APPENDIX-I

C)

i) Objectives of the Project:

The Principal objectives of the present research Project are:

1. To create a digital data base to assess the watershed characterization of the basin.

2. To carry out appraisal of rural conditions of a study region.

3. To investigate the present pattern of resource utilization, particularly land, water and vegetation.

4. To access the risk of soil erosion and potential of runoff by developing and validating the runoff model for Hiranyakeshi basin with HEC-HMS software by using RS and GIS techniques.

5. To investigate the causes of watershed deterioration.

6. To estimate the potential of roof top and surface rain water harvesting.

7. To prepare a watershed treatment plan. Including agronomic and mechanical measures such as

a . In agricultural land,

b . Erosion control measures for non-agricultural land,

c . Water conservation and roof and surface water harvesting structures.

d . Groundwater recharge and management,

e . Nursery raising and community plantation,

f . Agro-forestry and social forestry,

g . Protection, conservation and enrichment of degraded forest lands – by applying GIS, GPS and Remote Sensing techniques.

8. To carry out site suitability analysis for conservation of land and water resources.

APPENDIX-II

C)

ii) (A) Report of the Work Done during the year 2012-2013:

1. Soil depth map generated of Hiranyakeshi basin
2. Soil texture map generated of Hiranyakeshi basin
3. Rainfall map generated of Hiranyakeshi basin
4. 35 years station wise daily rainfall data collected from IMD, Pune
5. 35 years data arranged in excel sheet format
6. Slope map generated of the basin
7. DEM and TIN map generated of the basin
8. Change detection analysis carried out by using temporal satellite images
9. Irrigation projects distribution map generated of Hiranyakeshi basin
10. Geology, Geomorphology & Lineament map generated of the basin
11. Land capability map of the basin generated of the basin

❖ **GIS Software Used in Project:**

1. ERDAS Imagine 9.0
2. Arc GIS 9.3 Desktop Application
3. ArcSWAT (Arc GIS 9.3 Tool)
4. Global Mapper

❖ **Project Work Process:**

I) Soil depth and soil texture map generated of Hiranyakeshi basin from the base provided by NBSS& LUP, Nagpur. (National Bureau of Soil Survey & Land Use Planning)

II) Tahasil wise annual average data collected from Agriculture department government of Maharashtra and rainfall map of study region has been generated by applying spatial interpolation method in ArcGIS 9.3

III) Generated rainfall run-off model based on 35 years station wise daily rainfall data collected from IMD (Indian Meteorological Department), Pune which was in the text (.txt) file format.

IV) After getting the rainfall data from IMD, generated an excel sheet in which segregated the station wise daily rainfall data in individual excel sheet for data attachment to the spatial layer in ArcGIS 9.3

V) Slope map generated in percentage for 6 classes from the Carto DEM satellite images were gathered from Bhuvan site.

VI) TIN and DEM map generated for showing elevation differences in the study region from Carto DEM image

VII) Change detection analyses are carried out from the three temporal satellite images of the study region which are Landsat TM of 1989, Landsat ETM of year 2000 and IRS p6 Liss-III of year 2007.

VIII) Various major , minor and other irrigation projects maps generated which show the ongoing and proposed irrigation projects implemented in the basin area.

IX) Geology, Geomorphology and Lineament maps are prepared of the basin area on the basis of the maps provided by GSI, Pune

X) Land capability map of the basin area has been prepared on the basis of USDA (1973) method.

❖ **Project Work to be done:**

1. USLE model generation
2. Rainfall runoff model generation
3. Socio-economic survey of 10% sample villages
4. Final plan of action comprising:
    a. Sub-basin prioritization for land and soil reclamation
    b. Various site suitability measures to be recommended for watershed management
    c. Awareness regarding peoples participation in Watershed Management Programme.
5. Final project report writing

ii. (B) Paper Presented:

1. "Application of Change Detection Techniques for land Use/ Land cover Analysis of Hiranyakeshi Basin" presented in International Conference on "Sustainable Water Resource Development and Management" organized in Department of Environmental Science, Shivaji University, Kolhapur on 20 & 21st December 2012

2. "Prioritization of Vedganga sub-watersheds using Morphometric and Geoinformatic Technique" presented in International Conference on "Sustainable Water Resource Development and Management" organized in Department of Environmental Science, Shivaji University, Kolhapur on 20 & 21st December 2012

3. "Application of Geoinformatic Technology for Urban Solid Waste Management: A Case Study of Gwalior City of MP, INDIA" Presented in National conference on " Recent trend in Technological Development" held in Department of Technology, Shivaji University, Kolhapur on 26 & 27th December 2012

4. "Identification of Land Capability Classification of Hiranyakeshi Basin using Geoinformatic Techniques" presented in National conference on "Earth Observation and Geoinformation Sciences for Environment and Sustainable Development" held at Department of Geography, University of Mumbai on 7th to 9th February 2013.

5. "Application of Geoinformatics in Urban Health Care: A Case Study of Aurangabad city in Maharashtra, INDIA" presented in UGC-SAP-DRS-I sponsored National seminar on 'Resource Appraisal and Sustainable Regional Development' held at Department of Geography, Shivaji University, Kolhapur on 12 & 13th March 2013.

iii) (C) Paper Publications :

❖ **Online Publication :**

1. Dr. S.S. Panhalkar, Mali S.P. & Dr. C.T. Pawar published paper entitled, "Morphometric analysis and Watershed development Prioritization of Hiranyakeshi basin in Maharashtra, India" in International Journal of Environmental Sciences, Vol. 3, No. 1, July 2012 (ISSN-0976-4402)

2. Dr. S. S. Panhalkar published paper entitled, "Delineating Flood Vulnerability Zones Along Coastal Tract of Thiruvallur District, Tamilnadu using Geospatial

Technology" in International Journal of Remote Sensing and Geoscience, Volume 2, Issue 3, p.p. 27 – 33, November 2012. (ISSN-2319-3484)

3. Project fellow, Mali S.P. published research paper entitled, "Geoinformatics application for Urban Utilities information system: A case study of Pune city, Maharashtra, INDIA" in International Journal of Computer Applications, Volume 65 No.22 p.p. 33-39, March 2013. (ISSN-0975-8887)

4. Mali S.P., Dr. S. S. Panhalkar & Dr. C.T.Pawar have communicated a research paper entitled, "Micro Level study of soil degraded areas in Krishna Canal Command area (Maharashtra) Using GIS" to Academic Journal for communication.

❖ **Journal Publications :**

1. Application of Geoinformatics in Urban health care: A case study of Aurangabad city in Maharashtra, INDIA" has been accepted for "Young Researcher" Multidisciplinary National Journal, Vol.No.2, 1, April 2013.

III) Has the progress been according to original plan of work and towards achieving the objectives? **Yes.**

IV) Please Indicate the difficulties, if any, experienced in implementing the project: **Inadequacy of funds to purchase the satellite imageries for the study of spatio-temporal change detection analysis.**

V) If Project has not been completed, please indicate the approximate time by which it is likely to be completed. A summery of the work done for the period (Annual basis) may please be sent to the commission on a separate sheet : **In Progress**

VI) If Project has been completed, please enclose the summary of the findings of the study. Two bound copies of the final report of work done may also be sent to the commission. : In Progress.

VII) Any other information which would help in evolution of work done on the project:

1.Principal Investigator Prof. C.T.Pawar delivered Key note address entitled, "Water Management for Sustainable Development" at UGC sponsored state level seminar on "Population, Tourism & Agriculture Development in Drought Prone Area" at Dahiwadi College, Dahiwadi. District Satara on 3rd & 4th October 2012

2. Prof. C.T. Pawar has Published research paper entitled, "Geographical Study of dispersion of rural settlement in Kolhapur district of Maharashtra" in collaboration with his research student, Goa Geographer, Vol. VIII No-1, Dec 2011. p.p. 99-105

3. Prof. C.T.Pawar has published research paper entitled, "Study of Fertility status of Soil and Nutrients recommendation in Panchganga Basin (Maharashtra): A Micro Level Analysis", Indian Stream Research Journal, Vol. 1, issue 5, June 2011 (Late Published)

4. Co-Investigator Dr. S. S. Panhalkar has been appointed as a Coordinator of one Year Post Graduate Diploma in Geoinformatics course conducted by Department of Geography, Shivaji University, Kolhapur on 18th October 2012

5. Co-Investigator Dr. S. S. Panhalkar has been selected and Joined as a Associate Professor, In Dept. of Geography, Shivaji University, Kolhapur, since 10/ 01/2013

6. Project fellow Mr. Mali S.P. has been registered for his Ph.D degree course entitled " Integrated Watershed Management in Hiranyakeshi Basin: A Geoinformatic Approach" under the guidance of co-investigator Dr. S. S. Panhalkar in Department of Geography, Shivaji University, Kolhapur

SIGNATURE OF THE PRINCIPAL INVESTIGATOR

Principal Investigator
UGC Major Research Project

SIGNATURE OF CO-INVESTIGATOR

REGISTRAR
SHIVAJI UNIVERSITY,KOLHAPUR

Registrar,
Shivaji University, Kolhapur.

UNIVERSITY GRANT COMMISION
BAHADURSHA MARG
NEW DELHI – 110 002

UTILIZATION CIRTIFICATE

Certify that the grant of Rs. 3,57,867/- out of Rs. 11,45,407/- received so far from the University Grant Commission from total approved grant of Rs. 12,52,452/- under the scheme of support for the Major Research Project entitled, "Watershed Development and Management in Hiranyakeshi Basin (Maharashtra) : A Geoinformatic Approach" vide U.G.C. letter No: F.No.39-11/2010 (SR) dated 23-12-2010 has been fully utilized for the purpose for which it was sanctioned and in accordance with the terms and conditions laid down by the University Grants Commission.

Principal Investigator
U.G.C. Major Research Project

Principal Investigator
UGC Major Research Project.

Registrar
Shivaji University, Kolhapur

Registrar,
Shivaji University, Kolhapur.

F.A.O
Shivaji University, Kolhapur

Finance & Accounts Office
Shivaji University, Kolhapur

Co-Investigator
U.G.C. Major Research Project

Annexure-V

UNIVERSITY GRANT COMMISION
BAHADURSHA JAFAR MARG
NEW DELHI – 110 002

1. Name of the Principal Investigator: **Prof.(Dr.) C. T. Pawar**
2. Department of University : **Department of Geography**
   Shivaji University Kolhapur
3. U.G.C. Approval No. and Date : F.No.39-11/2010 Dated: 23 Dec 20210
4. Title of the Research Project : **"Watershed Development & Management in Hiranyakeshi Basin (Maharashtra): A Geoinformatic Approach".**
5. Effective date of starting the project: **01/02/2011**
6. (a) Period of Expenditure from : **01/02/2012 to 31/03/2013**
   (b) Detail of Expenditure :

Sr. No	Items	Amount Approved	Expenditure in 2012-13
A	**Non-Recurring:**		
1	Books & Journals	50000	**36,288**
2.	Equipments	50000	**10,395**
A	**Recurring :**		
1.	Honorarium to Retd. Teacher (1-4-2012 to 31-3-2013)	4,32,000	**1,44,000**
2.	Project Fellowship (1-4-2012 to 31-3-2013)	4,78,452	**96,000**
3.	Contingency	50,000	**12,045**
4.	Travel/ Field Work	60,000	**33,469**
5.	Overhead Charges	82,000	**25,670**
6.	Hiring Services	50,000	---
	Total	**12,52,452/-**	**3,57,867/-**

PRINCIPAL INVESTIGATOR

Principal Investigator
UGC Major Research Project

CO-INVESTIGATOR

REGISTRAR

Registrar
Shivaji University, Kolhapur.