

CHAPTER 19

GEOGRAPHY

Doctoral Theses

01. ARORA (Mamta)
Urban Agricultural Planning for Sustainable Food and Non Food Supply in Delhi NCR.
Supervisor : Dr. Suresh Kumar Bandooni
Th 25111

Abstract
(Not Verified)

The main objective of the study is to highlight the benefits, constraints and planning framework for urban agriculture and sustainable food supply in Delhi-Central NCR. The study is based on both primary and secondary data. The data has been processed using advanced statistical techniques such as percentage, Weaver index, Diversity Index, Chi-square and Principal Component Analysis (PCA). The samples have been collected from residential, industrial, institutional and peri-urban areas of Delhi-Central NCR. The total sample size exceeds 200. Urban agriculture is gaining momentum in Delhi-Central NCR. Various case-studies highlights the contribution of urban agriculture in Delhi- Central NCR such as The President Estate, Edible Routes, DTEA, Lotus Petal School, Satguru Ashram, Organic Farm Tour, Art of Living, NGO etc. All the institutes strongly support that urban agriculture can be promoted in Delhi – Central NCR for sustainable food and non-food supply. At the Institutional Level, urban agriculture is an economically viable and environmentally sustainable as they have dedicated staff with all the resources to harness maximum benefits. Indian government whether at the national level or local level yet to officially recognize and acknowledge urban agriculture as a strategy to make cities resilient or towards sustainable development. The unification of urban agriculture into urban planning is a multifaceted task requiring multi-stakeholder and coordinated approach as falling under different jurisdiction of different types of authorities. The concept can be unified rationally at each level of the city planning process. The region requires an empowering strategic plan and policy framework guiding the development of city farming such as soil-less farming and vertical farming. Indian government whether at the national level or local level yet to officially recognize and acknowledge urban agriculture as a strategy to make cities resilient or towards sustainable development. The unification of urban agriculture into urban planning is a multifaceted task requiring multi-stakeholder and coordinated approach as falling under different jurisdiction of different types of authorities. The concept can be unified rationally at each level of the city planning process. The region requires an empowering strategic plan and policy framework guiding the development of city farming such as soil-less farming and vertical farming.

Contents

1. Introduction 2. Study area 3. Dynamics of land use on food and non food supply 4. Institutional contribution in urban agriculture in Delhi central NCR 5. Urban agriculture food and non food supply: A micro level supply 6. Urban agriculture planning for sustainable food and non food supply 7. Conclusion and recommendation.

02 GAUTAM (Anant)

Impact of Anthropogenic Activities on Groundwater Dynamics in Punjab.

Supervisor : Prof. S. C. Rai

Th 25115*Abstract*
(Not Verified)

The present study analyses the impact of anthropogenic activities on groundwater dynamics in the Bist-Doab region of Punjab. The region has experienced about 169% growth in built-up area between 1996 and 2016. High population density, increasing level of urbanization, industrialization, over-exploitation of groundwater resources, wheat-paddy mono-cultivation, higher application of fertilizers, untreated discharge of sewage directly to the groundwater and other human centric activities have led to the quantitative and qualitative decline of groundwater in the region. In central parts, the fluctuation up to 30 m has been recorded with a decrease in groundwater storage up to 674487 m³ and 682216 m³ per pixel in pre- and post-monsoon seasons, respectively. Groundwater table declined at an average rate of 56 cm and 62 cm per year in pre-monsoon and post-monsoon seasons, respectively. In Jalandhar, the decline was recorded at 133 cm per year in pre-monsoon and 149 cm per year in the post-monsoon season. Weathering of silicate and carbonate minerals have been found dominant attributing Ca - Mg - HCO₃ type of groundwater. The bi-plot of d-excess vs. $\delta^{18}\text{O}$ reveals rainwater as the source of groundwater recharge for most of the samples. The groundwater zoning concerning LULC, average annual groundwater level, and groundwater quality for domestic and irrigation purposes using MCDA analysis reveals that groundwater of moderate quality has been found in about three fourth (72%) of the study area. However, the groundwater quality is of grave concern mainly in the southern parts due to intensive agricultural activities and unsustainable development. The present study proposes certain groundwater management strategies viz., comprehensive planning of LULC pattern, change in cropping pattern, promotion of organic farming, treatment of urban and industrial wastes, rainwater harvesting, mass-based groundwater recharge movement, and groundwater governance to deal with the emerging problems of groundwater resources in the region.

Contents

1. Introduction 2. Geographical background of the study area 3. Dynamics of land use/cover change 4. Analysis of groundwater status 5. Hydrogeochemical modelling of groundwater 6. Groundwater quality assessment 7. Groundwater zoning and sustainable management. Summary. References and photoplates.

03. PANT (Atithi)

Environment Socio Economic Setup and Perceived Impact of Climate Change in Kumaon Himalaya Uttarakhand.

Supervisor : Dr. V. S. Negi

Th 25112*Abstract*
(Not Verified)

The present research is also aspires to investigate the changes in climatic conditions, socio-economic setup and land use. The research covers four objectives: the first objective is to assess the changing climatic conditions of Kumaon Himalaya. The changes in climatic conditions has been calculated and represented by the linear trend (monthly and annual) of temperature and variability (monthly and annual) of precipitation, temperature and humidity were computed using coefficient of variation. The second objective is to analyse the Socio-

economic setup with respect to changing environment. The demarcation of 24 villages has been done on the basis of altitude zonation maps. The household level survey had been conducted on 360 samples. Analysis of level of development (socio- economic, and infrastructural) has been done on the basis of Composite index method to show the level of development in various districts as well as in the selected villages by giving them ranking in order to obtain levels of overall development. The third objective is to assess the changes in land use, the sub-setting of satellite images were performed for extracting study area from both images by taking geo-referenced out line boundary of Kumaon Region. The maps were created from classifications of spectro-temporal features derived of data from the Moderate Resolution Imaging Spectro-radiometer (MODIS). The fourth objective is to understand perceived impact of climate change and local mitigation strategies to cope with climate change. The Hazard Vulnerability Assessment has been done to elucidate the risk assessment by giving Hazard, Vulnerability and Management assessment ranking on the basis of local responses, for identifying frequency of disaster occurrence and its impact on livelihood. Keywords: Environment, Society, Economy, Perceived Impact, Climate Change and Kumaon Himalaya

Contents

1. Introduction 2. Geographical profile of the study area 3. Climate change spatial & temporal analysis 4. Population socio economic set up and levels of development 5. Land use land cover change analysis 6. Climate change & its perceived impact on the region 7. Summary and conclusion. Bibliography. Appendix.

04. PAWAN KUMAR

Agricultural Diversification and Livelihood Security in Mountains Framings Systems of Sikkim Himalaya.

Supervisor : Prof. S. C. Rai

Th 25113

Abstract (Not Verified)

Agriculture is the mainstay of the majority of the rural population of Sikkim. This important aspect on which more than 70% population depends has been consistently overlooked. Therefore, an attempt was done: (i) To assess the existing pattern of land-use with special reference to agricultural land-use; (ii) To analyse the potentiality of the region for diversification of agriculture; (iii) To find out the gross and net availability of food; (iv) To understand the farmer's perception and observation on livelihood security in the study area, and (v) To suggest measures for agricultural development and land-use to ensure a sustainable livelihood. So firstly, satellite imagery of Sikkim and secondary data was used to access different categories of agricultural land-use/cover. Irrigation intensity, land-use efficiency, land-holding size were also calculated. Cropping intensity, crop concentration, crop ranking, crop deviation, crop consistency, crop combination, and crop diversification are calculated to achieve the second objective. For third objective, pattern of consumption, spatial pattern of carrying capacity of land and the status of food security were calculated in terms of calorific and monetary value. Standard nutrition unit, consumption unit, gross and net food availability, carrying capacity of land both in calorific and monetary value were calculated. For fourth objective primary data was collected using a multistage stratified random sampling technique from 12 villages i.e. 300 households, 25 households from each village using a questionnaire. Factors affecting the livelihood and econometric analysis were calculated using logistic regression and the multinomial logistic

regression model. The analysis shows that the p-value of age, operational landholdings, education, and distance from the market were found significant. SWOT analysis from the agricultural scenario is done. Water harvesting tank, polyhouse and polybed cultivation, integrated pest and nutrient management, farming community development, soil conservation, organic farming, agroforestry, and infrastructure development were suggested for agricultural development.

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1. Introduction 2. Geographical profile of the study area 3. Land use/cover analysis 4. Analysis of agricultural diversities 5. Gross and net food availability 6. Contours of sources of livelihood security 7. Planning for agriculture development 8. Summary. References.

05. SAINI (Atul)
Shifting of Monsoon Onset and its Impact On Environment in India.
 Supervisor : Dr. Netrananda Sahu
Th 25114

Abstract (Not Verified)

Monsoon season plays a very crucial role in determining the annual state of the Indian economy. Agriculture in a large part of India still depends on monsoon timing and the amount of monsoon rainfall. Therefore, pan-India scale spatio-temporal analysis of monsoon onset and rainfall is completed to understand the complexities and variation in the scale of the shift in monsoon onset. Three different methods were used to explore the behaviour of monsoon onset. Whereas, pan-India scale study to understand the long-term trend of rainfall was also completed using a multimethod approach. Besides this, the association of the monsoon onset with the length of monsoon (LoM) and rainfall amount was also explored. As a special case, trend analysis of rainfall for the West Coast Plain and Hill Agro-Climatic (WCPHAC) region was completed to understand the grid wise trend of rainfall in the region. It is found that monsoon onset is influenced by different climate modes. El Niño and drought years have observed the late onset of monsoon with high magnitude in different parts of India. Moreover, La Niña and flood years have the early onset of monsoon. Grid wise analysis also shows similar results; however, the year-wise analysis was influenced by the stochastic atmospheric disturbances. Parts of northern India and the west coast have a significant monotonic trend of early-onset, whereas grid points in northern Maharashtra show late-onset. Monsoon onset is found significantly correlated with LoM season and interesting results on rainfall and extreme excess days in ± 1 standard deviation LoM season were also obtained. The multimethod approach-based analysis shows three sub-divisions in India with a significantly monotonic rainfall trend. WCPHAC region has a significant monotonic rainfall trend in July, August and September monsoon months, along with it, January month and DJF season also have a monotonic trend.

Contents

1. Introduction 2. Long term trend of rainfall in Monsoon season in India 3. Spatio temporal characteristic modes(objective methodology) 4. Relationship between monsoon onset and length of monsoon season and consequent rainfall events 5. Determination of Grid wise monsoon on set and its spatial analysis 6. Shifting of monsoon onset and length of monsoon onset season (India as a unit) 7. Monsoon

rainfall and its impact on agro climatic region of India (Case of west coast plain and hill agro climatic region 8. Summary and conclusion.

06. SANTOSH KUMAR
Climate Change, Glacial Fluctuation and Geo Hazards in the Kumaun Himalaya Region, Uttarakhand.
 Supervisor : Dr. Anju Singh
Th 25116

Abstract
(Not Verified)

Climate change has a direct impact on the temperature sensitive snow and ice cover, Geo-hazards and water supply. The present research work tries to access the climate change trends and estimation of glacial fluctuation and associated geo-hazards in the Kumaun Himalaya Region, Himalaya. Kumaun Himalaya region is part of Central Himalaya, geographically located in the eastern side of Garhwal division in Uttarakhand. The present research tries to access the climate change trends and estimation of glacial fluctuation and its associated impact on geo-hazards in the Region. The results show that monthly, annual and seasonal air temperature has increasing trend at significant level during the past 110 years, as against the global average of 0.5°C. The overall monthly and annual precipitation has decreasing trend at significant level in all weather station under study except Mukteshwar. Glacial fluctuation analysis (1995, 2003 & 2015) illustrates that gradual decrease in snow cover area from 4066 sq. km (1995) to 1559 sq. km in 2015. Glaciers of Kumaun Himalayan Region are showing retreating trend with varying rate which is evident in Pindari, Kafni and Milam glaciers. Large scale melting and retreat of seasonal snow was observed in Pindari and Kafni throughout the winter. Analysis shows that the glacier is not only receding in length but also in terms of glaciated area from all the sides. The huge amount of moraines and number of debris cones and talus fans along the valley were observed at the front of Pindari glacier, which clearly indicates influence of climate change in the region. This combination of glacial retreat, negative mass balance, early melting of seasonal snow cover winter time increase in stream runoff and associated geo-hazards suggests an influence of climate change in Kumaun Himalaya region.

Contents

1. Introduction 2. Geographical profile of the study area 3. Climate change assessment 4. Snow cover change and glacier dynamics 4. Climate change and glacier response 6. Climate change and geo hazards zonation 7. Summary and conclusion. Selected bibliography. Appendix.

07. SIWACH (Prerna)
Fear of Gendered Violence and Access To Public Spaces : A Study Of Urban Delhi.
 Supervisor : Dr. Anindita Datta
Th 25584

Abstract
(Not Verified)

The aim of the thesis is to study how gender and space implicate each other, producing gendered spaces, the role of fear of gendered violence in accessing public spaces. Using the study of urban Delhi, we show the experiences of women's fears of violence and gendered access to public spaces, fears of a privileged urban woman, with stipulated markers of privilege. The study seeks to examine the social geographies of women's fear of

violence and examine the strategies adopted by women to navigate through these fearful situations and the barriers in articulating and reporting of gendered violence. The ethnographic anthropological study shows, how the common public spaces are gendered, curtailing women's mobility. Fear of gendered violence remains a major factor determining access to spaces, these fears are not uniform; they are multifaceted and inherent social differences underlain them. Leisure by and far remains a gendered experience with various spatialities in leisure. Women subconsciously internalize the patriarchal bargains adopted as coping mechanisms and strategies in everyday lives to overcome any unforeseen violence. Both real and perceived barriers exist in creation of gender neutral spaces ranging from design, planning and infrastructure of cities to media portrayal. There are numerous barriers in reporting of violence such as physical, administrative, social and psychological, contributing in enhancing fears. A structural change along with gender mainstreaming and societal development is required to make our cities safe and inclusive. The significance of this study is that it informs our theoretical understanding of how space is socially constructed, produced and reproduced in everyday lives and male violence is an important characteristic of patriarchal structure used to keep women away from public spaces. Adoption of gender equality and spatial visibility in tandem with each other is the need of the hour. The historical evolution of legal framework of M&A in India was studied by dividing the history into three phases. Indian legal framework governing M&A activities was critically analysed through major laws and regulation namely the Companies Act 2013, the Competition Act 2002, the Foreign Exchange Management (Cross Border Mergers) Regulations 2018, the Securities Exchange Board of India (Substantial Acquisition of Shares and Takeovers) Regulations, 2011 and the Income Tax Act, 1961. The contribution of the Indian judiciary and quasi-judicial bodies in the field of merger and amalgamation in filling up the gaps between the statutory law and pragmatic circumstances was analysed. The study concludes with suggestions that can make the legal framework regulate and facilitate M&A activities effectively especially in view of recent economic developments due to Covid-19.

Contents

1. Fear of gendered violence and access to public spaces 2. Delhi: perspectives on gender, gendered violence and gendered access 3. Social geographies of women's fear of violence in public spaces of Delhi: examining participant's narratives 4. Negotiating the fear of violence: everyday spaces and participant's strategies 5. Barriers to articulating and reporting gendered violence in accessing public spaces: interpretations from participant's narratives 6. Towards safe and gender inclusive cities: interpretations and the way forward. References and bibliography. Appendix

08. SRIVASTAVA (Ankur)

Strategic Environment Assessment of Hydro Electric Projects in Himalaya : A Case Study of Kinnaur District, Himachal Pradesh.

Supervisor : Dr. Poonam Sharma

Th 25537

Abstract (Verified)

Himachal Pradesh in Indian Himalaya Region has a significant hydro power potential as it has been estimated through hydrological, topographical and geological investigations that about 20,000 MW of hydro power can be harnessed in the state by installing various large, medium, small and mini/micro hydroelectric projects in its river basins. Apart from developmental aspects there have been some negative traits of these projects which were invisible decades back but in the current scenario the impacts are clearly visible. Away from the ground realities the expansion of

hydropower in Himachal Pradesh especially in Kinnaur district is taking place at an unprecedented pace in recent years. There have been nominal benefits due to developmental projects to local communities such as short term employment at construction or production sites but the threat perception regarding environmental conditions and conflicts over water resource right may further deteriorate this fragile mountain ecosystem. Strategic Environmental Assessment (SEA) is considered as a tool for mainstreaming environmental consideration in energy sector policies. This assessment tool can be fully integrated into the overall strategic planning initiatives for the power generation sector and in particular for preparation of Power Development Plan. The unprecedented installation of hydro power projects could be vulnerable to such fragile mountain ecosystem as the region doesn't suits to developmental projects, either geologically or environmentally. The loopholes and constraints present in EIA process have been filled upon in SEA practices. Buffer zonation along major projects and Satluj river are the major highlight of this study. The marginality of the mountainous people could be reduced by their incorporation in developmental projects. People's participation is a major criteria for success of any developmental project in mountainous region. Thus development along with cooperation of the locals is the only way for proper final implementation of such projects in north western Himalayas.

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1. Introduction 2. Geographical profile of study area 3. Hydro electric projects and hydrological dynamics 4. Hydro power and ecological sustainability 5. Impact of hydro electric projects on development aspects 6. Summary and conclusion. Bibliography and appendix.

M.Phil. Dissertations

09. DAS (Kundan)
Flood Management in Dwarakeshwar River Basin, West Bengal.
Supervisor: Dr. Ashis Kumar Saha
10. SINGH (Pratap)
Men's Involvement in Family Planning and its Effect On Reproductive Health of Women In Uttarpradesh.
Supervisor: Dr. Subhash Anand and Dr. Praveen K. Pathak
11. SRIVASTAVA (Shoryabh)
Sustainable Adaption Techniques for Livelihood Security through Organic Farming in Dewal Block, Uttarakhand.
Supervisor: Dr. Ashis Kumar Saha