Problematic Uses and Practices of Farm Ponds in Maharashtra

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Although the construction of farm ponds is portrayed as a miracle strategy by the state and central government as well as popular media, the manner of its implementation and practice in arid and semi-arid regions of Maharashtra is a cause for worry. Farmers extract a huge amount of groundwater to store in large-sized farm ponds. The need of the hour is to appropriately regulate farm pond practices in the state.

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Consecutive droughts and water scarcity have made life in rural Maharashtra, particularly of the farming community, miserable. The situation is alarming, so much so that water from tankers in many water-scarce pockets of the state is getting distributed with police protection. This also includes the fact that in many areas of the state, in order to distribute water and secure water resources, Section 144 of the Indian Penal Code (IPC) has been enforced (Sutar 2016; Banerjee 2016). The situation has become so dire that for the first time in the history of the state, potable water is being supplied by special water-trains to water-scarce areas. As a result, because of no livelihood opportunities and water scarcity for domestic needs, rural masses are migrating to nearby cities and towns in huge numbers. These are not just migrants but ecological refugees who have been forced to leave their native settlements in search of livelihoods and assured basic potable water. The key questions that arise are, why and how does such an extreme condition of water scarcity occur in several rural pockets of the state?

Water-saving Technologies

During the green revolution, widespread electrification at the farm level drastically increased the amount of groundwater extraction from wells and surface storages. This has resulted in groundwater depletion in many pockets of the state. During that period, deep borewell technology helped the irrigating farmers. Borewell technology became much cheaper and easily available, which led to a virtual race among small, marginal and large landowning farmers to drill more borewells in their farms. Several deep borewells assisted farmers to extract a huge amount of groundwater, enabling them to grow different cash crops on large areas. Even after drilling many vertical and lateral borewells, irrigating farmers failed to extract even a small amount of groundwater. Many of them were forced to cut down their matured horticulture yards, mainly of sweet lemon and pomegranate, which they grew with a lot of care and hope. Post the 1990s, farm pond technology became a new ray of hope for the farmers. Farm ponds were originally conceived to collect and store rainwater so as to provide protected irrigation to crops during periods of water scarcity.

Government Schemes and Policy Initiatives

The advantage of farm pond technology, which ensured that water was available throughout the year, even in water stressed conditions, attracted a large number of irrigating farmers. Nowadays in the media, stories regarding farmers who use farm ponds successfully in terms of effective water-use for cash crops that earn them a high profit are commonly reported. Overall, the media is portraying farm ponds as the miracle strategy that addresses the water scarcity problem. Realising the advantages of the farm pond strategy, state governments and

the central government came up with various schemes to promote and subsidise the construction of the ponds on a large scale, while applying a plastic lining inside it. In the current drought situation, Chief Minister Devendra Fadnavis has already announced that anyone who demands a farm pond will get one; the scheme is popularly known as "Magel Tyala Shet Tale" (Abhay 2016). He has also stated his government's intentions to build a farm pond in each and every farm (*TOI* 2015). Additionally, the central government's budget for 2016–17 set an ambitious target to construct five lakh farm ponds and wells within a year in rainwater-scarce areas of the country (*Decipher IAS* 2016). Thus, there is now a supportive policy environment which seeks to accelerate the construction of farm ponds, particularly in the arid and semi-arid regions of the state.

Conception to Implementation

However, the overall ground-level picture of farm pond usage and practice is dismal. There is a clear contradiction between the main objectives of the farm pond policy and how these ponds are actually being used by farmers. Although, rainwater harvesting is one of the main objectives behind the farm pond strategy, in practice it is almost impossible to find a functioning farm pond where rainwater is collected and stored. In fact, in direct contradiction to the purpose of building such ponds, most of the farm pond owners still extract groundwater from dug wells and borewells and then store it in the same farm ponds. Therefore, farm ponds have become the new way for groundwater extraction and have increased the competition amongst farmers to further extract groundwater. As a result, such extraction is causing a grave depletion of the groundwater levels in these regions.

Farm ponds were conceived as an important strategy for groundwater recharge through percolation. However, in practice, in almost all functional farm ponds, high-micron plastic paper is applied to stop the seepage of stored water. Even the state is promoting the use of plastic lining through a subsidy for the plastic. Hence, there is little possibility of water from the ponds percolating to the groundwater. In some of the functional farm ponds, inlet and outlet valves, which are mandatory by design to receive the rainwater and discharge the additional water, are non-existent. This illustrates that, although at the policy level the term "farm pond" is widely used, in practice farm ponds are but big storage tanks of extracted groundwater.

The second key concern is the overall absence of regulation and appropriate planning while sanctioning farm ponds and in its actual construction. For sustainable planning of overall water resources at the village or watershed level, the total carrying capacity of that area, which supplies the total amount of water for different uses and structures, needs to be seriously considered. Ideally, depending on the carrying capacity of the area, the total number of farm ponds to be constructed in the specific village or watershed area, needs to be planned. It seems that there is lack of clarity at the policy level and with the functionaries involved in implementing the scheme. There are many villages in the state where farm ponds are abundant; in one of the micro-watershed villages (1,810 hectares) of Jalana district, there are over 325 fully-functional large-sized farm ponds. Along with the number of unregulated farm ponds, another concern is the possibility that farmers are in violation of the approved size for building a farm pond. Although subsidies are granted for the construction of farm ponds of a specific size, almost all farmers personally invest their money to drastically enlarge the size and depth of their ponds so as to store more water. In many villages, farm ponds range in size from half an acre to one acre, along with an average depth of 40 feet to 50 feet. Thus, at present, there is no control and regulation on the number of farm ponds in a village and their size and depth.

The third major issue of concern is the increasing rate of evaporation of the overall surface water and particularly the water stored in farm ponds. In many pockets of arid and semi-arid Maharashtra, the maximum temperature during summer reaches up to 40°C to 45°C which increases the rate of evaporation. Therefore, with an increasing number of farm ponds—regulated or not—a huge amount of groundwater extraction to store water in the ponds, and a changing and volatile climate, the issue of evaporation of water from farm ponds becomes more alarming and is a cause for serious concern.

Man-made Natural Resource Disaster

In many water-scarce regions of the state, farm ponds have resulted in creating a water shortage for drinking and domestic needs. In many villages, even during the summer, there is water stored in many of the farm ponds (pumped groundwater) that is enough to irrigate cash crops. However, the same villages face a severe drinking water problem, and are dependent on public tankers. This practice is resulting not only in depletion of groundwater, but also the drying up of surrounding dugwells and borewells. In villages where there are a large number of farm ponds constructed, there is a threat of the reduction of the run-off, which is an important source of water for downstream villages. Even the practice of pumping large amounts of groundwater from shallow and deep aquifers is affecting the water flows in streams and drains, which creates another threat to an already diminishing ecosystem.

What Should and Can Be Done

In arid and semi-arid regions, particularly those areas used to irrigate orchards and grow crops in the rabi and summer seasons, the farm ponds strategy is certainly very useful. But, the existing practices of farm pond construction and water-use are making the problem of water scarcity even more severe. To effectively address the issue, the following seven regulatory and policy measures need to be seriously considered:

(1) Ban on extracting groundwater to store in farm ponds: In already water stressed regions, specifically those declared as semi-critical and overexploited zones, the extraction of groundwater to store it in farm ponds should be strictly prohibited. In such regions, it should be mandatory for farm pond

owners to store the rainwater or run-off in the farm ponds.

(2) Limitation on the number of farm ponds in the village or watershed area: In any village or watershed area, considering the overall sustainability of the water resource and the carrying capacity of the area, the total number of farm ponds that can be constructed should be fixed. Most importantly, while making such plans, local hydrogeology, the level of groundwater depletion in the area, and the water dependency of downstream villages need to be taken into consideration.

(3) Controlling the size of farm ponds: It is important to control the enlargement of the size and depth of farm ponds by farmers beyond the sanctioned norms. This is important to assure that the groundwater and aquifers are not entirely extracted by a few farmers. To achieve this, state subsidy for construction of farm ponds should be sanctioned for only those farmers who give a written agreement to abide by the sanctioned design (size and depth).

(4) Changes required in the provision of subsidy: Presently, the big farmers and orchard cultivators are at the centre of the subsidy scheme and other promotional strategies offered by the government. However, small farmers who depend solely on rainfall should be the focal point for this.

(5) Alternatives to the plastic lining: The high-micron plastic paper, which is used for lining the farm pond is costly and harmful for the environment. Therefore, there is a pressing need to research on cost-effective and environment-friendly alternatives to the plastic lining. In this direction, the Watershed Organisation Trust (WOTR) has made an experiment to apply a mixture of soil and cement in appropriate proportion. In one of the project villages in the Marathwada region, a farm pond is coated with a mixture of 80% amount of soil and 20% amount of cement with jaggery added into it. This exercise reduced the total cost by 50%, and even after two years since the initial coating of the farm pond, the lining is working effectively by not allowing any water seepage from the pond.

(6) Construction of a common farm pond to secure the drinking water needs: Although farm ponds as a strategy has proved to be very useful for protective irrigation, looking at its utility/ability to secure water during the scarcity period, this strategy can also be used to secure domestic and drinking water needs of all villagers and animals throughout the year. The basic consideration behind this suggestion is that, if an individual farmer can secure water for his irrigation needs throughout the year by using farm ponds, then it is also possible and feasible to secure the domestic and drinking water needs of the villagers by using the same strategy. The WOTR conducted an experiment in a village in Marathwada, where a common farm pond has been constructed with the capacity to provide water for at least three months during the scarcity period. The experiment bodes well for replicating farm ponds in small villages so as to secure drinking water needs. This idea needs to be further researched and tested on a large scale.

(7) Measure to reduce the rate of evaporation: There is a pressing need to reduce the rate of evaporation of water stored in the farm ponds. Some immediate measures, like reducing the surface size and increasing the depth of farm pond structures, using non-harming solutions (such as Evalock) in the stored water, and applying floating covers on the surface (such as waste plastic bottles) can be promoted. However, the long-term strategy should be to limit the number of farm ponds, regulating their size, and most importantly ensuring that groundwater is not extracted to be stored in farm ponds.

Conclusions

The present condition of drought and water scarcity in Maharashtra, particularly in the rural parts, is certainly alarming. Although, the groundwater depletion is a result of multiple factors and the problem has multidimensional aspects, the mushrooming of farm ponds should be seen as one of the major factors contributing to water scarcity. Hence, before it is too late, it is wise to implement preventive measures, such as the ones suggested, to avoid the adverse effects that farmers and villagers are facing today. At the same time, there is a need to explore the opportunities in the farm pond strategy to make it more appropriate for securing drinking in water-scarce villages, as well as adaptive measures to counter the growing challenge of climate change.

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