

ASSIGNMENT BOOKLET

Certificate in Water Harvesting and Management (CWHM)

**(Assignment for the January
and July Session 2013)**

Note: First of all read the assignment/questions and instructions carefully and identify the components of an assignment. You should read the relevant sections and sub-sections of a unit while preparing your responses and write answers in your own words. Your responses should not be a verbatim reproduction of the textual materials/blocks provided for self-learning purposes. We also suggest that, you may read additional materials available in your study centre or in any other library before preparing your responses. But extra reading is not a must to answer these assignments.



**School of Agriculture
Indira Gandhi National Open University
New Delhi -110068
2013**

Dear Learner,

Welcome to the Certificate in Water Harvesting and Management (CWHM) programme.

We hope that you have gone through the Programme Guide for CWHM carefully. It is extremely important to complete the assignments within the stipulated time to be eligible to appear for the term-end examination. All the assignments of CWHM are Tutor Marked Assignments (TMAs) and are part of the continuous evaluation process.

Before you write the assignments, read the instructions provided in the Programme Guide carefully and go through the course materials. If you have any doubts or problems pertaining to the courses and assignments, contact the concerned academic counsellor at your Study Centre. If you still have problems, do feel free to contact us at the School of Agriculture.

You are requested to go through the course material first and then complete the assignments. Your answers should not be a verbatim reproduction of the textual materials/blocks provided for self-learning purposes. **Please submit your assignments at the Study Centre allotted to you before the due date as mentioned below:**

Course Code	Last Date for January 2013 Session	For July 2013 Session
ONR-001	31 st January 2013	31 st July 2013
ONR-002	28 th February 2013	30 th August 2013
ONR-003	25 th March 2013	25 th September 2013

Wish you all good luck for successful completion of the programme.

Note: Minimum 35% marks in Continuous Assessment i.e., each assignment in each course is required for completion of a course for CWHM programme.

*School of Agriculture
Indira Gandhi National Open University,
Maidan Garhi, New Delhi-110068, India.*

Assignment -1
Course Code: ONR-001

Maximum marks: 50

Answer the following questions. All questions carry equal marks.

1.	(a) What are the gross and utilizable water resource potentials in the country? What is the per cent of utilizable groundwater potential? Explain the efforts for enhancing irrigation potential since independence.	5
	(b) 'The civilizations have always developed and prospered along the river banks' Comment and name two famous civilizations.	5
2.	(a) What do you understand by water stress and water scarcity? Explain the implications of water scarcity in the present context.	5
	(b) Define irrigation efficiency and irrigation intensity. How these can be improved?	5
3.	(a) Define water pollution? Differentiate between surface and groundwater pollution.	5
	(b) Visit a nearby river and observe the colour of water at different places in the river and compare it with the water available at your home.	5
4.	(a) Define roof top rainwater harvesting. What are the advantages of water harvesting?	5
	(b) Why rainwater harvesting is important in major cities of our country? What is the main step different state governments have taken for enforcing rainwater harvesting?	5
5.	(a) Define watershed management. What is Participatory Rural Appraisal? List important points for conducting a PRA exercise.	5
	(b) What do you understand by integrated watershed management and how this can improve the living conditions of the rural people?	5

Assignment - 2
Course Code: ONR-002

Maximum marks: 50

Answer the following questions. All questions carry equal marks

1.	Distinguish between any four of the following:	4×2.5 $= 10$
	(a) Recording and Non recording rain gauge	
	(b) Surface and subsurface runoff.	
	(c) Infiltration and percolation.	
	(d) Surface and groundwater pollution.	
	(e) Effluent and influent flow.	
2.	(a) Define time of concentration. Compute time of concentration for a watershed, if the length of flow path is 800 m with a slope of 5%.	5
	(b) How weather conditions affect the runoff. How runoff rate can be estimated. List the assumptions of rational method of runoff estimation.	5
3.	(a) What do you understand by hydrology? With the help of neat sketch explain different components of hydrological cycle?	5

	(b) What is water budget? Express it in the form of mathematical equation along with definition of different components.	5
4.	(a) How will you measure discharge by volumetric method? Compute the discharge of an open channel if it takes 2 minute to fill a cylindrical tank of 0.8 m diameter and 1.2 m depth of water. (b) Differentiate between turbidity and Electrical conductivity. How do you observe them?	5 5
5.	(a) What do you understand by tropical cyclones? Distinguish tropical and extra tropical cyclones and also list their characteristics. (b) Explain Normal Ratio Method for estimation of missing rainfall data of a particular rain gauge. Compute annual rainfall of a missing station 'x' if annual rainfall of four surrounding stations is 500, 910, 750 and 470 mm respectively.	5 5

Assignment – 3

Course Code: ONR-003

Maximum marks: 50

Answer the following questions. All questions carry equal marks

1.	(a) What do you mean by <i>in-situ</i> water harvesting technique? Describe two <i>in situ</i> water harvesting techniques in detail. (b) What do you understand by the term ITK? List any four ITK along with the region where it was used in different parts of the country.	5 5
2.	(a) Why is water conservation so crucial for agriculture in today's scenario? (b) Discuss in detail water harvesting potential of a roof top or agriculture catchment.	5 5
3.	(a) Distinguish between domestic and community rainwater harvesting systems. List two main important components of roof water harvesting system. (b) Distinguish between surface and drip irrigation. Why should irrigation be applied at the critical growth crop growth stages, explain	5 5
4.	(a) What is runoff coefficient and why it is important for designing any good water harvesting structure? Compute the size of storage tank to meet the water requirement of 6 members of a family for 1 month. Assume per capita water requirement is 120 litre per day. (b) Why lining of ponds is important? Discuss different methods of lining of the pond.	5 5
5.	(a) Describe the artificial groundwater recharge. What are the advantages of artificial groundwater recharge? (b) How will you recharge groundwater in the abandoned open wells? Explain with figure.	5 5