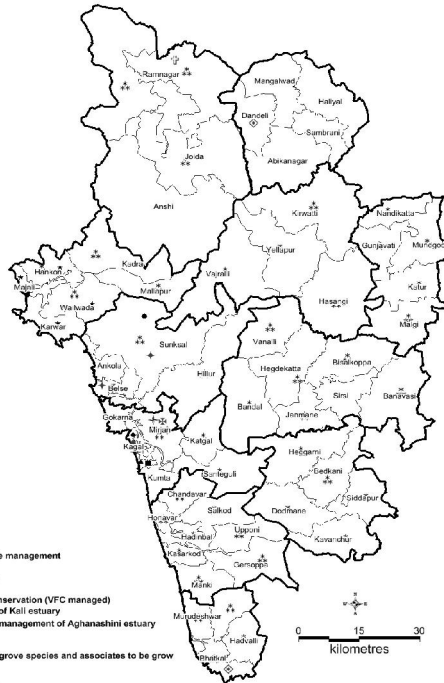


Adopting Clustering Approaches - Ecology Integrated Sustainable Development of Uttara Kannada

Ramachandra T.V.

Subash Chandran M.D
Prakash N. Mesta

Joshi N.V.



**Western Ghats Task Force, Government of Karnataka
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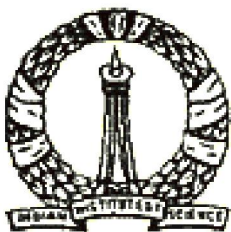
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July 2013

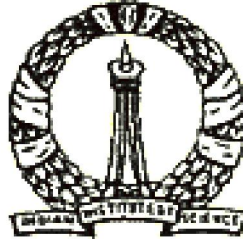
**Environmental Information System [ENVIS]
Centre for Ecological Sciences,
Indian Institute of Science,
Bangalore - 560012, INDIA**

Web: <http://ces.iisc.ernet.in/energy/>
<http://ces.iisc.ernet.in/biodiversity>

Email: cestvr@ces.iisc.ernet.in,
energy@ces.iisc.ernet.in



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Ramachandra T.V.

Subash Chandran M.D

Joshi N.V.

Prakash N. Mesta

Energy & Wetlands Research Group, Centre for Ecological Sciences, IISc

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Sahyadri Conservation Series: 30

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Email: cestvr@ces.iisc.ernet.in,

energy@ces.iisc.ernet.in

sahyadri@ces.iisc.ernet.in

Adopting Clustering Approaches - Ecology Integrated Sustainable Development of Uttara Kannada

Ramachandra T.V.	Subash Chandran M.D	Joshi N.V.
Prakash N Mesta		

Summary

The concept of economic clustering and trade guilds in India has roots in pre-history. The cocoons and silk processing industry has traditionally existed in clusters, in places such as Banaras, Kancheepuram, Kashmir etc. Cluster-based economic development has become an increasingly popular topic for researchers and economic development professionals. The approach is considered an important aspect of a broader re-orientation of research and economic policy towards laying the foundations of a microeconomic approach for prosperity and growth. The past decades were under the spell of macroeconomics and the creation of market institutions in developing economies. While there is now fairly broad consensus on the type of macroeconomic and legal conditions necessary to achieve economic progress, it is also becoming clearer that these conditions are not sufficient. As a new approach to help economies reap the full potential of an improved macroeconomic and legal context cluster-based efforts have received a lot of attention. Clusters are groups of companies and institutions co-located in a specific geographic region and linked by interdependencies in providing a related group of products and/or services. Because of the proximity among them – both in terms of geography and of activities – cluster constituents enjoy the economic benefits of several types of positive location-specific externalities.

This report presents integrated clustering of villages for inclusive growth promoting eco-friendly, local resources, local skill and man-power based thematic developmental programmes through laying a stronger foundation for sustainable growth. Micro-finance and revival of village centred enterprises and clustering of villages for thematic development programmes can greatly improve financial and livelihood security of rural homes, and could provide largest venues for women empowerment.

Introduction

Cluster-based economic development has become an increasingly popular topic for researchers and economic development professionals. The approach is considered an important aspect of a broader re-orientation of research and economic policy towards laying the foundations of a microeconomic approach for prosperity and growth. The past decades were under the spell of

macroeconomics and the creation of market institutions in developing economies. While there is now fairly broad consensus on the type of macroeconomic and legal conditions necessary to achieve economic progress, it is also becoming clearer that these conditions are not sufficient. As a new approach to help economies reap the full potential of an improved macroeconomic and legal context cluster-based efforts have received a lot attention (Ketels, 2003).

Clusters are groups of companies and institutions co-located in a specific geographic region and linked by interdependencies in providing a related group of products and/or services. Because of the proximity among them – both in terms of geography and of activities – cluster constituents enjoy the economic benefits of several types of positive location-specific externalities. These externalities include, for example, access to specialized human resources and suppliers, necessary knowledge base, a competitive atmosphere calling for higher performance, and learnings from the close interaction with specialized customers and suppliers (Ketels, 2003). Porter (2000) observed that in the age of globalization, economic geography involving clusters of entrepreneurs/service providers would look paradoxical. Changes in technology and location have diminished many of the traditional roles of location. Yet clusters, or geographic concentrations of interconnected companies (in the author’s focus) were considered a striking feature of virtually every national, regional, state and metropolitan economy, especially in more advanced nations. Porter’s work caused a surge of interest in clusters as drivers of economic growth and hubs of innovation.

Ittyerah (2009), simplifies a ‘cluster’ (in the Indian context) as the agglomeration of small and medium enterprises producing same/similar products/services or engaged in the same line of manufacturing activities or services, located within an identifiable and, as far as practicable, contiguous area. The cluster concept gained prominence as an economic policy tool aimed to foster innovation and the growth of a competitive private sector in developing countries. More recently, donors and development agencies have paid increasing attention to the potential of cluster initiatives to bring about pro-poor effects. Thriving clusters can generate employment, income and opportunities for the local community and become drivers of broad-based local economic development (UNIDO, 2010).

In the last two decades, hundreds of cluster initiatives have been launched, involving virtually all regions of the world and their number is growing. Two-thirds of European Union countries have introduced the cluster approach in their innovation policy, while several European initiatives are based on the provision of incentives and funding to boost competitive territorial advantages (Oxford Research AS, 2008).

Clusters are also a widespread phenomenon in developing economies and can display levels of dynamism and innovation similar to those in industrialized countries. The high-tech industry of Bangalore, India, the Chilean wine clusters and the Sialkot, Pakistan, surgical instruments cluster

are examples of many successful cases. These dynamic clusters have achieved high growth levels, gained a stable foothold in the international market and generated wealth and prosperity at the local level (UNIDO, 2010)

Objectives of clustering

- ❖ **Consideration of Skills:** Eg. Expertise in fishery, wildlife trails and bird watching
- ❖ **Need for upgrading skill to meet challenges:** Through training programmes and awareness creation
- ❖ **Identification of trainers and training institutes:** To improve the skill base of clusters; providing skills to match the needs of the cluster.
- ❖ **Generating economic opportunities for the poor:** Promoting productive activities that facilitates fairer distribution of income, than capital-intensive equipment; investing in upgrading the skills and employability of marginalized segments, such as women, migrants (Gowlis for eg.), forest tribes and castes, and encouraging the production of goods and services affordable by the poor. For the participation of the poor in the decision making, NGOs, village councils, women's federations and self-help groups will play key roles.
- ❖ **Importance of participatory approach:** To start with, the adoption of a participatory approach, openly oriented at empowering the poor fringes of the society contributes to reducing their marginalization and encourages their active participation in the economic life of the cluster by improving their self-confidence and social status.

Advantages of clustering

- **Collective efficiency gains:** While the growth of individual small-scale firms is constrained by limited access to resources and inability to achieve scale and scope economies, firms within clusters benefit from collective efficiency gains, i.e. “the competitive advantage derived from local external economies and joint action” (Schmitz, H. 1997). External economies include the availability of a specialized labour force, machinery and input suppliers, the attraction of traders and buyers as well as an industrial atmosphere where information and knowledge are easily shared. Therefore, cluster enterprises are able to achieve higher and sustained growth rates, for synergies and collaborative linkages allow them to pool resources and efforts together for the achievement of shared economic goals. Collective efficiency gains can be further enhanced when the institutional and policy frameworks are responsive to the firms' needs and supportive of their efforts (Bellandi, M. 2002).
- **Spatial proximity effects:** The achievement of collective efficiency gains is facilitated by spatial proximity such as among firms within clusters. Risk is decreased when firms

know their partners and can easily gather information on their reliability. Firms have fewer incentives to engage in opportunistic behaviour since this will affect their future ability to acquire economic partners as well as attract social stigma. In general proximity may facilitate the development of trust-based relations that lower transaction costs and support collaborative interactions (UNIDO, 2010).

- **Pro-poor growth:** A cluster approach can be a valuable tool to tackle poverty and lay the ground for a process of broad-based growth. This is partly due to the fact that clusters are also socio-economic systems where the population of firms overlaps with the community of people and their families, living and working in a delimited territory. Not only do entrepreneurs and workers share a similar social, cultural and political background, but also norms of reciprocity and collective practices of self-help are common among employers and employees. Overall, this accounts for a distribution of the benefits of growth that is likely to be more inclusive than in other economic systems (UNIDO, 2010)

Yet, this is only one part of the story. A considerable number of clusters in developing countries are lagging behind, trapped in a vicious circle of cutthroat competition. Although representing substantial pockets of entrepreneurial activities and providing a living to entrepreneurs and workers, when clusters are unable to shift from stagnation to growth, their potential to contribute to the development of local communities remains largely untapped (UNIDO, 2010).

Economic Clustering in Ancient India

The concept of economic clustering and trade guilds in India has roots in pre-history. The cocoons and silk processing industry has traditionally existed in clusters, in places such as Banaras, Kancheepuram, Kashmir etc. In *Jataka*, the Kasi Kingdom is mentioned as a principal center of manufacturing cotton as well as those of silk in the 5th century or 6th century B. C. Cotton cloths of Kasi were exquisitely woven, smooth, bleached completely white, and their fibres were fine and soft. Tradition says that when Buddha died, his remains purified with balm were wrapped with brand new cotton cloths of Kasi. Spinning and weaving of cotton was known to Harappans 5000 years ago. The Agarbatti industry had its traditional clustering in Mysore. Bidar became an important centre of alloy metal artworks especially silver inlay on metals. Spice growing trade in general clustered along the South west India, particularly Calicut, Cochin, Nagarabastikeri, Banavasi etc. With the development of cities as industrial trade centers various industries and enterprises clustered in the cities where different streets specialized in production or trading of different wares.

Collapse of agro-pastoral cum forestry clusters of central Western Ghats: Pre-colonial land use system in central Western Ghats was characterized shifting cultivation, secondary forests and

savanna lands in hilly places, fairly large sized sacred groves (kan forests), and permanent cultivation in valleys. Whereas secondary forests were used for routine biomass needs, the sacred groves preserved climax forest biodiversity. There was regulated harvest of NTFP like pepper, cinnamon, Caryota toddy, medicinal plants edible fruits etc. from the *kan* forests which were also the sources of perennial waters like streams and springs, ponds and lakes. These kans had prime role in recharging wells in the valley downside. The landscape heterogeneity and the forests interspersed with grassy blanks and savannas favoured rich wildlife in the region. This traditional system of community based landscape management suffered with the British claim over all forests including sacred groves and shifting cultivation areas. The kans got merged with the rest of the reserved forests and lost their identity as sacred places. Isolated kans in the middle of villages were depended upon by the locals for firewood, leaf manure and other needs as they were not allowed such goods from timber rich secondary forests. The Western Ghats Panel (2011) observed “serious deficit in environmental governance all over the Western Ghats tract” and urged that that immediate steps must be taken to address such issue. The Panel is impressed both by levels of environmental awareness and commitment of citizens towards the cause of the environment, and their helplessness in the face of their marginalization in the current system of governance.

Extraction pressures from forest based industries: The 1940’s witnessed escalating demands from forest based industries like plywood, matchwoods etc on the forests of central Western Ghats. Dandeli Paper factory established in 1950’s relied heavily on bamboo resources until almost near collapse of bamboo forests in Uttara Kannada. As choice timbers were getting depleted in forests even kans were not spared from industrial felling.

Community based NTFP harvests replaced by contract system: The British, for the first time, started auctioning forest produce like pepper, cinnamon, shikekai, honey etc. to the contractors. The system of collection of NTFP by contractors was found to be very destructive to the forests, and the village communities were hard pressed for resources. In the recent decades the move has been strengthening to give such NTFP collection rights to the VFCs and tribal co-operatives.

The hazards from monoculture plantations: Over-extraction of natural teak and the stoppage of shifting cultivation saw teak trees getting scarcer in Uttara Kannada. The British launched from late 19th century systematic programmes to clear fell as much of natural forests to raise teak plantations. The plantation activity became more vigorous after independence, and Eucalypts and Australian Acacias were added to the monocultures. Very often these plantations got infested with weeds like Lantana and Eupatorium suppressing the native vegetation. In the heavy rainfall areas especially, the replacement of natural forests with plantations, especially along hill slopes, caused severe soil erosion and drying up of perennial streams.

Impact of hydro-electric projects on ecology and livelihoods: Commissioning of the Linganmakki dam and Gersoppa dam for generation of hydro-electricity in the Sharavathi River resulted in increased fresh water flow in the post monsoon and summer months diluting salinity in the estuary to nearly fresh water conditions (<0.5 ppt) most of the year. This caused serious collapse of the estuarine fisheries, both in diversity and quantity. Accordingly fisheries based livelihoods declined seriously in Sharavathi estuary and bulk of estuarine fishermen went elsewhere in search of jobs. The edible bivalve (clams and oysters) based fisheries also witnessed complete collapse. Mangroves are represented by very limited species that can survive in low brackish water conditions. Whereas the adjoining estuary of Aghanashini, which is not impacted by hydroelectric projects, has nearly 90 species of fishes Sharavathi has hardly 50% of this diversity. In the Kali estuary also, because of hydel projects upstream, fish diversity is much lower than in Aghanashini and edible bivalves shifted more towards the river mouth to a restricted zone.

The bane of estuarine shrimp aquaculture: Since early 1970's intensive shrimp aquaculture started in Uttara Kannada estuaries with least regard for environmental norms. The traditional salt tolerant Kagga rice growing gazni fields were cut up and converted into shrimp ponds with almost irreversible consequences. The mangroves were totally cleared for creating many such farms. Monoculturing of shrimps with artificial feeds drastically cut down the sustainable production of a diversity of fishes from the gazni rice fields. Today, due to various reasons aquaculture is on the decline but the estuarine ecology suffered seriously from this mega-venture. Moreover with the contract system for fish catching from gaznis and shrimp aquaculture the traditional estuarine fisherfolks are restricted to the open parts of the estuary for fishing purposes bringing greater fishing pressure on the estuarine ecosystems.

Concept of Sustainable Development

The original concept of sustainable development articulated in Our Common Future is of "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Some of the highlights of Principles of Ecologically Sustainable Development enunciated by Justice Brian Preston of Australia are the following: (http://www.lec.lawlink.nsw.gov.au/agdbasev7wr/_assets/lec/m4203011721754/preston_principles):

- Effective integration of economic and environmental considerations in the decision-making process.
- Ecologically harmful cycle caused by economic development without regard to and at the cost of the environment could only be broken by integrating environmental concerns with economic goals. The Plan of Implementation of the World Summit on Sustainable Development held in Johannesburg, 2002, noted the need to "promote the integration of the three components of sustainable development- economic development, social

development and environmental protection- as interdependent and mutually reinforcing pillars”

- The Precautionary Principle suggests that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation

Application of sustainability principles for Uttara Kannada

Our current studies in Uttara Kannada during the course of last two years, and studies for the past have created a sound database for the central Western Ghats-west coast region as a whole enabling us to formulate an outline plan for decentralised, ecology inclusive, low risk sustainable development for bulk common good. The plan is in consonance with global trends in eco-friendly development for humid tropics. The highlights are stated below:

- Protection of the pristinely environment wherever possible, demarcating such areas, involving biodiversity rich centres associated with forests, hydrologically significant areas like Myristica swamps and high endemism forests, sacred groves, highly productive estuaries etc.
- The development plans are inclusive, aimed at better livelihood opportunities for the locals, promotive of entrepreneurship at the grassroots, involving even the most underdeveloped areas and marginalized people; at the same time these plans are in spirit not to harm the fragile ecology of the district any further. Though there are no claims of zero ecological damage, simultaneous ecosystem enrichment is envisaged through apiculture, restoration of mangrove ecosystems, beach vegetation and bio-shielding, protection of Myristica swamps and relic climax forests, eco-friendly redesigning of village peripheral forests etc.
- In the field of agriculture the thrust is on organic farming, in situ conservation of indigenous crop varieties, cultivation of medicinal plants and their primary processing, marketing of organic products, crop insurance against damages from wildlife, agro-processing, value addition, use of locally produced bio-pesticides and biofertilizers etc.
- A variety of low risk and low investment and least polluting cottage and small scale industries, mostly based on locally available or produced raw materials and locally trained manpower are proposed. These are visualized taking into account global trends and sustainability. For instance production of handmade goods or using low cost machinery and locally fostered human resources are going to reduce energy and transportation costs, and at the same time preventing mass migration of youth from impoverished villages into the cities, where burgeoning population and associated crises are turning out to be unsolvable for the Government. The fillip to growing of medicinal plants, apiculture, sericulture, preparation of vegetable dyes, scientifically prepared

plant products like kokam butter, coconut products, canned fruits, nutraceuticals, participatory ecotourism etc. are meant to capture the global market in the near future.

- In the energy sector, having researched on the silent but serious repercussions within the ecosystems of hydro-electric projects, (Sharavathi and Kali estuaries- for instance), we recommend widespread harnessing of solar energy for integrated eco-development, apart from biogas, energy efficient stoves, biofuel etc.
- The high importance given to fodder farms at panchayat levels is based on the finding of fodder scarcity and prohibitive price of other cattle feeds. The tendency of the people to do away with cattle is primarily because of increased expenses on maintaining them. The reduced availability of cattle manure will tell upon soil fertility and soil structure badly and undermine agricultural systems. Fodder farm is a simple low cost solution for livestock maintenance and achieving prosperity through dairying and for greater soil fertility and protection.

Clustering approaches for ecology integrated sustainable development of Uttara Kannada has been suggested based on the discussions with the well-known economist **Prof. Gopal Kadekodi, CDS, Dharwad.**

Ecology Integrated Clustering for Development of local bodies

The geographical clustering approach for integrated, ecologically sound development seems to be the only solution for sustainability in rural India, a country which is still a fair mix of advanced state of biotechnology, IT industry and global leaders in textile production, iron steel and transportation co-existing with slash and burn cultivation in the North-East, handmade clothes, village blacksmiths, bullock carts and stone age canoes. The integrated eco-cluster approach, recommended here for Uttara Kannada district, is meant to protect ecology, biodiversity, water resources, culture and traditions while paving way for locality-specific economic development, primarily aimed at elevating levels of livelihood security. Such development is meant to counter the adverse impacts of globalization on environment and human life in this fragile, humid tropical zone rich in biodiversity, both cultivated and wild, and to arrest the recent trends in mass migration of youth, deserting their villages, seeking better livelihoods in big cities. The clustering of gram panchayats, including small towns, for carrying out a proposed set of economic activities per cluster, envisaged here, is the best alternative to mega-projects and macro-economic development for a fragile tropical zone, a part of the Western Ghats, one of the Global Biodiversity Hotspots of the world. As the cities like Bangalore are becoming unlivable due to burgeoning population and chaotic development with water and power crisis looming large, rising pollution and scanty living spaces, the strains are felt in the Western Ghats for siphoning of water, producing hydro-power and even thermal and nuclear power, and extracting diverse kinds of natural raw materials, endangering ecology and impoverishing rural life, making the youth migrate in large numbers deserting their rural homes and leaving behind their traditional livelihoods.

Cluster Development Approach for Uttara Kannada

Sector-wise cluster development approach is already inherent and is gaining increasing importance in Karnataka. For, instance in the field of crop production Bangalore urban and Rural, Kolar and Tumkur constitute a mango cluster targeting production of export quality mangoes. Dakshina Kannada, Udupi, Uttara Kannada and Kolar make a cashew cluster. Most of the malnadu districts of the State belong to a cocoa cluster and so on. All sector integrated, ecology based cluster approach is lacking so far.

A taluk-wise clustering of Uttara Kannada has been proposed here for future ecology-integrated sustainable development. In each taluk the taluk headquarters along with adjoining gram panchayats will constitute one cluster. The coastal gram panchayats are grouped into coastal clusters in view of their proximity to sea, marine fishing as a form major livelihood, their threats from sea level rise and sea erosion in future, nearness or inclusion of estuaries and creeks, which themselves are highly productive ecosystems, low, hilly lateritic terrain, the possible compacted deposits of ancient Gondwanaland erosion, with specialized ecosystems and so on. The inner coastal panchayats bordering on Western Ghats are grouped into separate clusters. If major west flowing rivers intervene in the landscape the gram panchayats on either sides are grouped into separate clusters. In the Malnadu taluks the eastern relatively drier gram panchayats and western ones along the crest of the Western Ghats, clad in mainly evergreen forests, make separate clusters. The Anshi-Dandeli Tiger Reserve, inclusive of Anshi National Park and Dandeli Wildlife Sanctuary along with associated villages constitute one cluster. In this cluster developmental activities are primarily related to eco-tourism and associated ones, considering the sensitivity of the conservation area. In Mundgod and Haliyal, the taluks merging with the Deccan zone, the GPs of relatively flatter eastern portions having numerous ponds and lakes are brought in clusters separate from those bordering Malnadu forests. Development activities are proposed considering the terrain, landscape elements, ecology, farming systems, associated human life etc. The resulting clusters form self-reinforcing networks of local industries, research institutions, universities, financial bodies and public sector organisations characterised by high level of competition and collaboration.

Cluster facilitators and need for institutional structure for implementation: Village panchayats form ideal units for implementation of cluster approach for integrated eco-friendly development. The success of cluster based development programmes will depend on the active participation of facilitators. The various Government departments, financial institutions and NGOs will have active roles to play for the success of the integrated cluster-base approach. In addition there is also need for district and taluk level facilitator committees for scrutinsation of developmental plans and review of progress achieved. The role of some facilitators, for instance, are indicated below

Forests and wildlife departments

- As forests constitute a major asset of the district the Forest Department need to be strengthened with more manpower.
- Development of nurseries involving local people. People be encouraged and guided to make nurseries of forest trees and medicinal plants (*Coscinium fenestratum*, *Nothapodytes nimmoniana*, *Asparagus racemosus*, *Embllica officinalis*, *Saraca indica*, *Terminalia bellirica*, *Adhatoda vasica*, *Rauwolfia serpentina*, *Tinospora cordifolia* etc)
- It is suggested to look into the feasibility of purchase of medicinal plants or their products by the Forest Department itself, or by the local VFCs from the producers at fair prices, and the sale/supply of these goods to pharmaceuticals to be undertaken by the Forest Department itself. This recommendation is being made so as to stop rampant illegal collection and trade of medicinal plants from the wild.
- The local ayurvedic pharmaceuticals (within the district), and local people to be engaged in cultivation and value addition to medicinal plants be supplied with medicinal plants/products on priority basis to enrich the local economy and employment potential
- NTFP collection and value addition,
- Developing bee-keeping involving forests and mangroves. As bee-keeping is recommended as an important activity for almost all clusters, roadsides, common lands, under-stocked or degraded forest patches around villages be planted with appropriate nectar plant species.
- Contract system for collection of NTFP from forests found to be highly detrimental to forests and biodiversity and economic well being of local people be stopped forthwith and co-management system involving local people be adopted.
- Production of bamboo based products by local craftsman and effective utilization of bamboo for local development is important
- Use of alternative energy sources replacing firewood
- Development of bettas for tree farming, medicinal plants and fodder,
- Promoting backwater, mangrove, and beach tourism, development of rural tourism and home stays in the vicinity of forests and wildlife areas
- Regular conduct of training in bird-watching, wildlife studies, trekking trails, hygiene and solid waste management involving VFCs, local youth in forest and wildlife related tourism areas be arranged with view of generating eco-friendly employment potential.
- Utilization of weeds and harvestable trees/tree parts, bamboos, canes etc. from plantations or other designated areas for vegetable dyes, medicines, weaving, furniture, handmade paper, sports goods production
- Awareness creation and conservation of sacred groves, sacred kans, which are biodiversity and hydrology significant areas and still playing unique cultural roles in rural society.

- All hydrologically significant forest patches, as indicated, for instance, by high Western Ghats endemism among trees, be preserved both for the sake of perenniality of water courses and for the biodiversity content.
- The Department to consider pooling back good part of income from VFC managed areas into sustainable income generating activities in the cluster level

District Industries Centre (DIC)

Main focus agency for promotion of small scale and cottage industries.

- Easy registration of small scale and cottage industries
- Infrastructure assistance
- Investment subsidies
- Linking with Employment Generation programmes
- Entrepreneurship development programmes
- Technical training
- Assisting in sale of products, buyer-seller meets
- No new red and orange category industries in malnadu and coastal taluks. Orange category may be considered under strict norms and social audit, away from biodiversity centres

Tourism Department

Integrated community based eco-tourism development is being conceptualised to benefit some clusters of adjoining local self government units as a strategy to address high incidence of poverty among the communities while such areas are teeming with tourism potential

- Developing integrated community based eco-tourism
- Assistance in building aesthetic cottages/rooms as part of home stays of bonafide locals or local VFCs. Local grass root level tourism related enterprises to be preferred against construction and commercial lobby.
- Developing tourism awareness in the appropriate panchayat clusters. Conducting programmes on safeguarding local cultures, performing arts and biodiversity
- Getting necessary registration/licenses for village home stays managed by individuals/VFCs/communities, and exhibiting details on location-wise home-stays through web pages
- Training youth in tourism/homestay management
- Fostering tourism related entrepreneurship among the local people so as to increase self employment opportunities in rural areas and small towns.

Horticulture Department

- Facilitate farming of desired crops only under insurance coverage
- Training in preservation of fruits and vegetables to women
- Promoting organic cultivation for exports and Indian markets

Financial institutions

Government financing and micro-financing institutions to step in to promote cluster level development programmes through local panchayats, VFCs, BMCs, NGOs, departments, societies etc. Financing from charitable and voluntary organizations and NGOs and not-for profit financiers to be considered and may be recommended by related departments. Crop insurance, preferably, in identified human-wildlife conflict zone is highly necessary for future of biodiversity conservation. Financial literacy is very critical for participatory development programmes envisaged.

Mining and Geology

- Mining in Western Ghats to be phased out. Mining for building stones/jelly be limited to meet local demands, and in any case not to be transported out of the district.
- Sand mining in west coast rivers and estuaries to be limited strictly for use within the district only.
- Considering coastal laterite as Gondwanaland soil/rock deposit, and its limited nature, its special ecosystem value sustaining rare and unique biodiversity, laterite quarrying from coastal hills be strictly limited to meeting local demands. Laterite transport to outside the needs to be banned
- Mining of stones/sand/shell etc. from VFC/BMC jurisdiction areas be limited to bonafide local use and in any case not to be transported outside local area/district as is deemed fit by the joint decision of VFC-BMC and Forest and Mining-Geology departments.

Education Department (Primary and Secondary)

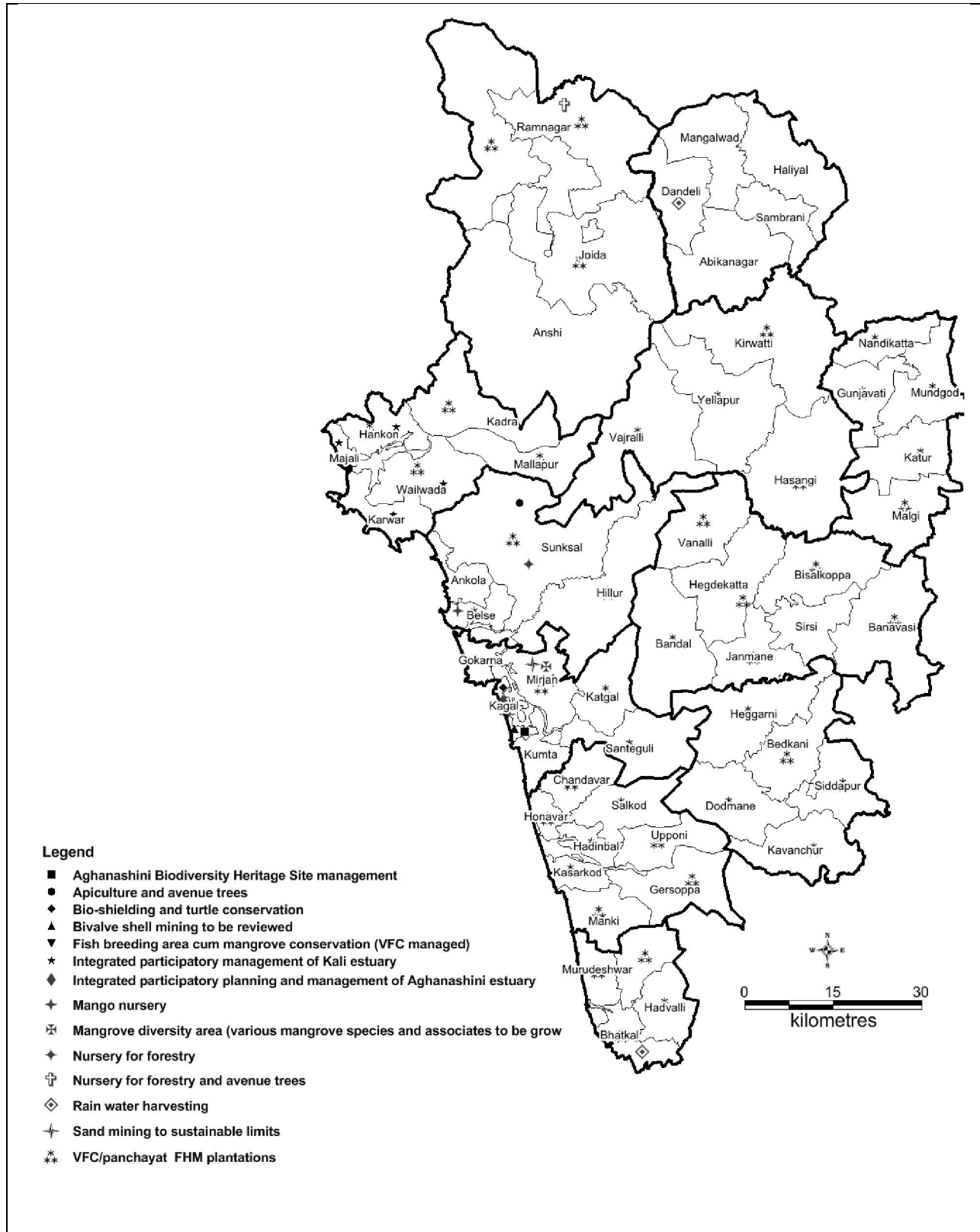
Our initiatives with high school students and teachers show they are effective in documenting many aspects of biodiversity and related knowledge existing at village level. With a reasonable time, say one or two days spent on motivating them and familiarizing them with the concepts of biodiversity documentation and data collection formats, they could contribute substantially towards building up a dynamic database at village level ready for integration into the People's Biodiversity Registers. They are more effective in meeting and interviewing organic farmers, in noting down details on traditional cultivars, collecting details on sacred groves, major wildlife related details etc.

District administration/Zilla panchayat

- Thin plastic carry bags production and sale to be banned, so as to promote locally produced cloth and paper bags.
- Hoteliers and bulk purchasers of milk to purchase milk in larger containers, which the milk producers are to use mandatorily and need based
- Use of plastic disposable cups and plates to be banned so as to reduce environmental hazards and to provide market for locally produced biodegradable eco-friendly materials made up of say areca-spathe or washable utensils. Government institutions, offices, public sector undertakings, educational institutions, temples, hoteliers and roadside eateries, and bulk caterers to comply with such norms.
- Imposition of fines/cleaning charges be levied on polluters at all levels
- Toilet facility within reach of every household

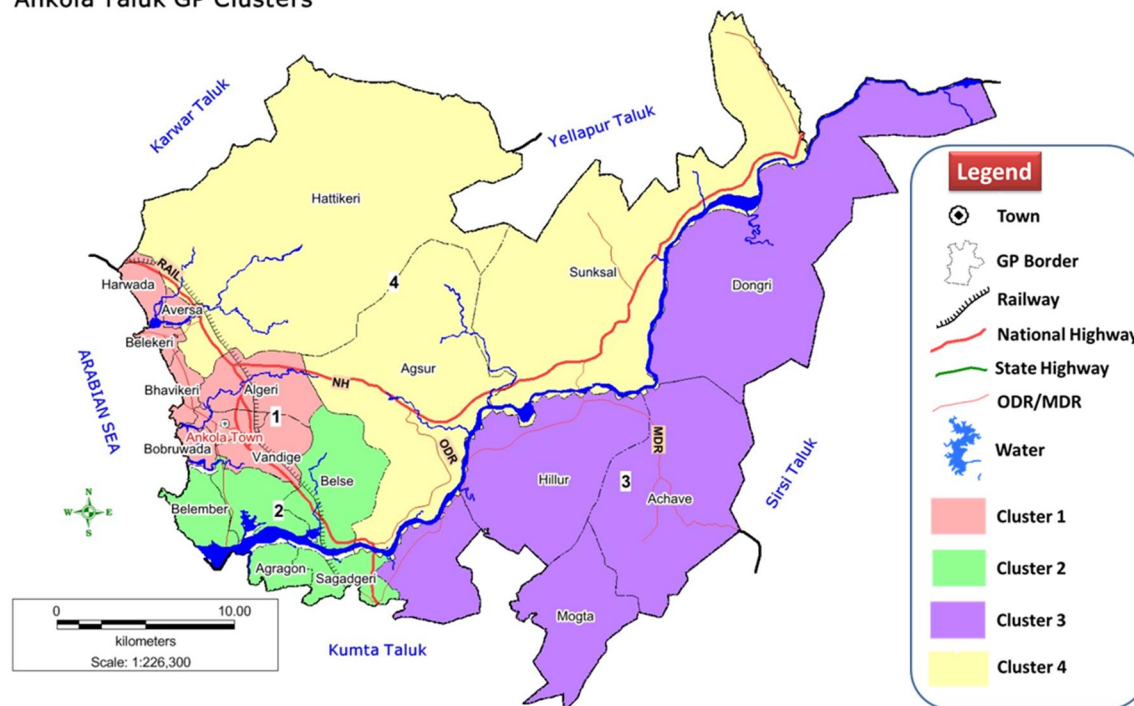
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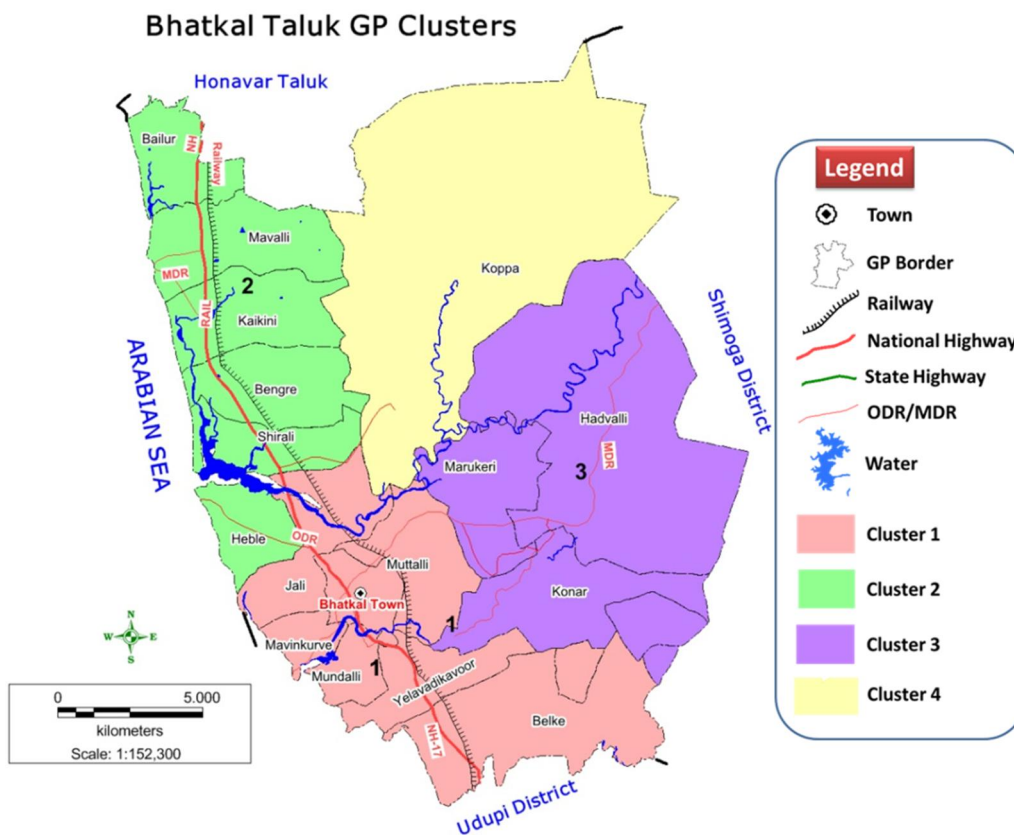


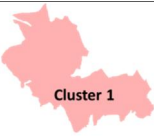



Taluk-wise Clusters

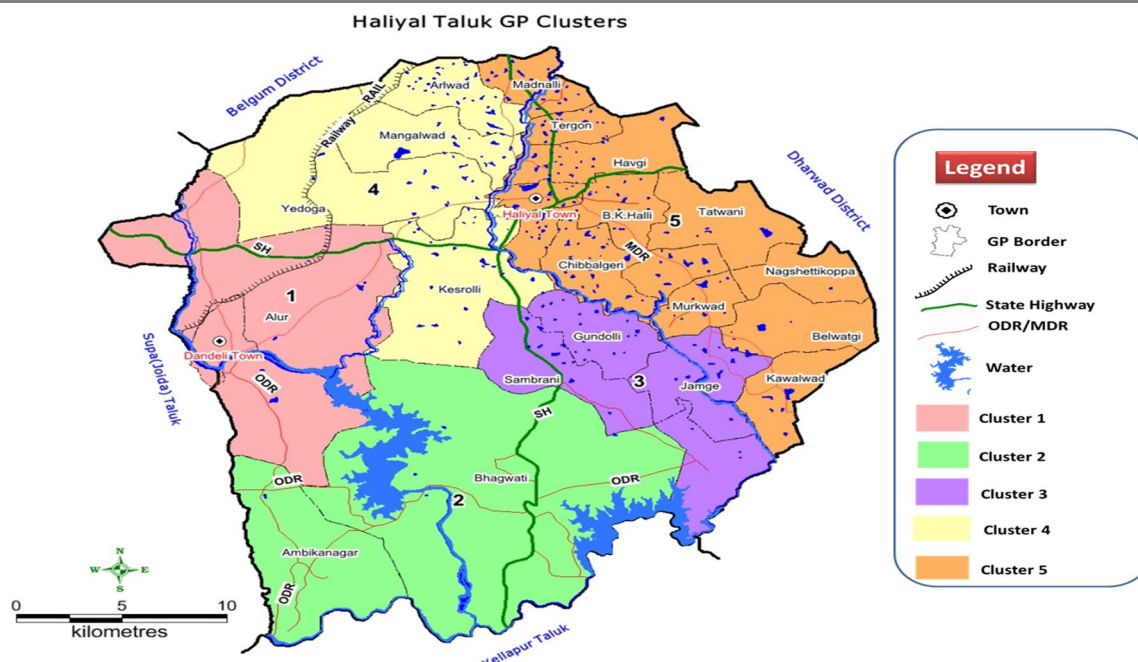
Ankola Taluk GP Clusters








Clusters	Activities
 <p>Cluster 1</p>	Biopesticides, food products, gem and jewellery, readymade garments; training center for fashion technology; watermelon cultivation; fish products; home stays; incentives for community/private sacred groves in good condition; tour operators
 <p>Cluster 2</p>	Bee keeping and bee nurseries; VFC/panchayat FHM plantations, home for elderly; medicinal plants cultivation & processing; Water melon cultivation; mango pulp; mango nursery; incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition
 <p>Cluster 3</p>	Bee keeping, livestock and dairying, gobargas, VFC/panchayat FHM plantations; vegetable dyes; VFC managed health tourism; Motigudda home stays and tree houses; mango pulp; hospital services, incentives for rare traditional cultivars, rewards to certified organic farmers, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; sericulture
 <p>Cluster 4</p>	Bee keeping, livestock and dairying, gobar gas, VFC/panchayat FHM plantations; vegetable dyes; nursery for forestry, apiculture and avenue trees; herbal toilet soaps; hospital services, incentives for rare traditional cultivars, rewards to certified organic farmers, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; sericulture

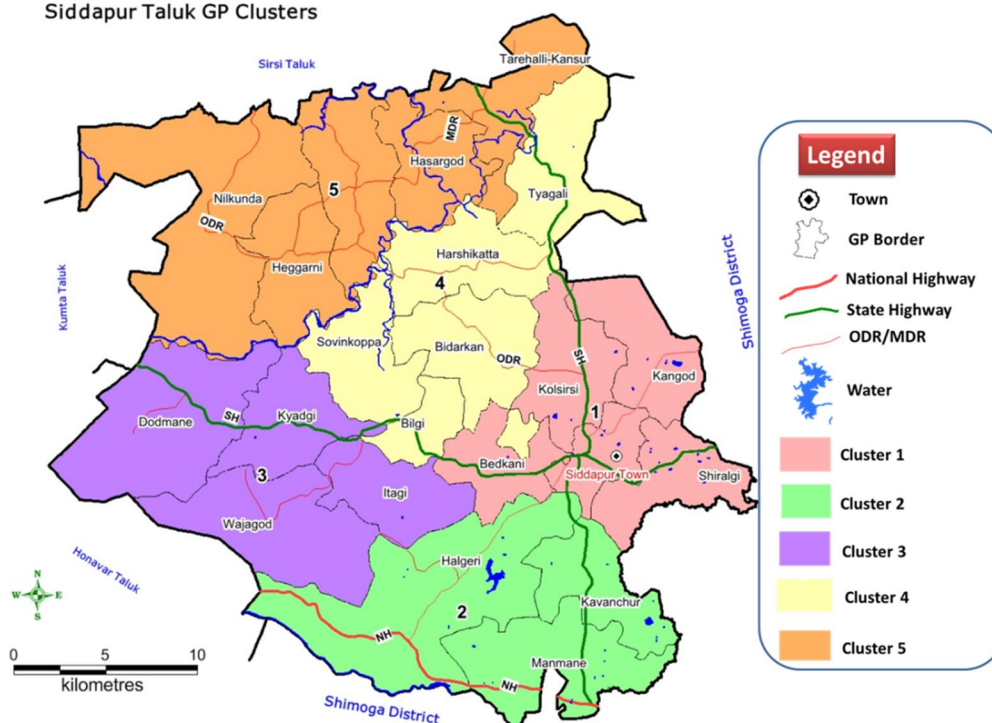







Clusters	Activities
 <p>Cluster 1</p>	Bee keeping, VFC/panchayat FHM plantations, home for elderly; vegetable dyes, readymade garments; jasmine cultivation, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; tour operators
 <p>Cluster 2</p>	VFC/panchayat FHM plantations; biopesticides and bio-fertilizers; VFC/individuals managed home stay tourism, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition
 <p>Cluster 3</p>	Bee keeping, livestock and dairying, gobargas, VFC/panchayat FHM plantations; medicinal plants cultivation and processing; hospital services, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition
 <p>Cluster 4</p>	Bee keeping and bee nurseries; livestock and dairying, gobargas, VFC/panchayat FHM plantations; vegetable dyes; herbal toilet soaps, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; VFC managed home stay tourism



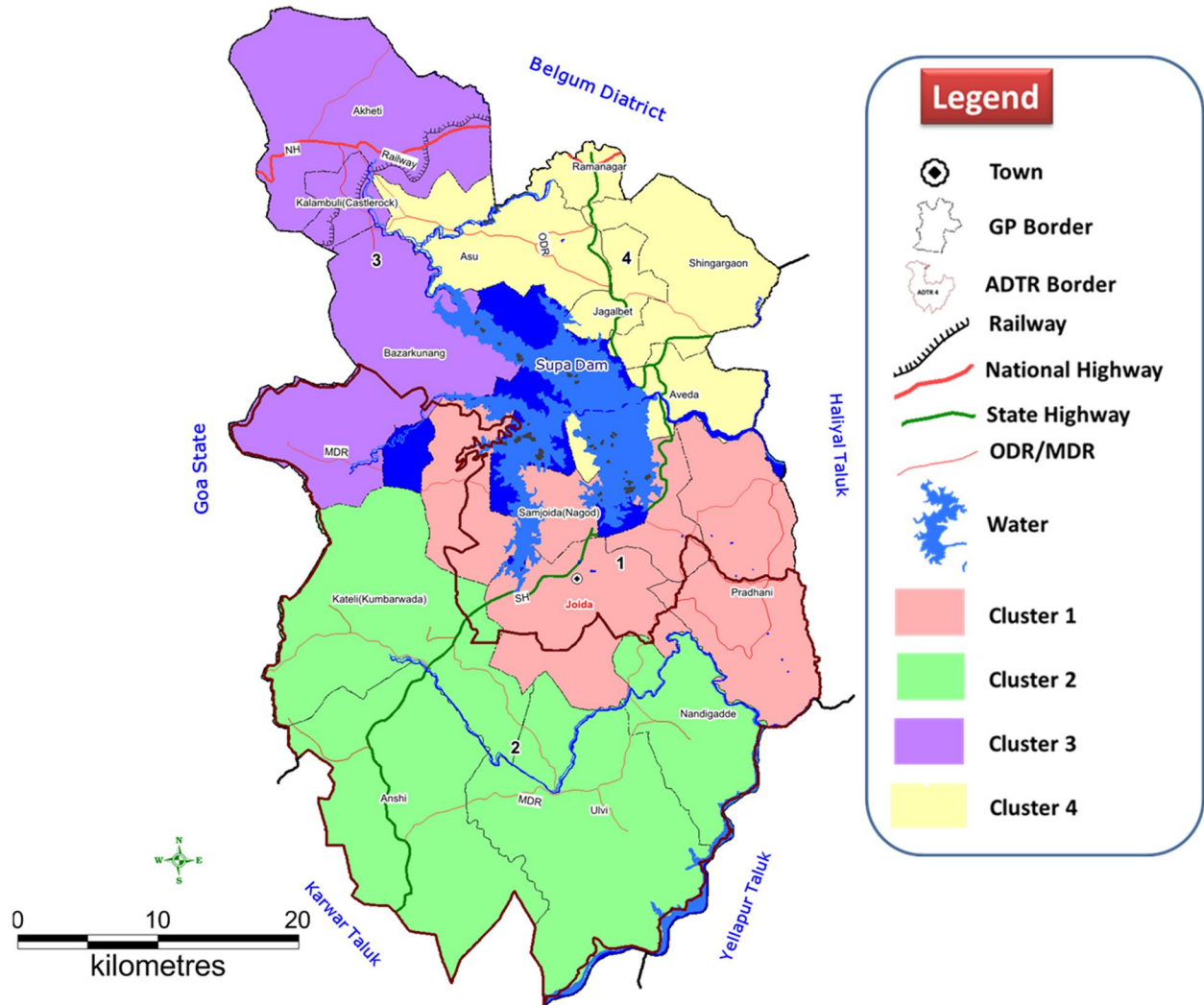
Clusters	Activities
	Bee keeping, livestock and dairying, gobargas, sericulture, home for elderly; vegetable dyes; medicinal plants cultivation and processing; bamboo products; Tulsi cultivation and extract; hybrid seeds, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition
	Bee keeping, sericulture; vegetable dyes; handmade paper products; home stay tourism; bamboo products; Pongamia plantations, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; VFC/individual managed home-stay tourism; training in making bamboo cottages
	Bee keeping, Fish farming, livestock and dairying, gobargas, sericulture; Pongamia and neem plantations; biodiesel and bio-pesticides; tamarind plantations and products; poultry; hospital services, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition
	Bee keeping, Fish farming, livestock and dairying, gobargas, sericulture; mulberry nursery; Pongamia and neem plantations; bio-pesticides and biodiesel; purified neem oil; hybrid seeds; poultry, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition
	Bee keeping, Fish farming, livestock and dairying, gobargas, sericulture; poultry feed; Pongamia and neem plantations; biodiesel and bio-pesticides; bio-fertilizers; purified neem oil; hybrid seeds; poultry and powdered eggs; tamarind products, tamarind nursery, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; tour operators





Siddapur Taluk GP Clusters

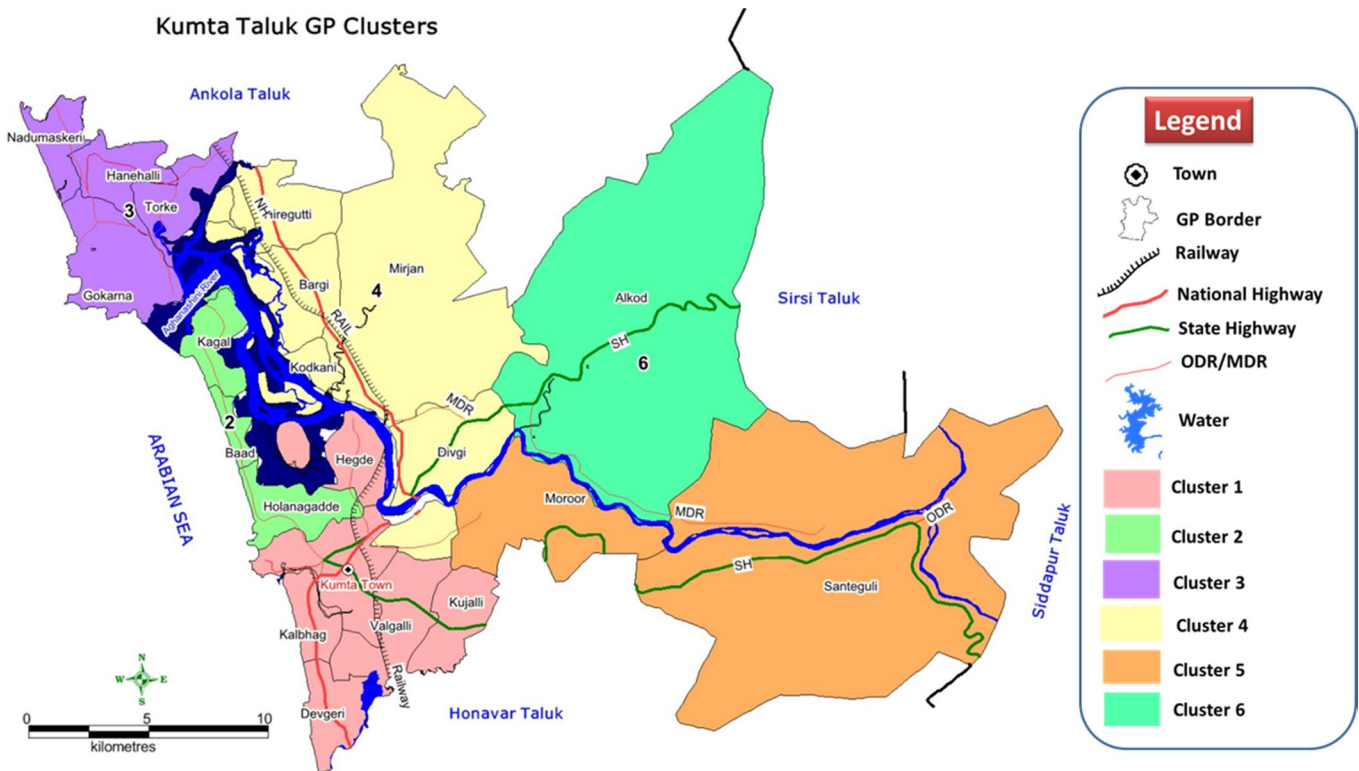




Clusters	Activities
 <p>Cluster 1</p>	VFC/panchayat FHM plantations, sericulture, home for elderly; organic products certification; microwave assisted hot air and vacuum drying of food & spices, ayurvedic medicines; sun dried fruits and vegetables; training centre for bee keeping and honey testing lab, incentives for rare traditional cultivars , incentives to certified organic farmers ; incentives for community/private sacred groves in good condition; tour operators
 <p>Cluster 2</p>	Bee keeping and bee nurseries; livestock and dairying, gobargas, VFC/panchayat FHM plantations, sericulture; vegetable dyes; palm sugar; aromatic plants and essential oil distillation; orchids and cut flowers, indoor plants, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; cloth and paper bags
 <p>Cluster 3</p>	Bee keeping, VFC/panchayat FHM plantations; medicinal plants cultivation & processing; handmade paper products; palm sugar; aromatic plants and essential oil distillation; wild mango pickles; orchids and cut flowers, indoor plants; home-made organic chocolates; hospital services, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; VFC/individual managed home stay tourism
 <p>Cluster 4</p>	Bee keeping, livestock and dairying, gobargas, VFC/panchayat FHM plantations, sericulture; vegetable dyes; fruits and vegetables preservation; wild mango pickles; hospital services, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition
 <p>Cluster 5</p>	Bee keeping, VFC/panchayat FHM plantations; indoor plants and orchids; medicinal plants cultivation and processing; organic village home stay tourism; handmade paper products; palm sugar; wild mango pickles; home- made organic chocolates; hospital services, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition





Supa(Joida) Taluk GP Clusters

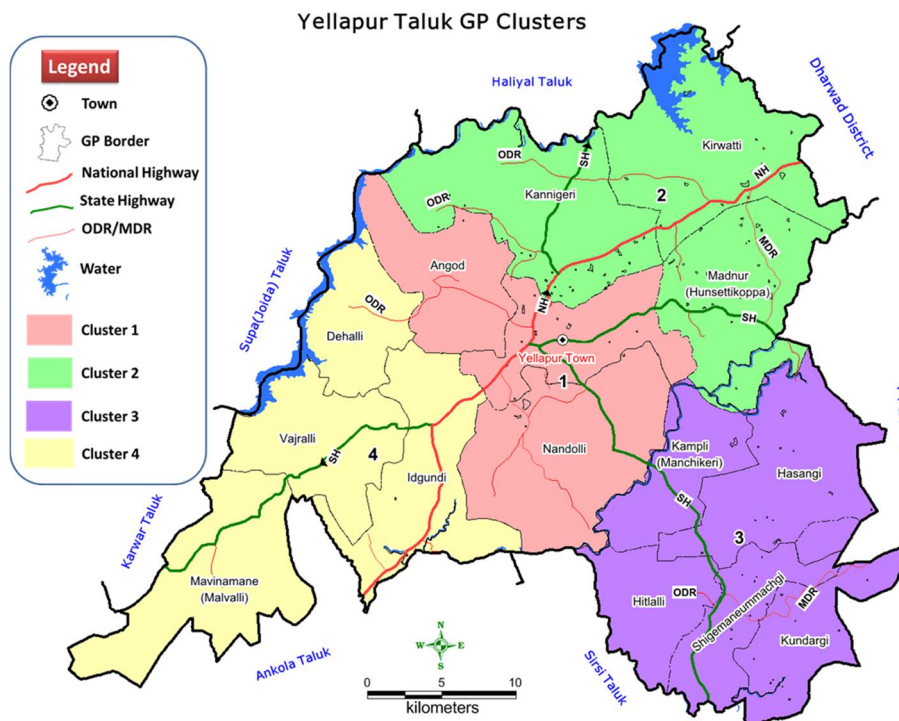






Clusters	Activities
 <p>Cluster 1</p>	<p>Bee keeping, Fish farming, livestock and dairying, gobargas, VFC/panchayat FHM plantations, sericulture; vegetable dyes; handmade paper; cloth and paper bags; sports goods making; leather products; computer training centre; weaving with palm leaves, cane and bamboo works; training in making bamboo products; Pandanus leaf products; trekking and bird watching to Sintheri Rocks and Kavala caves, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; tour operators</p>
 <p>Cluster 2</p>	<p>Bee keeping, organic and forest honey sales, medicinal plants cultivation and processing; VFC managed home stay tourism; wildlife tourism Anshi National park; Ulavi pilgrimage; tourist cottages in Ulavi; training in tourism management; VFC managed holiday home bamboo cottages; pickles from wild berries; Tulsi cultivation and extract; bamboo mat painting; incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition</p>
 <p>Cluster 3</p>	<p>Bee keeping, Fish farming, livestock and dairying, gobargas, VFC/panchayat FHM plantations; vegetable dyes; water-sports training; VFC managed home stay tourism in forest villages; holiday home bamboo cottages; monsoon trail to Dudhsagar Falls; aromatic plants and essential oil distillation; orchids and cut flowers; hospital services, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition</p>
 <p>Cluster 4</p>	<p>Bee keeping, Fish farming, livestock and dairying, gobargas, VFC/panchayat FHM plantations, sericulture; vegetable dyes; nursery for forestry and avenue trees; bamboo products; orchids and cut flowers; hospital services, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; VFC/individual managed holiday homes</p>

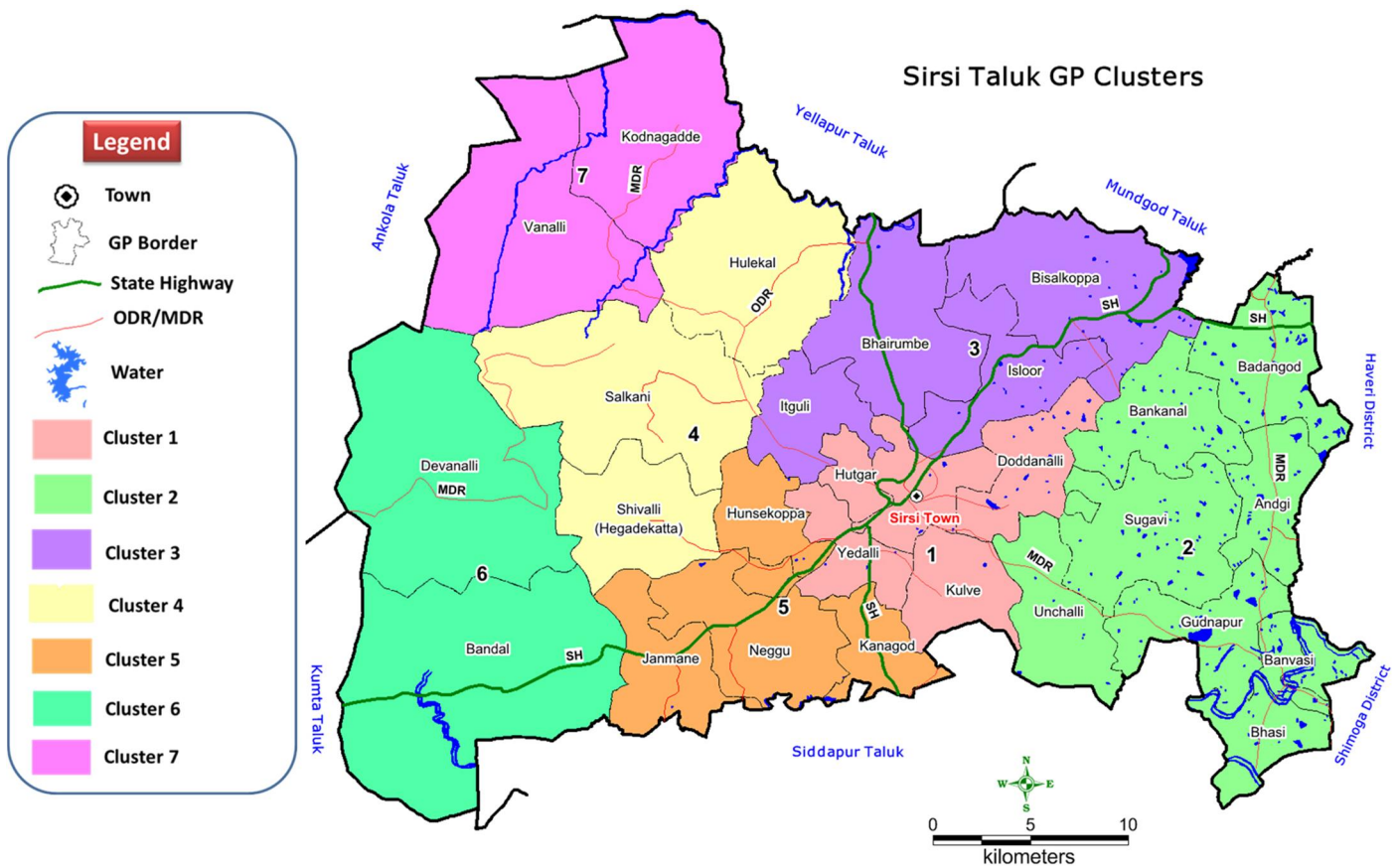




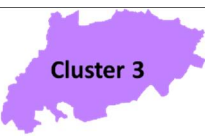
Clusters	Activities
 <p>Cluster 1</p>	<p>Vegetable dyes; Coconut products (virgin coconut oil; purified oil; spray-dried coconut milk powder, desiccated coconut, coconut vinegar), hand-made paper; cloth and paper bags; wood carving; metal inlaid wood carving; training centre for handicrafts; jewellery development and training centre; organic lime industry; Alvekodi onion expansion and storage, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; tour operators</p>
 <p>Cluster 2</p>	<p>Dry fish, marine algae products; coastal home stay tourism; training in tourism management; training in making palm-bamboo cottages; training in stone carving; Pandanus leaf products; Integrated, participatory planning and management of Aghanashini estuary. Bio-shielding and turtle conservation programmes. Bivalve processing and canning. Aghanashini Biodiversity Heritage Site management; bivalve shell mining to be reviewed; sand mining to sustainable limits, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition</p>





 <p>Cluster 3</p>	<p>Vegetable dyes; home stay tourism; iodized salt, confectionery, bakery; bakery training centre for women; bee-keeping; training centre for bee-keeping; arts and handicrafts museum and trade centre; sales of organic products; certified organic eateries, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; tour operators</p>
 <p>Cluster 4</p>	<p>Bee keeping, VFC/panchayat FHM plantations, home for elderly; cloth and paper carry bags; mangrove study tourism, bird watching and sport fishing; estuary interpretation centre, VFC run estuarine holiday home. Fish breeding area cum mangrove conservation (VFC managed); mangrove diversity area (various mangrove species and associates to be grown); estuarine crab fattening area. Integrated, participatory planning and management of Aghanashini estuary; sand mining to sustainable limits, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; sericulture</p>
 <p>Cluster 5</p>	<p>Bee keeping, livestock and dairying, gobargas, VFC/panchayat FHM plantations; poultry, poultry feed, powdered eggs, vegetable dyes, kokam products, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition;sericulture</p>
 <p>Cluster 6</p>	<p>Bee keeping, livestock and dairying, gobargas, VFC/panchayat FHM plantations, vegetable dyes, medicinal plants cultivation and processing; pickles from wild berries etc; cane and palm leaf products; VFC managed holiday home palm houses; Yana trekking and bird watching; hospital services, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition</p>



Clusters	Activities
 <p>Cluster 1</p>	Bee keeping, training centre for bee-keeping; forest honey; honey testing lab; livestock and dairying, gobargas, VFC/panchayat FHM plantations, home for elderly; handloom units; VFC/individual run home stay tourism; holiday home bamboo-palm cottages; training in making bamboo-palm cottages; Pongamia plantations and biodiesel unit, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; tour operators
 <p>Cluster 2</p>	Bee keeping, Fish farming, VFC/panchayat FHM plantations, sericulture; vegetable dyes; bamboo products; Pongamia plantations; aromatic plants and essential oil distillation, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; cloth and paper bags
 <p>Cluster 3</p>	Bee keeping, livestock and dairying, gobargas, VFC/panchayat FHM plantations, sericulture; Pongamia plantations; desiccated banana, jackfruit, papaya etc. , incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition
 <p>Cluster 4</p>	Bee keeping and honey certification; livestock and dairying, gobargas, VFC/panchayat FHM plantations; vegetable dyes; medicinal plants cultivation & processing; home stay tourism; orchids and cut flowers; home-made organic chocolates; hospital services, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition













Clusters	Activities
 <p>Cluster 1</p>	IT related activities, Livestock and dairying, gobargas, fish farming, home for elderly; vegetable dyes, food products; entrepreneur development institute; incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; tour operators
 <p>Cluster 2</p>	Bee keeping, Fish farming, livestock and dairying, gobargas, VFC/panchayat FHM plantations, sericulture; mulberry nursery; sericulture training institute; home stay tourism; hybrid seeds, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition
 <p>Cluster 3</p>	Bee keeping, Fish farming, livestock and dairying, gobargas, VFC/panchayat FHM plantations, sericulture; hybrid seeds, incentives for rare traditional cultivars; incentives for community/private sacred groves in good condition

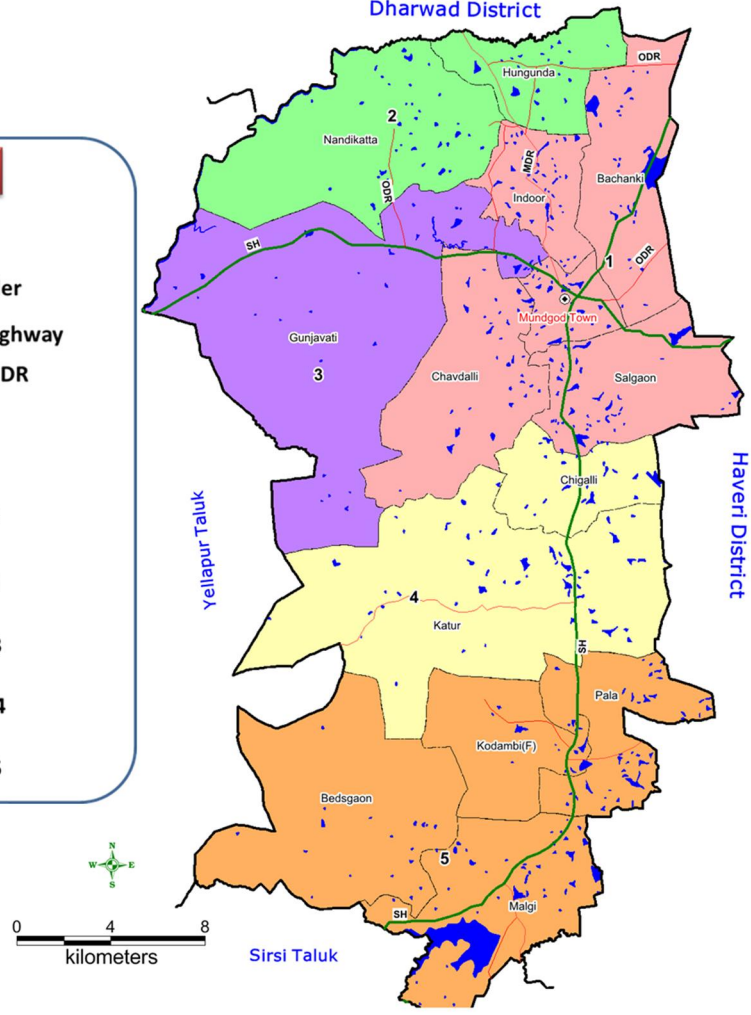
 <p>Cluster 4</p>	<p>Bee keeping, livestock and dairying, gobargas, VFC/panchayat FHM plantations; aromatic plants and essential oil distillation; medicinal plants and processing units; home-made organic chocolates, incentives to certified organic farmers; incentives for community/private sacred groves in good condition</p>
 <p>Cluster 5</p>	<p>Bee keeping, VFC/panchayat FHM plantations, incentives for rare traditional cultivars, incentives to certified organic farmers, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; cloth and paper bags</p>
 <p>Cluster 6</p>	<p>Bee keeping, VFC/panchayat FHM plantations; vegetable dyes; medicinal plant cultivation and processing; holiday home woodland cottages; orchids and cut flowers; hospital services, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition</p>
 <p>Cluster 7</p>	<p>Bee keeping, VFC/panchayat FHM plantations; vegetable dyes; orchids and cut flowers; hospital services, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; areca spathe products</p>






Mundgod Taluk GP Clusters

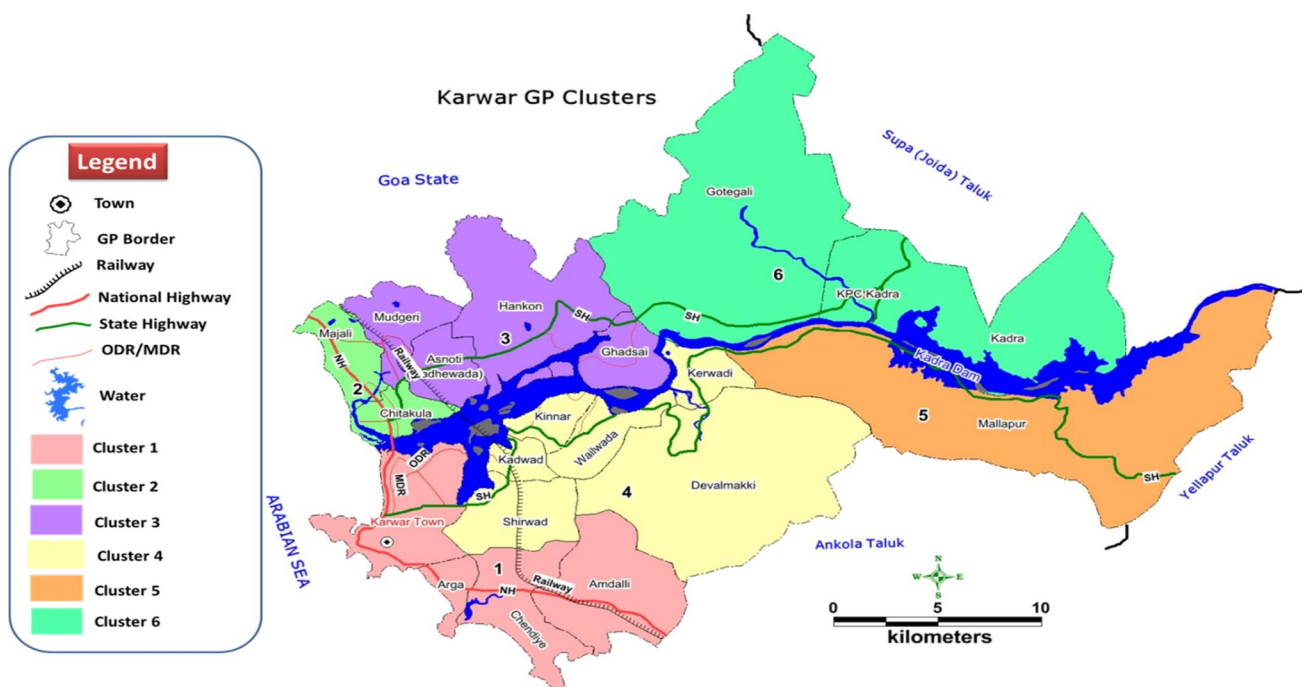
Dharwad District







Legend

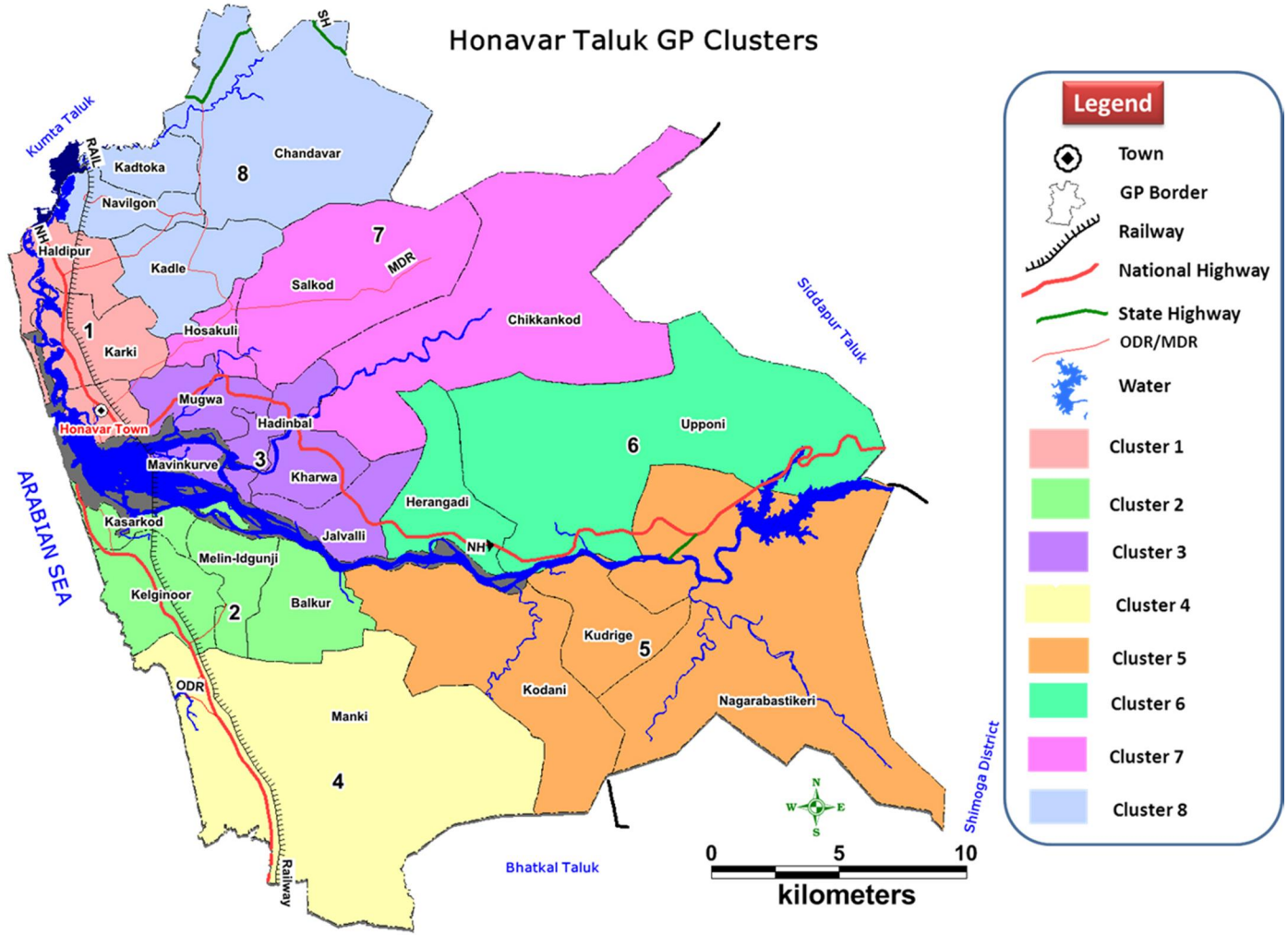
-  Town
-  GP Border
-  State Highway
-  ODR/MDR
-  Water
-  Cluster 1
-  Cluster 2
-  Cluster 3
-  Cluster 4
-  Cluster 5











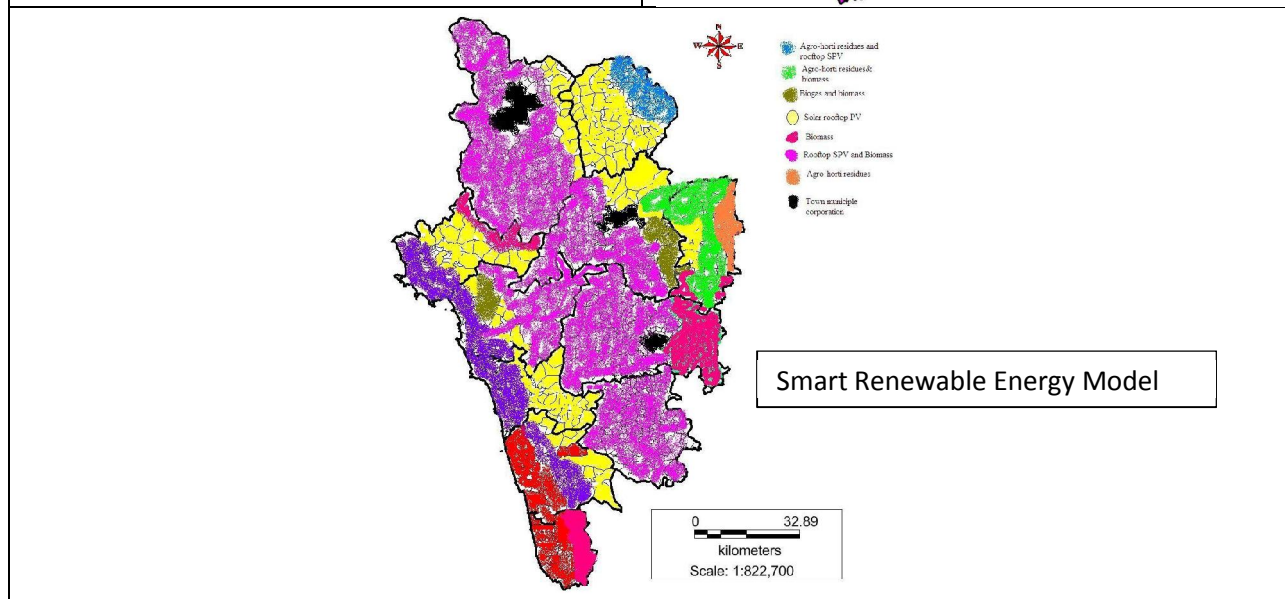
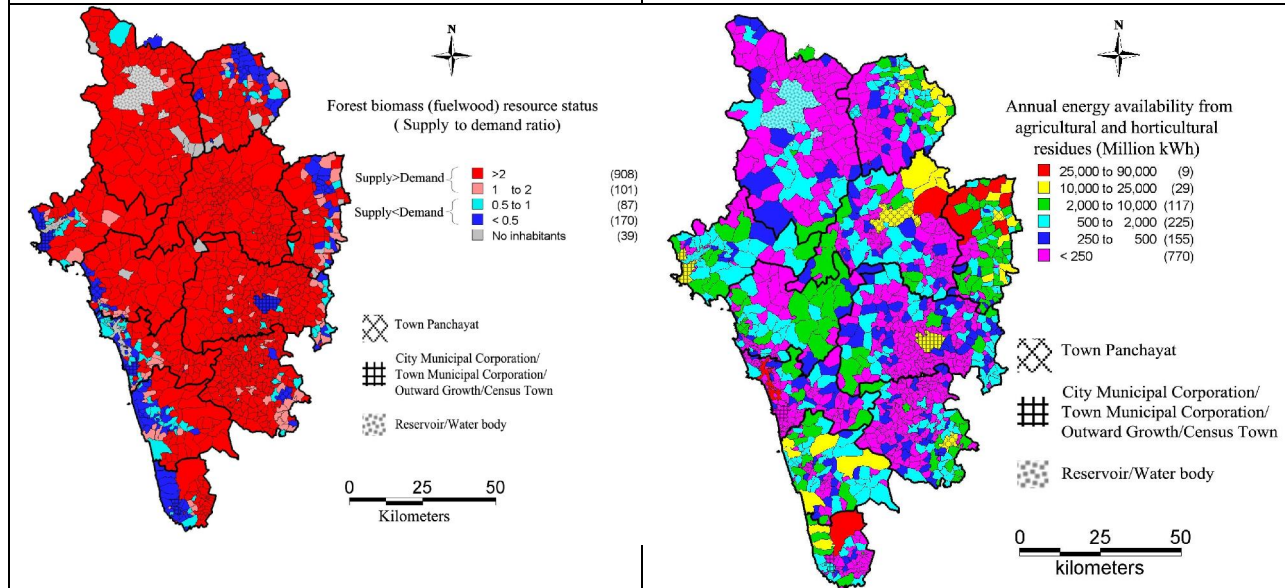
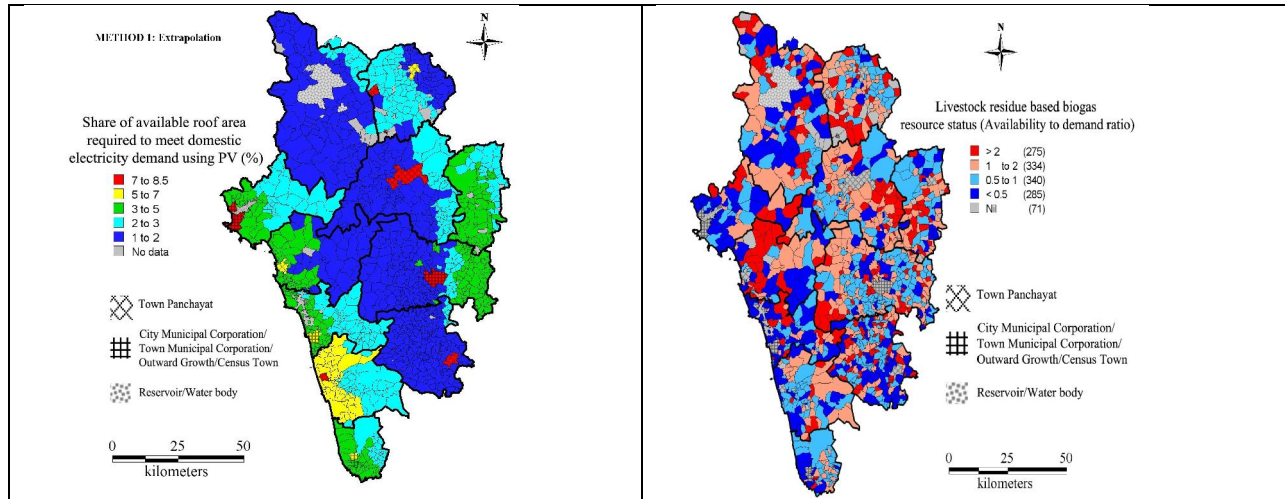
Clusters	Activities
 <p>Cluster 1</p>	<p>Bee keeping, Fish farming, livestock and dairying, gobargas, VFC/panchayat FHM plantations, sericulture; CFTRI based ragi products; organic tomato sauce, poultry, powdered eggs; training institute for handloom and wool weaving; mango pulp; home stay (linked to mainly Tibetan colony visits) , incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition</p>
 <p>Cluster 2</p>	<p>Bee keeping, Fish farming, livestock and dairying, gobargas, VFC/panchayat FHM plantations, sericulture, poultry, tamarind farms and tamarind products (concentrates etc.); mango pulp, incentives to certified organic farmers; incentives for community/private sacred groves in good condition; training in making bamboo cottages</p>
 <p>Cluster 3</p>	<p>Bee keeping, Fish farming, livestock and dairying, gobargas, VFC/panchayat FHM plantations, sericulture; vegetable dyes; tamarind farms and tamarind products (concentrates etc.) , incentives for rare traditional cultivars, incentives to certified organic farmers incentives to certified organic farmers; incentives for community/private sacred groves in good condition; cloth and paper bags</p>
 <p>Cluster 4</p>	<p>Bee keeping, Fish farming, livestock and dairying, gobargas, VFC/panchayat FHM plantations, sericulture; vegetable dyes; mint cultivation & encapsulation; hybrid seeds, incentives for rare traditional cultivars, incentives to certified organic farmers; incentives for community/private sacred groves in good condition</p>
 <p>Cluster 5</p>	<p>Bee keeping, Fish farming, livestock and dairying, gobargas, VFC/panchayat FHM plantations, sericulture; medicinal plants cultivation & processing; hybrid seeds; hospital services, incentives for rare traditional cultivars, incentives for certified organic farmers</p>

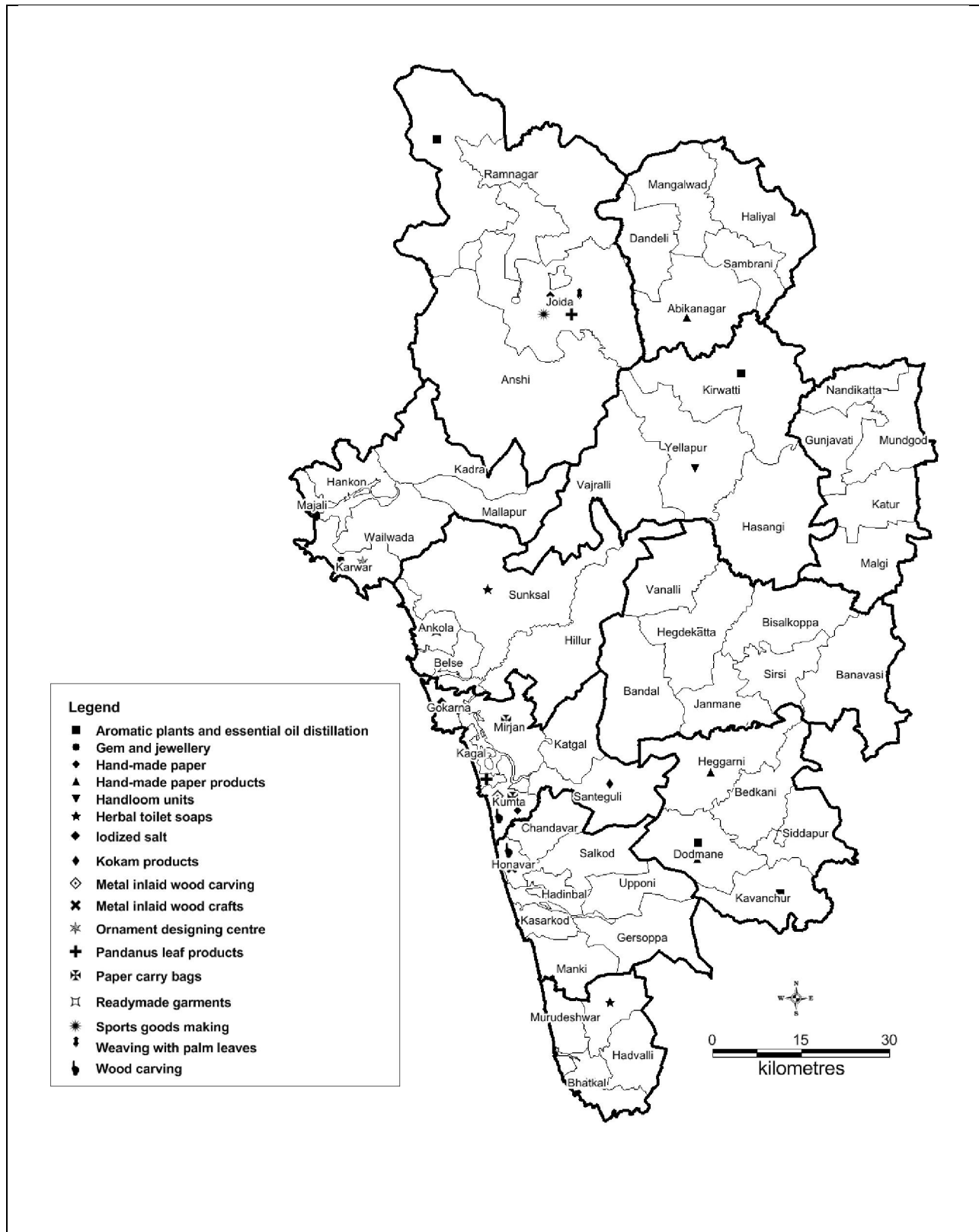


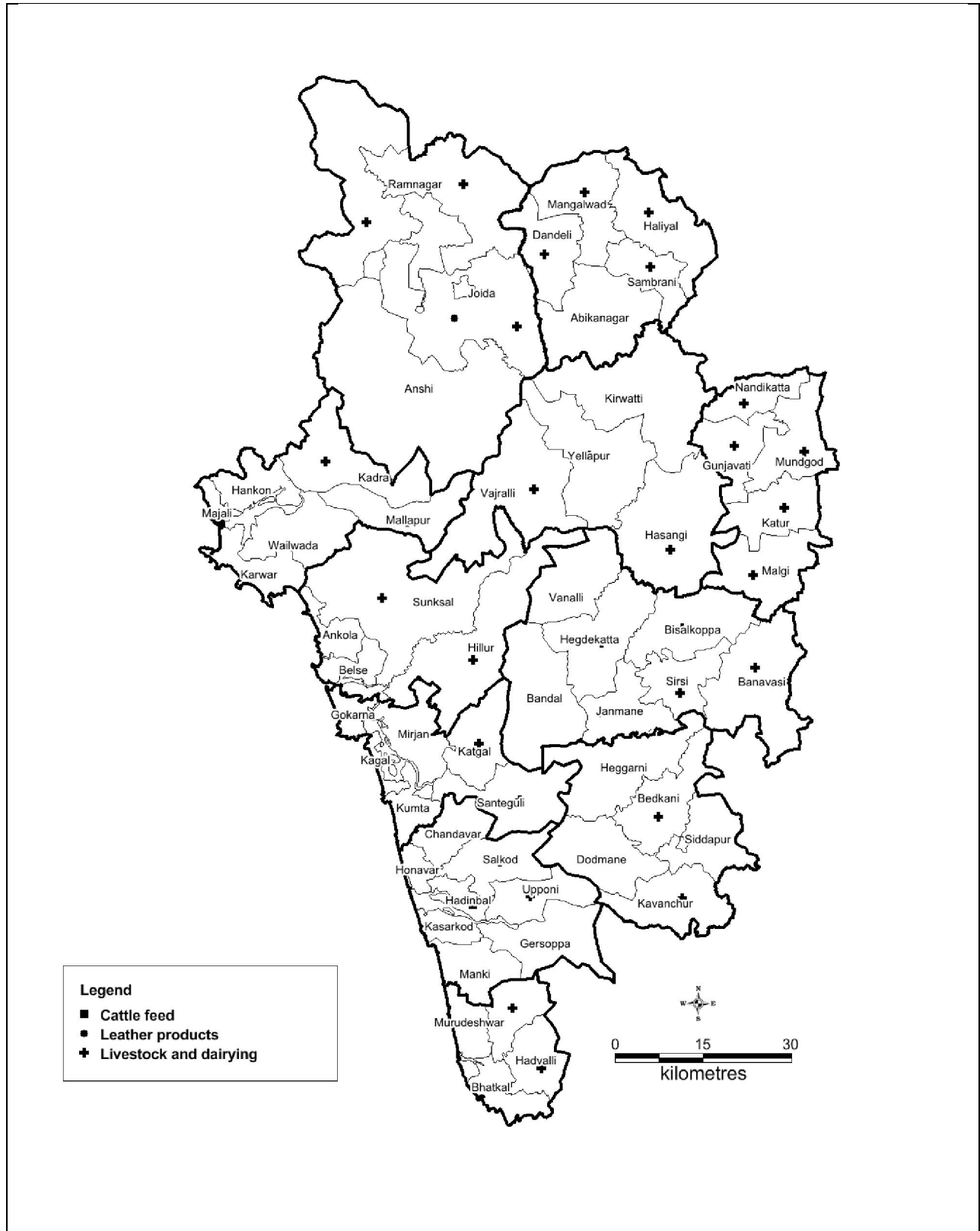
Clusters	Activities
 <p>Cluster 1</p>	IT related development; Vegetable dyes; medicinal plants cultivation & processing; gems and jewelry, ornament designing centre, Tulsi cultivation and extract; integrated participatory management of Kali estuary; tour operators
 <p>Cluster 2</p>	Dry fish; coastal home stay tourism; training in making palm cottages; medicinal plants cultivation; Noni cultivation; Tulsi cultivation and extracts; integrated participatory management of Kali estuary; cloth and paper bags; turtle conservation
 <p>Cluster 3</p>	Bee keeping, VFC/panchayat FHM plantations, home for elderly; coir products; backwater tours in native crafts; river front home stays; integrated participatory management of Kali estuary, incentives for rare traditional cultivars, incentives for certified organic farmers
 <p>Cluster 4</p>	Bee keeping, VFC/panchayat FHM plantations; medicinal plants cultivation & processing; coir products; hospital services; integrated participatory management of Kali estuary, incentives for rare traditional cultivars, incentives for certified organic farmers
 <p>Cluster 5</p>	Bee keeping, livestock and dairying, gobargas, VFC/panchayat FHM plantations; vegetable dyes, incentives for rare traditional cultivars, incentives for certified organic farmers; sericulture
 <p>Cluster 6</p>	Bee keeping, livestock and dairying, gobargas, VFC/panchayat FHM plantations; vegetable dyes, incentives for rare traditional cultivars, incentives for certified organic farmers; areca-spathe products; sericulture

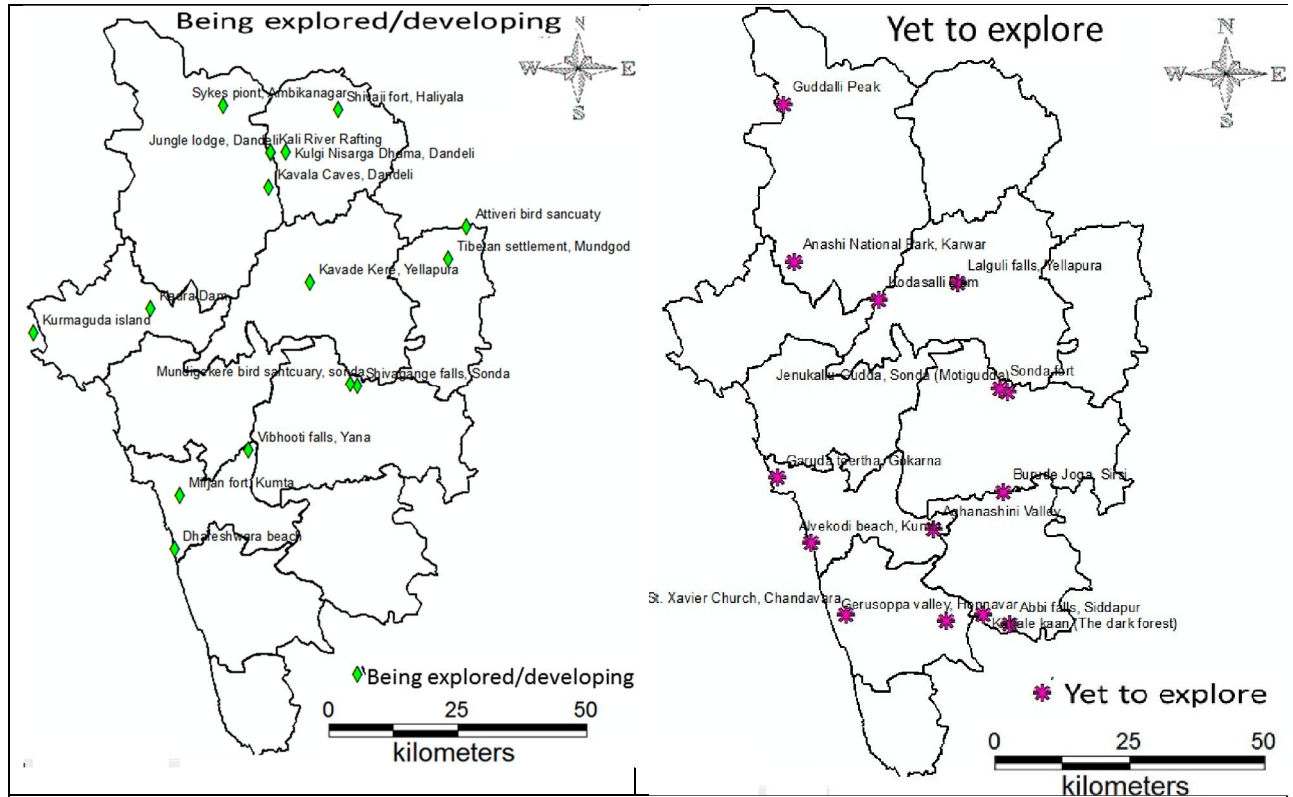


Clusters	Activities
 <p>Cluster 1</p>	<p>VFC/panchayat FHM plantations; organic products certification; honey testing lab; medicinal plants cultivation & processing; organic coconut hair oil; coconut oil natural soap; Calophyllum inophyllum cultivation and bidiesel; wood carving; metal inlaid wood crafts, incentives to certified organic farmers; tour operators</p>
 <p>Cluster 2</p>	<p>Bee keeping, VFC/panchayat FHM plantations, dry fish, home stay tourism; academy for Yakshagana and performing arts; Calophyllum inophyllum cultivation, incentives for rare traditional cultivars, incentives to certified organic farmers; cloth and paper bags</p>
 <p>Cluster 3</p>	<p>Bee keeping, VFC/panchayat FHM plantations; cattle feed; coir products; training centre for coir products; backwater tours in native crafts; river front home stays, incentives for rare traditional cultivars; incentives for certified organic farmers</p>
 <p>Cluster 4</p>	<p>Coastal home stay tourism; training in making palm-bamboo cottages; Bee keeping, VFC/panchayat FHM plantations; Calophyllum inophyllum cultivation, incentives for rare traditional cultivars, incentives for certified organic farmers;</p>
 <p>Cluster 5</p>	<p>Bee keeping, VFC/panchayat FHM plantations; woodland holiday homes of bamboo and palms; trekking trail to Govardhanagiri (Kanur fort) and bird watching; hospital services, incentives for rare traditional cultivars, incentives for certified organic farmers; areca-spathe products</p>
 <p>Cluster 6</p>	<p>Bee keeping, livestock and dairying, gobargas, VFC/panchayat FHM plantations; vegetable dyes; hospital services, incentives for rare traditional cultivars, incentives to certified organic farmers</p>
 <p>Cluster 7</p>	<p>Bee keeping, livestock and dairying, gobargas, VFC/panchayat FHM plantations; vegetable dyes; cane and palm leaf products; hospital services, incentives for rare traditional cultivars, incentives for certified organic farmers</p>
 <p>Cluster 8</p>	<p>Bee keeping, VFC/panchayat FHM plantations; vegetable dyes; medicinal plants cultivation & processing, incentives for rare traditional cultivars, incentives for certified organic farmers</p>

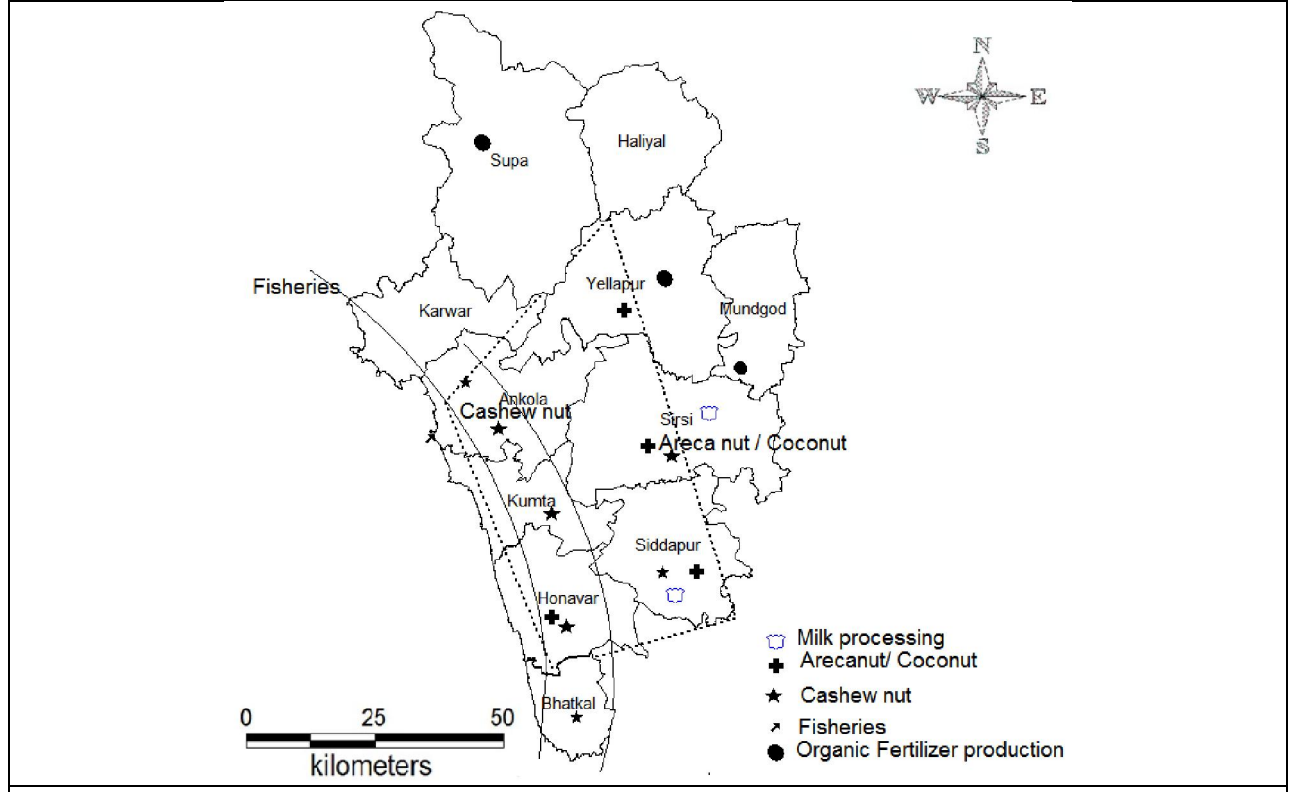


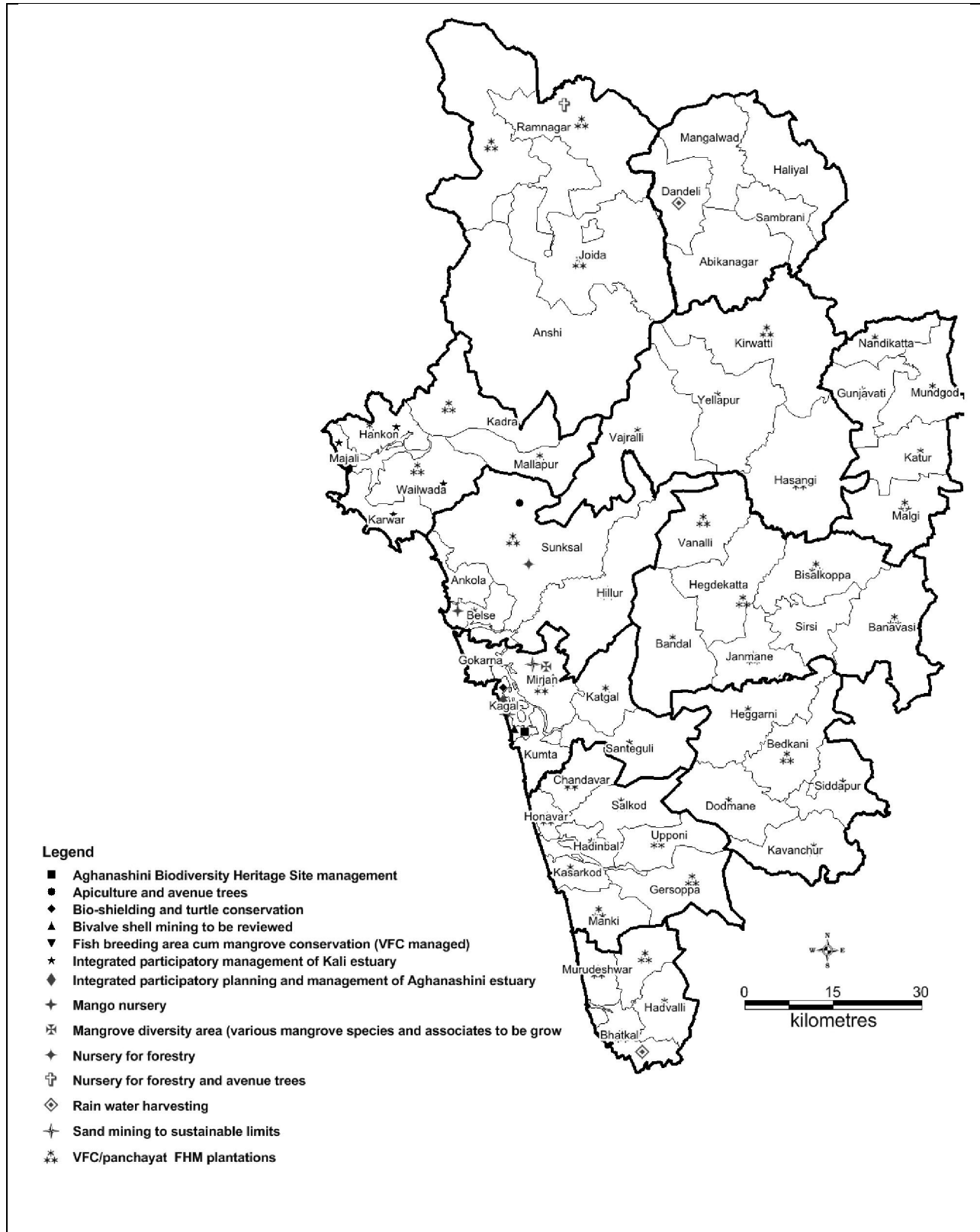




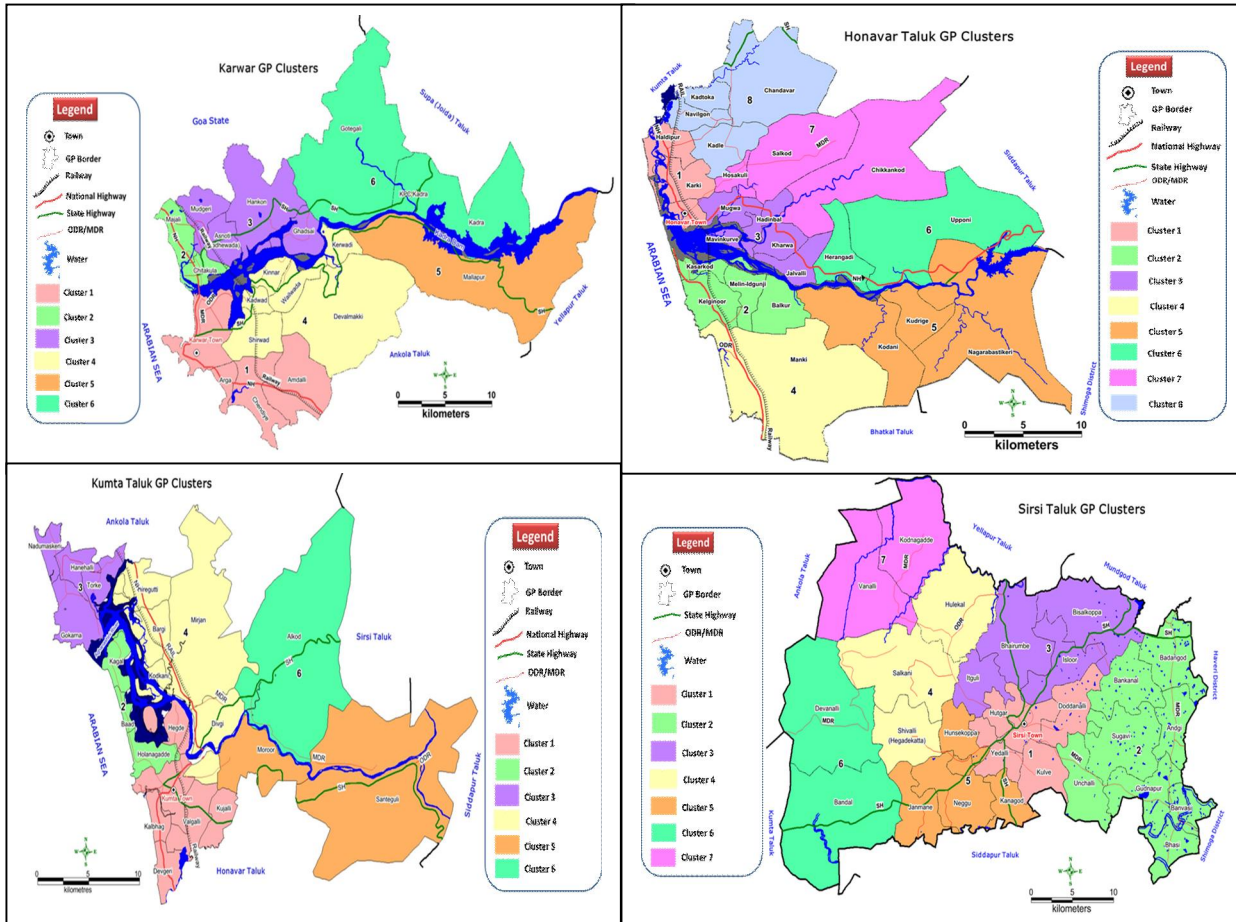


Tourism





Sahyadri Conservation Series 30



ENERGY AND WETLANDS RESEARCH GROUP, CES TE15
CENTRE FOR ECOLOGICAL SCIENCES,
 New Bio Science Building, Third Floor, E Wing,
 [Near D Gate] INDIAN INSTITUTE OF SCIENCE
 BANGALORE 560 012

Telephone : 91-80-22933099 /22933503 extn 107

Fax : 91-80-23601428/23600085/23600683[CES-TVRR]

Email : cestvr@ces.iisc.ernet.in,

energy@ces.iisc.ernet.in

Web: <http://ces.iisc.ernet.in/energy>

<http://ces.iisc.ernet.in/biodiversity>

Open Source GIS: <http://ces.iisc.ernet.in/grass>