

UNIVERSITY GRANTS COMMISSION
BAHADUR SHAH MARG
NEW DELHI - 110 002

STATEMET OF EXPENDITURE INCURRED ON FIELD WORK

Name of the Principal Investigator :- Dr.Mali Popat Dnyandeo

Name of the place visited	Duration of the Visit		Mode of Journey	Expenditure incurred (Rs.)
Aurangabad	15-11-2012	17-11-2012	By Car	8048=00
	Solapur	Aurangabad	workshop	2000=00

Certified that the above expenditure is in accordance with the UGC norms for Minor Research Project

SIGNATURE OF PRINCIPAL INVESTIGATOR

PRINCPAL

(SEAL)

UNIVERSITY GRANTS COMMISSION
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Final Report of the work done on the Minor Research Project
(Report to be submitted within 6 weeks after completion of each year)

1. Project report No. : **Final Report**
2. UGC Reference No. : **F-47-1958/11 (WRO)**
dated – **22th March., 2012**
3. Period of report: from : **30-03-2012 to 29-03-2014.**
4. Title of research project : **“ Study of fracture identification and Recharge of groundwater in Basaltic Terrain, Maharashtra. ”**
5. (a) Name of the Principal Investigator : **Dr.Mali Popat Dnyandeo**
(b) Deptt. : **Geology**
(c) College where work has progressed : **Walchand College of Arts and Science, Solapur 413006**
6. Effective date of starting of the project : **22-03-2012.**
7. Grant approved and expenditure incurred during the period of the report:
 - a. Total amount received : **Rs.95,000=00**
 - b. Total expenditure Rs. : **Rs 95,096 = 00**
 - c. Report of the work done: (attached a separate sheet)
 - i) Brief objective of the project :
 - 1) To investigate Ground water fracture zones in the area of water scarcity in District ,Maharashtra
 - 2) Locate spot for ground water exploration where the aquifer will be highest yield at minimum depth.
 - 3) Geophysical survey by electric resistivity method on selected spot.
 - 4) Drilling of bore well on selected spot through grampanchayat ,Agriculturist, Industrialist, etc.
 - 5) Yield testing of borewalls.
 - 6) Ground water recharge through borewells.
 - 7) Summary & conclusion of water problems in selected village.

ii) Work done so far and results achieved and publications, if any, resulting from the work (Give details of the papers and names of the journals in which it has been published or accepted for publication :- **Attested**

iii) Has the progress been according to original plan of work and towards achieving the objective: **Yes**

iv) Please indicate the difficulties, if any, experienced in implementing the project: - **No**

v) If project has not been completed, please indicate the approximate time by which it is likely to be completed. A summary of the work done for the period (Annual basis) may please be sent to the Commission on a separate sheet: **No, the Project has been completed to my Satisfactions.**

vi) If the project has been completed, please enclose a summary of the findings of the study. Two bound copies of the final report of work done may also be sent to the Commission:- **Two Copies of the Final report are attached**

vii) Any other information :- **Research Papers Published, On the accession of world water day the rain water harvesting workshop was arranged in college campus.**

(Dr.P.D.Mali)
PRINCIPAL INVESTIGATOR

(Dr. A. H. Manikshete)
PRINCIPAL

**UNIVERSITY GRANTS COMMISSION
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NEW DELHI – 110 002**

**PROFORMA FOR SUBMISSION OF INFORMATION AT THE TIME OF SENDING THE
FINAL REPORT OF THE WORK DONE ON THE PROJECT**

01.	Title of the Project	“Study of fracture identification and Recharge of groundwater in Basaltic Terrain, Maharashtra.”
02.	Name and Address of the Principal Investigator	Dr. Mali Popat Dnyandeo Walchand College of Arts & Science, Solapur
03.	Name and Address of the Institution	Walchand College of Arts & Science, Solapur Walchand Hirachand Marg, Ashok Chowk, Solapur-413006
04.	UGC Approval Letter No. and Date	F-47-1958/11(WRO) dated – 22th March., 2012
05.	Date of implementation	30/03/2012
06.	Tenure of the Project	2 years
07.	Total Grant Allocated	Rs.95,000/-
08.	Total Grant Received	Rs.95,000/-
09.	Final Expenditure	Rs.95,096/-
10.	Title of the Project	“Study of fracture identification and Recharge of groundwater in Basaltic Terrain, Maharashtra.”
11.	Objectives of the Project	Sheet attached
12.	Whether objectives were achieved (Give Details)	Yes Attached
13.	Achievements from the project	Sheet attached
14.	Summary of the Finding's	Yes sheet attached
15.	Contribution to the Society	Sheet attached
16.	Whether any Ph.D. Enrolled/Produced out of the project	Nil
17.	No.of publications out of the project	Attached

**(Dr.P.D.Mali)
PRINCIPAL INVESTIGATOR**

**(Dr. A. H. Manikshete)
PRINCIPAL**

13. Achievements from the project

The aims and objectives of the research project were achieved and presented the work in various research journals, seminars, local news paper etc. The knowledge of groundwater exploration and rainwater harvesting is explored in various colleges, Society groups. The research was carried out by B.Sc.I and B.Sc.II students. The books were used during research work and some books are available to the students. The purchased equipment's are regularly useful for further research studies, College students etc. The study material is useful to society. This research work is a burning problem of the society.

14. Summary of the Findings

The development of Indian agriculture depends upon availability of water. Surface water is mostly available in rainy season. Most of the winter and summer season depend on groundwater. In recent years irrigation is increased drastically and as a result the groundwater level goes down at alarm level. Most of the dugwells in the study area mostly dry or very scarce water.

The aim of my study is to identify fracture zones in Basaltic terrain because groundwater is mainly accumulated in fractures in the rock and these fractures are called as water veins. The success of Bore well depends upon underground water veins. So before the drilling of bore well, the identification of water veins and their depth is important. Considering these two points, I have taken about 50 observations with help of dowsing method, Geophysical methods as seismic and Electrical Survey method. As per the observations of groundwater exploration, I conclude my study as follows,

To identify aquifer zone in investigation area, the reconnaissance survey is necessary to identify water veins with respect to their depth. After identification of water veins, the next step is to identify maximum cross connection of water veins with minimum depth with the help of dowsing rod. In such a way, I find probable good aquifer spot. The confirmation of the said spot will be done after the observations of the geophysical method. There are two popular methods to identify rock type, their layer and nature of porosity and permeability. It is observed that, for shallow aquifer identification, Seismic timer instrument gives better result for rock identification and its structure. For better results of these instruments, the depth up to 120 ft is considerable. The electrical resistivity instrument was used to identify rock types and number of layers and their depth. The lithological studies were done up to a depth of 328ft.(100 meter). The investigation area is Basaltic terrain hence Wenner configuration was used. This method gives very fruitful results especially for bore wells to know outer casing and inner casing. In the study area there are three types of red bores as soft red bores (collapsible), Medium red bores and hard red bores. Soft red bores need inner casing and it is best identified by Wenner configuration.

This study gives best result of groundwater exploration. In study area i.e. in Basaltic terrain around Solapur district, I got about 85% to 90% probability after post monsoon period. For 100% correct identification of water veins, there is a need of reliable instruments, but unfortunately no one can invent such instrument throughout the world.

As the groundwater exploration increases the groundwater level declines. Then there is a need of rainwater harvesting. It is observed that, after the rainfall about 5% to 25% rainwater percolated in the earth crust depending upon the porosity and permeability of the rock. Hence, this percolation of rainwater is not sufficient, the artificial recharge is necessary. To overcome the groundwater conditions the parameters like Trenches, Pits are taken for surface water percolation. Direct recharge of rainwater through Dug well and Bore well got very good result. This method of rainwater harvesting is economic and it is necessary to implement forcefully through government and semi government agencies.

15. Contribution to the Society:-

Solapur District is a drought-prone area which is recorded in Solapur District Gazette Book. Water is very precious in this area because due to dry climate, there is a huge amount of horticulture and cane sugar. Considering the value of groundwater, the following activity was carried out,

1. Free seminar for farmers was organized on groundwater exploration and rainwater harvesting on the occasion of World Water Day. Around the Solapur District 67 farmers were attended the seminar.
2. Awareness programme on groundwater harvesting and exploration was arranged in following colleges,
 - A) Dayanand Velenkar Commerce College, Solapur.
 - B) Hirachand Nemchand College of Commerce, Solapur.
 - C) Walchand College of Arts and Science, Solapur.
 - D) Burla Women's College, Solapur.
 - E) Lokpriya High School, Solapur.
 - F) Participated seminars in Sakal newspaper.
 - G) BMIT Engineering College, Solapur. (3 times)
 - H) Various apartments in Solapur city, etc.

