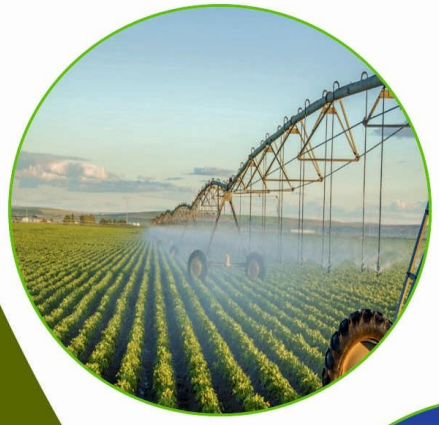
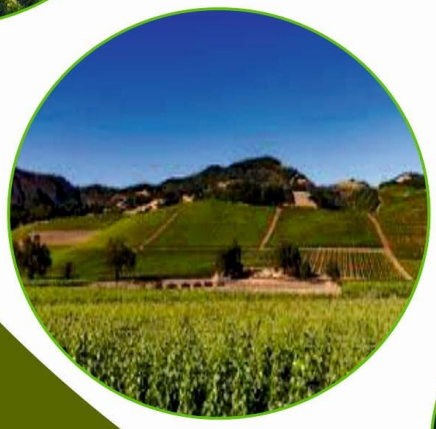
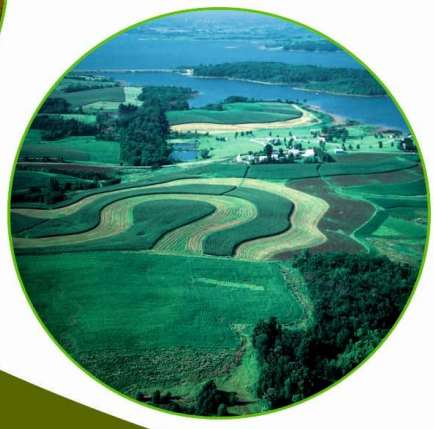
LAND RESOURCE: METHODS & MANAGEMENT

Dr. Dnyaneshwar Shivaji Suryawanshi

Associate Professor of Geography,
Department of Geography,
VWS Arts, Commerce & Science College,
Dhule, Maharashtra







Kripa Drishti Publications, Pune.

LAND RESOURCE:

METHODS & MANAGEMENT

Author

Dr. Dnyaneshwar Shivaji Suryawanshi

Associate Professor of Geography,
Department of Geography,
VWS Arts, Commerce & Science College,
Dhule, Maharashtra.

Kripa-Drishti Publications, Pune.

Book Title: **Land Resource: Methods & Management**

Author by: **Dr. Dnyaneshwar Shivaji Suryawanshi**

1st Edition

ISBN: **978-93-94570-13-9**

Published: **March 2022**

Publisher:

Kripa-Drishti Publications

A/ 503, Poorva Height, SNO 148/1A/1/1A,
Sus Road, Pashan- 411021, Pune, Maharashtra, India.
Mob: +91-8007068686
Email: editor@kdpublications.in
Web: https://www.kdpublications.in

PREFACE

The drought prone area of Maharashtra is defined by the fact finding committee (1973) along with The Review Committee (1987) headed by V. Subramaniam. There are 09 drought-prone tahsils in Jalgaon district identified by V. Subramaniam in the study region. These tahsils are Amalner, Dharangaon, Parola, Erandol, Chalisgaon, Bhadgaon, Pachora, Jamner and Muktainagar. There are 47 circles included in these 09 drought prone tahsils. Land resources management for drought mitigation and upliftment of the present study is important because of their influence on the society and the economy of any nation. Reducing long term vulnerability to drought remains possible but requires a fundamental shift in the approaches to deal with water resources management. The word 'drought' indicates scarcity of water for ecosystems, land and human use, resulting in failing crops, livestock, livelihoods and human health. During the last century, this region experienced many episodes of drought whose frequency has increased during the last decades. This climatic phenomenon has negatively affected agriculture and livestock production and involved natural resources degradation. From this study, we can conclude that although drought phenomenon is complex and remains a little understood, many indicators of early warning and drought mitigation and strategies have been developed and tested by scientists worldwide. Most commonly, there are three components in a drought plan: monitoring and early warning; risk assessment; and mitigation and response.

Arable land covers a total area of 554843 hectares which is 79 % of total area of the study region. The per capita availability of land in the study area has declined from 0.49 hectare in 1981 to 0.33 hectare in 2011and is projected to slide down to 0.12 hectare in 2041. As far as agricultural land is concerned the per capita availability of land has declined from 0.25 hectares in 1981 to 0.15 in 2001 and is projected to slide down to 0.9 hectares in 2041. This decline in per capita land availability in the study region is mostly on account of rising population. The area under irrigation is constant but slightly increased from 3.3% in 1978-80 to 5.5 % in 2008-2010, due to new water conservation and management schemes.

Author

Dr. Dnyaneshwar Shivaji Suryawanshi
Associate Professor of Geography,
Department of Geography,
VWS Arts, Commerce & Science College,
Dhule, Maharashtra.

Acknowledgements

This book is successfully completed due to the efforts and involvement of numerous individuals and institutions. I would like to thank everyone who supported the entire book and made it success. I sincerely thank to the Hon. Prof. V. L. Maheshwar, Vice-Chancellor, and Prof. S. T. Insale Prov. Vice-Chancellor, KBC North Maharashtra University, Jalgaon for giving me an opportunity to carry out this book. I express my deep sense of gratitude to my mother Sau Bhikubai and my father Mr. Shivaji Rajaram Suryawanshi who are always busy in farming, yet they give me the idea of basic farming and land resource. I am obliged to the management, and the librarian of VWS College Dhule, for they permitted me to use their library. I sincerely thanks Ex. Head, Prof. N. A. Patil, Incharge Principal Ahire S. C., Prof V. D. Patil and Prof. Dr. Asha Kate for their precious guidance and encouragement. I am very grateful to Mr. Suresh Thombre for his constant encouragement and support to writing this book. Finally,

I extend my special thanks to NASA for Landsat5-TM and TRMM Satellite data providing for our research work. I am also thankful to Air bus defense, Germany to provide AMSR-E satellite data for our research. I am thanking to HDUG, Nasik for climate data. I am very grateful to Talathi & Circle revenue offices in Jalgaon district, Water resource & irrigation offices, Jalgaon for their real time help to provide me relevant data and information. Sincere thanks to certain libraries which provided me relevant information i.e. NRC Solapur, MPGRA Pune, IMD, Pune, VWS, College Dhule, Jaikar libraries Pune. I express my sincere thanks to the remaining known and unknown persons and institutes for their kind help and support.

Author

Dr. Dnyaneshwar Shivaji Suryawanshi
Associate Professor of Geography,
Department of Geography,
VWS Arts, Commerce & Science College,
Dhule, Maharashtra.

INDEX

Chapter 1: Introduction 1

1.1 Background: 1
1.2 Concept and Definition of Land Resource: 2
1.3 Concept and Definition of Drought: 3
1.4 Criteria for Identification of Drought-Prone Areas: 4
1.5 Concept and Definition of Management of Land Resources: 4
1.6 Review of Literature: 4
1.7 The Study Area: 7
1.8 The Selection of Topic: 9
1.9 Objectives of the Study: 10
1.10 Hypotheses: 10
1.11 Materials & Methodology: 11
1.12 Chapter Scheme: 12
1.13 Summary of Chapter: 13
1.14 References: 13

Chapter 2: Geographical Personality 16

2.1 Introduction: 16
2.2. Physiographic Divisions: 16
2.2.1 The high land zone: 16
2.2.2 The midland (central) zone: 17
2.2.3 The lowlands zone: 19
2.3 Geology: 19
2.4 Drainage System: 20
2.5 Soils: 24
2.5.1 Medium black soils: 24
2.5.2 Deep black soil: 26
2.5.3 Loam soils: 26
2.5.4 Sandy soils: 26
2.6 Natural Vegetation: 26
2.7 General Climatic Conditions: 27
2.7.1 Temperature: 28
2.7.2 Relative Humidity: 30
2.7.3 Wind speed and direction: 32
2.7.4 Evaporation: 33
2.7.5 Evapotranspiration: 35
2.7.6 Sunshine: 35
2.7.7 Special Weather Phenomena: 36
2.7.8 Rainfall: 37
2.8 Social Background: 45

2.8.1 Distribution of Population: 45
2.8.2 Population Density:....46
2.8.3 Sex ratio: 50
2.8.4 Literacy: 52
2.9 Economic Background: 54
2.9.1 Land Utilization: 54
2.9.2 General Land Use: 55
2.9.3 Area under forest: 55
2.9.4 Land not available for cultivation: 55
2.9.5 Barren and uncultivable land: 57
2.9.6 Culturabel Waste:....57
2.9.7 Fallow Lands:....57
2.9.8 Net Sown Area:....57
2.9.9 Agricultural land use:....62
2.9.10 Area Under irrigation: 65
2.10 Working Population: 69
2.10.1 Main workers: 69
2.10.2 Agricultural Workers: 70
2.10.3 Industrial workers: 71
2.10.5 Other workers: 71
2.10.6 Non working population: 78
2.11 Summary of chapter: 78
2.12 References: 79

Chapter 3: Agro Climatic Conditions....81

3.1 Introduction: 81
3.2 Materials and Methods: 83
3.3 Climatic variability:....85
3.4 Length of rain fed crop-growing period: 89
3.4.1 Variability in the LGP:....89
3.5 Dry and wet spells: 91
3.6 Study of Drought:....96
3.5.1 Meteorological drought severity Index: 101
3.5.2 Analysis of drought proneness:....104
3.5.3 Meteorological Drought Analysis....105
3.5.4 Departure Index (DI): 106
3.5.5 Agricultural drought assessment:....108
3.5.6 Analysis of drought assessment:....108
3.5.7 Creation of base map: 108
3.5.8 Geometric Rectification of Satellite data:....108
3.5.9 Agricultural drought severity index (ADSI):....109
3.5.10 Agricultural Drought Assessment Classification of land use map: 110
3.5.11 NDVI based ADSI:....110
3.5.12 Development of ADSI MAP:....111
3.6 Aridity: 115
3.6.1 Aridity Index:....116

3.6.2 Aridity Index of kharip season: 117
3.6.3 Aridity Index of Rabi season: 117
3.6.4 Annual: 119
3.7 Crop growth index: 119
3.7.1 Kharip Season: 120
3.7.2 Rabi season: 121
3.7.3 Annual: 121
3.8 Agro-climatic zones: 123
3.8.1 Southern assured (Wet) zone: 123
3.8.2 Transition (middle) zone: 125
3.8.3 Western scarcity (Dry) zone: 126
3.9 Summary of Chapter: 126
3.10 References: 127

Chapter 4: Availability of Land Resources 129

4.1 Introduction: 129
4.2 Land Resource: 130
4.3 Availability of Arable land: 132
4.4 Land – use: 133
4.5 Summary of Chapter: 139
4.6 References: 140

Chapter 5: Methods of Land Resources 142

5.1 Introduction: 142
5.2 M. G. Kendall's Ranking Coefficient: 143
5.3 Productivity Regions Based on Bhatia's Index: 152
5.4 Productivity Regions Based on Shafi's Modified Productivity Coefficient Index: 160
5.5 Drought Mitigation in the Study Region: Strategic Appraisal: 166
5.6. District Drought Management: 168
5.7 Summary of Chapter: 171
5.8 References: 172

Chapter 6: Conclusions and Suggestions 173

6.1 Introduction: 173
6.2 Summary of book: 173
6.4 Suggestions: 179
6.5 Hypothesis Testing: 180
6.6 Bibliography: 185

ABOUT THE AUTHOR

Dr. Dnyaneshwar Shivaji Suryawanshi

Suryawanshi *is Head & Associate Professor of Geography in Vws College, Dhule (M.S.). He has been 25 years of teaching, 20 years of research and 17years of administrative experiences. He obtained Ph. D.in Geography of Tribal Health from KBCNMU, Jalgaon and got training of GIS & RS in 2006 from IIRS, Dehradun. He was associate with IIAS, Shimla in 2009-2011for associatship. He had Principal of Vws College in Nov 2016 to August 2019 and also worked as the Director of Lifelong Learning Center in 2016 at KBCNMU, Jalgaon. He had submitted 10 research projects and written & published 186 references, edited & textbooks, refereed & peer-reviewed, non-refereed and proceeding research papers in reputed journal. He has organized 16 conferences, seminars & workshops. He supervised 12 Ph.D. & 05 M. Phil. Scholars. He was visited South Korea, Malaysia & Sri Lanka. He received best P.O. of NSS award (2008) by KBCNMU, Jalgaon, Young Social Scientist Award (2011) by ICSSR, New Delhi, Young Geographer Award (2012) by MBP, Pune, Travel Grant Award (2013) by American Science Foundation, Best Principal Award (2017) by KBCNMU, Jalgaon & Best Teacher Award (2020) by Divya Marathi Bhaskar news group. He is life member of NAGI, NGSI, ISRS, UGIT, UPGSI, AGA, GDRI MBP, Punjab Geographer and Deccan Geographer. His area of interest and research is Tribal Health and Sustainable Development. He was a member of Faculty of Science and BOS in Geography for last 10 years. He was the Senate and Management Council Member of KBCNMU, Jalgaon. (Maharashtra) in 2016-2019.*

KRIPA DRISHTI PUBLICATIONS

Price: ₹575

Kripa-Drishti Publications
A-503 Poorva Heights, Pashan-Sus Road, Near Sai Chowk,
Pune – 411021, Maharashtra, India.
Mob: +91 8007068686
Email: editor@kdpublications.in
Web: https://www.kdpublications.in

ISBN: 978-93-94570-13-9

9 789394 570139