Sixth Gyan Shodh

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West Gogulapalli, Allur Mandal, Nellore dist

Prepared by: A Geethasai Krishna

Participants: Patan Saida, Madhavi, A Geethasai Krishna, Brig P Ganesham

Host: A Laxman, West Gogulapalli

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On 1st March, 2014 again an exciting journey to learn started again but this time it is Gyanshodh.

I was filled with excitement since the salt extraction amazed every shodhayatri when we visited it for the first time during Shodhyatra. This time again to the same village to learn about the salt harvest process in detail and examining the opportunity for the usage of wind energy for pumping the ground saline(salt) water to salt pondsin the salt harvest thereby replacing electric motors.

Most of us take salt as granted in our daily life. We use it to make our dishes delicious and we find it very easy to get from the shop and then use it. I used to think, salt would be extracted easily from sea/oceans as they are abundantly available.This notion has changed after I have seen the hard work and hardships that farmer face to get that salt from the sea table to our dining table.

Gyanshodh started by reaching West Gogulapalli (30-40km) from kavali. We are a team of four people this time, Brigadier Ganesham sir, Madhavi akka, Patansaida garu (Mastless windmill innovator) and me.

Laxman, a salt farmer who toils in hot sun, which extracts salty sweat out of him, to make our foods delicious with salt, welcomed us into his home with warm smile. He was happy that we stood on our promise of visiting again. This time he is excited about our visit since he is curious to know about the possibility of windmill which would replace existing electric motors.

With everyone in the team being excited to learn, we embarked our journey from Laxman's house to the salt farms where salt is harvested. Unlike plain farms filled with water in December, this time it is a large landscape of white coloured pyramids. In December, when we visited these farms we got to know that in salt farms are in shutdown phase from Aug-Jan. As the temperatures in these months are not suitable for the salt harvest, farms which undergo harvest from Mar-June/July(depending on monsoon that year) are left open to nature and the rain water is dormant in the field these months. In the month of February these farms switch to the preparatory phase for harvest which is one of the back breaking steps in the process that involves pumping out dormant rain water, furtherpreparation of field which will be narrated below.

We along with laxman reached his field where he started enlightening us about process of salt harvest.

Salt harvest process:

In the month of February fields are dried by pumping out the stagnant rain water in the fields and the field is made ready for the harvest.

This place is located near to sea (Bay of Bengal), first step would be bringing ground salt water to the land which is done by the use of electricity. Bore well is installed at one of the selected points in the field and water is pumped out using electric, after few years/months depending on the salinity (saltiness) of water pumped out at a point farmer will have to dig one more bore at other point in the field. The way he tests the salinity is tasting the water coming out of the bore pump, if he spits it out due to the saltiness then he would consider that water in that point have sufficient amount of salt in water, which would help in profitable extraction of salt. If the existing point where bore well was installed previously has sufficient saltiness (salinity) present it will be used for this season, else a new bore has to be installed at other point in field.

After the brine(water containing large amount of salt) reaches the land it undergoes a 5 step process.

In the preparatory phase land is divided into 5 different blocks, in varied heights. These 5 blocks are the 5 stages of extraction.

Initially brine is pumped into the one of the blocks in the field which then redirects this brine to the adjacent block which happens through gravity since they are in varied heights,in similar fashion brine solution gets filled in the field in 5 different blocks.

5^{th} block is the final stage where salt is obtained and it is at the lowest level as compared to all other blocks (stages). The bottom layer in all the blocks is the clay but in the final block(stage) the bottom surface is specially prepared by using sand during the preparatory phase (Feb), here the surface is made level and hard by stamping field by bare feet. One of the main reason is that it will be easier to drag out the salt in the block easily if the surface is harder. This is one of the major steps in the preparatory phase before harvest.

After the brine reaches the 5^{th} stage, it is made to stand still for 4-5 days depending on the temperature. Due to the heat of sun, temperature of water raises and evaporation happens and the salt precipitates (to be deposited in solid form from a solution) in this stage, it will be drawn out of the field.

After precipitated salt is drawn out of the 5^{th} block, brine that is standing still in the 4^{th} block is allowed to enter the 5^{th} block by unblocking the passage. Similarly as brine in 4^{th} block enters the 5^{th} block, brine in the 3^{rd} block flows into the 4^{th} block and brine in 2^{nd} and 1^{st} block flow into the next stage.This makes 1^{st} block empty and brine is pumped into the 1^{st} block by using electric motor.

Again the brine in the 5^{th}block (stage) is made to stand still for 4-5 days depending on temperature.After this salt resulted is taken out. In this way the process continues till June/July (depending on monsoon).

As it is a continuous process farmer in the field will be collecting the salt precipitated, in the scorching sun and he never complains since it is major partner in his harvest.

If it rains for some time in a day during these months of harvest all the brine in all blocks is pumped back to the first block and then the process continues.

Chemistry of the process(my understanding):

As the brine at all the blocks is exposed to the sun, evaporation occurs in all blocks and the concentration of salt(% of salt in given brine solution) increases as the brine reaches the next stage. As an example let us assume if we pump 100ml of brine from the ground where it contains 20gms of salt, concentration of salt is 20%.As the evaporation occurs brine solution volume decreases to 80ml, water gets evaporated but the 20gm salt remains same, hence the concentration of salt increases to 25%.As the water reaches the 5^{th} block the concentration of salt will be very high and due to further evaporation of water from brine, salt starts precipitating(formation of solid from liquid) out since it doesn't have enough water to get dissolved and form a solution.

Packaging:

Salt crystals obtained from the 5^{th} blocks in the farm are collected and formed as a heap. This salt is sealed in packets by using the coal's heat energy. Here they are eliminating the use of electric sealing machine. Each packet weights 1kg and 25kgs i.e., 25 packets are further packed into one bag. These bags are distributed across the retailers by the wholesalers.

Production and Economics of salt harvest:

In this region farmer gets 5tons per acre in a season (when it is really hot-summer) per week.

100kg of salt fetches up to 100rs to the farmer. Sometimes middlemen (wholesaler) takes the advantage of the financial crisis of the farmer i.e., if farmer is in a need of instant money to solve some problem they bargain to receive 100kg at 80rs.

Irony in the economy is observed here:

From a bag of 25kg, how much does the middlemen earn and how much does the farmer earn.

Description	**Cost in Rs for a bag of 25kg**
Purchase cost from farmer	25
Packaging(cover, coal to seal)	24
Transport(1000rs per ton)	25
Total cost price of wholesaler	74

From the above table we can infer that for 25kg bag cost total cost price is Rs 74 i.e., Rs 3 per kg

Whereas selling price is Rs 5 per kg. Profit made by wholesaler is Rs 2 per kg.

Whereas the farmer who does daylong back breaking work under blazing sun sells Rs 1 per kg(sometimes 80paise) in which after eliminating production cost(electricity, labour) he earns 60paise as profit.

"This means for a sale of one ton of salt middlemen earns Rs 2000 as profit whereas farmer earns Rs 600 as profit."

This salt packet after the processing costs a minimum of Rs 15 and it goes upto Rs 25 .Whereas at the root level it is sold for Rs 1 per kg by the farmer. This shows how market is playing with the consumers. As the price of commodities increases we tend to earn more thereby making the consumers greedy. As correctly quoted by Brigadier Ganesham sir, lines by Prof.Anil Gupta sir, by looking at this scenario,

"Markets monitor demand and supply, not the misery of people"

Something to celebratehere in this economy is that it provides employment for the women in and around the village throughout the year. The salt produced from the farms is packaged and transported to the market. Awomen working whole day for packaging 100 bags(each 25kg) earns Rs 500.Even during the shutdown season (rainy) the salt stored will be packaged thereby providing employment.

Challenges:

A) To pump the ground water (brine), motorpumped bore well is used. As mentioned previously after few years(1-2) the salinity(saltiness or dissolved salt content of a body of water) of ground water decreases at a particular point, it compels farmer to dig another bore well at some other probable point in the field. After installation of bore well, if the salinity is less for the profitable extraction farmer has to select one more point in the field and install a bore well at that point again. Each time a bore well is installed it costs 10,000rs. With the technology we have now, I think we should be helpful to the farmer to prevent such losses.

B) Due to the continuous exposure to white reflected light, failing eyesight is one of the problems reported.

With a paradox ends the salt gyanshodh, **"the family who is producer of salt buys manufactured and processed salt from the industry".** Reason being a myth that the salt, which is industrially processed contains more benefits. Processed salt contains iodine, which is important to reduce deficiency that results in intellectual and developmental disabilities, but according to studies iodine will be naturally present in food supplies in the regions near sea coast. As this region is very near to sea they can consume their natural produce.

Apart from Salt harvest,

Discussions with Laxman on the windmill and its working, the way he grasped how it could help him to get away with the motor and his approach of thinking all different possible risks of installing it at one particular point is a learning for me to think in all possible ways before deciding upon changing status quo of existing system. Estimation about use of particular resources and optimizing the cost effectively by eliminating its usage by switching to available resources that would serve the same purpose is also one among those learnings.

It is also a great learning that unless one goes into the field and interact with the one working in it, it would not be a possible case to manufacture/design something for that target group. One will definitely end up missing something that is really required.

"We send our kids to a private school nearby Mandal even though we have a govt school just beside our home."

Living in the village with them helped me to understand the real issues of society. There is a govt. school which has capacity to teach till 7^{th} standard, but villagers are reluctant to send their kids to this school, instead they admit them to a school which is 7-8km away from the village. After discussion about effective usage of their own property (school) of the village, we understood the difference they see. Janardhan reddy brother of laxman says his son does some homework, studies for an hour after coming from school, whereas students studying in govt. school are not given homework and there is no trust on the teachers present there. People in village even feel pride about themselves if his son/daughter going to the school in the mandal nearby.

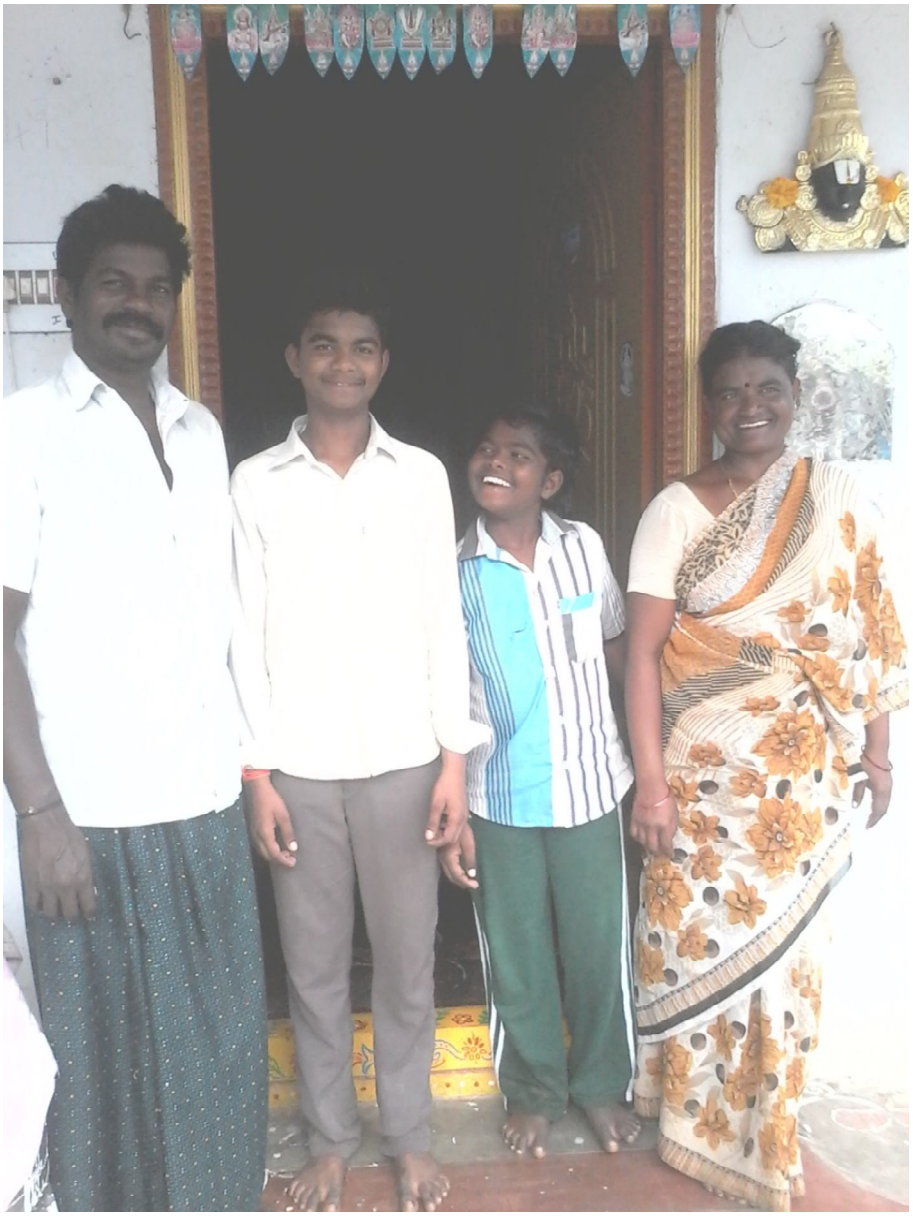
Encouraging the graduates from village to take up the entrepreneurship, a new path breaking idea by Brigadier sir, Grass Roots Entrepreneurship (GRE) to eliminate the middle men and providing an employment to the unemployed graduates, thereby benefiting the both farmer (sharing more % of profits) and unemployed graduate, discussion about this with the villagers, their response has shed light on how they perceive the job of middlemen to be difficult.

Response of the villagers to the various practices of organic farming when madhavi akka started interacting with them, illustrated that for them to believe in something about farming, they would believe in it more when someone who has practiced it tells directly about them and shares the results with them.

And the day came to an end with a delicious, mouth-watering,yummy,delectable dinner at Laxman's home. Thanks to Laxman's wife.

On the second day morning we left Gogulapalli with lot of learnings and lot of satisfaction that we know what it takes for the salt that makes our dishes tasty and delicious to reach us, the back breaking work it demands and the misery of the farmer.

Here is the pic of the Laxman and his family who have helped us to get enriched with rich knowledge.



Second day started off with meeting children at high school, Kavali, Brigadier sir enlightening them about the power of innovations. As I always mention the public speaking is a big takeaway by being at the brigadier sir lecture for me.

Day ended by meeting Gollapallem ashram students (staying at kavali) who are always inspiring and again with delicious dinner made by them.

We talked to them how to prepare ourselves for exams, modes of joining Army, and possibility of teaching them maths and science during summer (May-July). We assured that few volunteers from 14 CSY would be there with them in summer and undertake teaching.