

A do-it-yourself affordable round dam for farms

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Water is absolutely essential for life, therefore also for food production - whether it is used for drinking for humans or livestock watering, irrigation of crops or vegetables, fish farming, or processing of crops.

In order to use water productively, it needs to be stored in a tank or reservoir, depending on the purpose. The cost of one or more reservoirs or dams for the on-farm storage of water can form a considerable part of the investment in infrastructure.

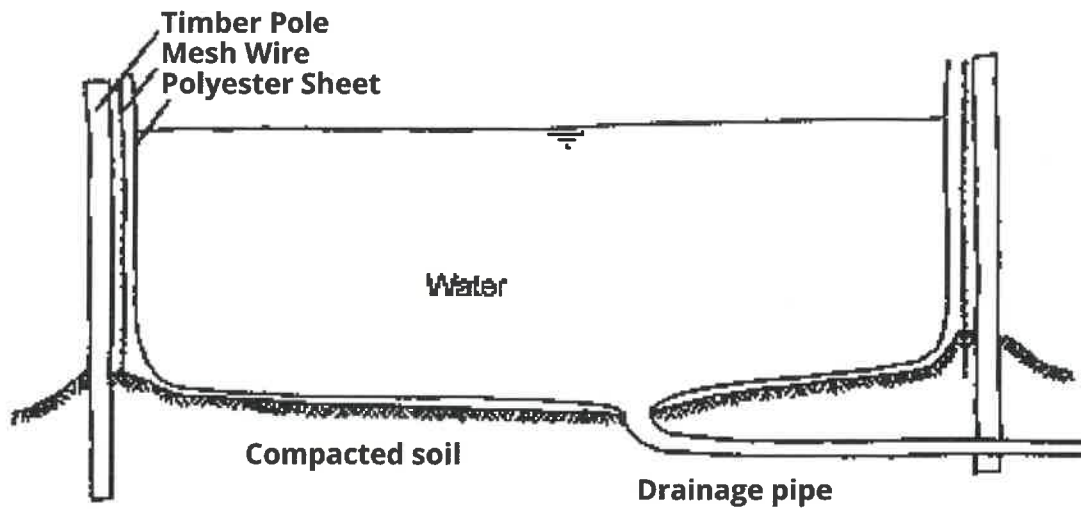
In order to provide an affordable water storage solution for farmers, ARC-Agricultural Engineering therefore examined possible alternative and cheaper ways to store water. A reservoir was erected for this purpose and its durability was evaluated over a period of three

years. It was exposed to all weather conditions and typical usage was simulated, by irrigating a vegetable plot from water stored in it. This included emptying, refilling, and cleaning on a regular basis. The reservoir fulfilled its purpose during the evaluation period.

The conventional round concrete / brick reservoir is a more durable structure, but costs considerably more and requires more labour during construction.

The affordable reservoir described in this article, requires regular maintenance due to normal wear and tear. It is also vulnerable to mechanical damage and must be fenced off in order to limit damage by animals. However, it could be a viable option to consider this structure, as it is much cheaper than commercially available dams.





Sectional view of the dam for detail of the construction

The cost of erecting this dam is less than half of the cost of erecting a round concrete dam and less than a quarter of the cost of installing a commercially available, prefabricated concrete dam

The round structure consists of welded wire mesh, covered on the inside by a lining of polyester cloth, which is painted with a waterproofing substance. The whole structure is secured within a number of treated timber poles, which are planted into the ground in a circle of the required diameter. The wire mesh is fastened on the inside of the "ring of vertical" poles.

The construction of the dam is simple and can easily be done by a farmer with own labour in a very short time. The materials are commonly available, easy to use, and no specialised knowledge or equipment is necessary.

It is possible to construct reservoirs from 10m³ to 100m³, depending on the intended purpose.

The following aspects should however be kept in mind in determining the optimum size of the reservoir:

- ◆ How often will water be pumped into the reservoir.
- ◆ What the total water consumption be during this period would be.
- ◆ The reliability of the water source.
- ◆ The anticipated damage caused by water shortages – if no storage capacity is available.

A complete manual on how to erect the dam and the necessary materials is compiled in a manual that is available at the ARC-Engineering campus.

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