

Farming without pumps

Shree Padre

Many farmers in the regions adjoining Karnataka and Kerala are relying on Surangas, the traditional water harvesting structures, for meeting water requirements of their crops. Surangas are man made caves of water which work on gravitational forces requiring no external power to operate.



A storage tank collecting water from surangas

“If we have to resort to pump based lift- irrigation like most of the arecanut farmers of our area”, says this Karnataka farmer, “we might have to say good bye to farming.”

Govinda Bhat Manimoole, 55, owns a farm in Buntwal taluk of Dakshina Kannada district that according to his own words, “is luckily hundred percent water secure.” Karnataka’s never ending ‘power cut’ doesn’t worry him. He has no dependence on electricity or diesel for irrigation. Though painstakingly, the family has been successful in providing gravity irrigation for his 2.5 hectare farm. Arecanut and coconut are his main crops. Pepper, banana and cocoa as intercrop provide additional income.

Batteries of 22 surangas spread across his hills provide required water for 1200 arecanut and 300 coconut trees. Each suranga gives a small amount of water. For appearance, it is of a thumb finger thickness. If measured, this will be in a range of 200 to 600 liters per hour. Water from these surangas is collected in a decentralized way in five earthen tanks. One such tank on the topmost arecanut plot gets water from a total of nine surangas. The collected water is carefully fed to the trees through micro irrigation.

Govind Bhat uses three types of water emitters – the dripper, foggers for arecanut and bubbler for coconut. Dipper oozes water drop by drop at the rate of eight liters per hour. Each arecanut tree is given two drippers. Fogger, on the other hand, sprays water like a tiny fountain and has sixteen liters per hour output. Only one fogger serves a tree. The last, bubbler has still larger ‘fountain’ and feeds 20 liter per hour.

Bhats manage the whole irrigation schedule at the turn of a gate valve. Everyday, about a couple of hour’s irrigation is given.

Luckily for them, though the discharge from surangas gets reduced by summer, the reduction is marginal. It was only recently, in 2007, Govinda Bhat introduced micro irrigation. Till then they were managing with hose irrigation. Even before that, till nineties, manual splashing of water was in vogue.

Manual splashing

Manual splashing was really cumbersome and back-breaking. A rectangular bowl shaped container was made from arecanut leaf sheath. Water was transported in the garden site through long earthen channels that required laborious maintenance every year. One has to bend down in ‘U’ shape and splash water to each tree bottoms several times. Subsequently, a wooden implement that permitted the workers to splash water in a vertical standing pose was introduced. But Bhats were managing with their traditional areca sheath container till they switched over to hose irrigation.

Lands in this area are quite sloping. As such, only terraced farming was possible. Breadth of each terraced plot is very less. Wherever the breadth is very less coconut is planted. A few rows of arecanut can not be raised here due to the very narrow strips.

Extension of the farm was step by step. Using the savings, the family has gone on extending by leveling a small strip once in a decade or so. More interestingly, for each plot, the family had done a ‘water availability’ test in advance.

Around forty feet height from the proposed leveling of a new plot, a suranga is dug. Only if enough water is available, terracing is done below. But, luckily, all the 25 surangas dug by this family haven’t totally failed them. Three are abandoned because their



Irrigating root zones

output is very low. Water from each suranga is collected in a earthen tank constructed below. To prevent crab menace and to avoid evaporation, water is transported through PVC pipes. There are five such tanks at different heights. By just opening the gate valve fixed to the outlet of the tank, irrigation commences in the plots below.

Inter-connected tanks

All the tanks are inter-connected through underground pipe network. So, if there is a tendency in the upper tank to overflow, water is immediately diverted to a lower tank.

“At one stage, more than half century ago, we had severe drought in summer. Water from a tank situated in the lowermost plot had to be painstakingly brought up on head load for our domestic purposes too”, recalls Achyutha Bhat, (81), Govinda Bhat’s father, “ Even later, after Shivarathri, - Shivarathri comes in February – we had very little water. So much so that if in a few years we irrigated by providing protective irrigation by physically carrying water in pots, there were years when we didn’t have no water at all to irrigate.”

The water crisis went up to 1987. Though the bore-well technology had by then arrived here, Bhats were least interested. They were fully aware that it is not a sustainable technology and would spell suicidal to their great blessing in farming – the gravity irrigation. Instead, the family decided to try their luck with more surangas.

Almost a suranga a year

In about a decades time thereafter, 6-7 surangas are dug. Bhats were determined to bid good-bye to the history of drought. Because of

Suranga

Suranga is a man made cave for water. Kasaragod district in Kerala and adjoining areas of Dakshina Kannada district of Karnataka has thousands of such traditional water harvesting structures. It is generally dug for drinking water. Of late, this skill is dying due to the advent of pump sets and bore wells.

Achyutha Bhat was instrumental in bringing this technology to his village Manila, way back in forties. By the time the skilled workers finished digging the first suranga in his farm, young Achyutha Bhat had picked up the intricacies. Now Manila village has around 300 surangas.

Completion of a suranga takes usually one season. Suranga digging is done only in the summer – say from February to May. Since the soil contains more moisture during monsoon and immediate post monsoon time, there are fears of it collapsing during digging. As such, in this period suranga digging is avoided. Generally surangas here have a minimum length of forty meters. Depending on the soil type, to dig this far, it might take anything from two months to three – four months. Width of the suranga is just enough for an ordinary person to pass through. Even today, the village has hand counts of labourers who know the skill. One ‘kolu’ (two and half feet) of suranga is charged at 150 Rupees. Longer the distance, this charge will go on increasing as it requires more labour once it reaches long distances.

Most important fact about suranga is that it provides crystal clear, non-polluted water round the clock without the requirement of a pump set. Secondly, it is the only water harvesting structure possible for people living on the upper reaches of a laterite hill. Even a poor farm labourer, in his spare time, can dig a suranga inch by inch. He can complete it in 2-3 months – with the help of an assistant, but without spending any cash!

Bayaru – a village of Kasaragod district in Kerala is ‘Mecca of surangas’. That village has an estimated 2,000 surangas.

this almost non-stop suranga digging (except in off season), the villagers used to say that “Manimoole Achyutha Bhat gets a suranga dug every year.”

One step towards crisis management is the construction of huge storage tank. With an estimated lakh litre water capacity, this stores rain water. In a phased manner, the stored water is used alternatively with the freshly collected water from surangas. This step also helped to bring down the water shortage.

The results were positive. Their water availability increased considerably, though the hose irrigation wasn’t satisfactory. Points out Govinda Bhat, “our soil profile is such that it doesn’t hold water for long. We were able to give only two rounds of hose – irrigation in a week. The leaves used to drupe down a bit and the overall look of the gardens were far from healthy. Yield levels too showed considerable fluctuations.



Bountiful yield of arecanut

“There was a time when a gunny bag would accommodate 60-70 of our coconuts. Now, with just 25 coconuts, it is full”, laughs Achyutha Bhat.

Good bye to drought

It was only in 2007, after switching over to micro-irrigation, the farm improved well. Since the requirement of water is less, they could irrigate daily. Crop also increased considerably, bringing down the level of fluctuation to a great deal.

“Now we have sufficient water for these 1500 palms and the intercrop. Though intercrops are there, they aren’t irrigated separately. “Whatever moisture is available in the soil, that takes care of these plants and vines”, explains Govinda Bhat.

What about the costs of these surangas? “We have to spend about the cost of a pumpset for each suranga. A little more on tanks. “But the recurring expenditure is, I would say, negligible. Maintenance of all the five tanks requires about 40 – 50 man days.” Micro-irrigation doesn’t need much labour. Just a round of checking, turning the gate-valve on and off etc would suffice.

Bhats have future plans of extending the cultivation for one or two plots more. But the present price of coconut and arecanut doesn’t give confidence for big investments. As such, Govinda Bhat is studying two diversifications – floriculture that is possible inside the areca garden and educational home stay. A whole

household and 2.5 acres of farm totally run by unique suranga water that too without the use of any fuel would attract many researchers, water activists and considerable interested people from outside. “We have plans to construct a couple of rooms, offer our traditional food & facilitate them to see and understand this dying art of strange digging and its sustainable uses”, hoped Govinda Bhat.

Not quite far off, Dandepady Achyutha Bhat, another old farmer, irrigates his 2 acre areca garden with suranga water. In about two kilometers vicinity of Bhat’s farm, there are 18 families of farmers and farm labourers. All put together, these families will have a total of 50 surangas.

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