A

Project Report

On

"Closed Water Balance Using GIS and Remote Sensing"

SUBMITTED AS THE PARTIAL FULFILMENT OF DEGREE OF

Master of Science in Geoinformatics

Submitted by

Maheshkumar K. Jadav

ID No.: 19GI11

Exam No.: 08

Under the Guidance of

Dr. Unnati Patel

ISTAR

Institute of Science & Technology for Advanced Studies & Research

Affiliated to Sardar Patel University

Recognized under Section 2(f) and 12(B) of the UGC Act 1956

INSTITUTE OF SCIENCE & TECHNOLOGY FOR ADVANCED STUDIES & RESEARCH (ISTAR)

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INSTITUTE OF SCIENCE & TECHNOLOGY FOR ADVANCED STUDIES & RESEARCH
(MANAGED BY CHARUTAR VIDYAMANDAL)
Accredited 'A' Grade by NAAC & Knowledge Consortium of Gujarat

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CERTIFICATE

This is to certify that Mr. / Miss **Maheshkumar Kalidas Jadav** Exam Number **8**, student of M.Sc. Geoinformatics, Institute of Science & Technology for Advanced Studies & Research, Vallabh Vidyanagar, Gujarat has carried out his/her 4th semester project work - (PS04CGIN21) in M.Sc. Geoinformatics from 18/02/2021 to 31/05/2021 as a partial fulfillment of Master of Science in Geoinformatics affiliated to Sardar Patel University.

Dr. Unnati A. Patel
Asst. Professor,
M.Sc. Geoinformatics

Dr. Nirmal Kumar J. I.
Principal

FES

FOUNDATION FOR ECOLOGICAL SECURITY

To whomsoever it may concern

This is to certify that Mr. Maheshkumar Kalidas Jadav of M. Sc. Geo-Informatics with Institute of Science & Technology for Advanced Studies & Research (ISTAR) College of Sardar Patel University has successfully completed his summer internship program "Closed Water Balance Using GIS and Remote Sensing" as a partial fulfilment of the course from 18/02/2021 to 31/05/2021 at India Observatory of Foundation for Ecological Security, Anand under the guidance of Mr.Chiranjit Guha (Principal Consultant, Analytics)

(External Guide)

Mr. Chiranjit Guha

Principal Consultant – Analytics

Foundation for Ecological Security, Anand

Mr. Ashok Jani

21-Jun-2021

General Manager

Foundation for Ecological Security, Anand

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Abstract

The study area, the Mandalgarh block Catchment, located in Bhilwara district of Rajasthan state. The catchment covers a total area of 166 Km^2. The area is located in Sub-humid southern plains. Knowing the magnitude of the available water resources is the most important step towards proper management.

In this study runoff from the catchment area has therefore been assessed using drainage analysis, peak discharge and catchment water balance methods for the year of 2020.

Actual evapotranspiration, the most crucial component for the catchment water balance study, was derived on pixels by pixel basis from MODIS, and Sentinel images acquired within the study period for surface water mapping and other remote sensing analysis.

The annual peak discharge using the catchment water balance method for the year 2020 was estimated to be **7969665** m3. For the purpose of runoff assessment per land use/cover unit, the catchment area has been classified into five major land use/cover units (agriculture area, built-up, forest, grassland and wasteland) using sentinel image of January 2020. Out of these land use/cover units the highest runoff per unit of area is generated from built-up areas while the lowest runoff is from forest areas.