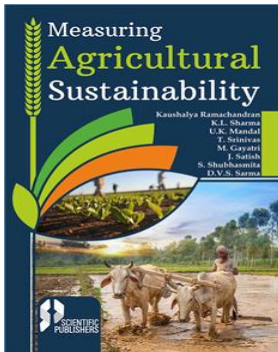


Measuring Agricultural Sustainability



[Kaushalya Ramachandran](#), [K.L. Sharma](#), [U.K. Mandal](#), [T. Srinivas](#), [M. Gayatri](#), [J. Satish](#), [S. Shubhasmita](#) & [D.V.S. Sarma](#)

ISBN	: 9789389184617	Book Format	: Book
		Binding	: Hard Bound
Language	: English	Edition	: 1
Imprint	: Scientific Publisher	© Year	: 2021
Pages	: 345	Trim Size	: 6 x 9
Weight	: Gms		
Release	: New		

Print Book : ₹2,550.00 **₹2,295.00** 10%Off

Blurb

The book is essentially a comprehensive reference book and can serve as handbook, manual and field guide. The book presents 51 sustainability indicators with scorecard that can be used as handbook by department staff and students involved in Natural Resources Management activities. The book presents detailed questionnaire that can be used for field and socio-economic survey and serve as field guide. The book consists of Jal-DSS manual explaining the manner in which the DSS can be used to measure agricultural sustainability by monitoring and evaluating watershed projects. It would be useful to engineering students in Soil & Water Conservation and Computer Sciences who presently study Soil and Water Assessment Tool (SWAT) developed in Texas A & M. Jal-DSS provides a comprehensive Indian tool to assess the impact of watershed projects and measure agricultural sustainability.

The book can serve as a significant supplementary reading material for students, academics and researchers of Geo-informatics, Geography, Computer Science, in B.Tech and M.Tech courses in Soil & Water Conservation, Geo-informatics and Computer Sciences in Universities and Research Institutions.

Table of Contents

Preface
Acknowledgement
Foreword
About Authors
Abstract
1 Introduction
1.1 Study Area
1.2 Location & Resource Base of Pamana Watershed in Rangareddy District, Telangana
1.3 Location & resource base of Chintapatla village watersheds in Rangareddy district, Telangana
1.4 Location & resource base of Gollapalli village watershed
1.5 Location & resource base of Dontanpalli watersheds
2 Watershed Development Program in India – Salient features
2.1 Agricultural Sustainability through Watershed Development Program in Indian Rainfed regions
2.1.1 Change in mode of WDP implementation
2.1.2 Guiding Principles for WDP under Common Guidelines implemented in 2008
2.1.3 WDP Management under Common Guidelines of 2008
2.1.4 WDP in Andhra Pradesh since Inception
2.2 Recent Financial allocations for Watershed Development Program in India & undivided Andhra Pradesh
2.3 Change in Approach of Watershed Development Program
2.3.1 Highlights of previous Watershed Development Program Guidelines
2.4 Genesis of Watershed Development Program in India
2.5 Management of projects under watershed development program

- 2.6 Importance of Soil & Water Conservation
- 2.7 Components of Watershed Development Program in Telangana
- 3 Using Watershed Framework to evaluate Agricultural Sustainability
 - 3.1 Rationale for the study
 - 3.2 Natural Resource Base for Indian Agriculture
 - 3.3 Trend in LULC in undivided Andhra Pradesh
 - 3.4 Extent of Rain fed Area in India
 - 3.5 Importance of Watershed Development Program in Future Schemes in India
 - 3.6 Practical utility of Watershed Development Projects
- 4 Land Utilization pattern in selected watersheds
 - 4.1 Data Sets used for the study
 - 4.2 Processing of IRS data for NDVI analysis using ERDAS IMAGINE (ver. 9.0) digital interpretation software
 - 4.3 Methodology for analysis of change in vegetation vigour at higher spatial level viz., ASER level
 - 4.4 Use of NDVI as indicator to assess impact of WDP in selected watersheds
 - 4.5 Use of NDVI as Sustainability Indicator
 - 4.6 Trend in NDVI
 - 4.7 Cropping pattern across selected watersheds
 - 4.8 Study of MODIS -NDVI for pre- & post- monsoon period on regional scale
 - 4.9 Use of Land Cover Change Studies (LCCS) to assess impact of WDP
- 5 Land Utilization pattern in selected watersheds
 - 5.1 Trend in Land use-Land Cover in selected Watersheds during 2005- 2013
 - 5.2 Methodology for LULC classification of watersheds
 - 5.3 Summary of LCCS trends in selected watershed villages
 - 5.4 Agricultural Sustainability as a result of LULC trends in selected watersheds
- 6 Methodology for Measuring Agricultural Sustainability through Implementation of Watershed Projects
 - 6.1 Methodology for Post-facto Monitoring & Evaluation (M&E) of Watershed Projects
 - 6.1.1 Description of Procedure for assessing Agricultural Sustainability
- 7 Development of Jal-DSS Software
 - 7.1 Concepts, Definitions, Acronyms & Abbreviations used in Jal-DSS document
 - 7.2 Scientific rationale for development of Jal-DSS
 - 7.3 Tools and technologies
 - 7.4 Programming Language: JAVA
 - 7.4.1 Java
 - 7.4.2 PostgreSQL, PostGIS
 - 7.4.3 Statistical Analysis
 - 7.4.3.1 R Library
 - 7.4.4 Visualization
 - 7.4.5 Operating System (OS)
 - 7.5 Description of the Application developed
 - 7.5.1 Database
 - 7.5.2 Application GUI
 - 7.5.2.1 Description of Module Decomposition
 - 7.6 User Interface of Jal-DSS
 - 7.6.1 Prerequisite button
 - 7.6.2 Database Button
 - 7.6.3 Input Button
 - 7.6.4 Data Input, Reading & Validation
 - 7.6.4.1 Graphic User Interface (GUI)

7.6.7.1 Graphic User Interface (GUI)

7.6.4.2 Validation of data type

7.7 Process Button

7.7.1 Filtering Module

7.7.2 Identification of Critical Indicators & assignment of respective weights

7.7.2.1 Critical Indicator (Parameter) Identification Module

7.7.2.2 Threshold Value Identification Module

7.7.2.3 Performing the ratio

7.7.2.4 Assigning Weights

7.8 Identifying Composite Sustainability Index (CSI)

7.9 Report Button

8 Spatial Evaluation of Watershed Projects using Raster Calculator

8.1 Application of Spatial Analysis to evaluated Agricultural Sustainability in Watersheds

8.1.1 Principle of Cell-based Spatial Analysis

8.1.2 Critical Evaluation Indicators of Agricultural Sustainability

8.2 Assessment of Watershed-level Sustainability using Raster Calculator

8.3 Comparison of impact of WDP across treated micro-watersheds in study area

8.4 Improvements in Monitoring & Evaluation Methodology of Watershed Projects

8.4.1 Monitoring of temporal variations in impact of Watershed Development Program on agricultural sustainability using Spatial Tool - Raster Calculator

8.4.1.1 Monitoring of Pamana Watersheds

8.4.1.2 Monitoring of Chintapatla Watershed

8.4.1.3 Monitoring of Gollapalli Watershed

8.4.2 Improvements in Evaluation methodology to assess impact of WDP on agricultural sustainability

8.4.2.1 Evaluation of Pamana Watershed

8.4.2.2 Evaluation of Chintapatla Watershed

8.4.2.3 Evaluation of Gollapalli Watershed

8.4.3 Outcome of M&E of WDP using Raster Calculator

8.5 Evaluation of impact of Watershed Project in Pamana village using Threshold value concept

8.6 Use of Sustainability Yield Index (SYI) for evaluation of Agricultural Sustainability

8.6.1 Concept of Sustainable Yield Index

8.6.2 Use of SYI to evaluate watershed projects

9 Conclusion

Annexure 1

Annexure 2

Annexure 3

List of Tables

This is computer generated document and does not require signature

Scientific Publishers

Date :- Thu Dec 02 2021