

# **ASSIGNMENT BOOKLET**

## **Certificate in Water Harvesting and Management (CWHM)**

### **(Assignment for the January and July Session 2020)**

**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  
2020**

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. On top of the first page of your answer sheet, please write the details exactly in the following format.

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Enrollment No.:.....  
Name:.....  
.....  
Address:.....  
.....  
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Course Code:.....  
Course Title:.....  
Study Centre:..... Date:.....  
(Name and Code)

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**Please submit your assignments at the Study Centre allotted to you before the due date as mentioned below:**

Course Code	Last Date for January 2020 Session	For July 2020 Session
ONR-001	31 <sup>st</sup> January 2020	31 <sup>st</sup> July 2020
ONR-002	29 <sup>th</sup> February 2020	30 <sup>th</sup> August 2020
ONR-003	25 <sup>th</sup> March 2020	25 <sup>th</sup> September 2020

We suggest that you should retain a copy of your assignment responses.

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.*

**Introduction to Water Harvesting**  
**Course Code: ONR-001**

**Maximum marks: 50**

**Note: Attempt all questions. All questions carry equal marks. Write your answer in about 250 words.**

1.	Write short notes on the following: i) Role of groundwater in irrigation ii) Rooftop Rainwater Harvesting iii) Surface Water Pollution iv) Watershed Management v) Panchayati Raj Institutions	10
2.	(a) What is rainwater harvesting? Write its advantages. (b) Prepare a list of rainwater harvesting structures available near to your home.	5 5
3.	(a) What is the main step different state governments have taken for enforcing rainwater harvesting? (b) Define groundwater pollution. Write various sources of groundwater pollution?	5 5
4.	(a) Describe the role of watershed management in sustaining agriculture. (b) Explain its importance of bottom up approach in effective implementation of watershed development projects in India.	5 5
5.	(a) Visit to a nearby village and find out the source of (i) irrigation water and (ii) drinking water. (b) Explain what is watershed management planning?	5 5

**Basics of Hydrology**  
**Course Code: ONR-002**

**Maximum marks: 50**

**Note: Attempt all questions. All questions carry equal marks. Write your answer in about 250 words.**

1.	Write short notes on the following: i) Rainfall Intensity-Duration-Frequency Relationships ii) Biochemical Oxygen Demand iii) Time of Concentration iv) Interception losses v) Hygienic Practices	10
2.	(a) Describe different forms of precipitation. (b) Differentiate between infiltration and percolation.	5 5
3.	a) Define transpiration. Discuss the factors affecting transpiration.	5

	(b) Describe water budget. Explain the different components of water budget equation.	5
4.	(a) A rainfall of 80 mm falls in 2 hours over a catchment of 200 ha. There was no discharge before the storm. The outlet discharge of 1.5 m <sup>3</sup> /s continued for 8 hours. Determine the (i) amount of runoff (ii) amount of water not contributing to runoff (iii) and runoff coefficient.  (b) The normal annual rainfall at stations A, B, C and D in a catchment are 525, 491, 603 and 521 mm respectively during the year 2007. The station C was out of order and annual precipitations for station A, B and D were recorded as 591, 540 and 452 mm respectively. Estimate the rainfall at station C in the year 2007.	5 5
5.	(a) Describe the impact of groundwater pollution.  (b) What is solar water disinfection? Write its advantages.	5 5

### Water Harvesting Conservation and Utilization

Course Code: ONR-003

Maximum marks: 50

**Note: Attempt all questions. All questions carry equal marks. Write your answer in about 250 words.**

1.	(a) Differentiate between <i>in-situ</i> and surface water harvesting. Describe any two <i>in situ</i> water harvesting techniques used in India.  (b) Describe importance of ITK in water harvesting. Describe any two ITK used in Rajasthan.	5 5
2.	(a) Describe the importance of water conservation for agriculture.  b) Differentiate between domestic and community rainwater harvesting systems. Describe the main components of rooftop rainwater harvesting system.	5 5
3.	(a) What is artificial groundwater recharge? Explain with figure recharge shaft with tubewells method of artificial groundwater recharge.  (b) A farmer applying 6 cm irrigation to 10 ha area and having 25 cows and of 25 buffalos. Assume water requirement of cow and buffalos are 70 and 60 litres/ day, respectively. Compute the gross storage capacity of a water storage pond to meet the water need for 60 days.	5 5
4.	(a) Explain the importance of irrigation scheduling in crop production.  (b) Discuss the role of lining materials for controlling seepage losses?	5 5
5.	Write short notes on the following: i) Contour bund ii) Agricultural Water Conservation iii) Water Demand iv) Uniformity coefficient v) Sprinkler irrigation	10