A Report

On

Installation and Set-up of Fourth Lysimeter

For

A PoCRA Project on;

"Determination of Crop Coefficients for Major Crops by Lysimetric Studies"

at

Dept. of Irrigation and Drainage Engineering,

Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola

Report on Installation and Set-up of Fourth Lysimeter

"Determination of crop coefficients for major crops by Lysimetric studies"

Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola.

Title of the project: Determination of crop coefficients for major crops by Lysimetric studies" at Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola.

Location: **Department of Irrigation and Drainage Engineering, Dr. Panjabrao Deshmukh Krishi Vidyapeeth Akola.**

Duration: **Three years.**

Total outlay: **Rs. 38.38 lakhs.**

Investigators:

Principal Investigator	:	Dr. S.B. Wadatkar, Professor and Head, Department of Irrigation and Drainage Engineering Dr. PDKV, Akola.
Co-Principal Investigator	:	Dr. A.N. Mankar, Assistant Professor, Department of Irrigation and Drainage Engineering Dr. PDKV, Akola.
		Dr. M.M. Deshmukh, Associate Professor, Department of Irrigation and Drainage Engineering Dr. PDKV, Akola
Coordinator for the project for three universities (MPKV, Rahuri; Dr PDKV, Akola and VNMKV, Parbhani)	:	Dr. S.D. Gorantiwar, PI CAAST-CSAWM and Head, Deptt. of Agril. Engg., MPKV, Rahuri.

MEMORANDUM OF UNDERSTANDING:

As proposed in the Nanaji Deshmukh Krishi Sanjeevani Prakalap (PoCRA) funded project on "Determination of crop coefficients for major crops by lysimetric studies", three lysimeters were already installed. M/S. Pratik Enterprises, Sahkar Nagar Pune, supplied and successfully installed fourth lysimeter at the experimental farm of AICRP on weed management; Department of Agronomy, Dr. PDKV, Akola under PoCRA Project on lysimetric studies, Department of Irrigation and Drainage Engineering, Dr. PDKV, Akola during 11th and 12th May 2023.

PROCUREMENT OF FOURTH LYSIMETER:

M/s. Pratik enterprises, Sahakar Nagar, Parvati, Pune supplied fourth lysimeter with its accessory on dated 06/04/2023. (Challan No.23109).

Following mentioned goods are received from Pratik enterprises.

Sr.No.	Material Description	Quantity
1	S.S. Inner tank size 1500×1500×1000 mm.	1
2	S.S. Outer tank size 1600×2100×1250 mm.	1
3	Weighing scale 1500×1500 mm.	1
4	Perforated frame	1
5	Panel Box S.S.	1
6	Solar panel	1
7	GI pipe	1
8	Solar panel frame	1

INSTALLATION SITE:

Fourth lysimeter was installed at the Experimental farm of AICRP on weed management; Department of Agronomy, Dr. PDKV, Akola on dated 11/05/2023.

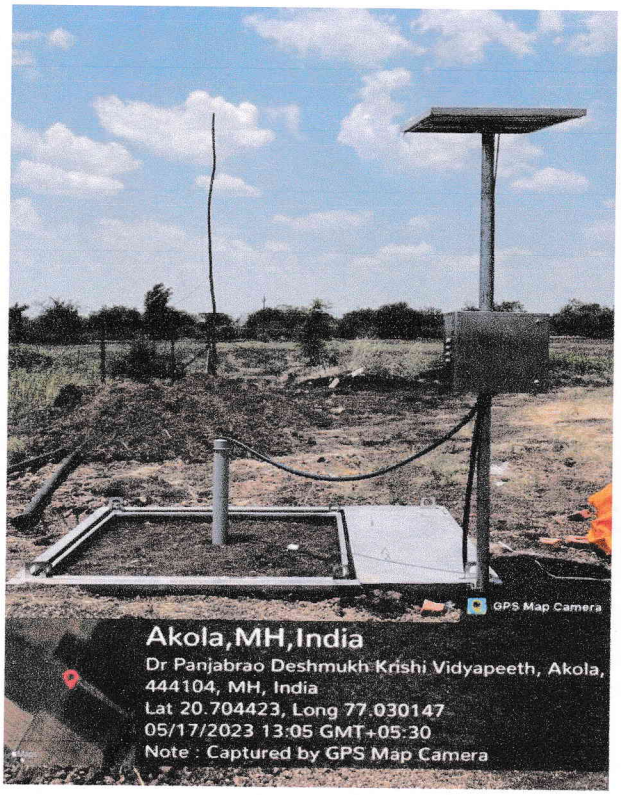

Image 1. Lysimeter Installation Site

LYSIMETER INSTALLATION:

Fourth lysimeter was installed at AICRP on weed management; Department of Agronomy, Dr. PDKV, Akola. Before the installation of lysimeters proper survey of the field was carried out and exact location for fourth lysimeter was marked.

Image 2. Layout for fourth lysimeter

In order to install the lysimeter, a dug-out (1.5m×1.5m×1.0m) was made in marked area. The soil from the marked area was manually withdrawn. While excavating the soil for lysimeter installation, the soil samples from five layers i.e., 0-20 cm, 20-40 cm, 40-60 cm, 60-80 cm, and 80-100 cm were collected for the analysis of physical as well as chemical properties of the soil.

Image 3. Excavation of pit

During excavation, the soil was carefully removed in five layers each of 20 cm depth and placed aside in separate piles on plastic sheet for backfilling. Each soil layer was placed in separate pile with a care of non-mixing or disturbing with others. For easy identification, excavated soil of each layer was labeled such L1, L2.L3, L4, and L5. After the achievement of desired dimension of lysimeter's inner tank, a pit sufficiently larger and deeper than the outer tank was dug by machine. The accurate measurement of inner

tank pit was taken. The soil excavated from the outer tank pits were placed at other separate piles.

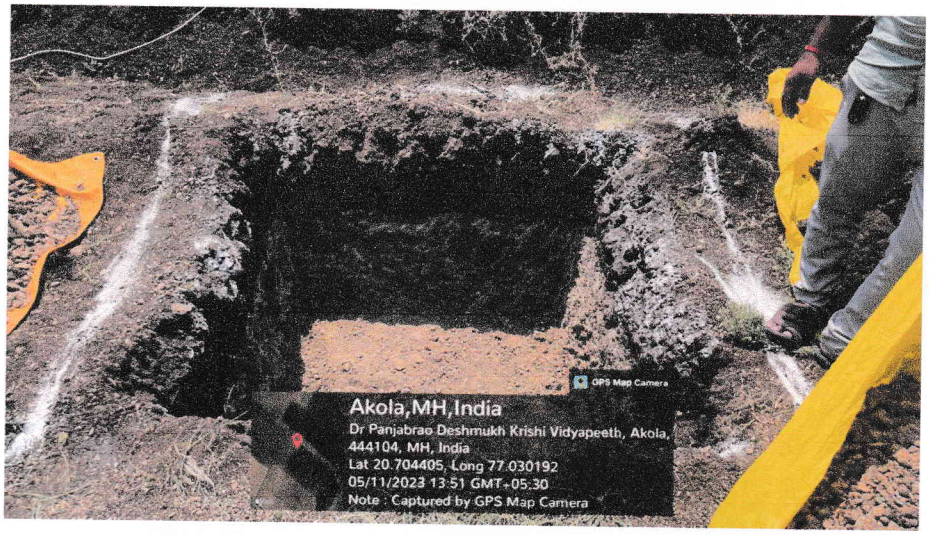

Image 4. Pit for inner tank with complete dimension

Images.5. Enlargement of pit for outer tank by Machine.

After enlarging the pit for outer tank, a sand layer of approximately 2-3 cm thick were sprayed at the bottom of the pit and the layer of burnt bricks was placed on sand layer.

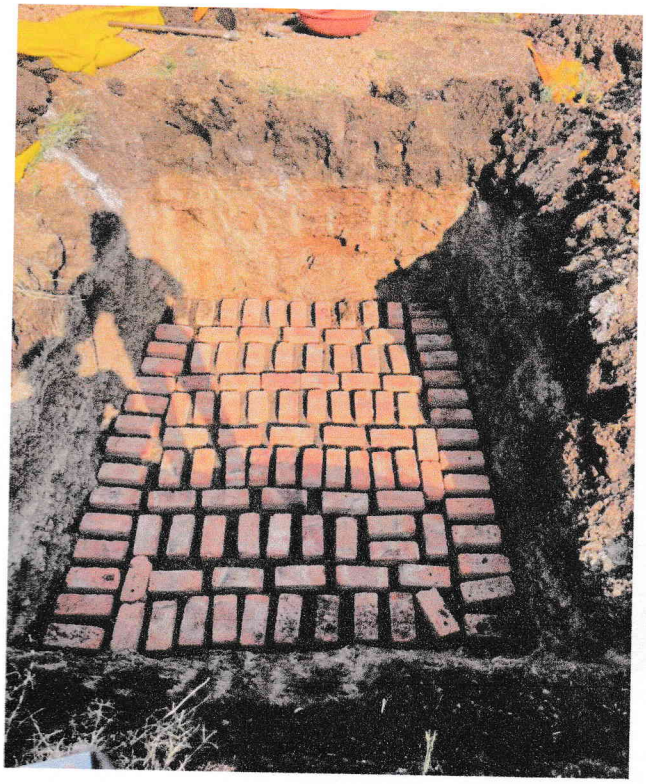

Image 6. Sand and bricks layer sprayed at Bottom of Pit

After that, the outer tank was placed in the pit by machine. Inner tank was placed in the outer tank by maintaining the 5-10 cm spacing between inner and outer tank from all four sides. The soil was filled around the outer tank of Lysimeter.

Image 7. Installation of outer and inner tank.

After successful installation of outer and inner tank, Soil sensors were placed at the depth of 20, 40 and 60 cm respectively and the marking was done in the inner tank at every 20 cm depth for backfilling the soils exactly same manner which was excavated. An

undisturbed soil layers were filled in inner tank of the lysimeter to match the natural soil profile.

Image 8. Soil sensors at depth 20, 40 and 60 cm depth.

Image 9. Backfilling the soil layer in inner tank according to surrounding natural soil profile

Additionally, the soils of each layer are slightly compacted to match the soil **density** in the lysimeters to that in the field. The inner tank of each lysimeters was filled **layer** by layer with maintaining its original homogeneity and bulk density. All of its **accessories** are assembled after that. A small surplus of topsoil was added later, after **continuous** watering had lowered the soil surface sufficiently. Finally, Lysimeter were **calibrated** in the field using standard loads of known mass.

Image 10. Calibration and assembling the accessories of the Lysimeter

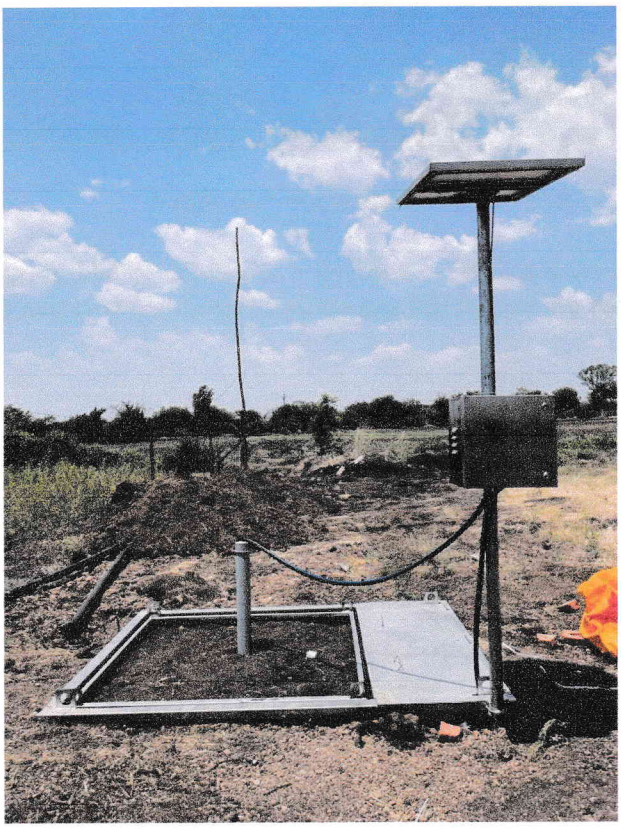

Image 11. Final installed Lysimeter at site

GPS LOCATION IMAGE OF LYSIMETER INSTALLATION:

Image 12. GPS image of Lysimeter 4.

For the upcoming kharif season, two lysimeters will be used to determine the crop coefficients of cotton and two lysimeters will be used to determine the crop coefficients of pigeon pea.

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