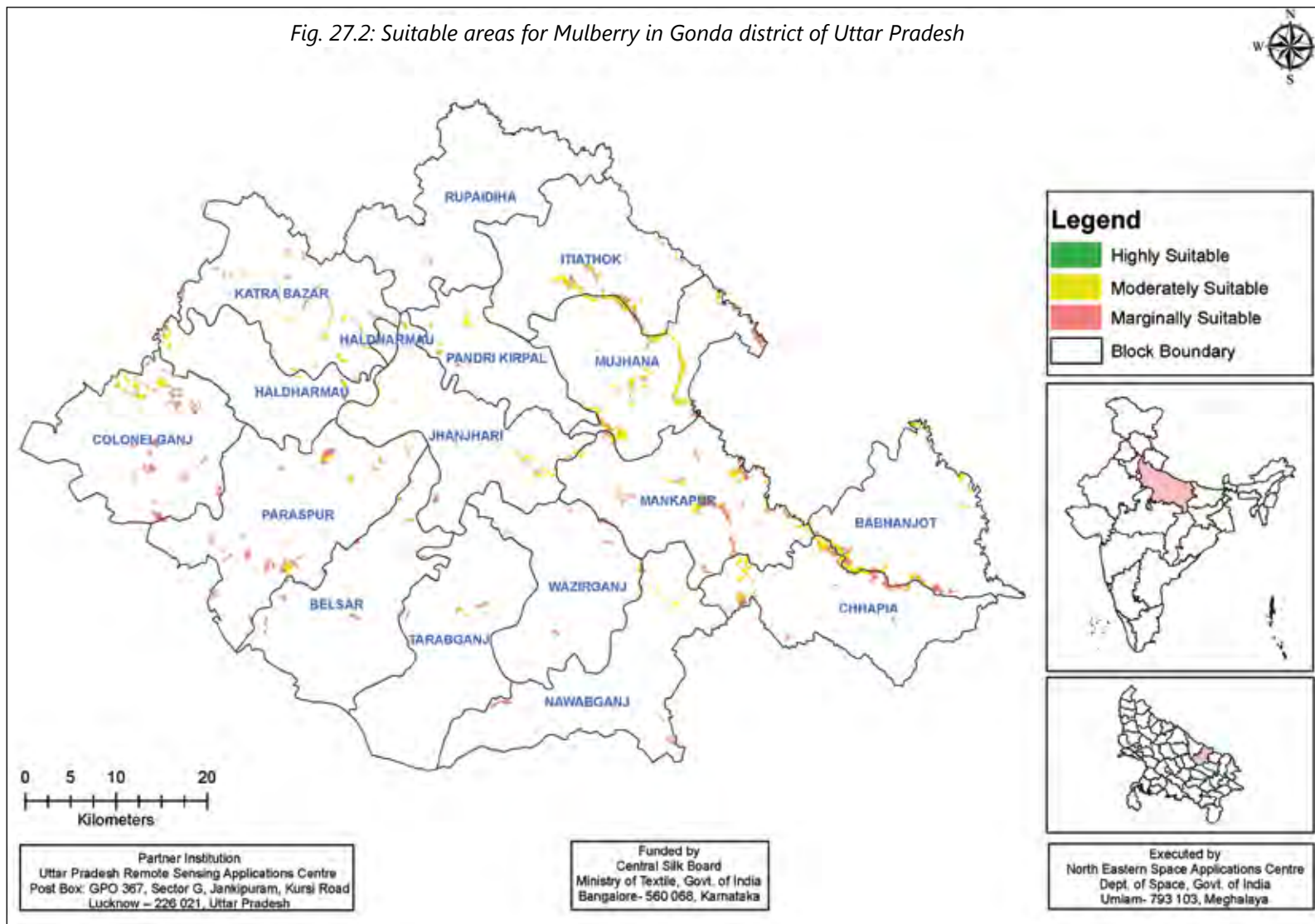


Fig. 27.2: Suitable areas for Mulberry in Gonda district of Uttar Pradesh



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Tables 28.3-28.5: Suitable Areas for Tasar in Jhansi, Lalitpur & Mahoba district of Uttar Pradesh

Table 28.3

| Block       | Suitable Areas for Tasar in Jhansi (ha) |          |
|-------------|---|----------|
|             | Suitable                                | Total    |
| Babina      | 8267.37                                 | 8267.37  |
| Bamour      | 10634.99                                | 10634.99 |
| Bangara     | 1099.83                                 | 1099.83  |
| Baragaon    | 1043.01                                 | 1043.01  |
| Chirgaon    | 3425.60                                 | 3425.60  |
| Gursarai    | 6578.70                                 | 6578.70  |
| Mau Ranipur | 1779.11                                 | 1779.11  |
| Month       | 2139.10                                 | 2139.10  |
| Total       | 34967.71                                | 34967.71 |

Table 28.4

| Block    | Suitable Areas for Tasar in Lalitpur (ha) |          |
|----------|---|----------|
|          | Suitable                                  | Total    |
| Bar      | 4371.49                                   | 4371.49  |
| Birdha   | 34650.84                                  | 34650.84 |
| Jakhaura | 6067.29                                   | 6067.29  |
| Mahroni  | 1515.98                                   | 1515.98  |
| Mandwara | 20980.59                                  | 20980.59 |
| Talbehat | 15669.90                                  | 15669.90 |
| Total    | 83256.08                                  | 83256.08 |

Table 28.5

| Block     | Suitable Areas for Tasar in Mahoba (ha) |          |
|-----------|---|----------|
|           | Suitable                                | Total    |
| Charkhari | 3693.34                                 | 3693.34  |
| Jaitpur   | 7963.26                                 | 7963.26  |
| Kulpahar  | 4074.32                                 | 4074.32  |
| Panwari   | 3653.48                                 | 3653.48  |
| Total     | 19384.40                                | 19384.40 |



Table 28.6: Suitable Areas for Mulberry in Pilbhit District of Uttar Pradesh

| Block        | Suitable Areas for Mulberry (ha) |          |          |          |
|--------------|----------------------------------|----------|----------|----------|
|              | High                             | Moderate | Marginal | Total    |
| Amaria       | 29.29                            | 458.98   | 6.24     | 494.52   |
| Barkhera     | 90.98                            | 508.19   | 133.17   | 732.33   |
| Bilsanda     | 21.68                            | 1.85     | 686.02   | 709.56   |
| Bisalpur     | 165.48                           | 290.92   | -        | 456.39   |
| LalauriKhera | 171.99                           | 1113.86  | 113.41   | 1399.26  |
| Marauri      | 11.90                            | 323.01   | 3596.06  | 3930.96  |
| Puranpur     | 92.45                            | 52.08    | 2347.45  | 2491.98  |
| Total        | 583.77                           | 2748.88  | 6882.35  | 10215.01 |

Fig. 27.3: Suitable areas for Tasar in Jhansi district of Uttar Pradesh

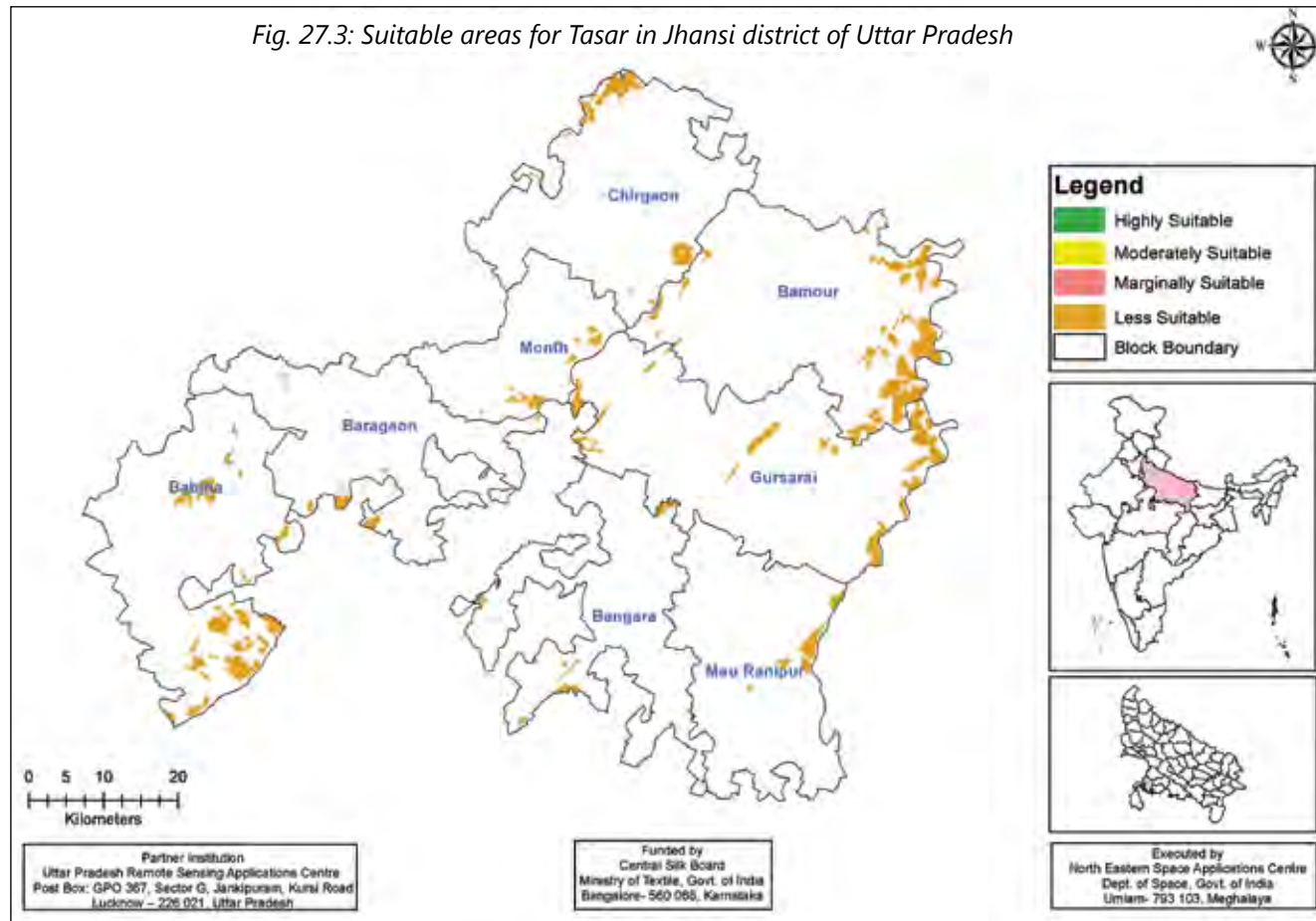






Fig. 27.4: Suitable areas for Tasar in Lalitpur district of Uttar Pradesh

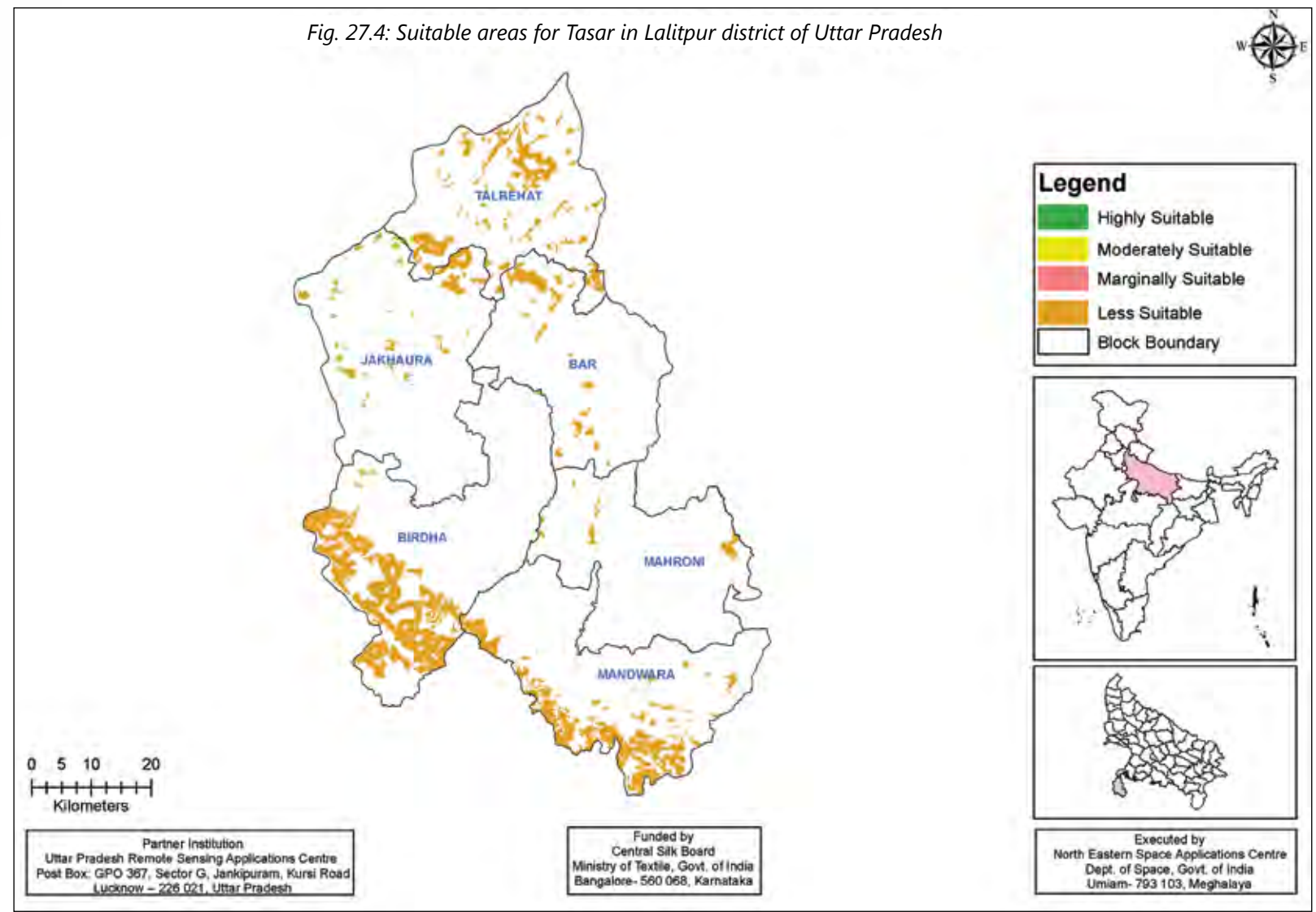
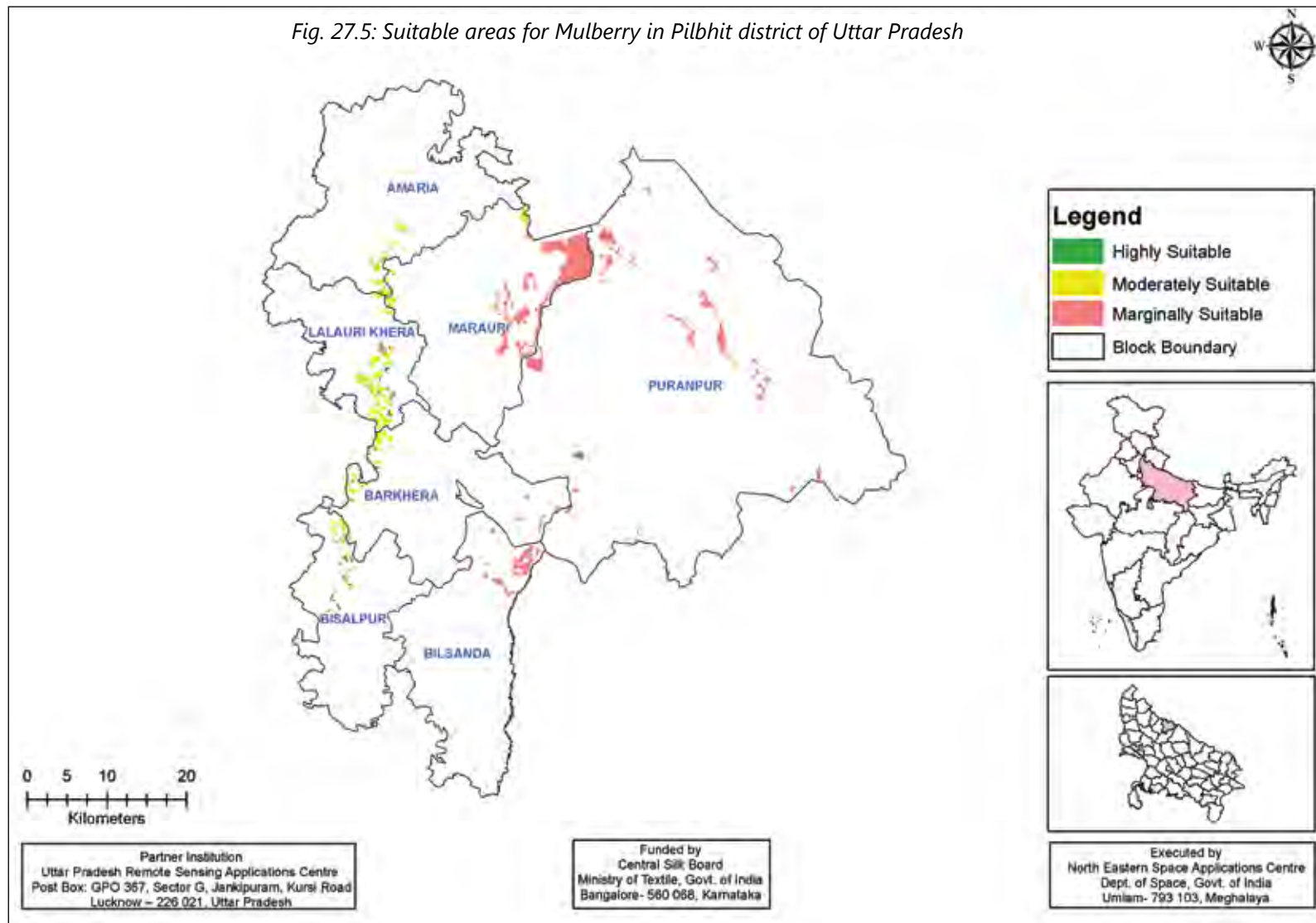


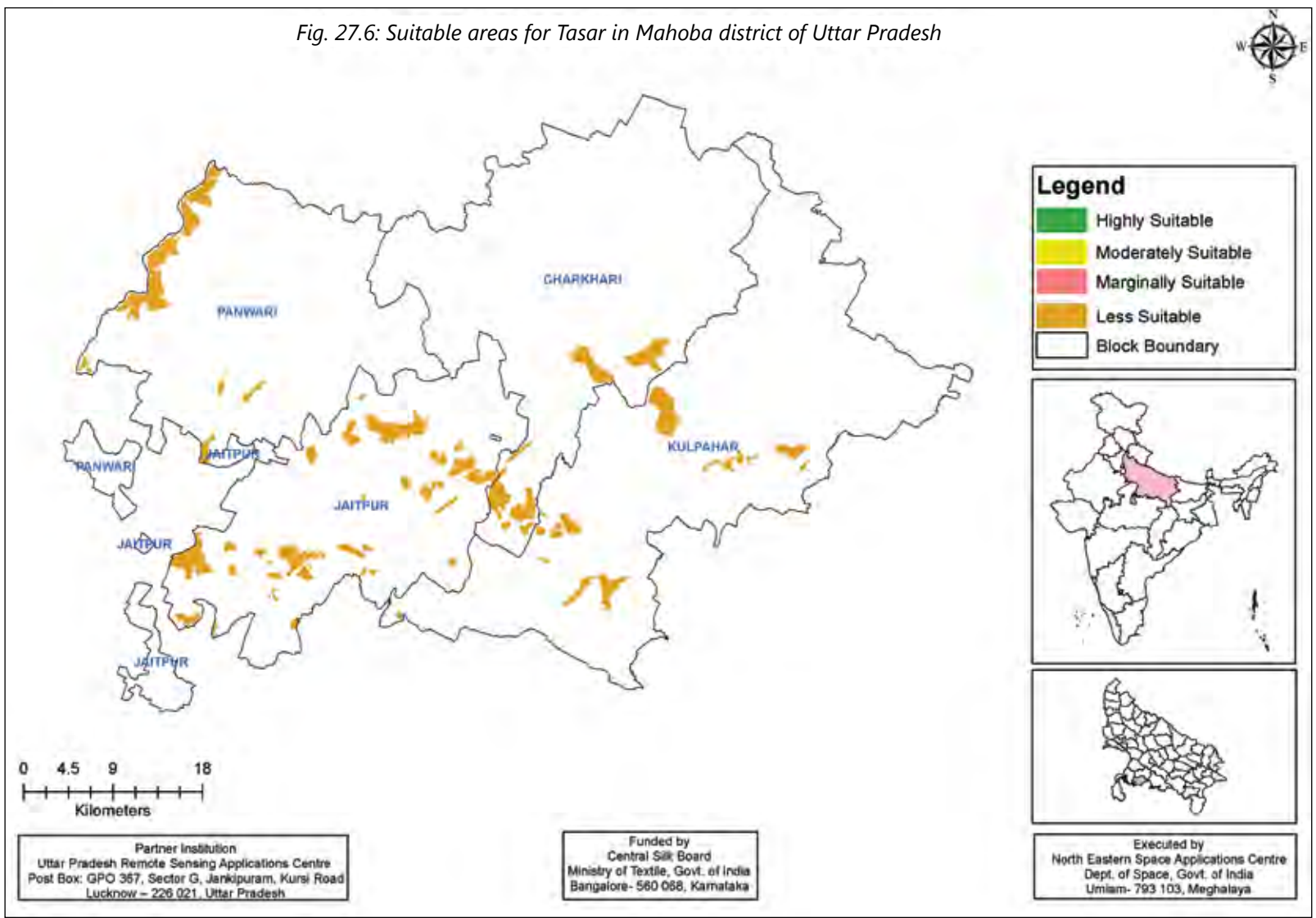
Fig. 27.5: Suitable areas for Mulberry in Pilbhit district of Uttar Pradesh



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Fig. 27.6: Suitable areas for Tasar in Mahoba district of Uttar Pradesh



## UTTARAKHAND

Located at the foothills of the Himalayan mountain ranges, it is largely a hilly State, having international boundaries with China (Tibet) in the north and Nepal in the east. On its north-west lies Himachal Pradesh, while on the south is Uttar Pradesh. It has a total geographic area of 51,125 km with Dehradun city as the Capital. Most of the northern parts of the state are part of Greater Himalaya ranges, covered by the high Himalayan peaks and glaciers, while the lower foothills were densely forested. Uttarakhand lies on the south slope of the Himalaya range, and the climate and vegetation vary greatly with elevation, from glaciers at the highest elevations to tropical forests at the lower elevations. It has almost all major climatic zones, making it amenable to a variety of commercial opportunities in horticulture, floriculture and agriculture.

Uttarakhand has the conducive agro-climatic conditions to produce all 5 varieties of silk, i.e. temperate and tropical Tasar, Muga, Eri and Mulberry silk, giving it a unique strength in the sector. However, sericulture was not a traditional activity in Uttarakhand but farmers that have engaged in sericulture are quite positive about sericulture as an alternative to traditional cash crops. It is estimated that one acre of mulberry can create direct employment for about 5 persons throughout the year. Women take up the majority of these on-farm production activities and downstream employment opportunities, which enhance household income.

Sericulture has developed a unique perspective in the context of livelihood development and soil conservation in Uttarakhand. Approximately 2000 acres mulberry plantation is available in Govt. farms as well as in private holdings. There are 72 mulberry farms in the state sector and 11 CSB units are established in the State to provide technical and research support for development of sericulture in Uttarakhand. The management of 31 government sericulture farms has been handed over to cooperative societies and SHGs which has given encouraging results. The remaining farms will be also being handed over gradually to co-operative societies and SHGs in a phased manner. Five districts were selected for mapping of potential areas for three types of sericulture viz., Mulberry, Muga and Tasar.

### Dehradun

This district is divided into two major parts, the main city Dehradun surrounded by Shivalik and the Himalayas, and Jaunsar Bavar, which is located in the foothills of Himalayas. The district is bordered by the Himalayas in the north, the Sivalik Hills to the south, the river Ganges to the east, and the Yamuna river to the west. It is located between latitudes 29 °58' N and 31°2'N and longitudes 77° 34' E and 78° 18'E with a total geographical area of 4,736 sq. kms.

### **Nainital**

Nainital lies in the Kumaun division with a total geographical area of 4251 sq. kms. To its north is Almora district and to its south lies the Udham Singh Nagar district. Champawat district flanks it in the east and district of Pauri Gahwal is in the west. It is located approximately in between 80 14' and 78 80' east longitude and 29 00' and 29 05' north latitude.

### **Pithoragarh**

The district lies between 29.4° to 30.3° North latitude and 80° to 81° East longitude along the eastern and southern part of the central Himalayas with Indo-Tibbetan watershed divide in the north and the Kali river forming a continuous border with Nepal in the east. The district is surrounded by the national boundaries of Almora, Champawat, Bageshwar and Chamoli districts and extends over an area of 7,217.7 sq. kms.

### **Udham Singh Nagar**

The district is located in the Terai region, and is part of Kumaon Division. It is bounded on the north by Nainital District, on the northeast by Champawat District, on the east by Nepal, and on the south and west by Uttar Pradesh state. The total geographical area of the district is 2,908 sq. km.

### **Uttarkashi**

Uttarkashi district is located in the Garhwal region of Uttarakhand and is a hilly district with a total geographical area of 8,016 km. There are many small and big rivers in the district. The Yamuna and the Ganges (Bhagirathi) are biggest among them. As per 2001 India census, Uttarkashi had a population of 16,220.



Tables 29.1-29.3: Suitable Areas for Mulberry, Muga & Tasar in Dehradun District of Uttarakhand

Table 29.1

| Block      | Suitable Areas for Mulberry (ha) |          |          |        |
|------------|----------------------------------|----------|----------|--------|
|            | High                             | Moderate | Marginal | Total  |
| Chakrata   | -                                | 0.36     | 15.10    | 15.46  |
| Doiwala    | 1.84                             | 0.50     | -        | 2.34   |
| Kalsi      | -                                | -        | 20.40    | 20.40  |
| Raipur     | 247.25                           | 149.61   | 71.41    | 468.27 |
| Sahaspur   | 5.42                             | 5.55     | 4.76     | 15.73  |
| Vikasnagar | -                                | -        | 1.42     | 1.42   |
| Total      | 254.51                           | 156.02   | 113.09   | 523.62 |

Table 29.2

| Block      | Suitable Areas for Muga (ha) |         |
|------------|------------------------------|---------|
|            | Suitable                     | Total   |
| Chakrata   | 1025.73                      | 1025.73 |
| Doiwala    | 690.58                       | 690.58  |
| Kalsi      | 933.69                       | 933.69  |
| Raipur     | 465.59                       | 465.59  |
| Sahaspur   | 53.62                        | 53.62   |
| Vikasnagar | 43.73                        | 43.73   |
| Total      | 3212.95                      | 3212.95 |

Table 29.3

| Block      | Suitable Areas forTasar (ha) |          |          |          |
|------------|------------------------------|----------|----------|----------|
|            | High                         | Moderate | Marginal | Total    |
| Chakrata   | 13315.98                     | -        | -        | 13315.98 |
| Doiwala    | 36.34                        | -        | -        | 36.34    |
| Kalsi      | 633.48                       | -        | -        | 633.48   |
| Raipur     | 1461.59                      | 0.56     | -        | 1462.16  |
| Sahaspur   | 1483.23                      | -        | -        | 1483.23  |
| Vikasnagar | 288.82                       | -        | -        | 288.82   |
| Total      | 17219.44                     | 0.56     | -        | 17220.00 |

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Fig. 28.1: Suitable areas for Mulberry in Dehradun district of Uttarakhand

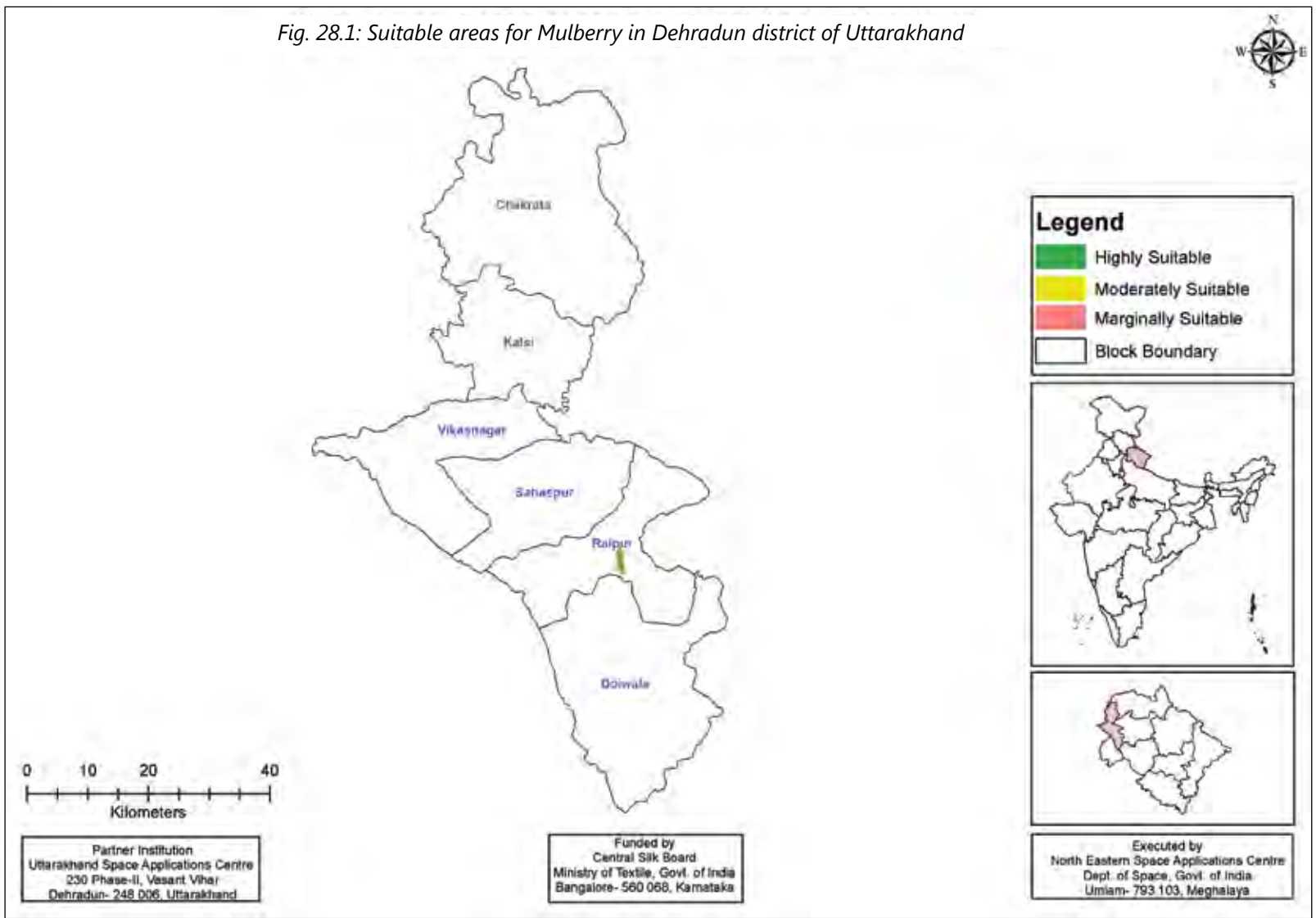
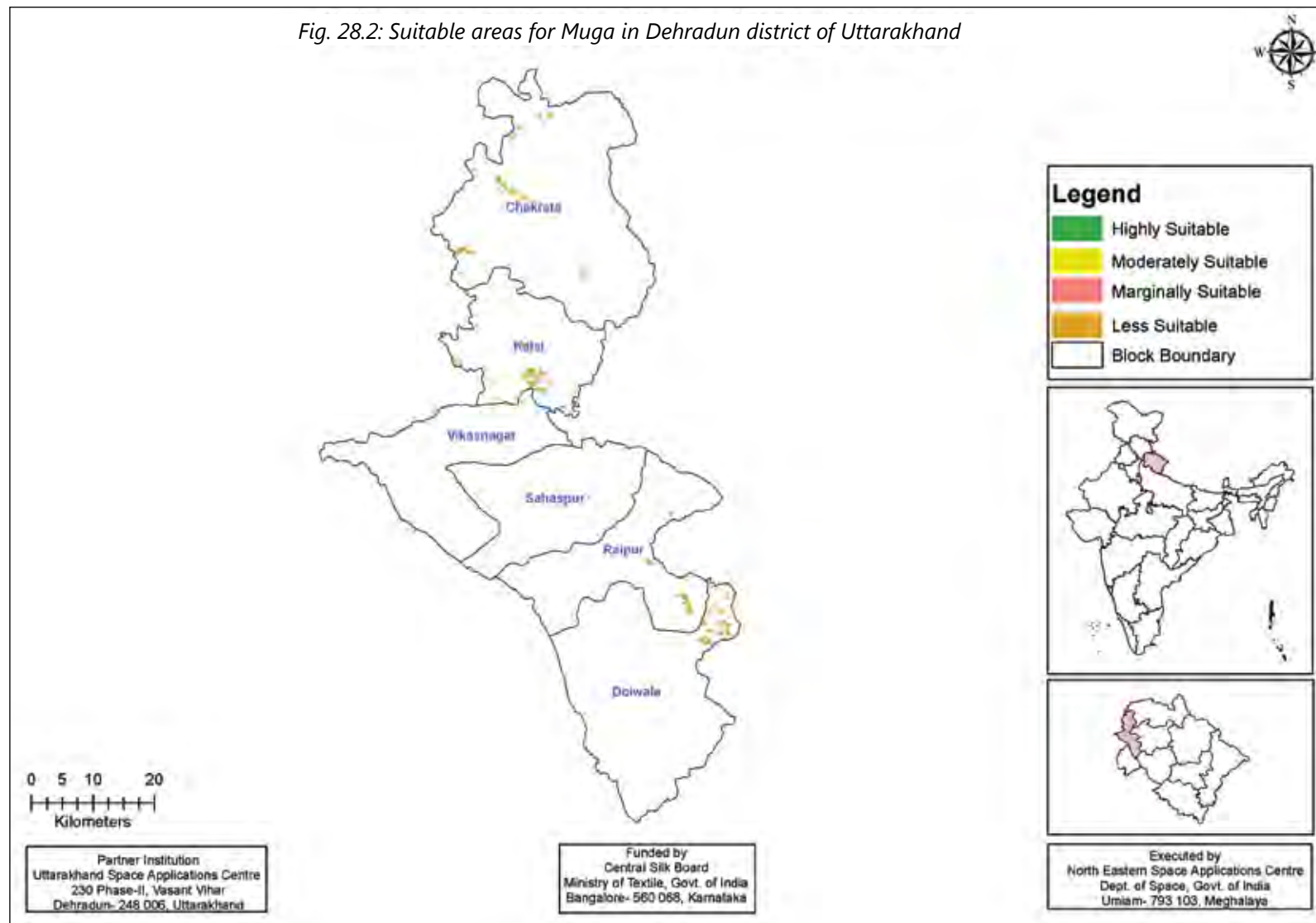


Fig. 28.2: Suitable areas for Muga in Dehradun district of Uttarakhand

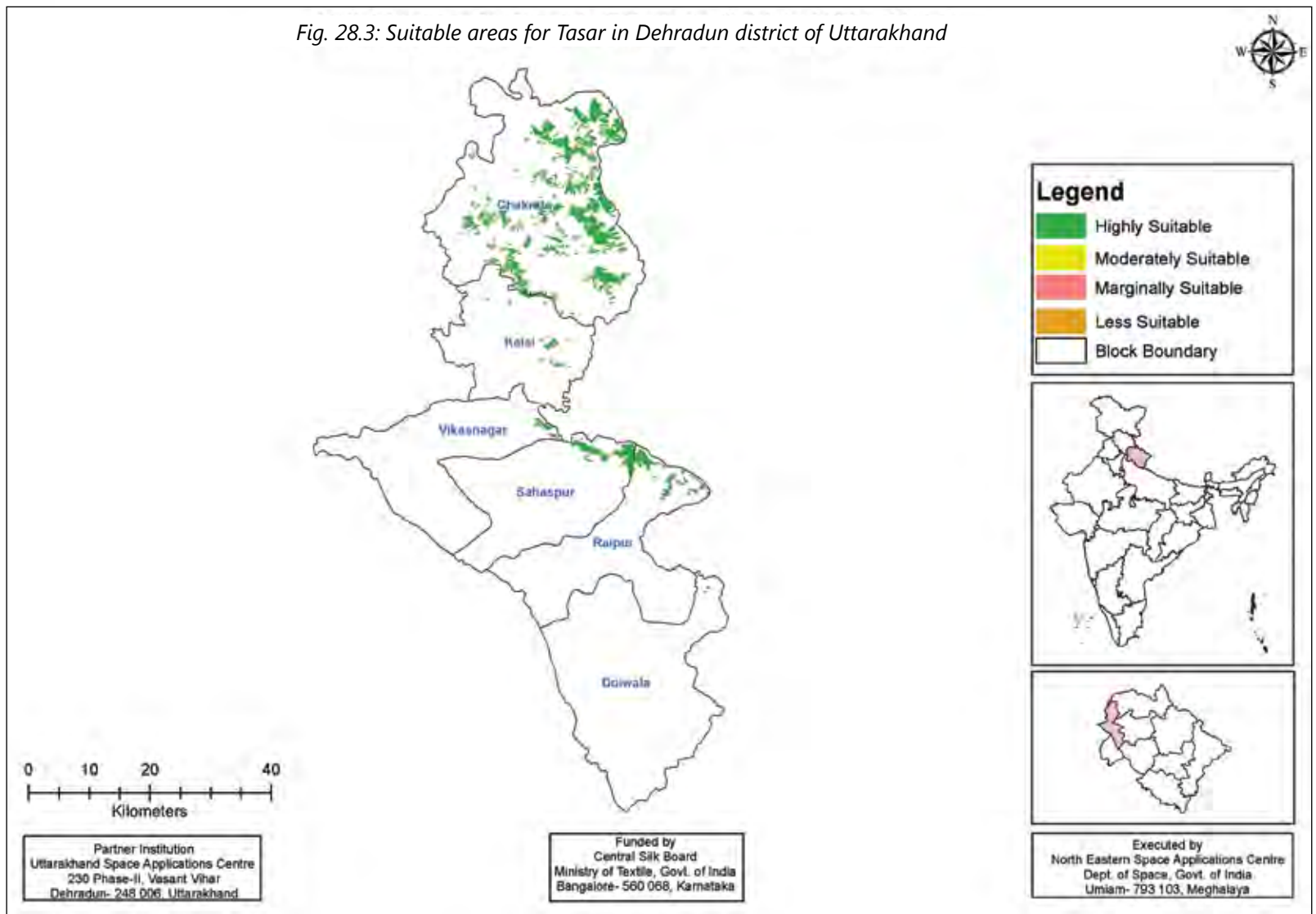


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Fig. 28.3: Suitable areas for Tasar in Dehradun district of Uttarakhand



Tables 29.4-29.6: Suitable Areas for Mulberry, Muga & Tasar in Nainital District of Uttarakhand

Table 29.4

| Block      | Suitable Areas for Mulberry (ha) |          |          |        |
|------------|----------------------------------|----------|----------|--------|
|            | High                             | Moderate | Marginal | Total  |
| Betalghat  | -                                | -        | -        | -      |
| Bhimtal    | -                                | -        | 1.10     | 1.10   |
| Dhari      | -                                | -        | -        | -      |
| haldwani   | 139.01                           | 48.57    | 25.16    | 212.74 |
| Kotabagh   | 80.05                            | 36.66    | 4.25     | 120.96 |
| Okhalkanda | -                                | -        | -        | -      |
| Ramgarh    | -                                | -        | -        | -      |
| Ramnagar   | 7.74                             | 6.48     | 54.23    | 68.46  |
| Total      | 226.81                           | 91.71    | 84.74    | 403.26 |

Table 29.5

| Block      | Suitable Areas for Muga (ha) |         |
|------------|------------------------------|---------|
|            | Suitable                     | Total   |
| Betalghat  | 1122.25                      | 1122.25 |
| Bhimtal    | 204.95                       | 204.95  |
| Dhari      | -                            | -       |
| haldwani   | -                            | -       |
| Kotabagh   | 127.75                       | 127.75  |
| Okhalkanda | 713.67                       | 713.67  |
| Ramgarh    | 484.18                       | 484.18  |
| Ramnagar   | 153.38                       | 153.38  |
| Total      | 2806.16                      | 2806.16 |

Table 29.6

| Block      | Suitable areas for Tasar (ha) |          |          |          |
|------------|-------------------------------|----------|----------|----------|
|            | High                          | Moderate | Marginal | Total    |
| Betalghat  | 7976.01                       | 280.08   | -        | 8256.09  |
| Bhimtal    | 6871.46                       | 259.63   | -        | 7131.09  |
| Dhari      | 2664.48                       | 635.92   | -        | 3300.40  |
| haldwani   | 1328.09                       | -        | -        | 1328.09  |
| Kotabagh   | 3781.35                       | 205.89   | -        | 3987.24  |
| Okhalkanda | 11271.14                      | 476.07   | -        | 11747.21 |
| Ramgarh    | 4957.62                       | 427.41   | -        | 5385.03  |
| Ramnagar   | 162.70                        | -        | -        | 162.70   |
| Total      | 39012.84                      | 2285.00  | -        | 41297.84 |

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Fig. 28.4: Suitable areas for Mulberry in Nainital district of Uttarakhand

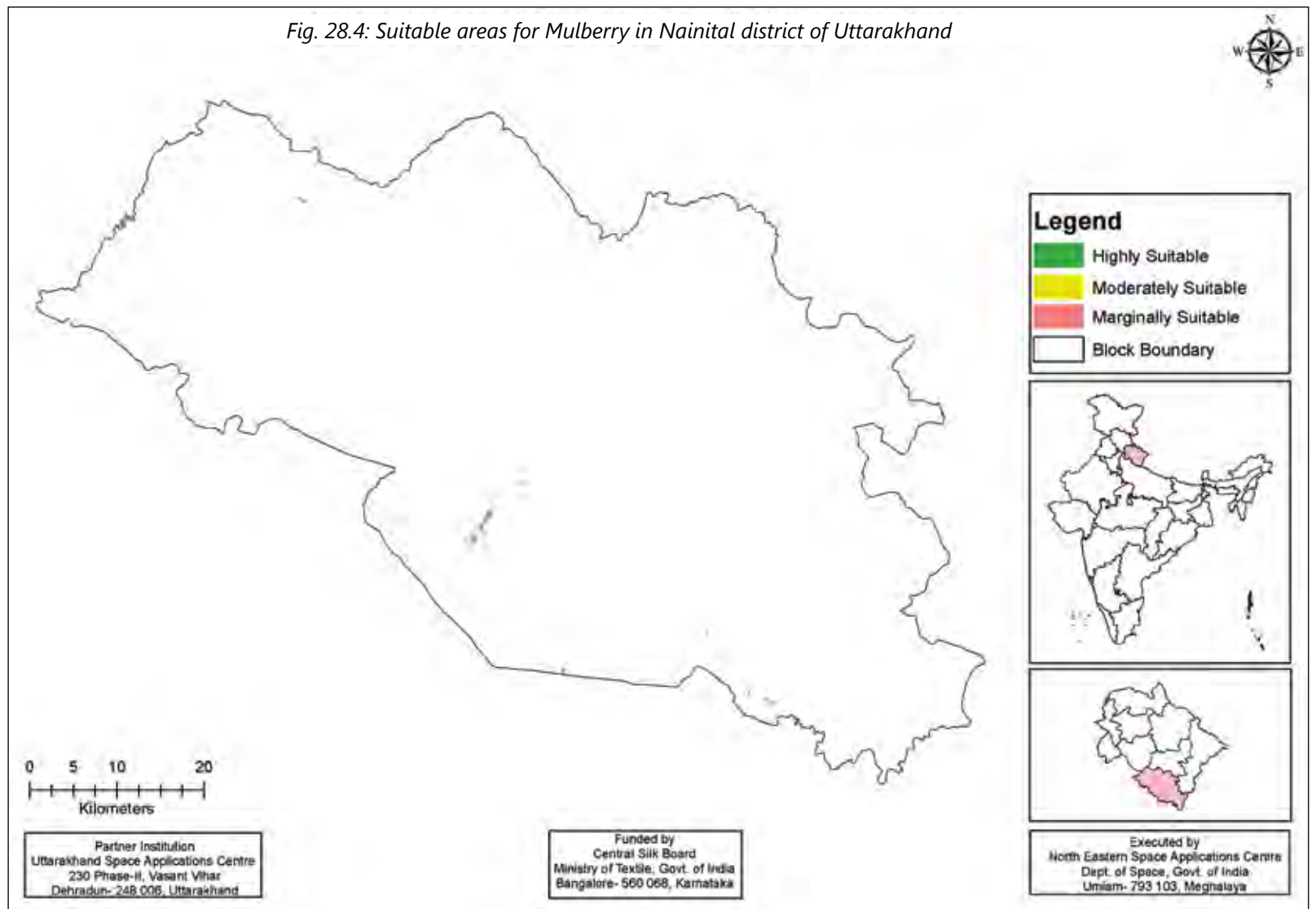
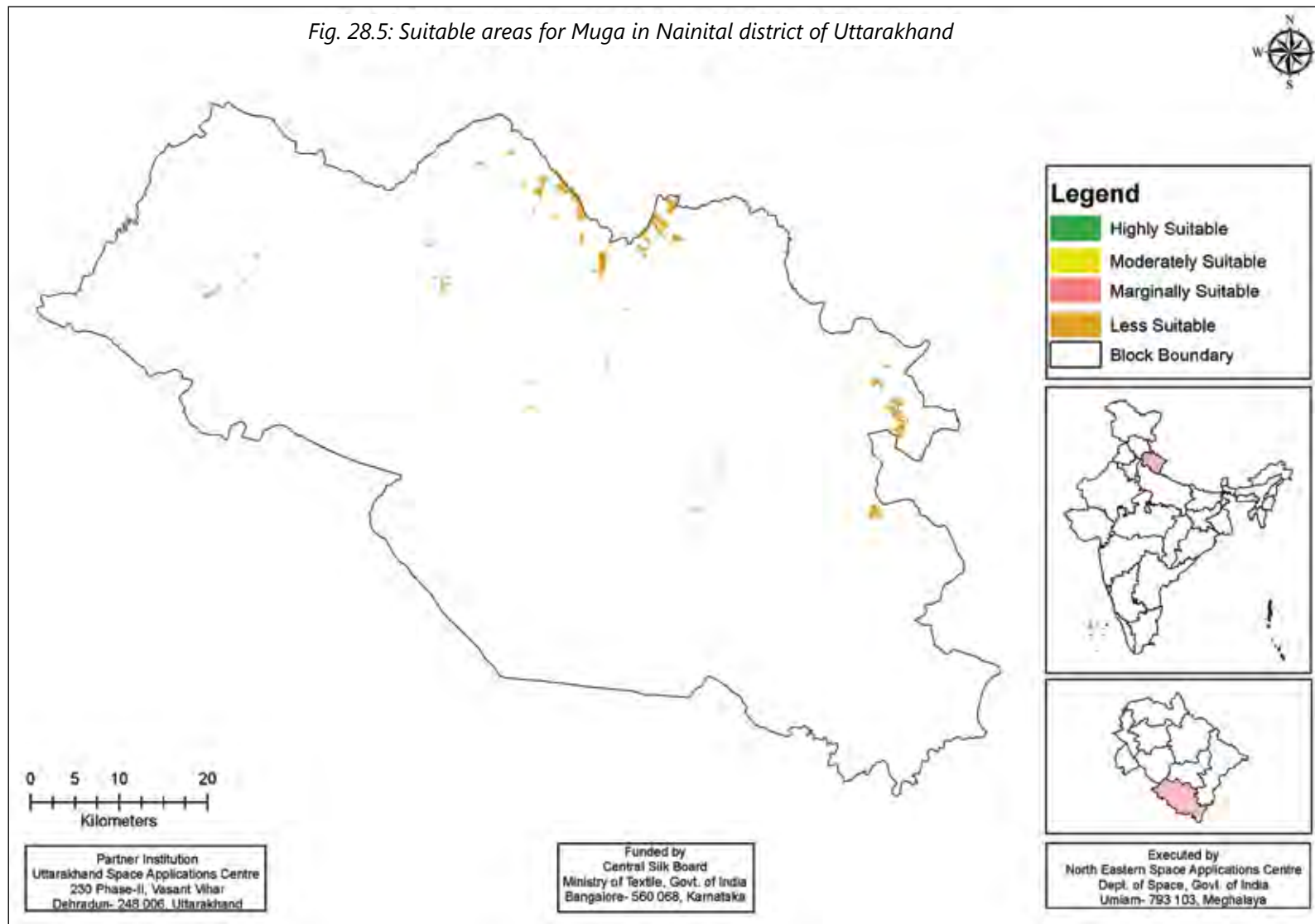


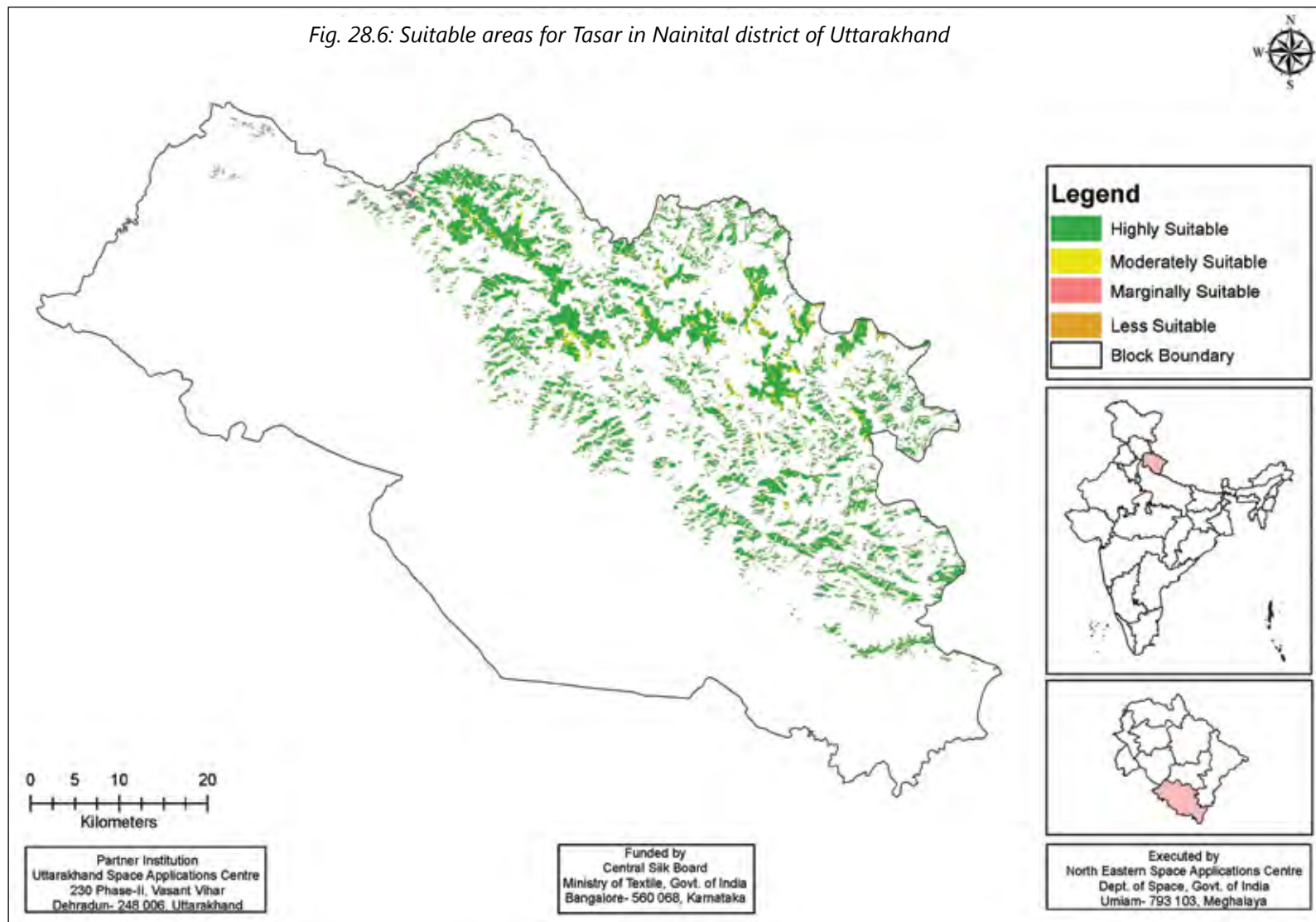
Fig. 28.5: Suitable areas for Muga in Nainital district of Uttarakhand



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Fig. 28.6: Suitable areas for Tasar in Nainital district of Uttarakhand



Tables 29.7-29.9: Suitable Areas for Mulberry, Muga & Tasar in Pithoragarh District of Uttarakhand

Table 29.7

| Block       | Suitable Areas for Mulberry (ha) |          |          |       |
|-------------|----------------------------------|----------|----------|-------|
|             | High                             | Moderate | Marginal | Total |
| Berinag     | -                                | -        | -        | -     |
| Darchula    | -                                | 15.61    | 33.42    | 49.03 |
| Didihat     | -                                | -        | -        | -     |
| Gangolihat  | -                                | -        | -        | -     |
| Kanalichina | -                                | -        | -        | -     |
| Munakot     | -                                | -        | -        | -     |
| Munsyari    | -                                | -        | -        | -     |
| Pithoragarh | -                                | -        | 5.21     | 5.21  |
| Total       | -                                | 15.61    | 38.63    | 54.24 |

Table 29.8

| Block       | Suitable Areas for Muga (ha) |         |
|-------------|------------------------------|---------|
|             | Suitable                     | Total   |
| Berinag     | -                            | -       |
| Darchula    | -                            | -       |
| Didihat     | 228.13                       | 228.13  |
| Gangolihat  | 320.87                       | 320.87  |
| Kanalichina | 2159.15                      | 2159.15 |
| Munakot     | 627.14                       | 627.14  |
| Munsyari    | 255.34                       | 255.34  |
| Pithoragarh | 527.19                       | 527.19  |
| Total       | 4117.83                      | 4117.83 |

Table 29.9

| Block       | Suitable areas for Tasar (ha) |          |          |           |
|-------------|-------------------------------|----------|----------|-----------|
|             | High                          | Moderate | Marginal | Total     |
| Berinag     | 8813.21                       | 591.01   | -        | 9404.22   |
| Darchula    | 9506.66                       | 17960.96 | -        | 27467.62  |
| Didihat     | 9430.88                       | 2720.85  | -        | 12151.73  |
| Gangolihat  | 8560.27                       | 998.18   | -        | 9558.44   |
| Kanalichina | 7475.18                       | 162.94   | -        | 7638.12   |
| Munakot     | 5025.99                       | 1955.67  | -        | 6981.66   |
| Munsyari    | 13132.64                      | 21561.85 | -        | 34694.49  |
| Pithoragarh | 5341.88                       | 1166.67  | -        | 6508.55   |
| Total       | 67286.71                      | 47118.11 | -        | 114404.82 |

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Fig. 28.7: Suitable areas for Mulberry in Pithoragarh district of Uttarakhand

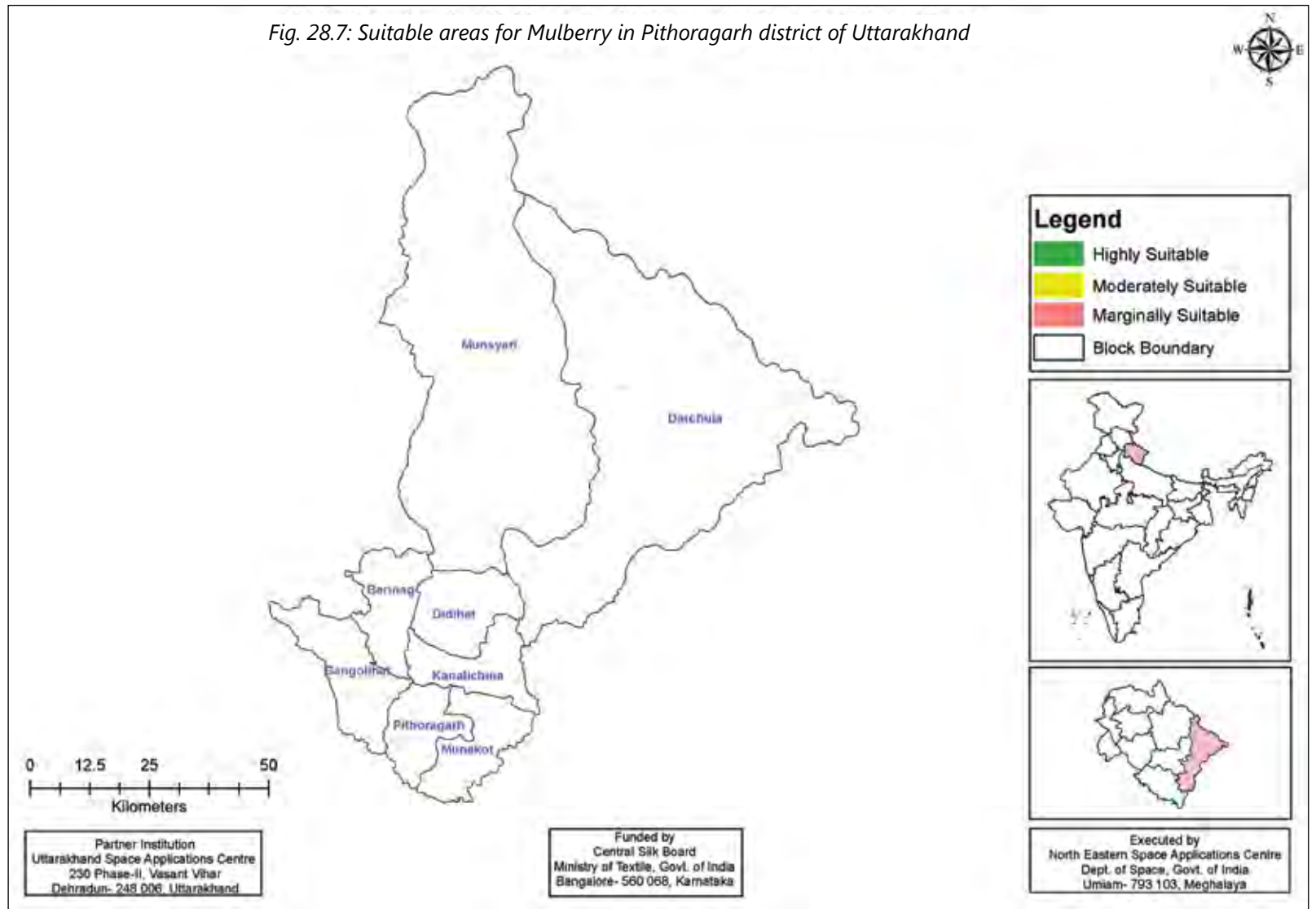
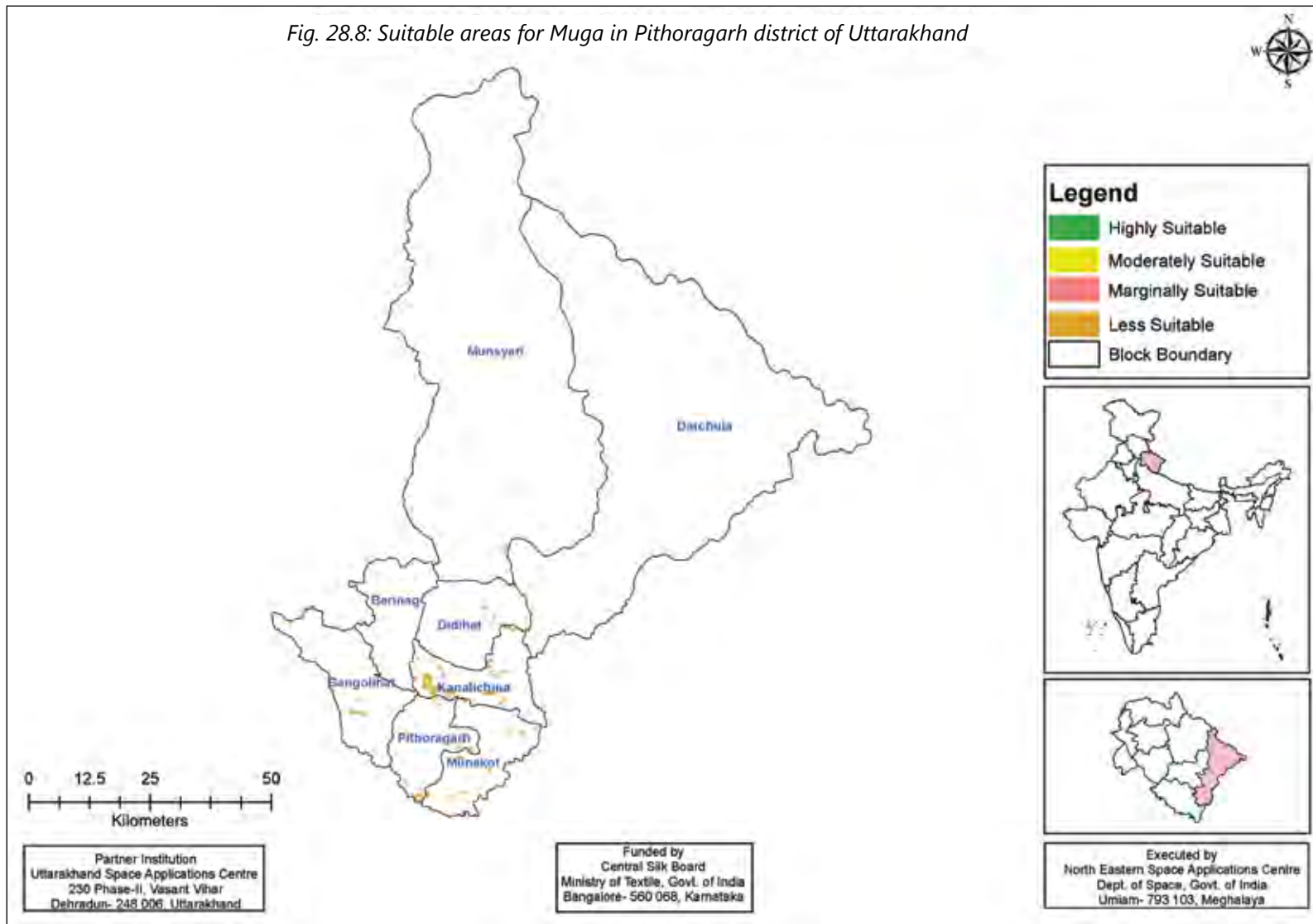


Fig. 28.8: Suitable areas for Muga in Pithoragarh district of Uttarakhand

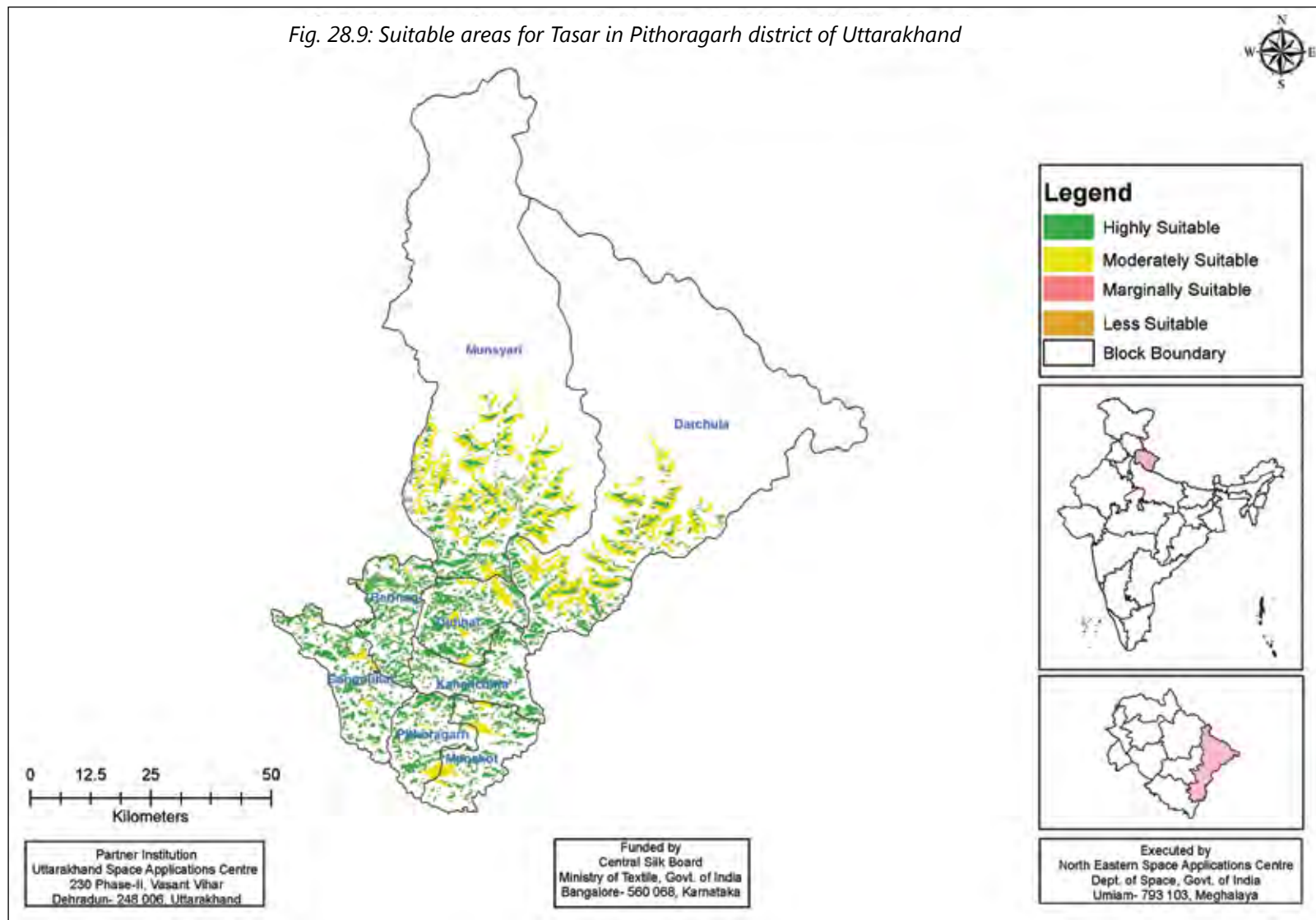


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Fig. 28.9: Suitable areas for *Tasar* in Pithoragarh district of Uttarakhand



Tables 29.10-29.13: Suitable Areas for Mulberry in Udham Singh Nagar & Uttarkashi District of Uttarakhand

Table 29.10

| Block     | Suitable Areas for Mulberry in Udham Singh Nagar (ha) |          |          |        |
|-----------|---|----------|----------|--------|
|           | High  | Moderate | Marginal | Total  |
| Jaspur    | 5.68  | 3.15     | 0.24     | 9.07   |
| Kasipur   | 35.27   | 17.64    | 20.65    | 73.55  |
| Khatima   | -   | -        | -        | -      |
| Rudrapur  | 60.90   | 6.69     | 2.19     | 69.79  |
| Sitarganj | 11.76   | 8.07     | -        | 19.83  |
| Total     | 113.62  | 35.54    | 23.08    | 172.24 |

Table 29.11

| Block         | Suitable Areas for Mulberry in Uttarkashi (ha) |          |          |       |
|---------------|--|----------|----------|-------|
|               | High   | Moderate | Marginal | Total |
| Bhatwari      | -  | 1.27     | 3.51     | 4.78  |
| Chiniyalisaur | -  | -        | -        | -     |
| Dunda         | -  | -        | -        | -     |
| Mori          | -  | -        | -        | -     |
| Naugaon       | -  | -        | -        | -     |
| Purola        | -  | -        | -        | -     |
| Total         | -  | 1.27     | 3.51     | 4.78  |

Table 29.12

| Block         | Suitable Areas for Muga in Uttarkashi (ha) |        |
|---------------|--|--------|
|               | Suitable                                   | Total  |
| Bhatwari      | 1.01                                       | 1.01   |
| Chiniyalisaur | 8.74                                       | 8.74   |
| Dunda         | 34.84                                      | 34.84  |
| Mori          | -  | -      |
| Naugaon       | 127.60                                     | 127.60 |
| Purola        | 74.95                                      | 74.95  |
| Total         | 247.14                                     | 247.14 |

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Table 29.13

| Block         | Suitable Areas for Tasar in Uttarkashi (ha) |          |          |           |
|---------------|---|----------|----------|-----------|
|               | High  | Moderate | Marginal | Total     |
| Bhatwari      | 18389.25                                    | 18506.14 | -        | 36895.40  |
| Chiniyalisaur | 5079.71                                     | 2808.64  | -        | 7888.35   |
| Dunda         | 13548.63                                    | 8872.00  | -        | 22420.63  |
| Mori          | 23916.42                                    | 17253.12 | -        | 41169.53  |
| Naugaon       | 13337.42                                    | 8898.43  | -        | 22235.85  |
| Purola        | 9185.39                                     | 3721.51  | -        | 12906.91  |
| Total         | 83456.82                                    | 60059.84 | -        | 143516.67 |

Fig. 28.10: Suitable areas for Mulberry in Udham Singh Nagar district of Uttarakhand

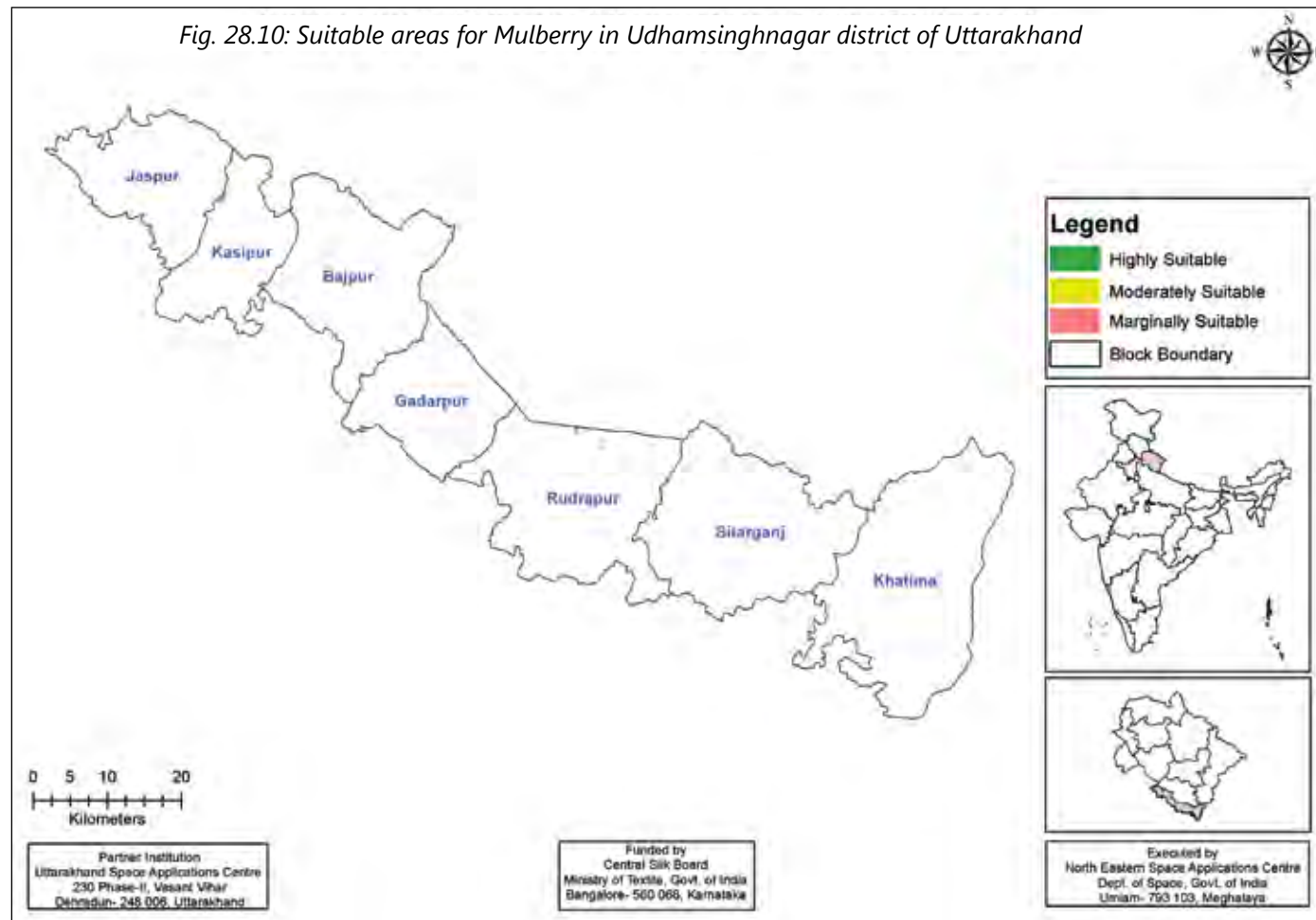
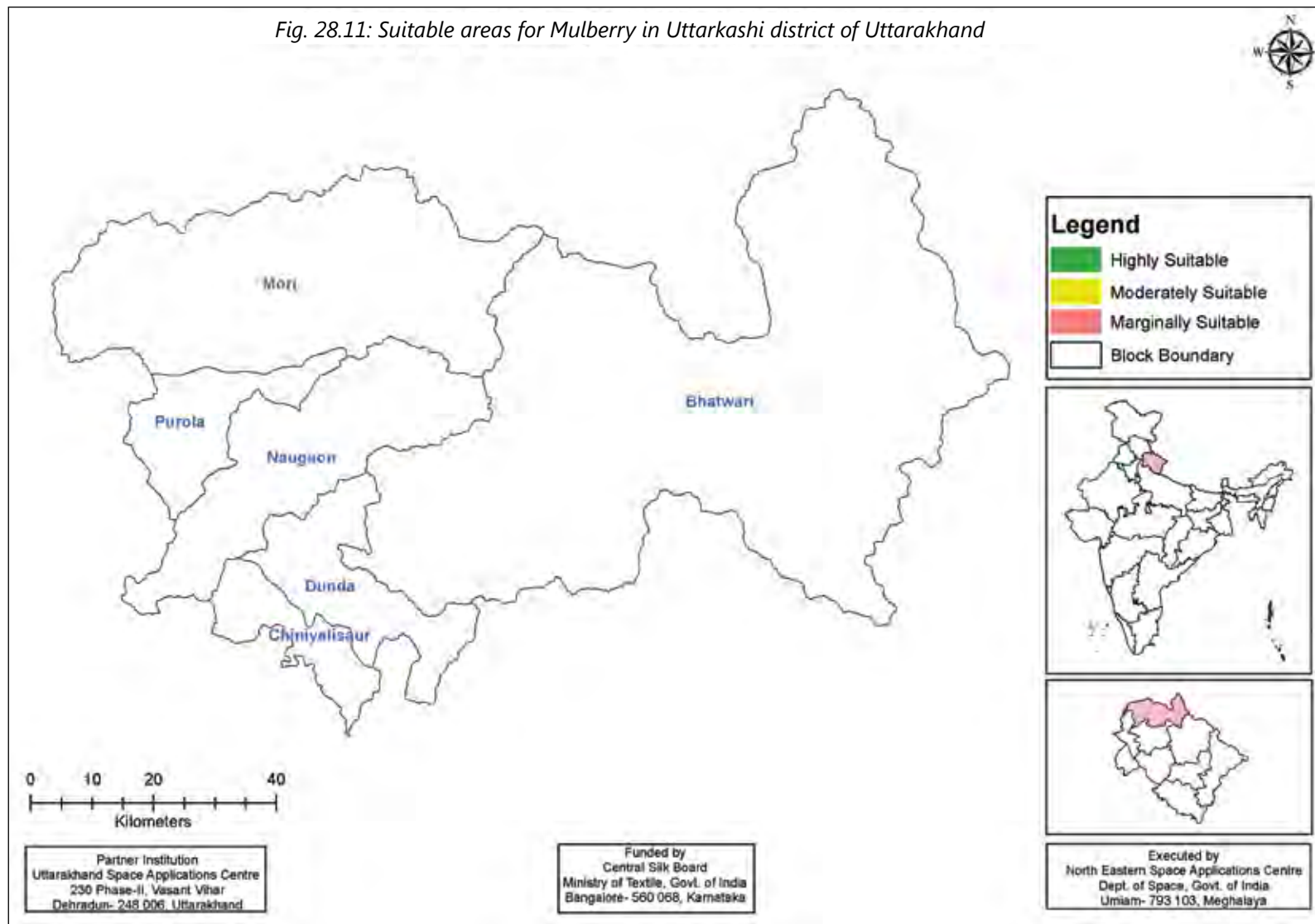


Fig. 28.11: Suitable areas for Mulberry in Uttarkashi district of Uttarakhand



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Fig. 28.12: Suitable areas for Muga in Uttarkashi district of Uttarakhand

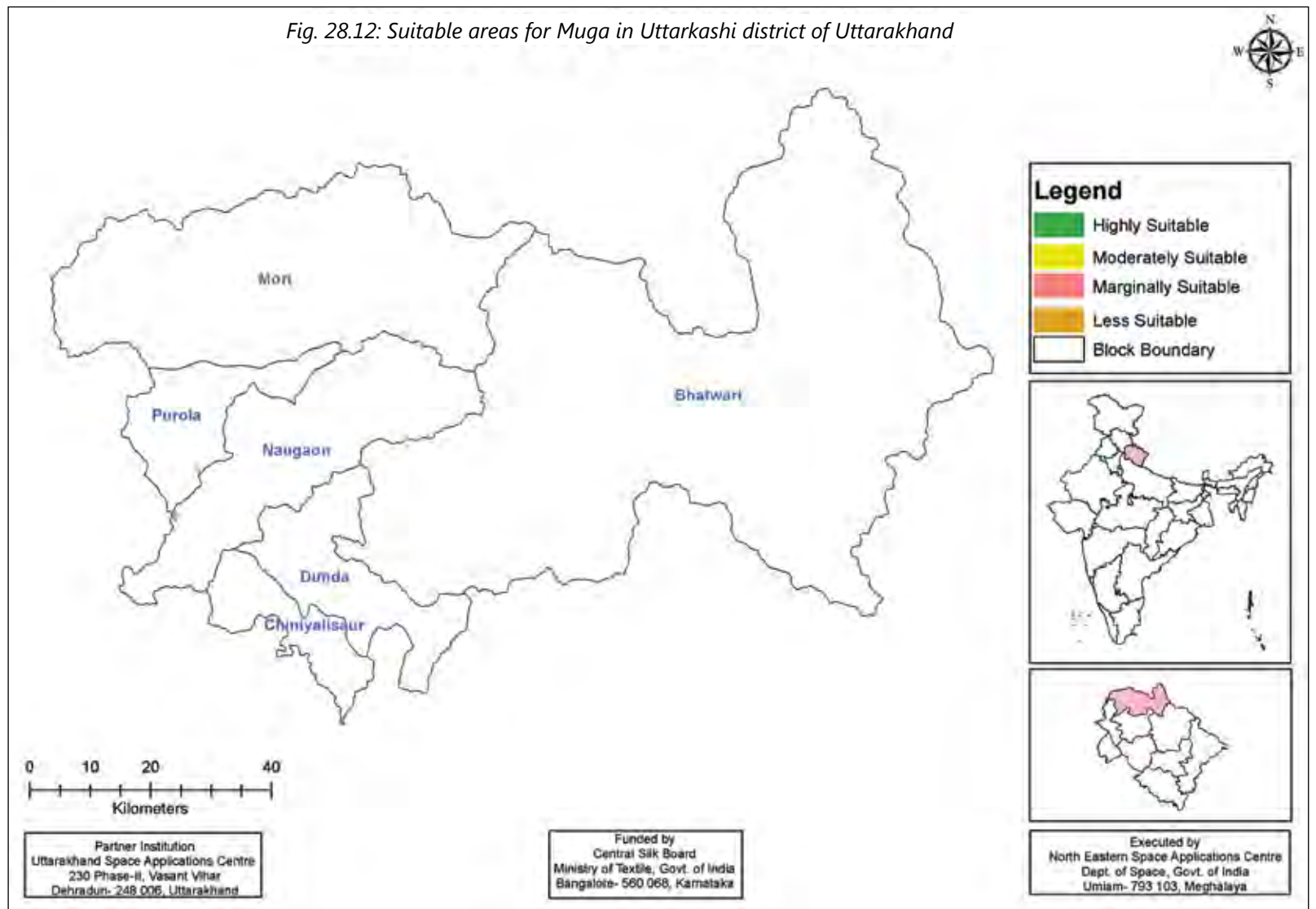
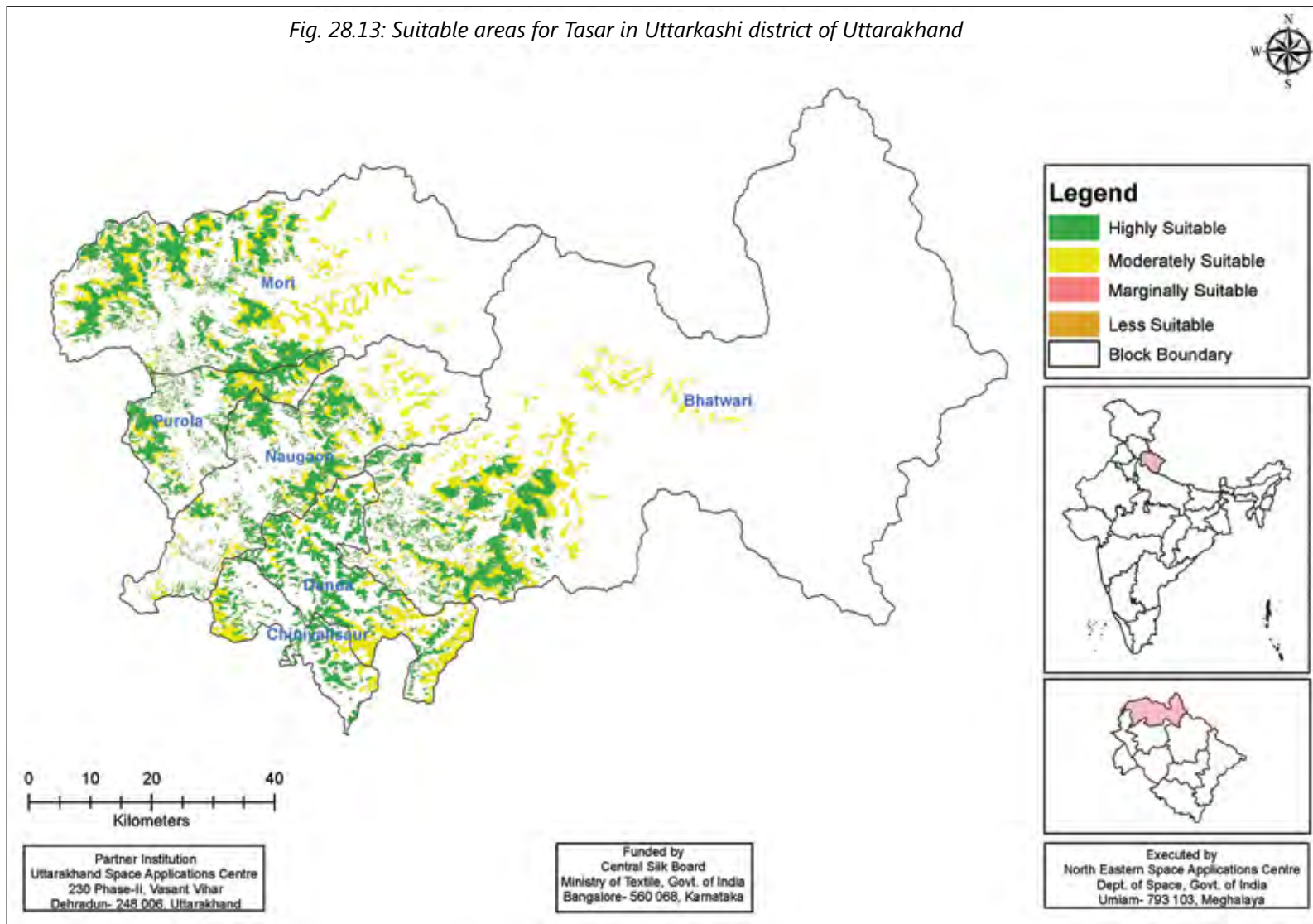


Fig. 28.13: Suitable areas for Tasar in Uttarkashi district of Uttarakhand



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DEVELOPMENT

## WEST BENGAL

West Bengal is the nation's fourth-most populous and spread over 88,750 km<sup>2</sup>. It is bordered by the countries of Nepal, Bhutan, and Bangladesh and the states of Odisha, Jharkhand, Bihar, Sikkim, and Assam. West Bengal encompasses two broad natural regions: the Gangetic Plain in the south and the sub-Himalayan and Himalayan area in the north. A major agricultural producer, West Bengal is the sixth-largest contributor to India's net domestic product. West Bengal's climate varies from tropical savanna in the southern portions to humid subtropical in the north with the highest day temperature ranging from 38 °C to 45 °C.

Sericulture, in West Bengal, is one of the age old rural based agro industries with global reach. Sericulture practices provided sustainable income and employment opportunities to the rural poor who are the main practitioners. Some unique features of the silk sector in West Bengal Districts are its rural nature, agro based, ecologically sustainable activity for the poor, small and marginal farmers, agriculture labourer and women in particular. Sericulture in West Bengal mainly cultivated in Cooch Bihar, Jalpaiguri, Maldah, Murshidabad, Nadia, Birbhum, Bankura, Midnapore (East & West) and Purulia district. Depending on physiographic divisions, the climate in West Bengal is conducive for rearing of all four varieties of silk (mulberry, eri, muga and tasar), Mulberry sericulture dominates with 65% in total plantation area, 89% in total production and 95% in exports. About 90% of mulberry silk production takes place in the districts of Murshidabad, Maldah, Birbhum, and Cooch Bihar. Area under the plantation of host plants of mulberry and tasar is 13,719 ha and 6397 ha respectively. The brand "Murshidabad silk" is not only famous across India, but also has a great demand throughout the world. At present, there are about 92,200 sericultural families, 43,891 spinners, 11,307 reelers and 310 weavers in the State. Many studies indicated that 60% of the activities in the pre-cocoon and post-cocoon sectors are carried out by women (Source: DOS, GOWB).

Nine districts viz. Bankura, Birbhum, Jalpaiguri, Koch Bihar, Maldah, Murshidabad, Pachim Medinipur, Purba Medinipur and Purulia were selected for mapping of potential areas for of sericulture development, where all the nine districts were covered under mulberry sericulture. The districts of Bankura, Birbhum, Pachim Medinipur and Purulia were selected also for Tasar. The districts of Jalpaiguri and Koch Bihar were selected also for Muga. Eri suitability were analysed only in Jalpaiguri district.

### Bankura

Bankura is located in the western part of the state and is lies between 22° 38' and 23° 38' north latitude and between 86°36' and 87°47' east longitude. River Demodar flows along the northern boundary of the district. The adjacent districts



are Bardhaman in the north, Purulia in the west and Paschim Medinapure in the south, on the south-east it is bounded by Hooghly district. The district has an area of 6,788 sq. kms.

### **Birbhum**

Birbhum is the northern most district of the Burdwan Division and extends over an area of 4545 Sq. Kms.. It lies between 23° 32' 30" and 24° 35' 0" north latitude and 88° 1' 40" and 87° 5' 25" east longitude. Birbhum is bounded on the north and west by Santhal Paraganas, on the east by the districts of Murshidabad and Burdwan and on the south by Burdwan, from which it is separated by the Ajay river.

### **Jalpaiguri**

Jalpaiguri district is the largest district of North Bengal, covering an area 6,245 sq. km. The district has international borders with Bhutan and Bangladesh in the north and south respectively and borders with Assam and the Darjeeling hills in the east, west and northwest. It is lies between 26° 16' and 27° 0' North latitudes and 88° 4' and 89° 53' East longitudes.

### **Koch Bihar**

Koch Bihar is a district under the Jalpaiguri Division of the state covering an area of 3387 sq. kms. The district lies between 25°57'47" to 26°36'2" North latitude and between 89°05'43" to 88°04'44" East longitude. It is located in the north-eastern part of the state and bounded by the district of Jalpaiguri in the north, state of Assam in the east and the international border in the form of Indo-Bangladesh boundary in the south as well as in the west.

### **Maldah**

Malda, the southernmost North Bengal district is comprised within the Jalpaiguri Division. The District is situated between the Latitude of 24°40'20"N to 25°32'08"N and Longitude of 88°28'10"E to 87°45'50"E covering an area of 3733 sq. kms. It is surrounded by Bangladesh and South Dinajpur in the east, Santal Parganas of Jharkhand state in the west, Uttar Dinajpur in the north and Murshidabad in the south.. It shares 165.5 km international border with Bangladesh.

### **Murshidabad**

Murshidabad district is situated on the left bank of the river Ganges and is very fertile. It is lies between 24°50'20" and 23°43'30" north latitude and between 88°46'00" and E 87°49'17" east longitude and covers an area of 5,341 sq. kms. Berhampore town is the headquarters of the district. It borders Malda district to the north, Jharkhand's Sahebganj district and Pakur district to the north-west, Birbhum to the west, Bardhaman to the south-west and Nadia district due south. The international border with Bangladesh's Rajshahi Division is on the east.



### Paschim Medinipur

Paschim Medinipur is situated in the south-western side of the state. It is bounded by Bankura district and Purulia district in the north, Mayurbhanj district and Balasore district of Orissa in the south, Hooghly district and Purba Medinipur district in the east and Singhbhum district of Jharkhand and Purulia district of West Bengal in the west. The district lies between 21 47' and 23 00' north latitude, and between 86 40' and 87 52' east longitude and covers an area of 9,345 sq. kms.

### Purba Medinipur

Purba Medinipur is located in the southern part of the state extending between 22 57' and 21 36' north latitude, and between 88 12' and 86 33' east longitude. Total geographical area of the state is 4151.64 sq.km. It is bounded to the north by Paschim Medinipur and Howrah Districts, east by Howrah and South 24 Parganas Districts and Bay of Bengal, South by Bay of Bengal and West by Paschim Medinipur District and the state of Orissa.

### Purulia

Purulia district lies between 22.60 degrees and 23.50 degrees north latitudes and 85.75 degrees and 86.65 degrees east longitudes with a total geographical area of 6259 km. The town of Purulia is the administrative headquarters of the district. This district is bordered on the east by Bankura and Paschim Medinipur districts, on the north by Bardhaman district and Dhanbad district of Jharkhand state, on the west by Bokaro and Ranchi districts of Jharkhand state and on the south by West Singhbhum and East Singhbhum districts of Jharkhand state.

Tables 30.1-30.2: Suitable areas for Mulberry & Tasar in Bankura district of West Bengal

Table 30.1

| Block         | Suitable areas for Mulberry (ha) |          |          |         |
|---------------|----------------------------------|----------|----------|---------|
|               | High                             | Moderate | Marginal | Total   |
| Bankurai      | 483.39                           | 736.91   | 4.61     | 1224.91 |
| Bankurail     | 1976.20                          | 369.86   | -        | 2346.05 |
| Barjora       | 1276.23                          | 586.33   | 1.37     | 1863.93 |
| Bishnupur     | 814.14                           | 632.99   | -        | 1447.12 |
| Chhatna       | 2179.61                          | 766.78   | 53.47    | 2999.86 |
| Gangajalghati | 1644.84                          | 1051.26  | 24.36    | 2720.45 |
| Hirbandh      | 24.39                            | 1557.60  | 109.27   | 1691.25 |
| Indpur        | 693.46                           | 2083.28  | 204.19   | 2980.94 |
| Indus         | -                                | -        | 16.11    | 16.11   |
| Joypur        | 104.06                           | 88.74    | -        | 192.81  |
| Khatra        | 317.72                           | 1061.81  | 123.66   | 1503.19 |
| Kotulpur      | -                                | 67.84    | -        | 67.84   |

|            |          |          |        |          |
|------------|----------|----------|--------|----------|
| Mejhia     | 155.94   | 578.79   | -      | 734.73   |
| Onda       | 2334.27  | 1569.95  | 1.11   | 3905.33  |
| Patrasayer | 55.68    | 852.43   | 35.83  | 943.94   |
| Raipur     | 1228.96  | 715.35   | 6.20   | 1950.51  |
| Ranibandh  | 1380.13  | 600.87   | 18.88  | 1999.88  |
| Saltora    | 502.99   | 2027.15  | 79.98  | 2610.12  |
| Sarenga    | 377.94   | 249.85   | 1.27   | 629.06   |
| Simlapal   | 1392.38  | 740.48   | 1.35   | 2134.21  |
| Sonamukhi  | 103.47   | 551.71   | 2.98   | 658.16   |
| Taldangra  | 605.87   | 1106.85  | -      | 1712.72  |
| Total      | 17651.67 | 17996.82 | 684.65 | 36333.14 |

Table 30.2

| Block         | Suitable areas for Tasar (ha) |          |          |          |
|---------------|-------------------------------|----------|----------|----------|
|               | High                          | Moderate | Marginal | Total    |
| Bankurai      | 401.58                        | 110.27   | 1305.72  | 1817.57  |
| Bankurail     | 146.91                        | 286.48   | 1895.39  | 2328.78  |
| Barjora       | 33.97                         | 37.91    | 2181.79  | 2253.67  |
| Bishnupur     | -                             | -        | 2015.26  | 2015.26  |
| Chhatna       | 2459.21                       | 1919.63  | 2818.92  | 7197.76  |
| Gangajalghati | 76.45                         | 82.20    | 1752.77  | 1911.42  |
| Hirbandh      | 2787.56                       | 194.74   | 5.50     | 2987.80  |
| Indpur        | 1307.53                       | 666.39   | 1275.20  | 3249.12  |
| Indus         | -                             | -        | 176.54   | 176.54   |
| Joypur        | -                             | -        | 422.40   | 422.40   |
| Khatra        | 1963.76                       | 794.30   | 318.64   | 3076.70  |
| Kotulpur      | -                             | -        | 174.39   | 174.39   |
| Mejhia        | -                             | -        | 873.36   | 873.36   |
| Onda          | -                             | 6.97     | 3087.02  | 3093.99  |
| Patrasayer    | -                             | -        | 424.42   | 424.42   |
| Raipur        | 2450.17                       | 798.34   | 1519.23  | 4767.74  |
| Ranibandh     | 4681.32                       | 732.94   | 190.67   | 5604.93  |
| Saltora       | 106.93                        | 95.17    | 5050.15  | 5252.25  |
| Sarenga       | 124.67                        | 82.87    | 749.19   | 956.73   |
| Simlapal      | 101.39                        | 213.59   | 2416.04  | 2731.02  |
| Sonamukhi     | -                             | -        | 503.27   | 503.27   |
| Taldangra     | 209.53                        | 222.67   | 3038.67  | 3470.87  |
| Total         | 16850.98                      | 6244.47  | 32194.54 | 55289.99 |



Fig. 29.1: Suitable areas for Mulberry in Bankura district of West Bengal

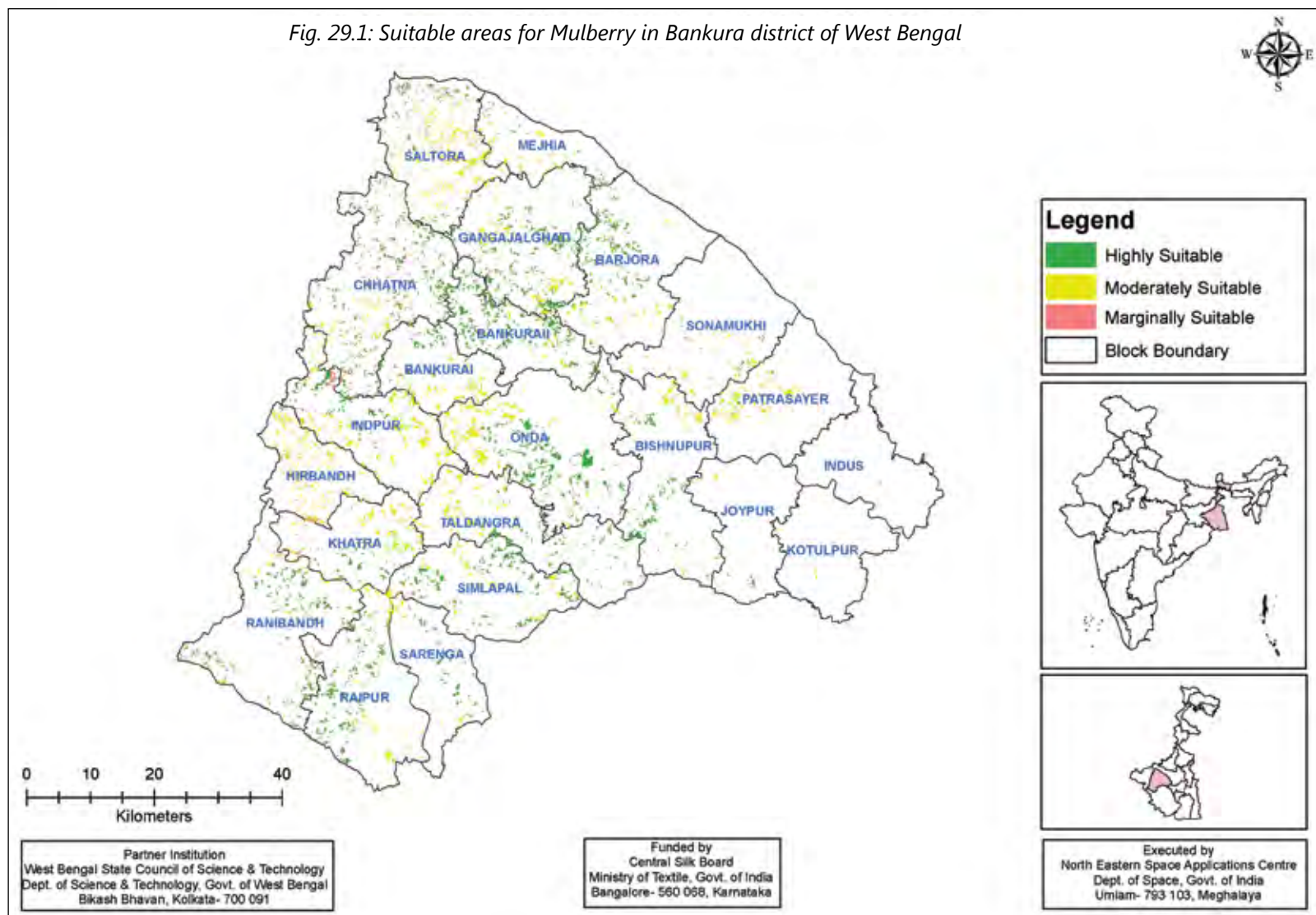
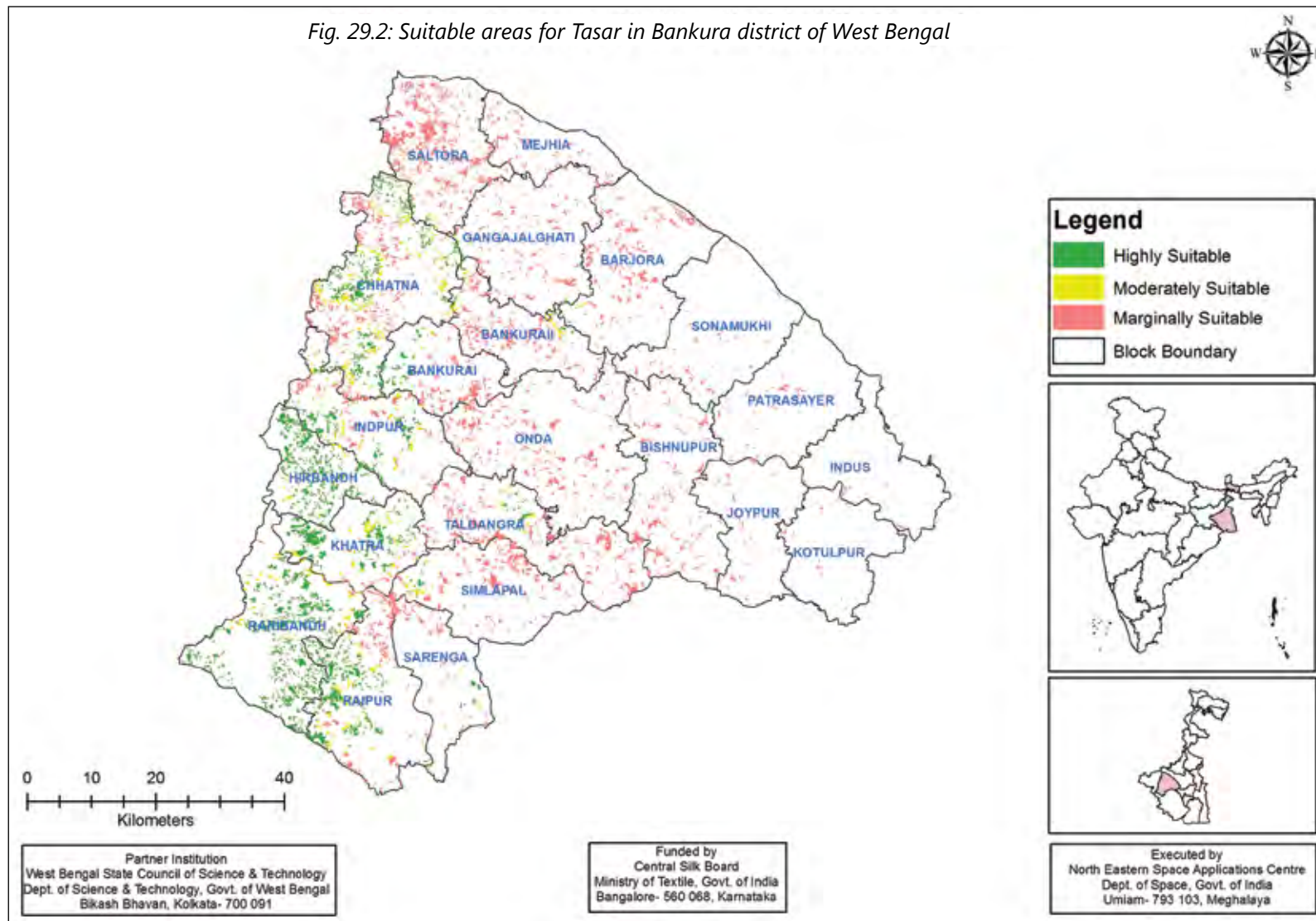


Fig. 29.2: Suitable areas for Tasar in Bankura district of West Bengal



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Tables 30.3-30.4: Suitable areas for Mulberry & Tasar in Birbhum district of West Bengal

Table 30.3

| Block          | Suitable areas for Mulberry (ha) |          |          |          |
|----------------|----------------------------------|----------|----------|----------|
|                | High                             | Moderate | Marginal | Total    |
| Bolpur         | -                                | 8.62     | 352.21   | 360.84   |
| Dubrajpur      | 2041.64                          | 116.92   | 42.31    | 2200.87  |
| Illambazar     | -                                | 191.08   | 68.02    | 259.10   |
| Khoyrasol      | 1303.03                          | 502.65   | 16.07    | 1821.76  |
| Labhpur        | -                                | 59.35    | 14.46    | 73.81    |
| Mayureshwari   | -                                | 1.36     | 8.82     | 10.18    |
| Mayureshwarii  | -                                | -        | -        | -        |
| Mohammad Bazar | 357.18                           | 712.87   | 543.16   | 1613.20  |
| Muraraii       | -                                | -        | 17.30    | 17.30    |
| Muraraiii      | -                                | -        | -        | -        |
| Nalhatii       | -                                | 21.60    | 50.31    | 71.91    |
| Nalhatiii      | -                                | -        | -        | -        |
| Nanoor         | -                                | -        | -        | -        |
| Rajnagar       | 1577.91                          | 2115.39  | 40.82    | 3734.12  |
| Rampurhati     | -                                | 6.31     | 478.60   | 484.91   |
| Rampurhatii    | -                                | -        | -        | -        |
| Sainthia       | -                                | 79.65    | 3.79     | 83.43    |
| Surii          | 414.72                           | 110.39   | 2.95     | 528.06   |
| Suriii         | -                                | 16.47    | -        | 16.47    |
| Total          | 5694.48                          | 3942.67  | 1638.83  | 11275.97 |

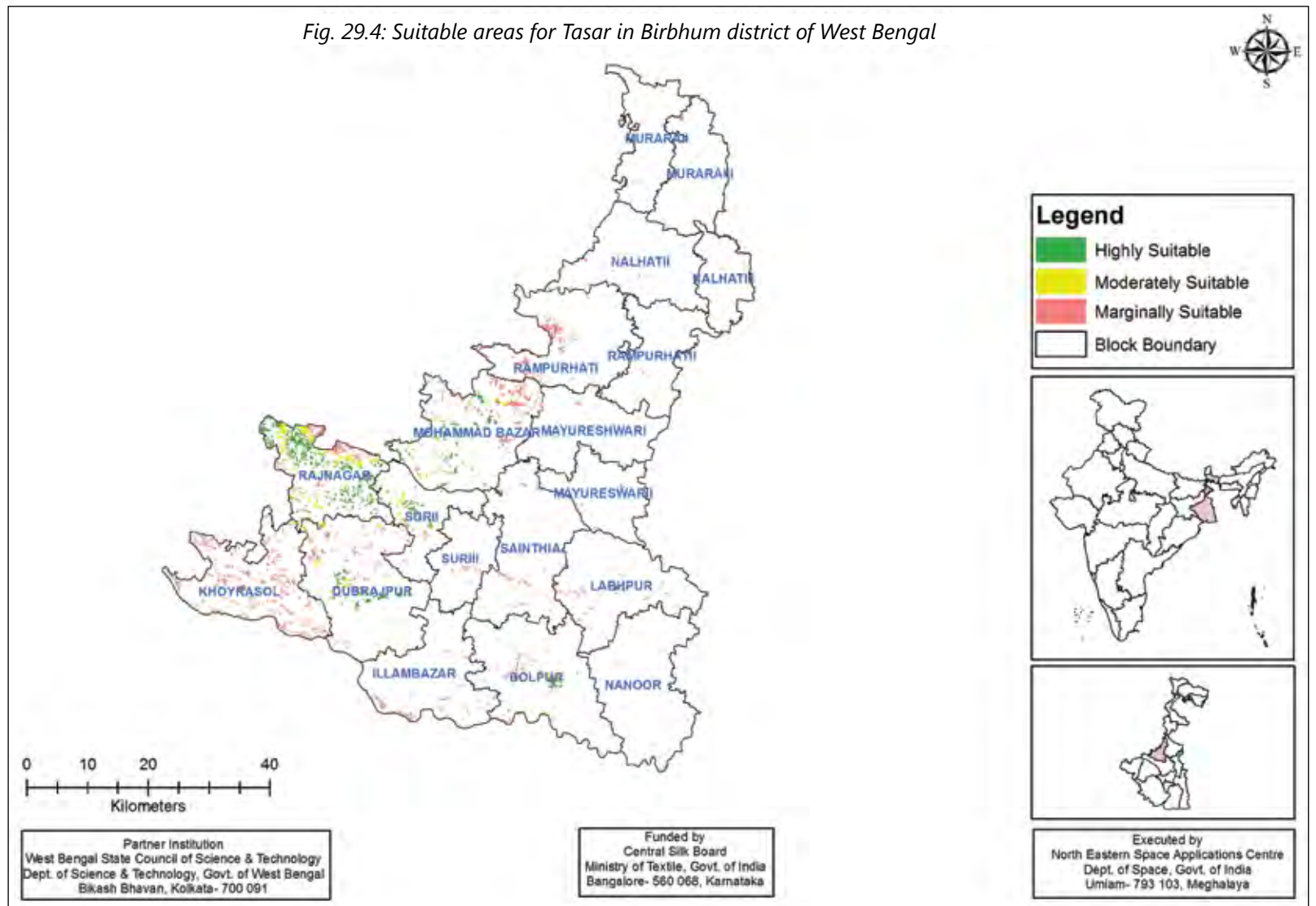
Table 30.4

| Block          | Suitable areas for Tasar (ha) |          |          |         |
|----------------|-------------------------------|----------|----------|---------|
|                | High                          | Moderate | Marginal | Total   |
| Bolpur         | 225.35                        | 185.35   | 544.83   | 955.53  |
| Dubrajpur      | 453.21                        | 461.56   | 933.79   | 1848.56 |
| Illambazar     | -                             | -        | 480.12   | 480.12  |
| Khoyrasol      | -                             | 27.88    | 2333.71  | 2361.59 |
| Labhpur        | 96.55                         | 5.35     | 277.43   | 379.33  |
| Mayureshwari   | -                             | -        | 129.36   | 129.36  |
| Mayureshwarii  | -                             | -        | 82.50    | 82.50   |
| Mohammad Bazar | 778.90                        | 480.43   | 1234.72  | 2494.05 |
| Muraraii       | -                             | -        | 50.78    | 50.78   |
| Muraraiii      | -                             | -        | 63.19    | 63.19   |





Fig. 29.4: Suitable areas for Tasar in Birbhum district of West Bengal



Tables 30.5-30.6: Suitable areas for Mulberry & Eri in Jalpaiguri district of West Bengal

Table 30.5

| Block        | Suitable areas for Mulberry (ha) |          |          |         |
|--------------|----------------------------------|----------|----------|---------|
|              | High                             | Moderate | Marginal | Total   |
| Alipurduari  | -                                | -        | 179.47   | 179.47  |
| Alipurduarii | -                                | -        | 48.87    | 48.87   |
| Dhupguri     | -                                | -        | 64.85    | 64.85   |
| Falakata     | -                                | 5.17     | 215.21   | 220.38  |
| Jalpaiguri   | -                                | -        | 75.10    | 75.10   |
| Kalchini     | -                                | -        | 252.64   | 252.64  |
| Kumargram    | -                                | -        | 202.27   | 202.27  |
| Madarihat    | -                                | 86.48    | 41.52    | 128.00  |
| Mainaguri    | -                                | -        | 82.33    | 82.33   |
| Mal          | -                                | -        | 42.14    | 42.14   |
| Matiali      | -                                | 4.28     | 102.71   | 106.99  |
| Nagrakata    | -                                | -        | 139.39   | 139.39  |
| Rajganj      | -                                | -        | 526.24   | 526.24  |
| Total        | -                                | 95.93    | 1972.74  | 2068.67 |

Table 30.6

| Block        | Suitable areas for Eri (ha) |          |          |          |
|--------------|-----------------------------|----------|----------|----------|
|              | High                        | Moderate | Marginal | Total    |
| Alipurduari  | 2546.28                     | 1031.49  | 2351.01  | 5928.78  |
| Alipurduarii | 4538.47                     | 1192.29  | 3470.62  | 9201.38  |
| Dhupguri     | 502.13                      | 421.91   | 9516.35  | 10440.39 |
| Falakata     | 1242.61                     | 625.86   | 4745.04  | 6613.51  |
| Jalpaiguri   | -                           | -        | 9020.37  | 9020.37  |
| Kalchini     | 42.82                       | 8.31     | 4424.74  | 4475.87  |
| Kumargram    | 3238.63                     | 1076.79  | 1912.21  | 6227.63  |
| Madarihat    | 969.91                      | 489.81   | 3079.75  | 4539.47  |
| Mainaguri    | 972.96                      | 633.28   | 8867.77  | 10474.01 |
| Mal          | 185.53                      | 276.12   | 4994.34  | 5455.99  |
| Matiali      | -                           | -        | 1722.84  | 1722.84  |
| Nagrakata    | -                           | -        | 1701.24  | 1701.24  |
| Rajganj      | -                           | -        | 6660.36  | 6660.36  |
| Total        | 14239.34                    | 5755.86  | 62466.64 | 82461.84 |

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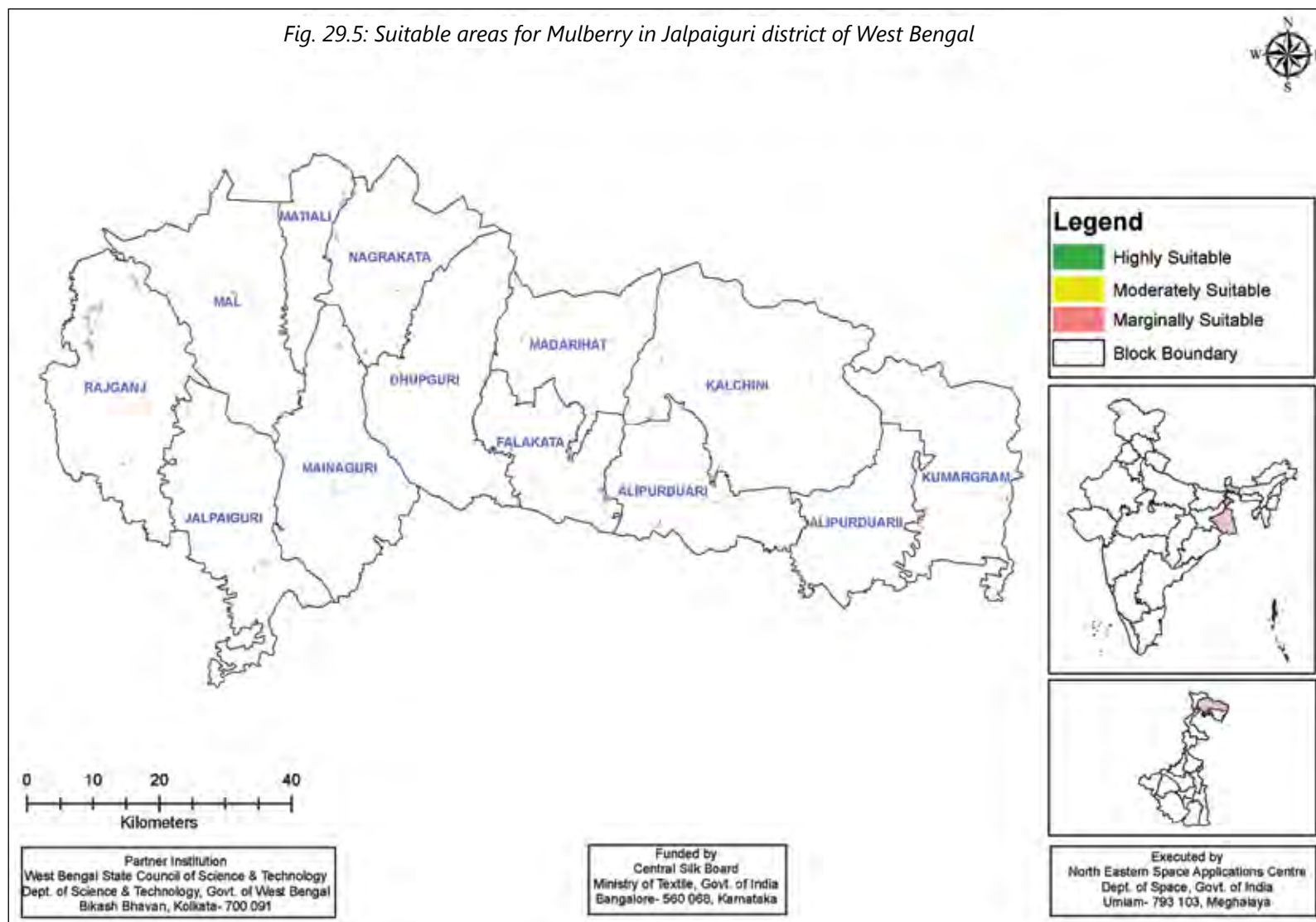




Tables 30.7: Suitable areas for Muga in Jalpaiguri district of West Bengal

| Block        | Suitable areas for Eri (ha) |          |          |          |
|--------------|-----------------------------|----------|----------|----------|
|              | High                        | Moderate | Marginal | Total    |
| Alipurduari  | 1111.01                     | 593.31   | 4224.44  | 5928.76  |
| Alipurduarii | -                           | -        | 9201.38  | 9201.38  |
| Dhupguri     | 444.24                      | 421.64   | 9574.58  | 10440.46 |
| Falakata     | 2.82                        | 99.97    | 6510.70  | 6613.49  |
| Jalpaiguri   | 3480.43                     | 915.65   | 4624.26  | 9020.34  |
| Kalchini     | -                           | -        | 4475.86  | 4475.86  |
| Kumargram    | -                           | -        | 6227.68  | 6227.68  |
| Madarihat    | -                           | -        | 4539.49  | 4539.49  |
| Mainaguri    | 338.33                      | 722.17   | 9413.50  | 10474.00 |
| Mal          | -                           | 0.78     | 5455.24  | 5456.02  |
| Matiali      | -                           | -        | 1722.84  | 1722.84  |
| Nagrakata    | -                           | -        | 1701.24  | 1701.24  |
| Rajganj      | -                           | 0.26     | 6660.10  | 6660.36  |
| Total        | 5376.83                     | 2753.78  | 74331.31 | 82461.92 |

Fig. 29.5: Suitable areas for Mulberry in Jalpaiguri district of West Bengal



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Fig. 29.6: Suitable areas for Eri in Jalpaiguri district of West Bengal

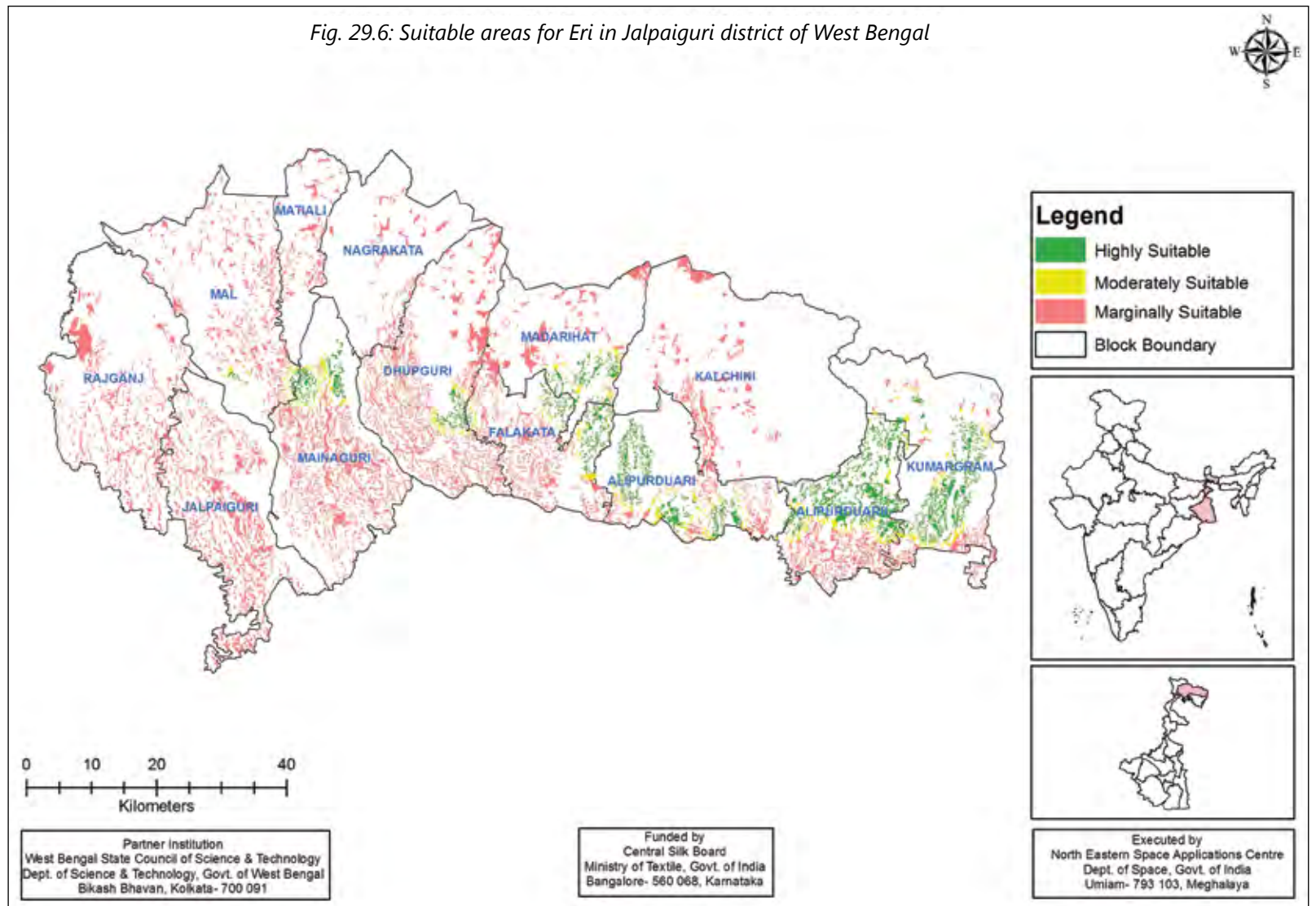
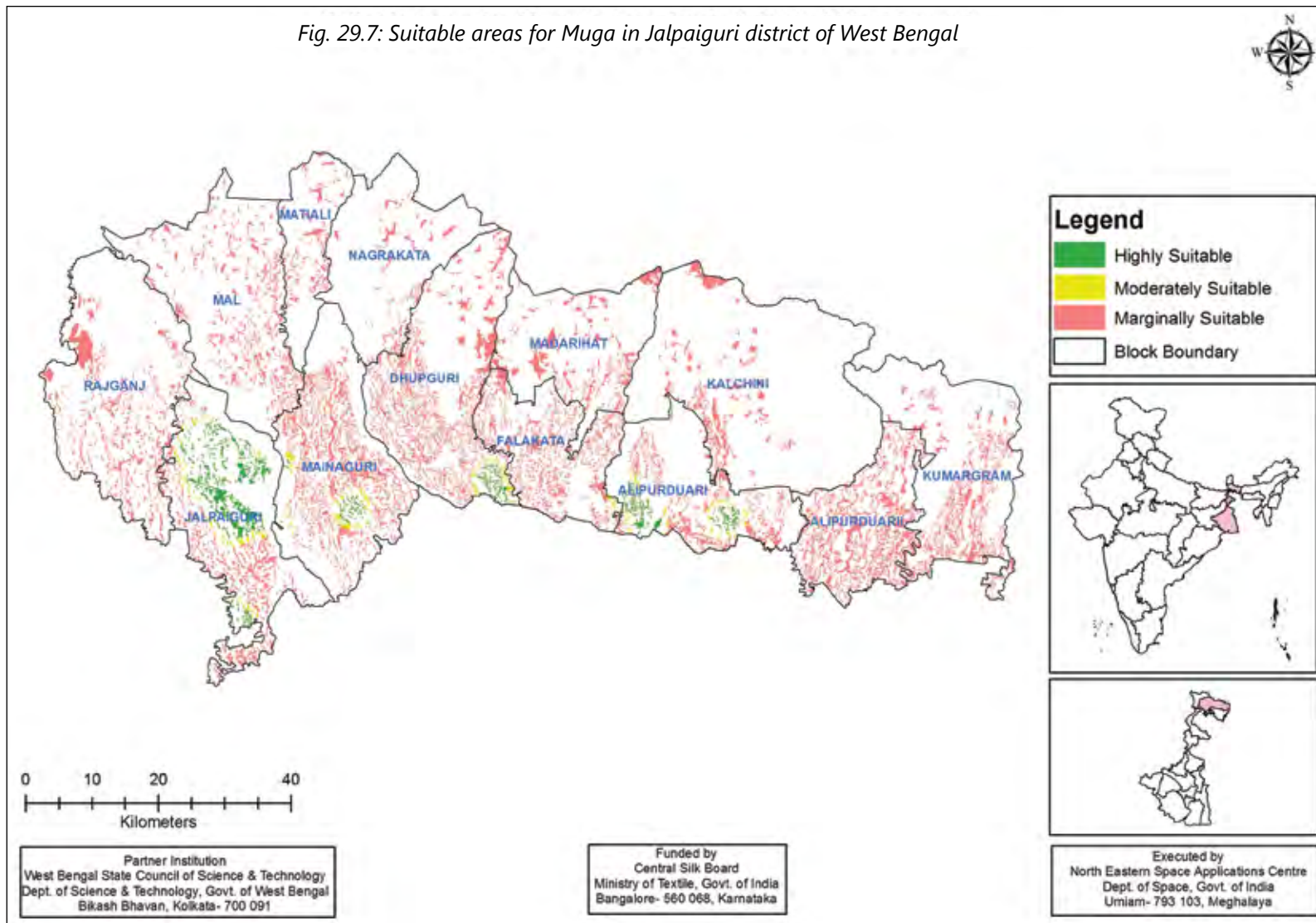


Fig. 29.7: Suitable areas for Muga in Jalpaiguri district of West Bengal



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Tables 30.8-30.9: Suitable areas for Mulberry & Muga in Koch Bihar district of West Bengal

Table 30.8

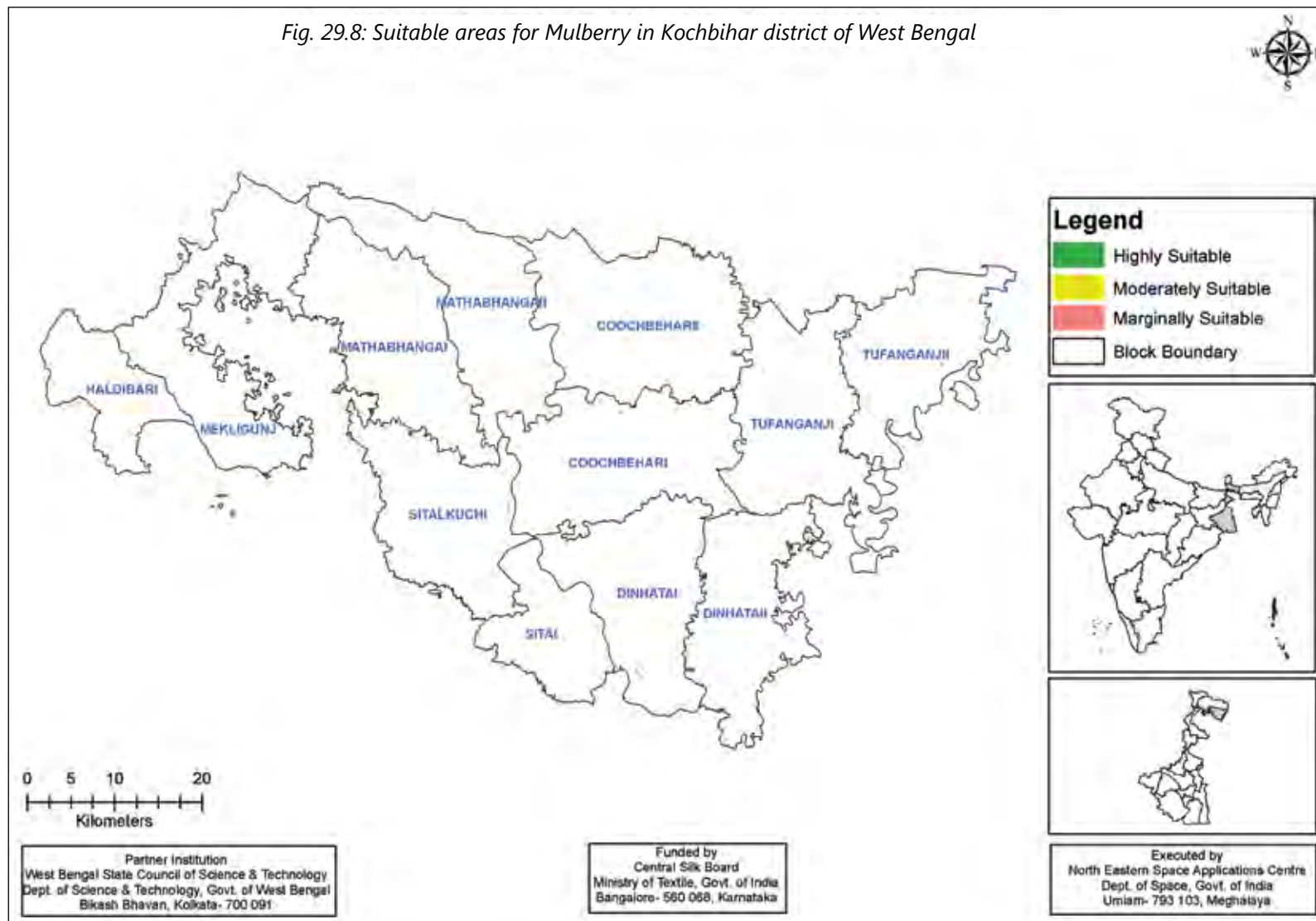
| Block         | Suitable areas for Mulberry (ha) |          |          |        |
|---------------|----------------------------------|----------|----------|--------|
|               | High                             | Moderate | Marginal | Total  |
| Cooch Behari  | -                                | -        | 16.37    | 16.37  |
| Cooch Beharii | -                                | -        | -        | -      |
| Dinhatai      | -                                | -        | 27.70    | 27.70  |
| Dinhataii     | -                                | -        | -        | -      |
| Haldibari     | -                                | -        | -        | -      |
| Mathabhangai  | -                                | -        | 13.27    | 13.27  |
| Mathabhangaii | -                                | -        | -        | -      |
| Mekhliganj    | -                                | 37.10    | -        | 37.10  |
| Sitai         | -                                | -        | -        | -      |
| Sitalkuchi    | -                                | -        | 29.05    | 29.05  |
| Tufanganji    | -                                | -        | 15.99    | 15.99  |
| Tufanganjii   | -                                | -        | 12.62    | 12.62  |
| Total         | -                                | 37.10    | 115.01   | 152.11 |

Table 30.9

| Block         | Suitable areas for Muga (ha) |          |          |          |
|---------------|------------------------------|----------|----------|----------|
|               | High                         | Moderate | Marginal | Total    |
| Cooch Behari  | 6050.48                      | -        | 903.64   | 6954.12  |
| Cooch Beharii | 4627.06                      | -        | 1699.51  | 6326.57  |
| Dinhatai      | 4921.30                      | -        | 706.97   | 5628.27  |
| Dinhataii     | 1938.81                      | -        | 3373.47  | 5312.28  |
| Haldibari     | -                            | -        | 2799.61  | 2799.61  |
| Mathabhangai  | 1689.41                      | -        | 4382.63  | 6072.04  |
| Mathabhangaii | 2352.10                      | -        | 2494.36  | 4846.46  |
| Mekhliganj    | -                            | -        | 5130.12  | 5130.12  |
| Sitai         | 1239.88                      | -        | 747.89   | 1987.77  |
| Sitalkuchi    | 3800.37                      | -        | 1289.63  | 5090.00  |
| Tufanganji    | 1961.62                      | -        | 3822.91  | 5784.53  |
| Tufanganjii   | 2601.75                      | -        | 1852.43  | 4454.18  |
| Total         | 31182.78                     | -        | 29203.17 | 60385.95 |



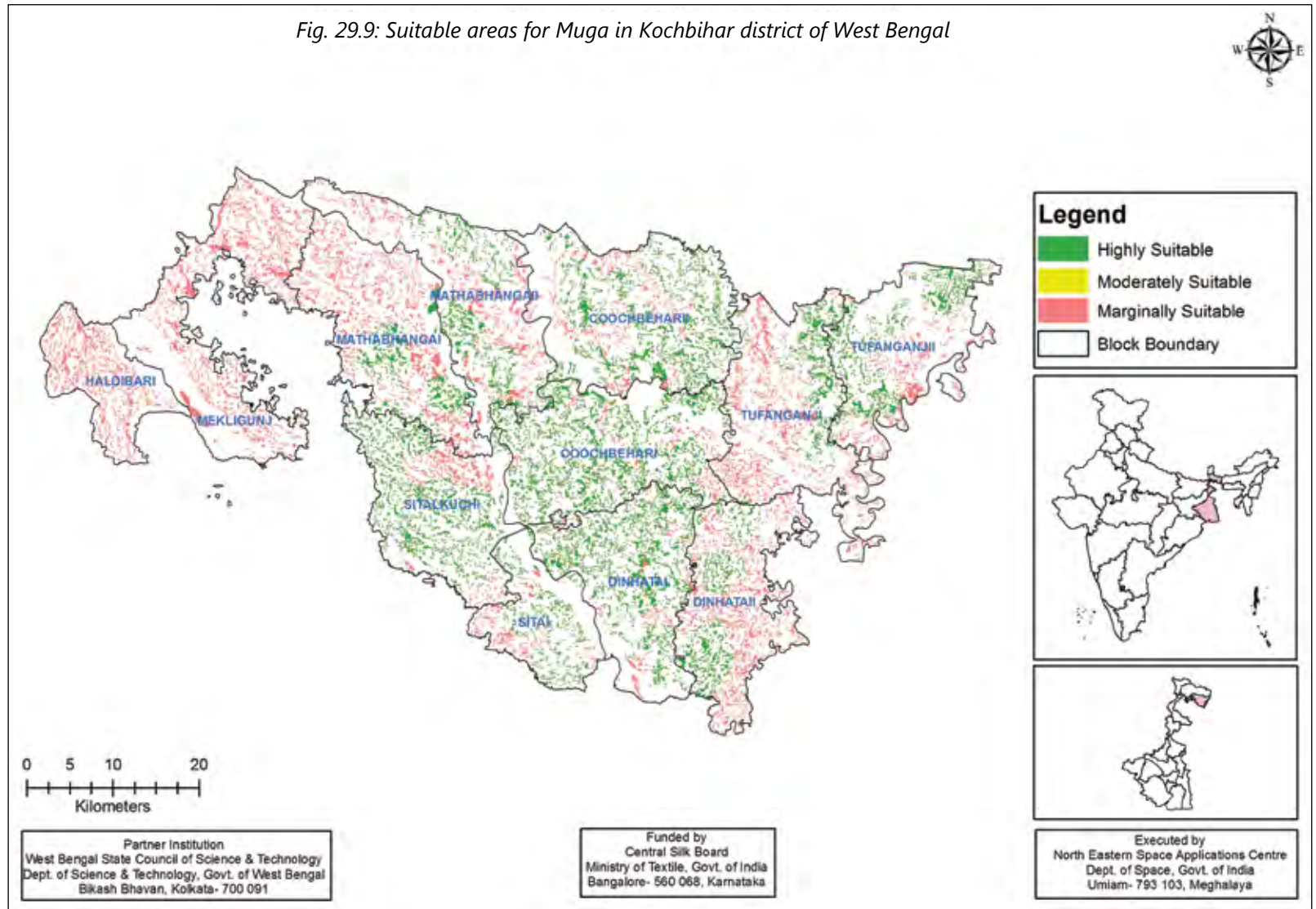
Fig. 29.8: Suitable areas for Mulberry in Kochbihar district of West Bengal



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Fig. 29.9: Suitable areas for Muga in Kochbihar district of West Bengal



Tables 30.10-30.11: Suitable areas for Mulberry in Maldah & Murshidabad district of West Bengal

Table 30.10

| Block              | Suitable areas for Mulberry in Maldah (ha) |          |          |         |
|--------------------|--|----------|----------|---------|
|                    | High                                       | Moderate | Marginal | Total   |
| Bamangola          | -  | 25.37    | -        | 25.37   |
| Chanchali          | 12.58                                      | 4.72     | -        | 17.30   |
| Chanchalii         | 20.90                                      | 67.64    | -        | 88.54   |
| Englishbazar       | -  | 194.04   | -        | 194.04  |
| Gazole             | -  | 26.56    | -        | 26.56   |
| Habibpur           | -  | 7.82     | -        | 7.82    |
| Harishchandrapuri  | -  | 12.79    | -        | 12.79   |
| Harishchandrapurii | -  | 170.47   | -        | 170.47  |
| Kaliachaki         | -  | 13.15    | -        | 13.15   |
| Kaliachakii        | -  | 136.88   | -        | 136.88  |
| Kaliachakiii       | -  | 381.40   | -        | 381.40  |
| Malda Old          | -  | 108.46   | -        | 108.46  |
| Manikchak          | -  | 67.87    | -        | 67.87   |
| Ratuai             | -  | 650.15   | -        | 650.15  |
| Ratuaii            | -  | 49.03    | -        | 49.03   |
| Total              | 33.47                                      | 1916.35  | -        | 1949.83 |

Table 30.11

| Block           | Suitable areas for Mulberry in Murshidabad (ha) |          |          |        |
|-----------------|---|----------|----------|--------|
|                 | High  | Moderate | Marginal | Total  |
| Beldangaii      | 63.02   | -        | -        | 63.02  |
| Berhampore      | 20.22   | -        | -        | 20.22  |
| Bharatpuri      | 88.90   | -        | 35.90    | 124.80 |
| Bharatpurii     | 20.57   | -        | 20.25    | 40.82  |
| Burwan          | 53.48   | -        | -        | 53.48  |
| Domkal          | -   | -        | 3.12     | 3.12   |
| Farakka         | -   | -        | 52.83    | 52.83  |
| Hariharpara     | -   | -        | 6.63     | 6.63   |
| Kandi           | -   | -        | 144.11   | 144.11 |
| Khargram        | -   | -        | 4.81     | 4.81   |
| Lalgola         | 24.99   | -        | -        | 24.99  |
| Nabagram        | -   | -        | 10.67    | 10.67  |
| Raghunathganji  | -   | 0.58     | -        | 0.58   |
| Raghunathganjii | 72.15   | 11.10    | 24.75    | 107.99 |

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|             |        |       |        |        |
|-------------|--------|-------|--------|--------|
| Raninagari  | 48.37  | -     | -      | 48.37  |
| Raninagarii | 87.88  | -     | -      | 87.88  |
| Samserganj  | -      | -     | 3.03   | 3.03   |
| Sutii       | -      | -     | 22.81  | 22.81  |
| Sutiii      | -      | -     | 6.02   | 6.02   |
| Total       | 479.58 | 11.68 | 334.91 | 826.17 |

Fig. 29.10: Suitable areas for Mulberry in Maldah district of West Bengal

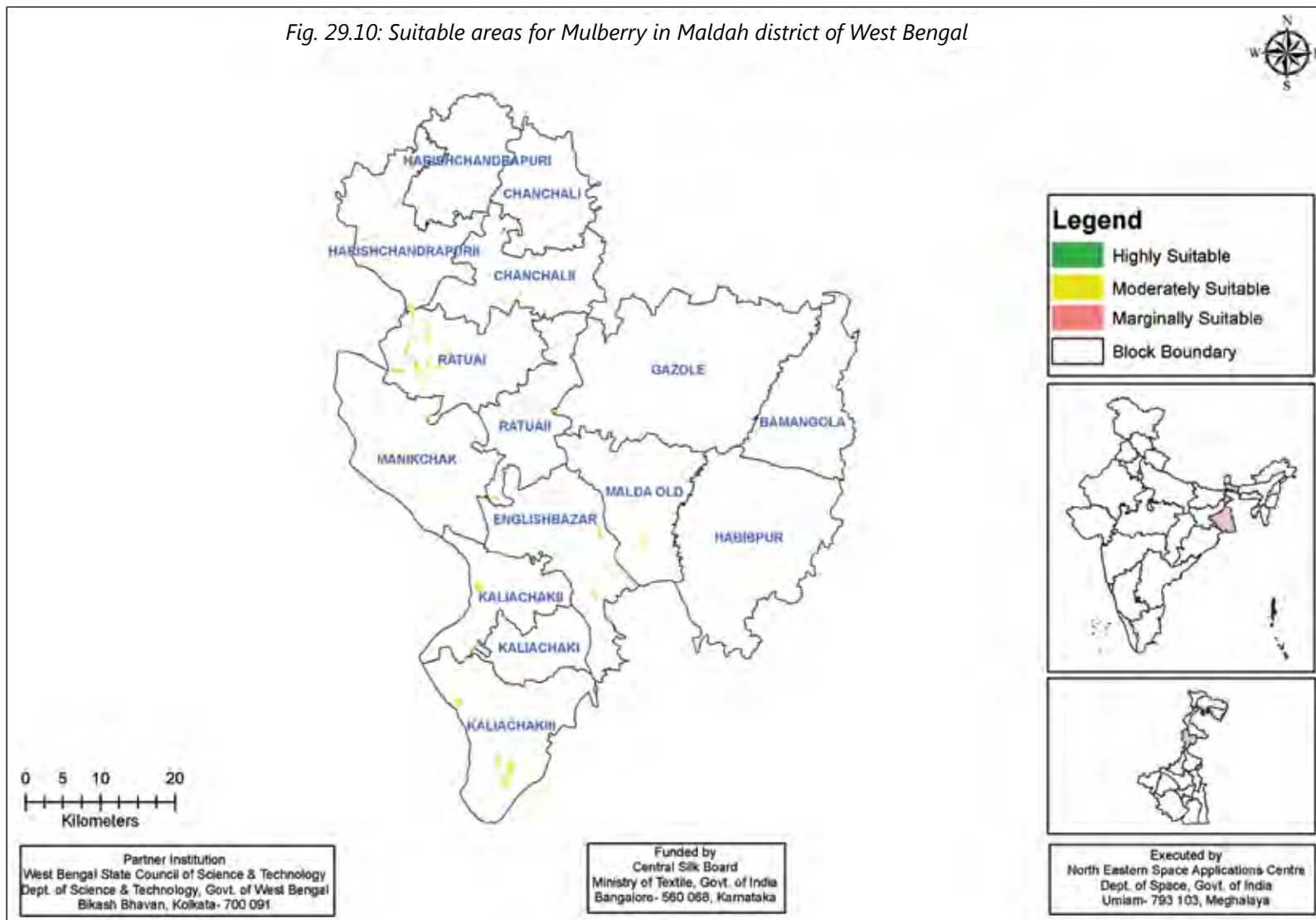
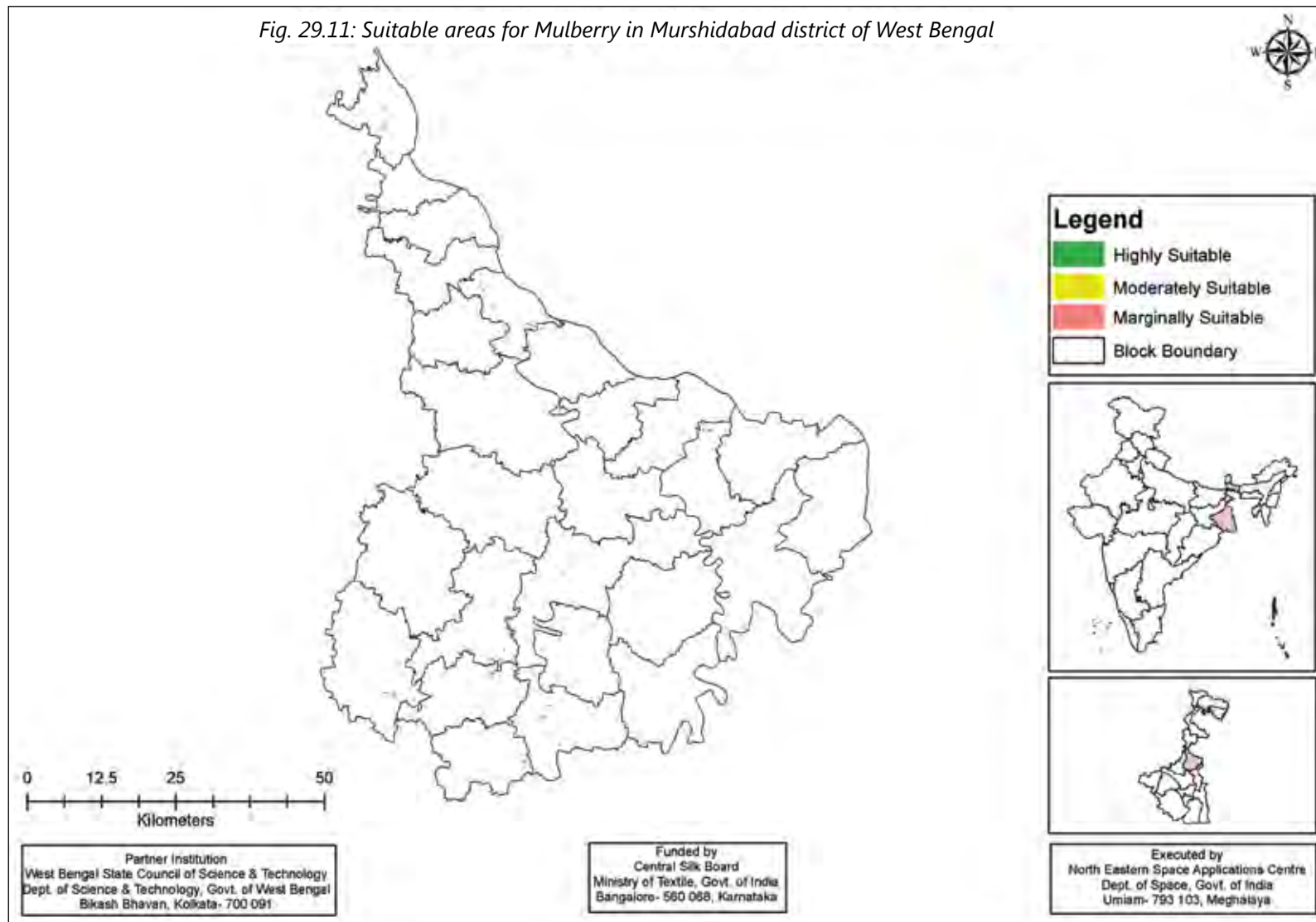


Fig. 29.11: Suitable areas for Mulberry in Murshidabad district of West Bengal



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Table 30.12: Suitable areas for Mulberry in Paschim Medinipur district of West Bengal

| Block            | Suitable areas for Mulberry (ha) |          |          |          |
|------------------|----------------------------------|----------|----------|----------|
|                  | High                             | Moderate | Marginal | Total    |
| Binpur-I         | 286.46                           | 253.31   | 68.04    | 607.81   |
| Binpur-II        | 583.75                           | 619.47   | 963.65   | 2166.87  |
| Chandrakona-I    | -                                | -        | -        | -        |
| Chandrakona-II   | 76.74                            | 103.63   | 125.17   | 305.54   |
| Dantan-I         | -                                | -        | -        | -        |
| Dantan-II        | -                                | -        | -        | -        |
| Daspur-I         | -                                | -        | -        | -        |
| Daspur-II        | -                                | -        | -        | -        |
| Debra            | -                                | -        | -        | -        |
| Garbeta-I        | 55.43                            | 916.58   | 154.26   | 1126.26  |
| Garbeta-II       | 147.95                           | 548.33   | 84.10    | 780.38   |
| Garbeta-III      | 93.16                            | 1338.30  | 416.00   | 1847.46  |
| Ghatal           | -                                | -        | -        | 0.00     |
| Gopiballavpur-I  | 601.42                           | 2981.15  | 462.56   | 4045.13  |
| Gopiballavpur-II | 20.84                            | 57.64    | -        | 78.49    |
| Jamboni          | 291.63                           | 1168.85  | 146.35   | 1606.84  |
| Jhargram         | 470.78                           | 2175.99  | 440.38   | 3087.14  |
| Keshiary         | 91.44                            | 246.03   | 14.43    | 351.90   |
| Keshpur          | 2.62                             | 183.40   | 229.38   | 415.40   |
| Kharagpur-I      | 336.86                           | 1600.69  | 336.29   | 2273.84  |
| Kharagpur-II     | -                                | -        | -        | -        |
| Midnapore        | 100.03                           | 521.56   | 116.80   | 738.39   |
| Mohanpur         | -                                | -        | -        | -        |
| Narayangarh      | 5.57                             | 227.12   | 5.15     | 237.83   |
| Nayagram         | 250.49                           | 3103.82  | 907.08   | 4261.38  |
| Pingla           | -                                | -        | -        | -        |
| Sabang           | -                                | -        | -        | -        |
| Salbani          | 178.92                           | 1647.94  | 217.87   | 2044.73  |
| Sankrail         | 220.08                           | 1598.31  | 113.54   | 1931.93  |
| Total            | 3814.17                          | 19292.14 | 4801.03  | 27907.33 |



Table 30.13: Suitable areas for Tasar in Paschim Medinipur district of West Bengal

| Block            | Suitable areas for Mulberry (ha) |          |          |          |
|------------------|----------------------------------|----------|----------|----------|
|                  | High                             | Moderate | Marginal | Total    |
| Binpur-I         | 1881.56                          | 11.07    | 2041.70  | 3934.33  |
| Binpur-II        | -                                | 1752.09  | 3547.71  | 5299.80  |
| Chandrakona-I    | -                                | -        | 39.18    | 39.18    |
| Chandrakona-II   | -                                | -        | 200.88   | 200.88   |
| Dantan-I         | -                                | -        | 144.40   | 144.40   |
| Daspur-I         | -                                | -        | 41.59    | 41.59    |
| Debra            | -                                | -        | 306.27   | 306.27   |
| Garbeta-I        | 48.68                            | 152.01   | 1526.04  | 1726.73  |
| Garbeta-II       | 66.44                            | 68.39    | 2601.59  | 2736.42  |
| Garbeta-III      | 94.34                            | 225.71   | 2751.55  | 3071.60  |
| Ghatal           | -                                | -        | 112.81   | 112.81   |
| Gopiballavpur-I  | 1768.11                          | 822.93   | 2952.96  | 5544.00  |
| Gopiballavpur-II | 2.30                             | 11.67    | 962.03   | 976.00   |
| Jamboni          | 212.52                           | 263.27   | 2185.49  | 2661.28  |
| Jhargram         | -                                | 11.37    | 6861.53  | 6872.90  |
| Keshiary         | -                                | 29.75    | 872.47   | 902.22   |
| Keshpur          | -                                | -        | 1477.60  | 1477.60  |
| Kharagpur-I      | 97.27                            | 153.98   | 3043.10  | 3294.35  |
| Kharagpur-II     | -                                | -        | 214.04   | 214.04   |
| Midnapore        | -                                | -        | 1611.68  | 1611.68  |
| Narayangarh      | -                                | -        | 270.43   | 270.43   |
| Nayagram         | 7904.36                          | 1867.87  | 7250.97  | 17023.20 |
| Pingla           | -                                | -        | 246.85   | 246.85   |
| Sabang           | -                                | -        | 235.25   | 235.25   |
| Salbani          | -                                | -        | 6288.64  | 6288.64  |
| Sankrail         | 1361.36                          | 1220.87  | 1601.80  | 4184.03  |
| Grand Total      | 13436.94                         | 6590.98  | 49388.97 | 69416.89 |

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Table 30.14: Suitable areas for Mulberry in Purba Medinipur district of West Bengal

| Block        | Suitable areas for Mulberry (ha) |          |          |        |
|--------------|----------------------------------|----------|----------|--------|
|              | High                             | Moderate | Marginal | Total  |
| Bhagawanpurl | -                                | 7.81     | -        | 7.81   |
| Egrall       | -                                | 167.45   | -        | 167.45 |
| Khejuril     | -                                | 2.70     | -        | 2.70   |
| Moyna        | -                                | 6.10     | -        | 6.10   |
| Panskural    | -                                | 176.17   | -        | 176.17 |
| Potashpurl   | -                                | 51.20    | -        | 51.20  |
| Potashpurll  | -                                | 104.62   | -        | 104.62 |
| Ramnagarl    | -                                | 118.70   | -        | 118.70 |
| Total        | -                                | 634.75   | -        | 634.75 |

Fig. 29.12: Suitable areas for Mulberry in Pachim Medinipur district of West Bengal

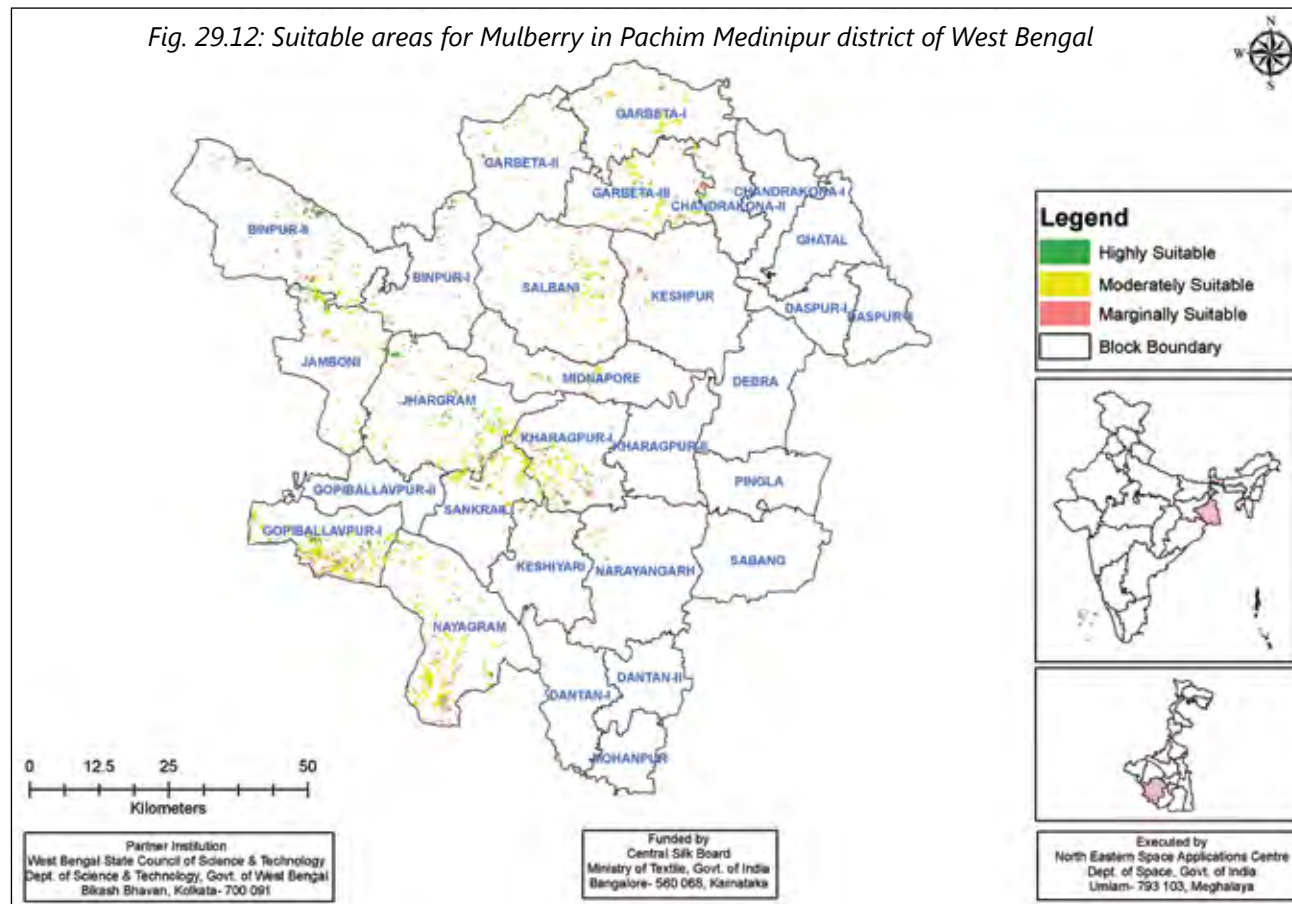
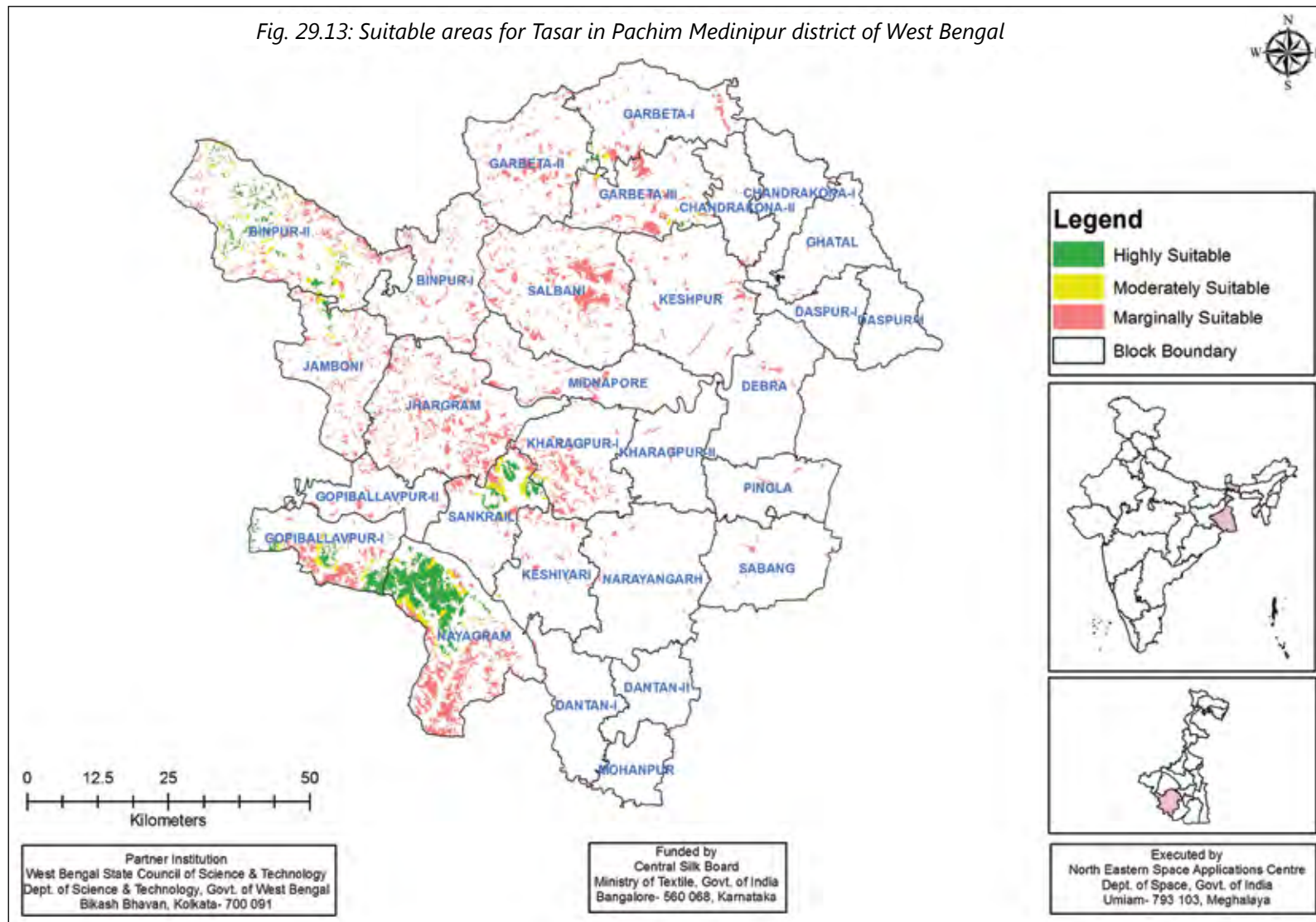


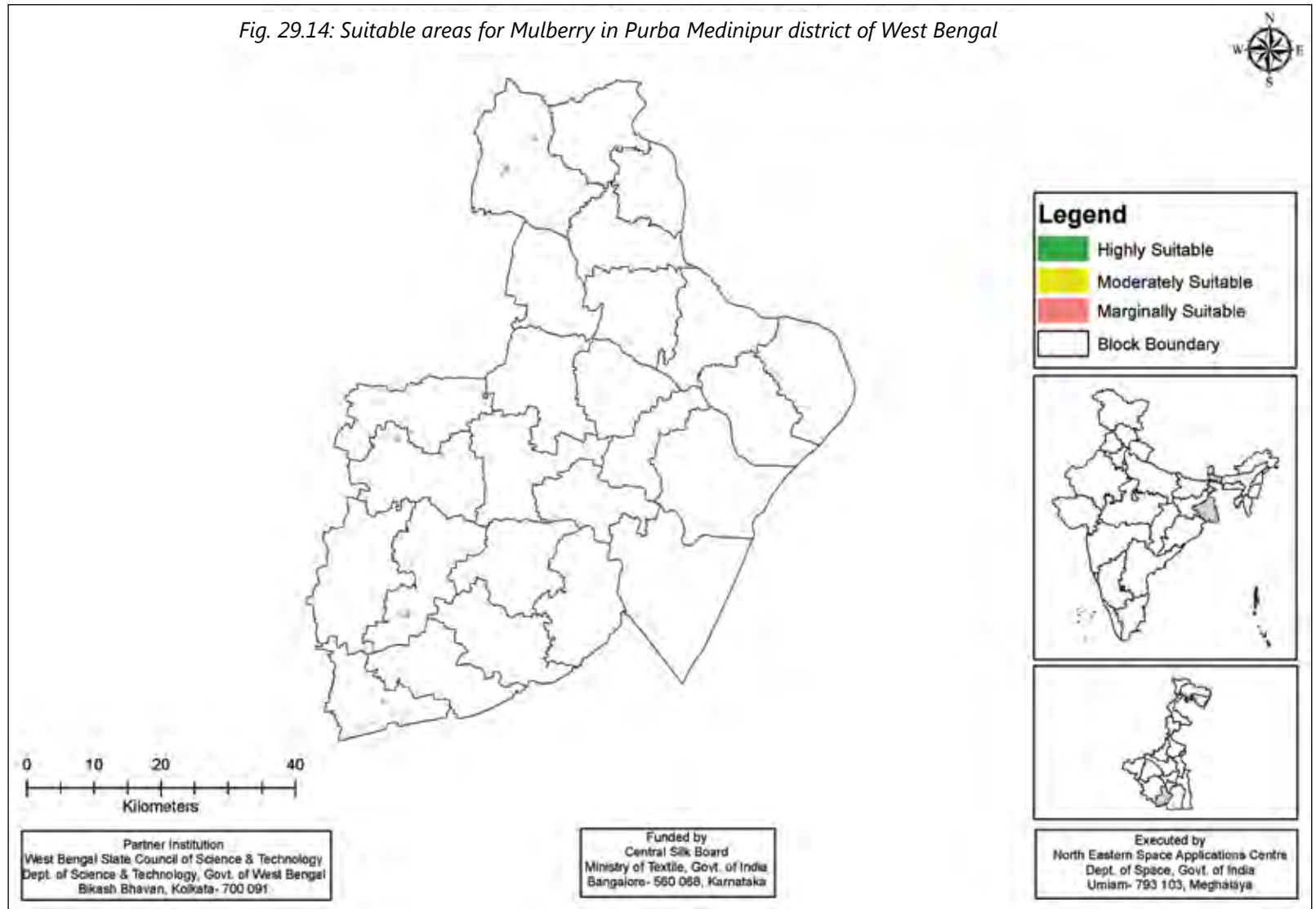
Fig. 29.13: Suitable areas for Tasar in Pachim Medinipur district of West Bengal



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Fig. 29.14: Suitable areas for Mulberry in Purba Medinipur district of West Bengal



Tables 30.15-30.16: Suitable areas for Mulberry & Tasar in Purulia district of West Bengal

Table 30.15

| Block          | Suitable areas for Mulberry (ha) |          |          |          |
|----------------|----------------------------------|----------|----------|----------|
|                | High                             | Moderate | Marginal | Total    |
| Arsa           | 871.02                           | 796.83   | 113.26   | 1781.11  |
| Baghmundi      | 160.42                           | 799.25   | 62.20    | 1021.88  |
| Balarampur     | 664.19                           | 287.31   | 204.23   | 1155.73  |
| Bandoyan       | 217.00                           | 268.43   | 206.04   | 691.47   |
| Barabazar      | 405.05                           | 422.09   | 773.47   | 1600.62  |
| Hura           | 1235.86                          | 1146.38  | 954.66   | 3336.90  |
| Jaipur         | 177.88                           | 291.45   | 1516.42  | 1985.76  |
| Jhaldai        | 52.67                            | 922.31   | 120.18   | 1095.16  |
| Jhaldaii       | 99.98                            | 978.99   | 303.74   | 1382.70  |
| Kashipur       | 2501.59                          | 803.68   | 207.85   | 3513.12  |
| Manbazari      | -                                | 858.03   | 573.64   | 1431.67  |
| Manbazarii     | 189.61                           | 342.47   | 41.87    | 573.96   |
| Nituria        | 18.44                            | 381.29   | 103.72   | 503.45   |
| Para           | 1182.92                          | 406.99   | 1110.90  | 2700.81  |
| Puncha         | 378.58                           | 799.29   | 1499.93  | 2677.80  |
| Puruliyai      | 163.88                           | 132.16   | 2234.69  | 2530.73  |
| Puruliyaii     | 131.35                           | 22.50    | 2619.87  | 2773.72  |
| Raghunathpuri  | 922.68                           | 107.17   | 911.07   | 1940.92  |
| Raghunathpurii | 45.01                            | 56.33    | 1356.19  | 1457.53  |
| Santuri        | 946.75                           | 522.06   | 110.35   | 1579.15  |
| Total          | 10364.89                         | 10345.02 | 15024.29 | 35734.19 |

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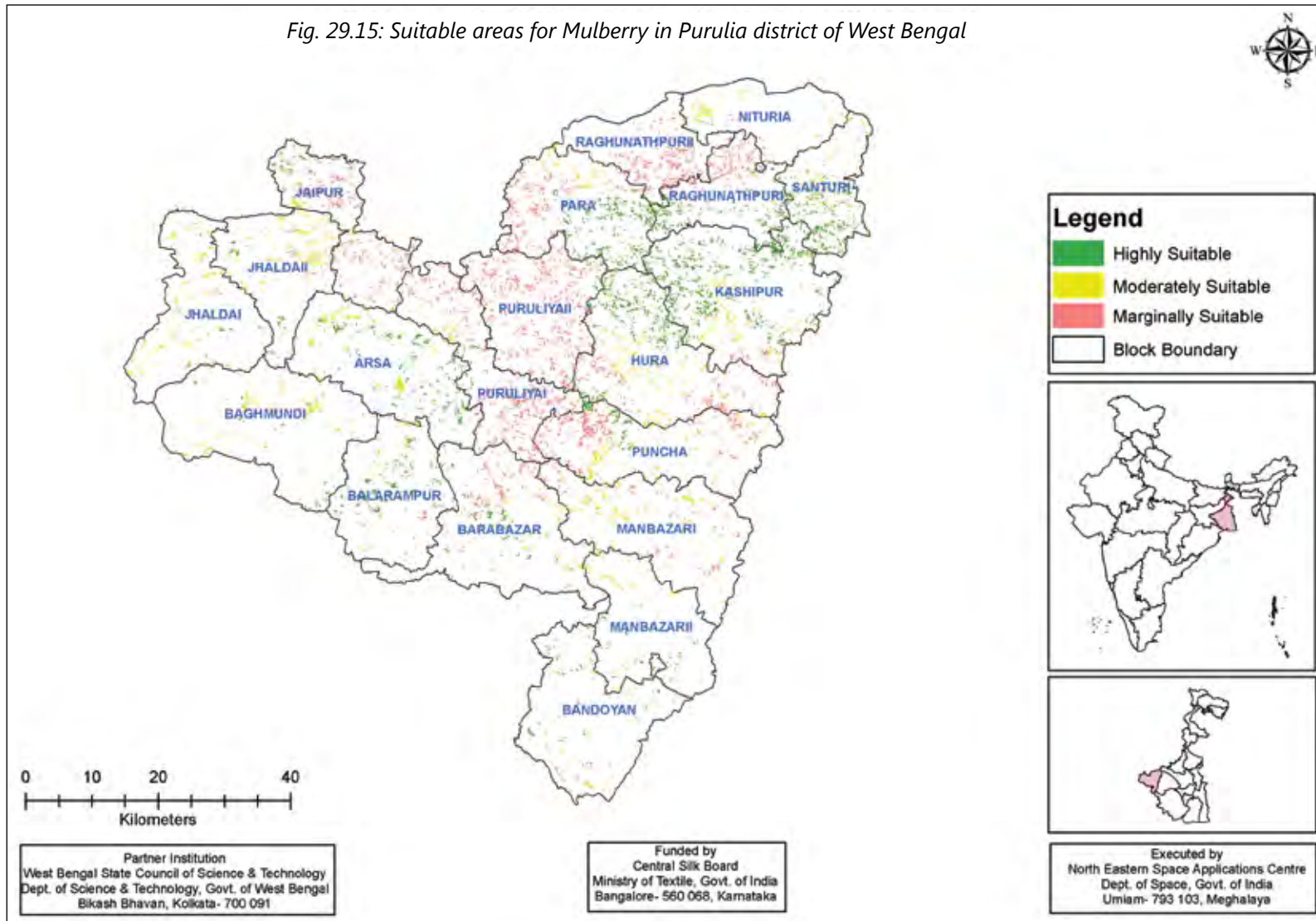


Table 30.16

| Block          | Suitable areas for Tasar (ha) |          |          |          |
|----------------|-------------------------------|----------|----------|----------|
|                | High                          | Moderate | Marginal | Total    |
| Arsa           | 30.68                         | -        | 2211.15  | 2241.83  |
| Baghmundi      | 668.64                        | -        | 1148.21  | 1816.85  |
| Balarampur     | 499.82                        | -        | 1862.00  | 2361.82  |
| Bandoyan       | 2697.08                       | -        | 698.69   | 3395.77  |
| Barabazar      | 759.97                        | -        | 2838.75  | 3598.72  |
| Hura           | 834.02                        | -        | 4527.22  | 5361.24  |
| Jaipur         | 1149.98                       | -        | 2342.72  | 3492.70  |
| Jhaldai        | -                             | -        | 2455.76  | 2455.76  |
| Jhaldaii       | 1025.37                       | -        | 1086.27  | 2111.64  |
| Kashipur       | 2837.52                       | -        | 3705.14  | 6542.66  |
| Manbazari      | 957.58                        | -        | 1509.58  | 2467.16  |
| Manbazarii     | 1723.99                       | -        | 1071.11  | 2795.10  |
| Nituria        | -                             | -        | 1212.64  | 1212.64  |
| Para           | 97.76                         | -        | 4330.58  | 4428.34  |
| Puncha         | 1708.63                       | -        | 1501.65  | 3210.28  |
| Puruliyai      | 1343.74                       | -        | 2612.37  | 3956.11  |
| Puruliyaii     | 42.28                         | -        | 4508.80  | 4551.08  |
| Raghunathpuri  | 410.31                        | -        | 2414.70  | 2825.01  |
| Raghunathpurii | 428.12                        | -        | 1867.20  | 2295.32  |
| Santuri        | 661.18                        | -        | 1797.55  | 2458.73  |
| Total          | 17876.67                      | -        | 45702.09 | 63578.76 |



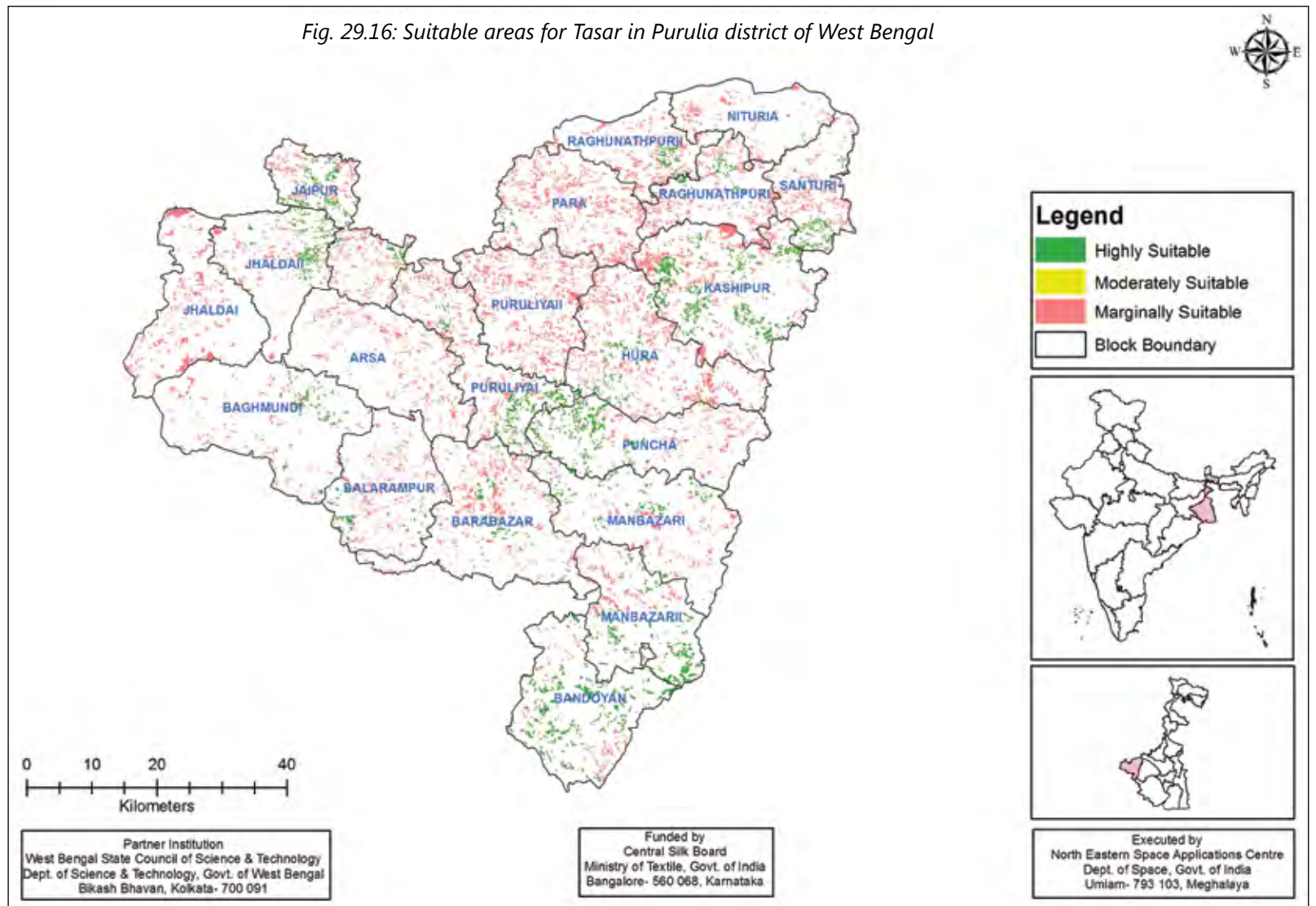
Fig. 29.15: Suitable areas for Mulberry in Purulia district of West Bengal



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Fig. 29.16: Suitable areas for Tasar in Purulia district of West Bengal





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*A project executed by*



**North Eastern Space Applications Centre**  
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