Case-III: Studying the Potters Community at Makarba and Fatehwadi Villages, Ahmedabad

(I) Introduction
The process of making pots by small manufacturers and associated problems are studied and presented in this report. Observations and understandings of the pot making process, along with people involved are made in field visits to villages (Makarba and Fatehwadi) near Ahmedabad. Analysis of the process and associated problems are mapped. Two of the major problems include injuries during the purification of clay and excessive pollution caused by kiln used for baking the pots. The ideas given by children are reviewed, however the solutions for the problems stated were not taken forward, partially due to the potters did not like them and also they also did not feel if these are any problems for them.

(II)Visits to Makarba And Fatehwadi Villages

![Figure 1 First view at Makarba](image1.jpg)

![Figure 2 Potters at work](image2.jpg)
Makarba

Potters are seen residing and working in small settlement of 3-4 huts in the village of Makarba near Ahmedbad. These potters are doing pottery since generations. Huts can be seen in the backdrop (Figure 1) of ready to sale pitchers arranged and stored in open space. A potter is manually shaping a pitcher i.e. final step before painting and baking in Bhatti/Kiln shown in Figure 3.

The head of one of the family told that they make around 100 pots a day which involves 4 people working, selling each for around 26-30 Rupees to wholesaler. Due to lack of operating cost, they do not sell pots directly to customers. He was very co-operative and explained the process of making pots in detail, starting from acquiring clay, preparing it, then rough shape on potter’s wheel, final shape by hand tools (stone and wooden plank) colouring and baking. He also explained the process of baking in detail, while he their common kiln/bhatti.

Interaction

**Q: Where do you get clay from? how much it costs?**

**A:** A truck load for Rs. 1700/- sufficient for about 500 pitchers (*matka*)

**Q:** Do kids go to school?

**A:** They go to school, I have not studied by all my children have studied 10/12th. They should know the calculations for running business.
Q: Why don't you send them to college or further studies?

A: College jaake kya karna h sarkari naukari to milti, private naukari se achha apna kaam kar le.
(What's the point in going to college, because they are not enough government jobs. It better to do own business/work then working in private firms)

Q: How much time it takes in learning making pots?

A: 6 months for learning shaping using stone and wooden tools and it takes about two years to learn handling potter's wheel.

Q: How do you do baking? (*Bhatti Kaise chalti hai?*)

A: We use broken pots for making base, stack unbaked pots (about 700 in one go), cover the top again with broken pots. Put fire from holes in bottom. It takes about 2 hours in full baking and we keep it overnight for cooling before taking the baked pots out.

Q: What do you use for fire in Kiln?

A: We use wood, buy it from carpentry market. Earlier we used to old *chappal*/footwear/plastics, etc. but it used to pots black and a lot smoke also used to there. Black pots are not sold and they used to go in waste.

Q: How many pots break in kiln and what do you with broken pots?

A: About 50-100 pots break in about 700 pots in load of kiln. Broken pots are used to make base and cover kiln during baking. Kiln also sustains for a season, every season we make new kiln.

Q (Ahmed): Tutte huye matke ka barik karke fir se mitti ki tarah kaam mein nahin le sakte kya? (Cant we reuse the broken pots?)

A: Nah, ek baar paki huyee mitti kaam k layak nahin rahti. (Once baked clay is not useful)

_Fatehwadi Visit_

Fatehwadi is a village of potters ranging from small to mass producers, from pitchers to diya makers, from manual to mechanized processes, from customized to designer earthen pots manufacturers, from family to industrial set-up of mass manufacturing, etc. Almost all of them live there and work there itself whether it is their own set-up or they go work on monthly/daily wages.

The team visited a family who makes _diyas_, flower pots, piggybanks, etc on a motor powered potter's wheel, a small industrial set-up where they use machines to make _diyas_, glasses/mugs, etc using hydraulic/mechanical presses and moulds and a joint family who used a lot of innovative tools and mechanized potter's wheels to make pots and custom designs.
At first place, a woman was seen mixing clay with water using her feet and a man was filtering it through wire-mesh to remove small stones, grass-leaves etc from clay before using it for making pots. On inquiring, the woman told us that this rigorous exercise strained her body, and the mud also contained stones, sticks, thorns and pieces of glass, which sometimes hurt her feet. They were seeing reusing the water coming out of their bathroom, wash-basins, kitchen, etc to mix in it clay.

There was another person working on a powered potter's wheel. He demonstrated us how to make different flower pots and piggybanks. And few of us also tried their hands on potter's wheel and handling clay on it.

Interaction

**Q: Why do you mix clay like with water?**

A: To clean the clay by remove stones, grass leaves, etc. which cause trouble in making pots and can weakens them.

**Q: Where are you coming from? Want to learn?** (Asked by one of the person there)

After we explained him, what was our intent and about SRISTI, he continued to speak that, "I teach a lot of people at various places, schools, etc. *NID wale bhi aate hain yahan.* Come I will show you how to make and you can also try. (Some of us actually tried).
At nearby location, mass manufacturing of different types of *diyas* with different designs was going on using hydraulic and mechanical pressing machines. The owner of set-up told that the each machine costs about Rs 30,000/- and can produce about 1000 pieces a day depending on shape and size. Women on daily/monthly wages were working on the machines. The owner explained us about the supply chain and value addition possibilities. He sells these diyas for ranging from 80 Paisa to 1.5 Rupees per piece to a wholesaler, who generally adds wax, etc and sells at much higher price to end users through high-end chains such as Big Bazar, Star Bazar, Shopping Malls, etc as exotic decorative items for various occasions such as *Diwali*. The owner of the place also showed us the some of the glasses/tumblers which had made on custom orders earlier, which would cost in the range on 3 to 6 Rupees per piece.

A group of Father and his two sons assisted by their wives were seen working in a tin-shade, which would look like yet another potter's working place. However, it was not. After entering the place, kids were seen playing on games high-end smart-phones, head (the father) was seen working on a motor-powered wheel with an arrangement to give shape to pots in well ventilated space. Table/pedestal fans were also there to provide them breeze in hot after-noon.

Mr Mayur Prajapati is very talkative and innovative person. He also mentioned about NID people coming there to learn various processes. He told that he has custom manufacturing pots for various customers, one of them is from Bangalore based firm. This firm is using the custom made earthen pots for composting manure and organic farming, etc. In this place, they were using bases of revolving chair to keep their molds while making pots and rotating them. Rubber strips, cut from old tubes of vehicle/cycles tyres, are being used to hold two/multiple parts of their molds together. They are also seen using old scooter tyres to support their molds.

He uses a machine to shape pots in POP molds. The process is quite fast and effective. Outcome is one of the best in the area. He later on told us that he is planning to have a machine which make pots such pitcher/matka having smaller opening then its which the current machine is not able. The current machine had a iron plate at the end which forced clay on the inner walls of the mold as it being rotated.
on motor powered wheel. He discussed that there could folding template which be folded after making *matka* so that it does not any walls or opening while taking out after completing the process.

Figure 6 Father is working on fixing mold and kids playing games on smart-phone
Figure 7 Workspace with Grandfather and Kids

Figure 8 A shot of the machine for making pots
(III) Problems and Solution given by Children

Problem 1: Fatigue caused by manual powering of potter’s wheel

Khush thought that manual potter's wheel can cause fatigue to the operator, so he thought of a pedal powered potter's wheel, specially for the potter's who does not have access to electricity. As shown in schematic sketch in Figure 10, Pedals, like a bicycle, are used to rotate the potter's wheel and braking is associated with a dynamo to generate electricity. The generated electricity can be stored in a battery and can be used for charging mobiles, tube light/bulb to work in dark, etc.

Problem 2: Back and hand pain caused in the process of shaping pots

Another problem observed during the visit is back and hand pain due to continuous movement of hands while sitting on ground for shaping pots. To reduce the hand movements, a device can be designed using the pedaling mechanisms like sewing machines (Figure 11). The machine has to move tapper/wooden piece used to shape the pots. The power applied to the tapper could be controlled by the speed of pedaling. This will also change the working posture from sitting on ground to sitting on chair, which could reduce the stress on operator's back.
Problem 3: Unable to produce earthen pots directly on potter's wheel

Priyansh noted that, however mechanized the potter's workshop was, but they were not able to produce final shape of *matka* on the potter's wheel. They needed to do the shaping process. He suggested creating an advanced mechanism for making pots with narrow openings. Mechanism suggested by Priyansh (Figure 12) has following steps:

The inflatable rubber material is dropped inside a POP (Plaster of Paris) mould of a pot.

The prepared clay is poured in the mould.

The potter's wheel is rotated.

The rubber material is inflated.

Clay gets arranged on the inside of the mould,

After the pot is taken out of the mould once it dries.
Problem 4: Drudgery in cleaning and preparing Clay

Samir and Ahmad suggested an idea of giant blender to mix soil with water run by a regulated motor to reduce human effort needed in it. This will also reduce the chances of exposing bare feet and hand to sharp stones, grass stokes, etc. present in the soil being cleaned. The same machine can also be used for final preparation of soil which is done by hand. Schematic sketch of the idea is shown in Figure 13.
Problem 5: Effort and time needed in cleaning soil

Shireen from Delhi, could not go to field due to fever, however she discussed the process with Ahmad and her school teachers who went to field. She came up with an idea of multi level sieve filtration. The idea focuses on the step after mixing the soil with water, which is to filter it from impurities using a sieve. This concept has a multiple number of sieves filtering out impurities of different sizes at different stages and results in the finality of pure clay soil. Shireen later added the idea of recycling the water from purified clay mixture to reduce the water consumption. She also thought of combining the machine of making pots with it, thus starting from preparing clay to making pots can be mechanized with better efficiency. Schematics of these ideas are shown in Figure 14.

(III) Problem Identification
After the children workshop finished, Prajal mapped the problems to decide the critical link in the system.

Problem Mapping

Observation from the first field visit, problem identified and overview of the whole process of pot making were mapped using problem mapping method explained by Prof Shashank Mehta. Brainstorming exercise was carried out to categorize the various processes, entity and form their relation maps.
Prof Katherine Bisset-Johnson and Mr Hiranmay Mahanta suggested to identify that aspect of the process which when improved will have the greatest benefit for the users. It can be anywhere in the supply chain and process of making earthen pots, be it raw materials, method, equipments/ machines used or services part.

Prof. M P Ranjan emphasized to look at the participation of everyone related to the problem including government, the community or the market.
Problems

Pain in legs and fear of injury during meshing of soil to filter it.

Back pain due to again and again standing and bending to lift and keep the pots. (This is very common problem).

Pollution due to kiln

"Some say that it is an exercise for them to purify soil by legs while others say that they want to keep the business limited and need no advanced solutions to problems. These replies don’t show that they don’t need solutions but the point is they don’t expect any solutions. Since nothing has changed for years they think nothing can be changed in the future." As reported by Prajal.
2nd Visit to Fatehwadi

Prajal, visited Fatehwadi once again to understand the process in detail and problems faced by the potters. Here are excerpts from his interactions, as reported by him.

Conversation with a large producer

I would like to brief a few conversations that I had with them. First of all I talked with Mr. Mayur Prajapati. He was one of the biggest producers of pots in that area. He explained me the whole process of making pots in detail and answered every question I asked. When I asked him of the problems that he faces in his process or his daily life he was mute at the beginning but eventually he told me the problem of street light and no cement roads leading to a lot of dust. As he was a big producer, he was well equipped with all the machines making the process better, easier and faster.

He had also ordered a new machine costing around 135,000 rupees that would not only improve the quality of products but make the process fast. He showed me one product of that machine and it was really much better.

Conversation with a small producer

This conversation was very different from what I thought it would be. People with a small business not using any machines are satisfied with the amount of pots they produce and the income they get in return. They have all the essential resources and their children are getting good education. Another reason for not using machine is that purpose of exercise is also solved if they purify and plough the clay with bare hands and foot. A kid told me that he wants to clear 10th and do a diploma course. The girl said that she doesn’t want to study after 8th class. They also lived on a house on rent of rupees 2,500 a month.
Another potter said that they don’t have enough money to buy a machine and also they are not interested in expanding their business. Their production is sufficient for them and they also have limited workforce which restricts expanding business. These people were satisfied with what they do, earn, and their whole lifestyle. They didn’t have any cooler, fridge, television, washing machine etc. not because they can’t have it but because they don’t need it.

**Conversation with Kailash Ramesh, worker on monthly basis**

She was also happy with her work. She had learnt the art of making pots in her childhood as it was her father’s business. Her husband was working in tiles industry for about 6000 per month. She earned about 3500 rupees a month. They had a 12 year old girl and a 10 year old boy. She would work from 8 in the morning to 1 pm and then from 4 pm to 7 pm. In between she went home to look after her kids and serve them food.

**Ideas**

After understanding the problems, some probable solutions to these would be manually operated mixer, shoes with nails and electric mixer.

**Idea 1: Drum with cutters to mix soil**

A container or drum shaped device can be designed with cutters inside to mix soil and water. (Figure 19)

![Figure 19 Drum for mixing clay](image)

This is a container or drum type setup with a side that which when rotated would rotate the inner blades and mix the soil with water.

This setup can be used for mixing soil with water for purifying as well ploughing the soil for making pots.

It would also remove the possibilities of injuries due to mixing by bare legs.

Estimated cost would be around 1000 rupees.
Material used will be iron/aluminium/stainless steel/wood.

The dimensions of the container would be about 50*50*50 cm.

One person said that he had already tried this design and was not suitable as it required great effort and also the output was not that appropriate.

Another woman said that she was not sure that it would work. Also she was not ready to invest in this business and wanted to keep the business limited.

Feedback by Prof. Katherine Bisset Johnson:

The spinning of the drum would not work here as they need to break lumps of soil and make a thick solution of soil and water. Also they take the quantity of soil according to the need. Another problem is space shortage.

Idea 2: Shoes with studs/nails

These are special water proof boots with nails at the bottom to mix the soil with water. (Figure 20)

The strap of nails will be an attachment to the shoes and can be removed if not required.

The shoes will be made as comfortable as possible so that discomfort is not an issue.

The cost of the strap would be approx. 500 rupees.

(IV) Reviews by the people when this solution was showed to the users

This solution was also tried by them but it didn’t work because the shoe would get stuck in the mud and would not move. The shoe will get heavy and become even more problematic as said by them. The same was the review when this solution was asked to others there.

Idea 3: Manually operated hammer
This is more or less same as the first idea but instead of blades is a hammer that mix the soil with water. (Figure 21)

The same setup can also be connected to a cycle so that instead of hands, legs can be used and effort can be reduced to some extent if possible.

But including cycle would add up to the components used which would thereby increase the cost of the product. The dimensions of the container would be about 50*50*50 cm.

![Manually Operated Hammer](image1)

Idea 4: Electric mixer

This is a container with power operated fan inside to mix the soil with water. (Figure 22)

The fan would be attached to a motor of appropriate power.
This product would obviously be costly as it includes motor.

The dimensions of the container would be about 50*50*50 cm.

**Reviews by the people when this solution was showed to the potter**-

This machine is already there in the market but costs around 30,000 rupees and is not affordable to the people there. This machine is much more fast and efficient. But money is an issue and another issue is space. Since most people have limited space they can’t install machines and increase production as space shortage would be an issue.

These solutions would remove the possibilities of injuries and/or make the process faster.

**Reviewing existing solutions**

Some big manufacturers also use machines for this part of the process which is more efficient and fast. But the machines cost much more which is not affordable by the small manufacturers. (Figure 23)

This is an electrically operated machine costing about 30-35 thousand rupees. Its capacity is much more and filters about 40 *gamela* of soil at a time. The process is fully automatic and requires only one person for a short period of time to feed the machine with soil.

![Figure 23 Existing machine for mixing clay for cleaning](image)

**(V) Conclusion**

After interaction with potters at Makarba and Fatehwadi problems were noticed and ideas were presented by children. Later Prajal decided to work on potter’s problems. As he spent more time with the potters in Fatehwadi and discussed his ideas with them, he found these problems perceived by him and children do not seem to be the problem for the potters, and decided to document the process till now and stop working further on this.