

ASSIGNMENT BOOKLET

Certificate in Water Harvesting and Management (CWHM)

**(Assignment for the January
and July Session 2012)**

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 and Regional Centre, Delhi-2
Indira Gandhi National Open University
New Delhi -110068**

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 or Regional Centre, Delhi-2.

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 2012 Session	For July 2012 Session
ONR-001	31 st January 2012	31 st July 2012
ONR-002	29 th February 2012	30 th August 2012
ONR-003	25 th March 2012	25 th September 2012

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

Answer the following questions. All questions carry equal marks

- 1)
 - a. What is the annual per capita water availability in Brahmaputra basin in Assam and Sabarmati basin in Gujarat? How is it related with rainfall conditions?
 - b. Define water stress and water scarcity and give the corresponding threshold values. Explain the implications of water scarcity in the present context.
 - c. What is the share of world's fresh water available in India and what is the percentage world population supported by it?
 - d. Explain the efforts for enhancing irrigation potential since independence.
- 2)
 - a. Differentiate between surface and groundwater pollution.
 - b. How can integrated watershed management improve the socio economic conditions of the rural people?
- 3)
 - a. Explain the importance of rainwater harvesting in urban as well as rural areas.
 - b. Explain two important water harvesting structures based on ITK.
- 4)
 - a. How is watershed management important for socio-economic development of rainfed regions of the country?
 - b. Enumerate different watershed management activities.
- 5)
 - a. What do you understand by Participatory watershed management concept?
 - b. With the help of a flow diagram describe the institutional arrangement for undertaking watershed projects in the country.

Assignment - 2
Course Code: ONR-002

Answer the following questions. All questions carry equal marks

- 1)
 - a. Distinguish between rainfall frequency and return period.
 - b. List important factors influencing rainfall and surface runoff.
 - c. What is hydrological cycle and list its components?
 - d. Define time of concentration.
- 2)
 - a. Write simple equation of water balance. List different components of water budget.
 - b. Define infiltration and distinguish between infiltration rate and accumulated infiltration. How would you measure them?
- 3)
 - a. Distinguish between convective and cyclonic rainfall with the help of diagram.
 - b. How will you estimate missing data by arithmetic mean method?
 - c. Compute average annual rainfall of a catchment by Thiessen polygon based on the following data :

Station	1	2	3	4	5	6
Rainfall, mm	450	600	750	390	550	690
Area of polygon, ha	200	300	290	450	600	150

- 4)
 - a. Distinguish between point source and non-point source surface water pollution. List different natural and artificial source of surface water pollution.
 - b. Explain two each important physical and chemical characteristics of water quality.
- 5)
 - a. What do you understand by water pollution? Distinguish between surface water pollution and groundwater pollutants.
 - b. Define disinfection and why it is necessary in drinking water? In what ways can it be accomplished household water treatment? Which one is the easiest and effective disinfection process?

Assignment - 3
Course Code: ONR-003

Answer the following questions. All questions carry equal marks

1.
 - a. Distinguish between *in-situ* and surface water harvesting techniques.
 - b. Describe the role of contour vegetative barrier for *in-situ* water harvesting with the help of neat diagram.
2.
 - a. Under what conditions embankment type and dug out cum embankment type are constructed?
 - b. What are the advantages of rainwater harvesting system? Distinguish between domestic and community rainwater harvesting system.
3.
 - a. What do you understand by water harvesting potential of a roof top or agriculture catchment?
 - b. Compute the size of storage tank to meet the water requirement of 10 members of a family for 3 months. Per capita water requirement is 70 litres per day.
4.
 - a. How are reservoirs used for water storage structures? Explain with the help of neat diagram?
 - b. Enumerate major steps for domestic water conservation.
 - c. Describe the functioning of dug well in artificial groundwater recharge.
5.
 - a. What do you understand by uniformity coefficient and how will you estimate it?
 - b. Define artificial groundwater recharge. List the methods of artificial recharge suitable for urban areas and explain two in detail.