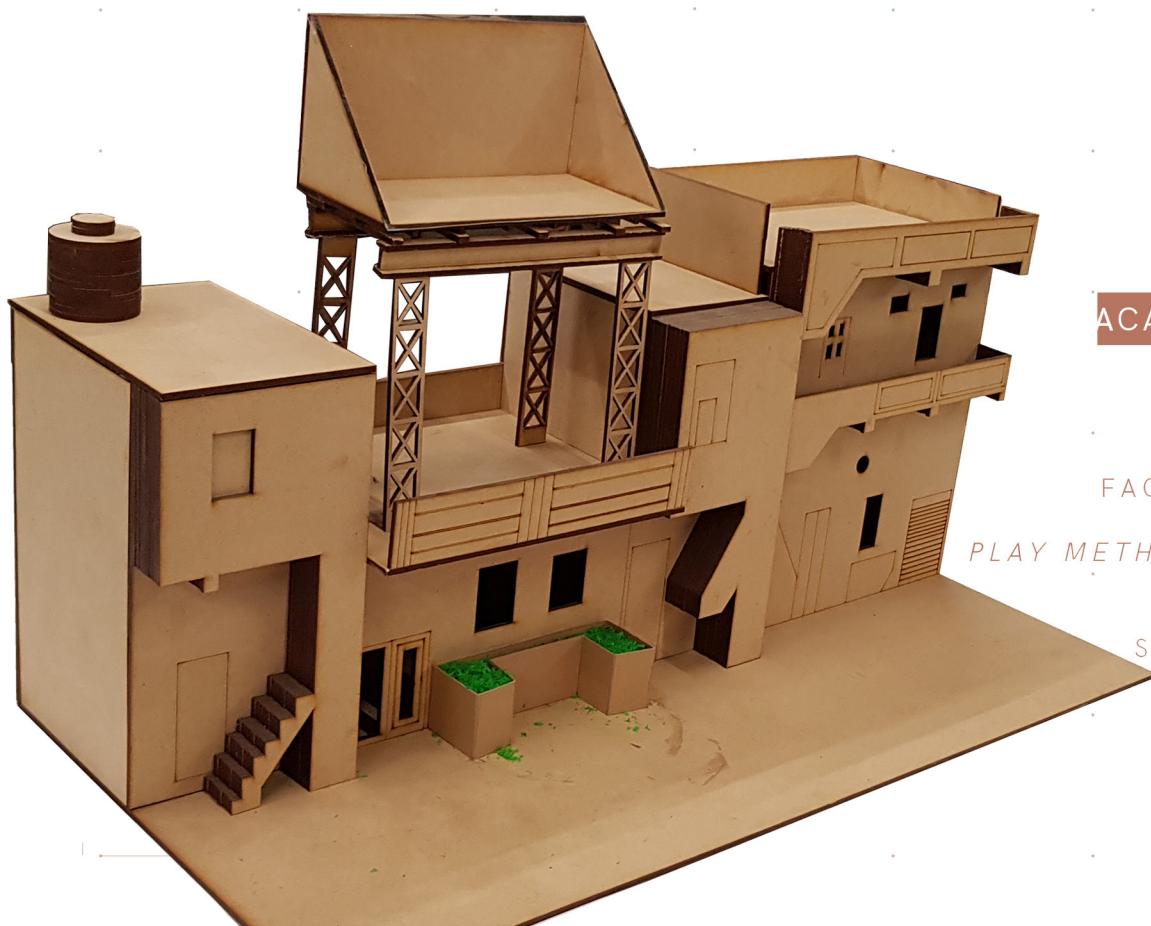


RITESH



ACADEMIC PORTFOLIO

B. URBAN DESIGN
FACULTY OF PLANNING
CEPT UNIVERSITY
PLAY METHODOLOGIES STUDIO

FACULTY:
SEBASTIAN TRUJILLO
KRUTI SHAH

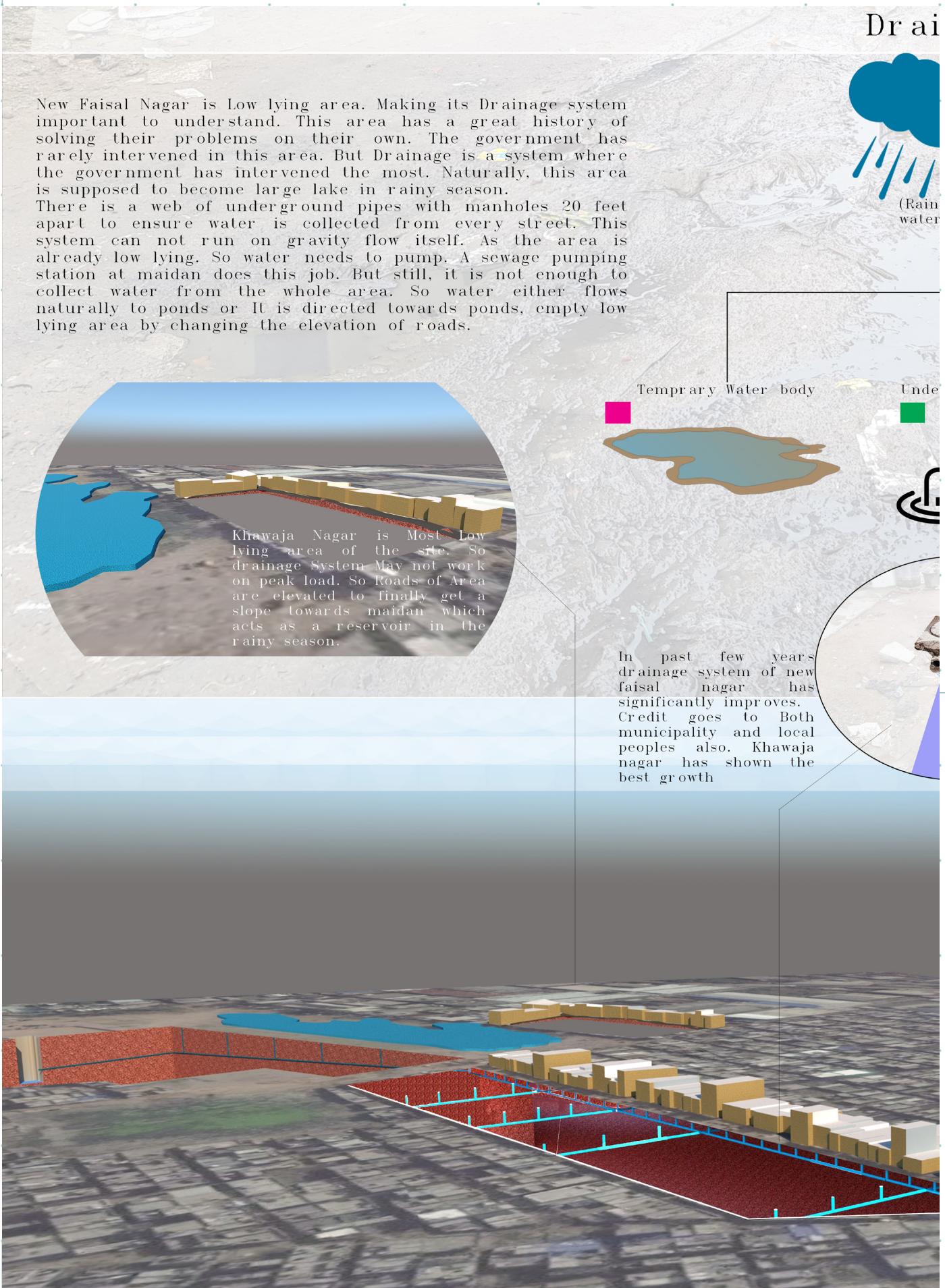
TA:
VIRAL LALWANI

MONSOON_2018

Mapping networks

New Faisal Nagar is Low lying area. Making its Drainage system important to understand. This area has a great history of solving their problems on their own. The government has rarely intervened in this area. But Drainage is a system where the government has intervened the most. Naturally, this area is supposed to become large lake in rainy season.

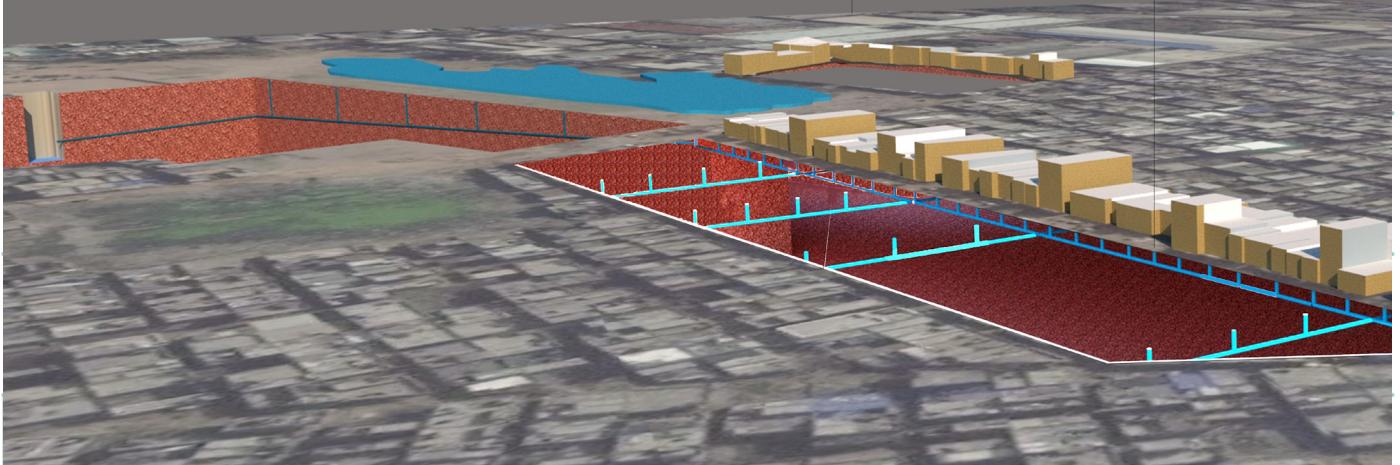
There is a web of underground pipes with manholes 20 feet apart to ensure water is collected from every street. This system can not run on gravity flow itself. As the area is already low lying. So water needs to pump. A sewage pumping station at maidan does this job. But still, it is not enough to collect water from the whole area. So water either flows naturally to ponds or It is directed towards ponds, empty low lying area by changing the elevation of roads.



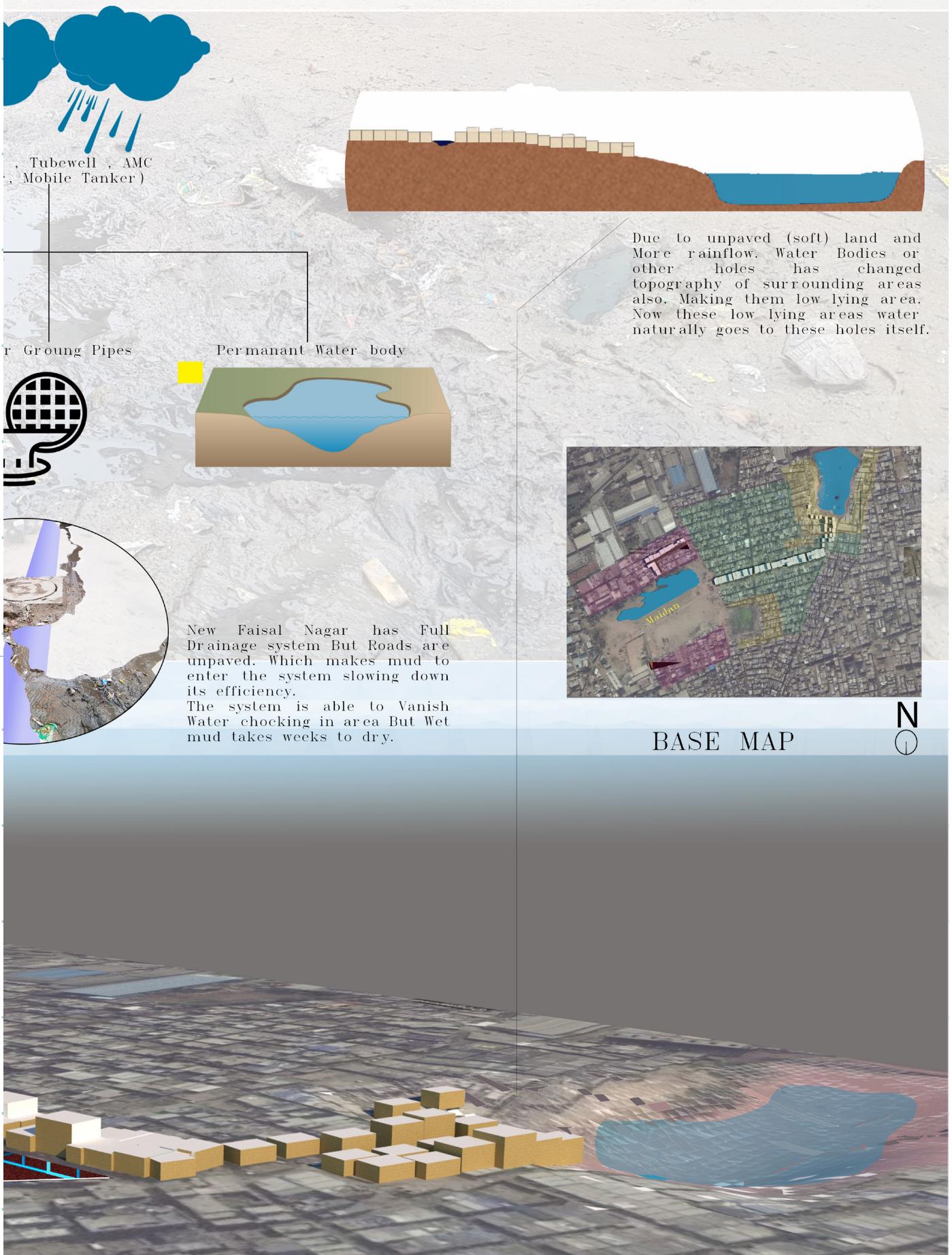
Khawaja Nagar is Most Low lying area of the site. So drainage System May not work on peak load. So Roads of Area are elevated to finally get a slope towards maidan which acts as a reservoir in the rainy season.

Drainage Network: Rainwater (blue cloud icon) enters through underground pipes (blue lines) and manholes (yellow dots). It is collected in temporary water bodies (pink squares) and eventually directed towards permanent water bodies (green squares).

Improvement Note: In past few years drainage system of new faisal nagar has significantly improves. Credit goes to Both municipality and local peoples also. Khawaja nagar has shown the best growth.



Drainage System



SEPTEMBER 24 > NOVEMBER 24 ~ 2018

Emerging Possibilities

>This module is about the designing a solution to some major problems of site. Through urban design intervention. So there was the great issue in area regarding water management. Availability of water, quality of water, Distribution of water, management of waste water, And drainage system. As water is key problems in all the slums around the world. So Urban design intervention can tackle such a great problem of the site.

INITIAL IDEAS

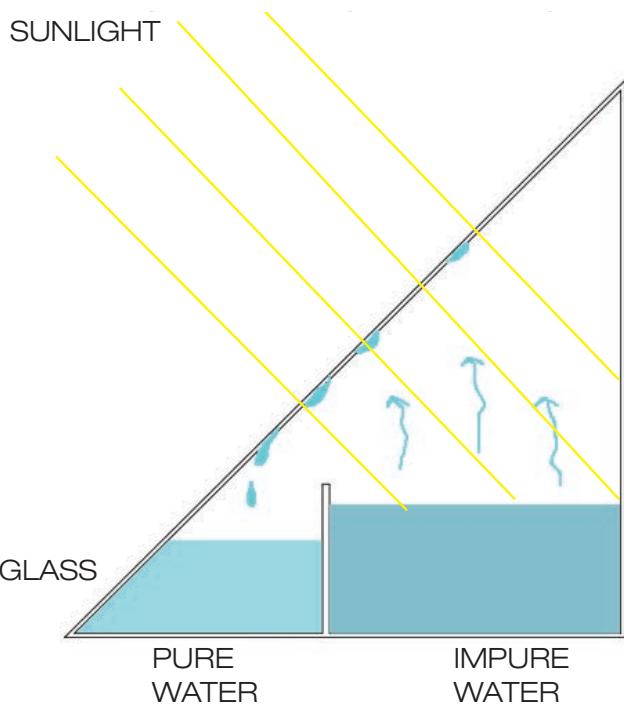
- Distribution of water via roller car.
Weight of water will help to build the uniform topography of area with time.
- Developing an open drainage system
Underground drainage system is not working anymore.
- Drinking water system for public

Public drinking water system

Why?

As availability of drinking water is rare in area, as compared to other problems. Because drainage system is well developed in area comparatively. And water supply is also in reach of all houses by open pipes. Although the situation is not very good. But drinking water is worst. People have to bring household water without any treatment. And water available in area is highly contaminated by chemicals. Killing peoples in area every year.

WATER PURIFICATION



In a solar still, impure water is contained outside the collector, where it is evaporated by sunlight shining through clear plastic or glass. The pure water vapor condenses on the cool inside surface and drips down, where it is collected and removed. Distillation replicates the way nature makes rain.

Initial Model

>It is a modified solar water still. Which is made by metal, and combination of glass and mirrors is used to increase the efficiency of the still. Also a sitting space for community is on the front of the device. It is a mobile device which can be manufactured and brought on the site later.



> After some research and understand of solar still working and process. It was found that size of device can be further decreased. And Lens and mirror will actually decrease the efficiency of still.

SITTING SPACE
SITTING SPACE IS DESIGNED TO HAVE SHADE DURING MOSTLY SUNNY HOUR.

BRIEF...

SOLAR WATER HUT IS A TEMPORARY STRUCTURE. IT'S BASICALLY A SOLAR WATER CYCLE ESPICALLY DESIGNED FOR NARROW STREETS OF FAISAL NAGAR. THIS WORK ON PROCESS OF EVAPORATION AND CONDENTATION. SUNLIGHT INCREASE THE RATE OF EVAPORATION. ALSO IT WILL ALSO BECOME COMMUNITY SITTING SPACE. IT IS DESIGNED STRICTLY BASED ON SUN PATH OF AREA. MIRRORS AND LENS SHOULD GET MAXIMUM SUNLIGHT WHILE SITTING AREA SHOULD GET MINIMUM SUNLIGHT. SITTING AREA SHOULD FACE SOUTH OF WEST TO MAKE THE DEVICE WORK EFFICIENTLY.

CONVERGING MIRROR
C SHAPE MIRROR WILL DEFLECT SUNLIGHT ON A ROD PLACED AT ITS FOCUS AND ROD WILL DEFLECT IT TOWARDS METAL SHEETS BELOW. WHICH WILL HEAT UP AND WILL INCREASE THE RATE OF EVAPORATION.

CONVERGING LENS
LENS WILL DEFLECT SUNLIGHT DIRECTLY ON METAL SHEET. LENS WILL FUNCTION MORE EFFICIENTLY AT NOON. WHILE MIRROR WILL FUNCTION MORE EFFICIENTLY IN EVENING.

TRANSPARENT SHEET
IT IS INCLINED ON AN ANGLE SO THAT WATER DROPS ACCUMULATED BELOW SHEETS FALL DOWN IN CONTAINER.

METAL SHEETS
METAL IS GOOD CONDUCTOR OF HEAT. EVENLY DISTRIBUTED HEAT WILL INCREASE THE RATE OF EVAPORATION.

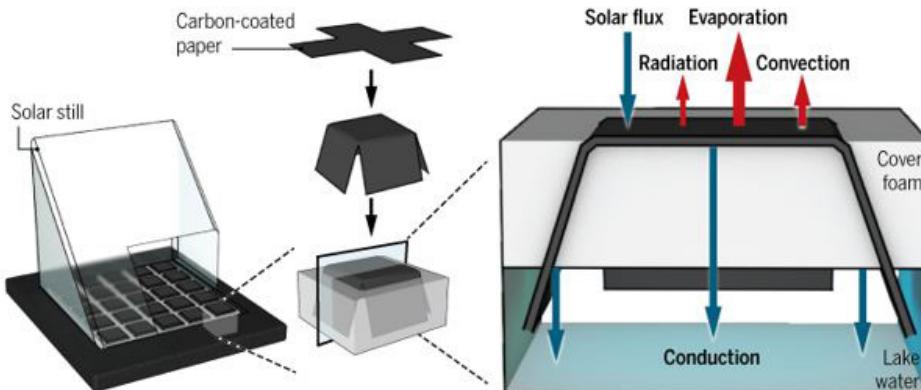
SUNRAYS

WATERDROPS

EVAPORATION

Time Problem

New device was developed in limited time after the feedback to old device and doing some research on basic process of filtration. Also new device should focus not only on water filtration but also on urban spaces. How will the devise affect urban spaces is crucial.



A solar still is made by placing carbon-coated paper (center) atop sections of a polystyrene block that floats on a water source to be purified (left).

Water wicks up the ends of the carbon-coated paper to the top surface. Incoming sunlight evaporates water that is collected for drinking.

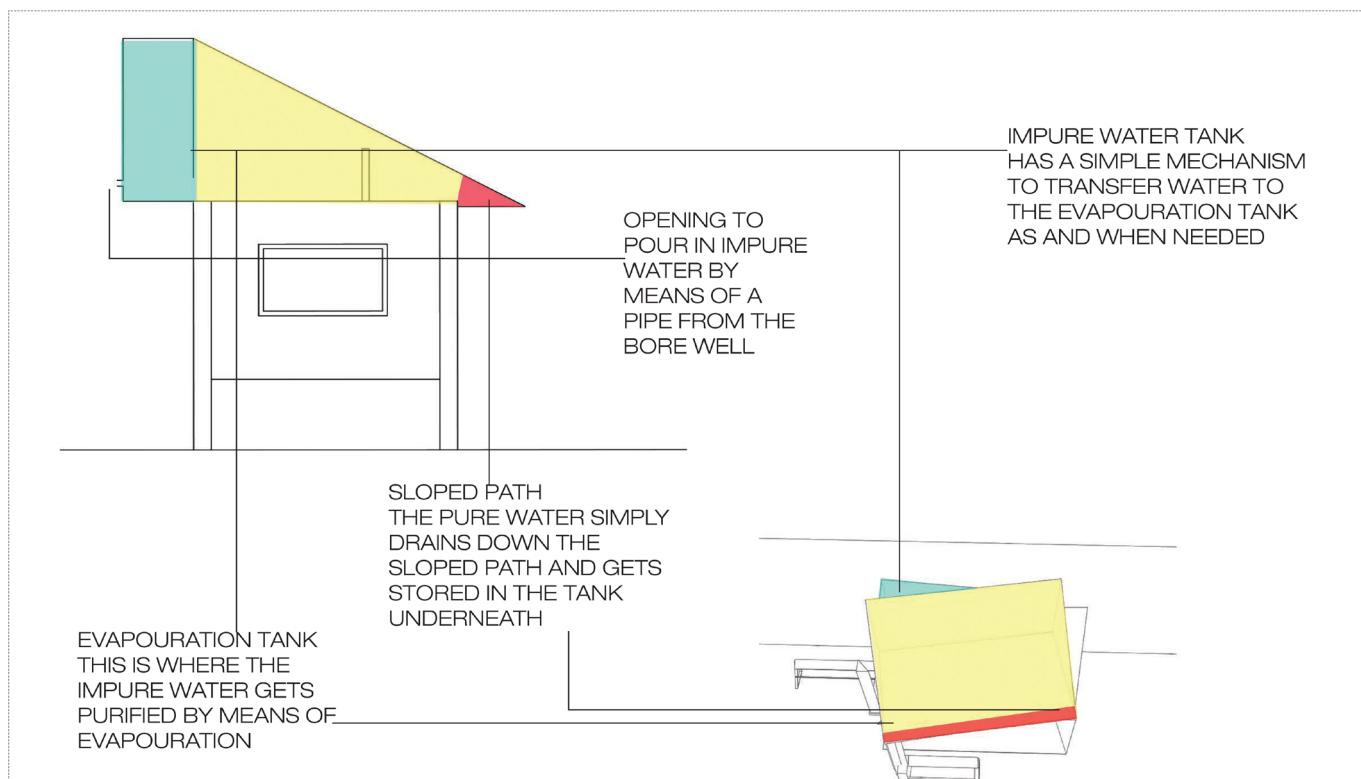
Fundamental working of highly effecient solar still.
(Technology and picture credit Sunny Buffalo)

>As an old device was using a lot of space on ground. the new device is lifted up giving a great sitting space below. Where the flexible design of benches can be implemented, which means oreantation of benches is flexible. Also, the whole device is made madular. Each component of the device is the seperate unit. And traingular allows changing the orientation of the main filtration device towards the sun.



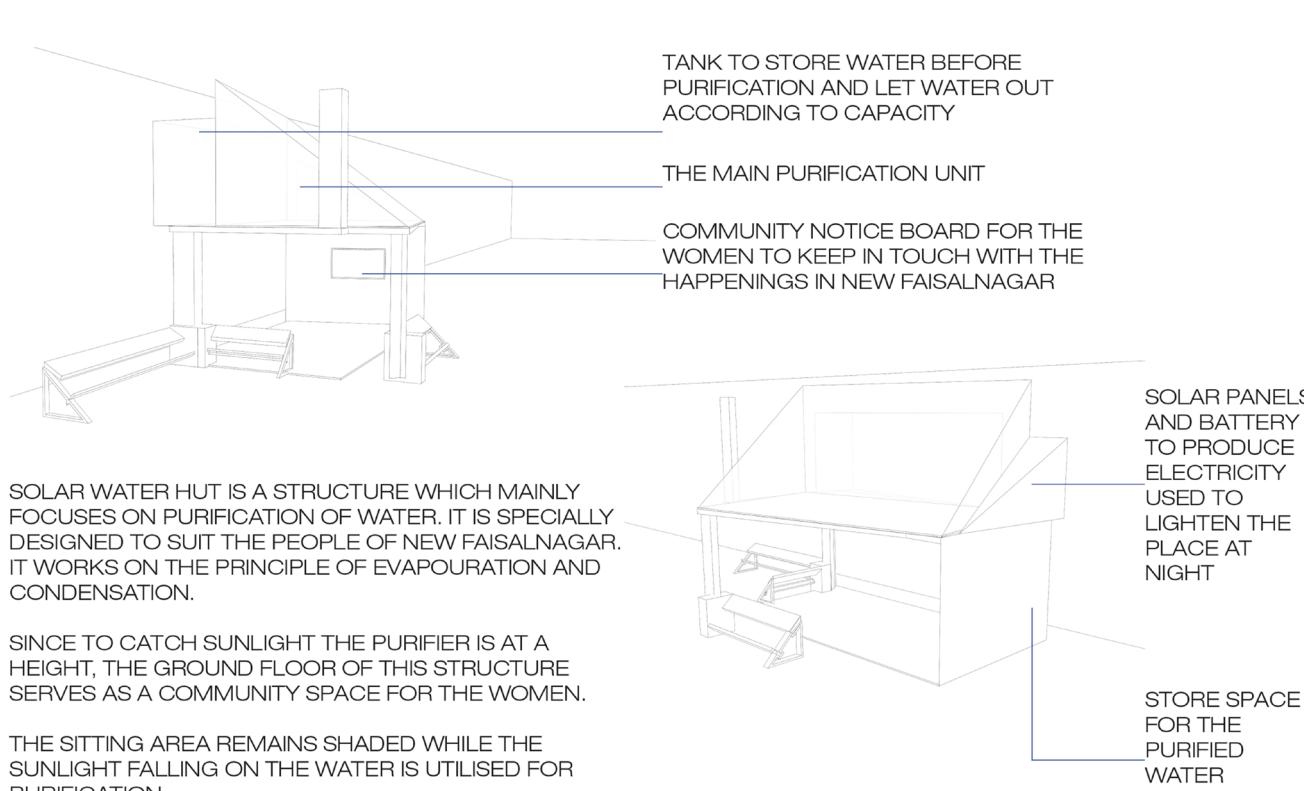
Sketch up model of device

Buff board model of device



>INSTRUCTIONS

SOLAR WATER HUT



SOLAR WATER HUT IS A STRUCTURE WHICH MAINLY FOCUSES ON PURIFICATION OF WATER. IT IS SPECIALLY DESIGNED TO SUIT THE PEOPLE OF NEW FAISALNAGAR. IT WORKS ON THE PRINCIPLE OF EVAPOURATION AND CONDENSATION.

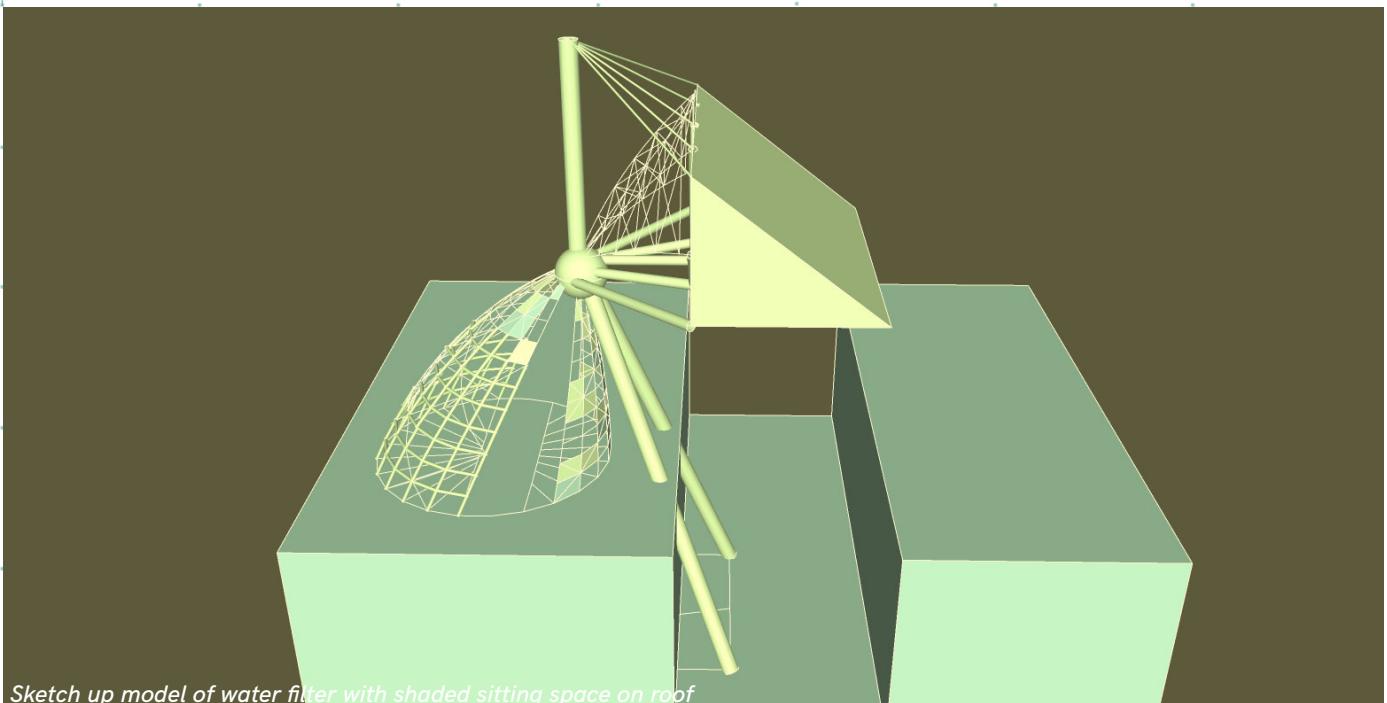
SINCE TO CATCH SUNLIGHT THE PURIFIER IS AT A HEIGHT, THE GROUND FLOOR OF THIS STRUCTURE SERVES AS A COMMUNITY SPACE FOR THE WOMEN.

THE SITTING AREA REMAINS SHADED WHILE THE SUNLIGHT FALLING ON THE WATER IS UTILISED FOR PURIFICATION..

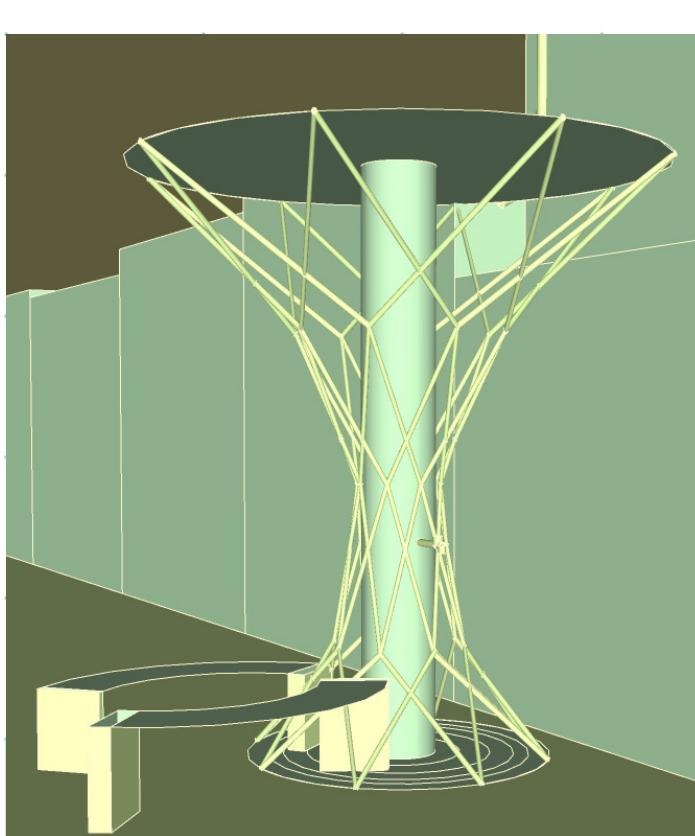
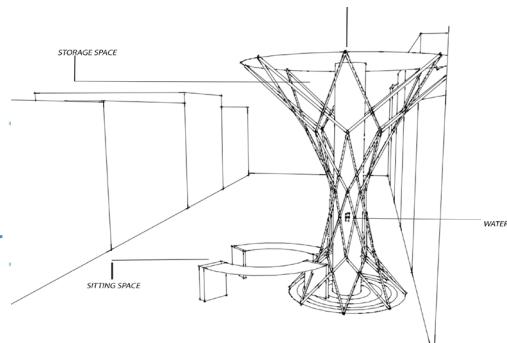
>USES

SOLAR WATER HUT

Intermediate review



Sketch up model of water filter with shaded sitting space on roof



Sketch up model of water dispenser



Buff board model of water dispenser



HOUSEWIVES

THE PLACE WOULD HELP
HOUSEWIVES STAY AWARE OF
WHAT IS HAPPENING AROUND
THEM. IT WOULD MAKE THEM
MORE CONFIDENT AND
CONNECTED



WATER SUPPLIER

THE STRUCTURE WOULD MAINLY
BELONG TO THE WATER SUPPLIER. IT
WOULD BOOST HIS INCOME



YOUNG GIRLS

JUST LIKE THE HOUSEWIVES, THE
PLACE WOULD BE A MEDIUM TO
CONNECT WITH THINGS HAPPENING
IN THE COMMUNITY AND OUTSIDE



YOUNG BOYS

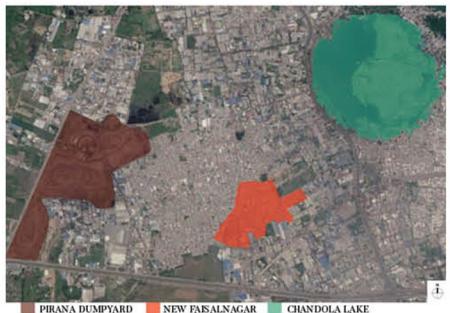
IT WOULD BE A PLACE FOR THE BOYS
WHO ARE SERIOUS AND RESPONSIBLE.
IT WOULD HELP THEM CONNECT WITH
THEIR SURROUNDINGS AND POLITICS.



Prefinal review

BACKGROUND

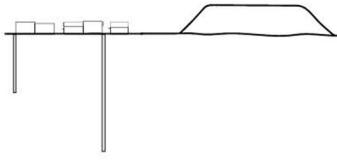
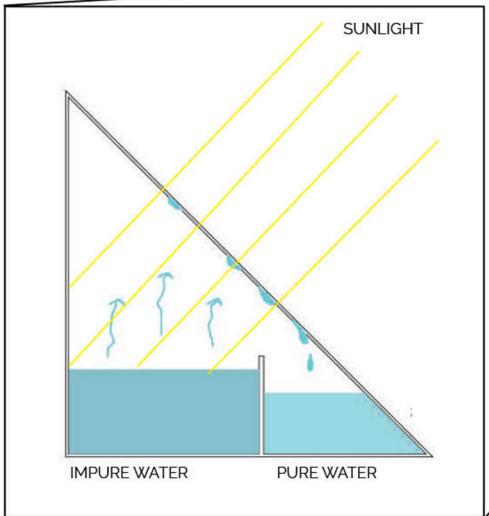
In 2002, following the infamous riots, many communities started living on the outer edge of Ahmedabad. New Faisalgardar is among those many localities. It is situated dangerously close to Pirana. Among the most urgent problems faced by the residents is that of availability of water.



PRESENT WATER NETWORK

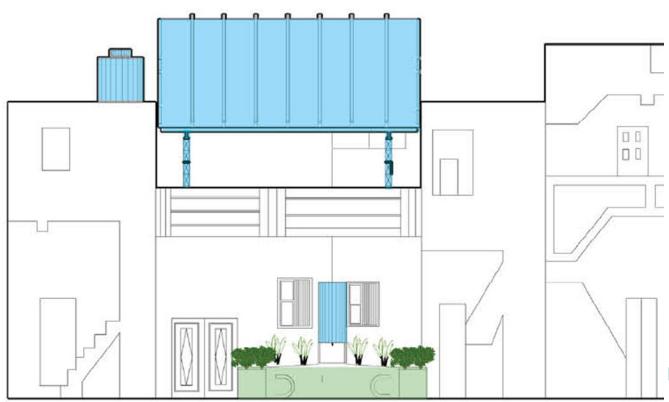
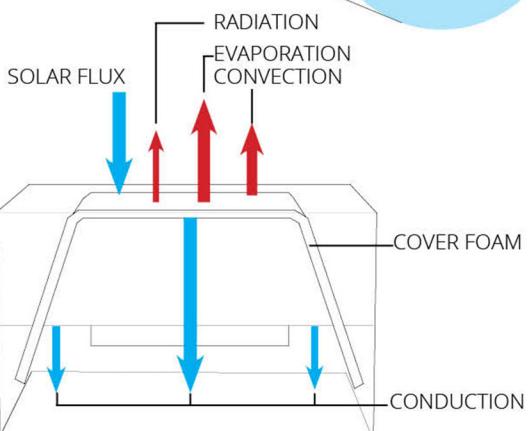
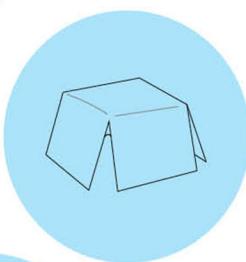
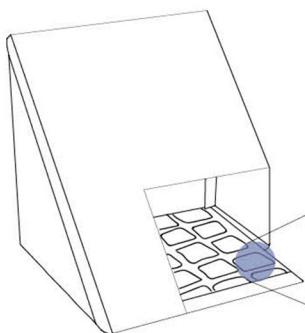
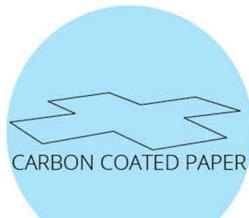
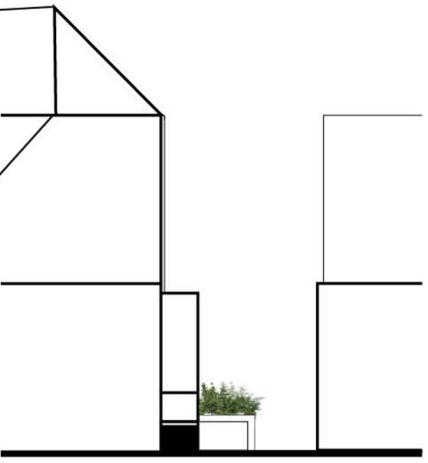
The existing system of water supply is mostly run by private suppliers and the mosques of the area. AMC supplies to a small number of houses. The main source of all the suppliers is groundwater collected from the borewells. The quality of water from the borewells is very low. The water mostly has colours and chemicals which lead to a lot of health issues

SOLAR STILL WORKING

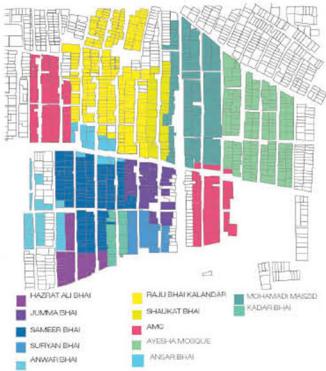


EFFECT OF PIRANA ON GROUNDWATER

Many harmful chemicals from the nearby Pirana dumpyard seep into the soil with rainwater and contaminate the already low water table heavily.



STA



WATER DISTRIBUTION

Many borewells in the locality are just 100 feet deep and serve poor quality water. Only a few borewells are more than 160 feet deep and have approved water quality.

The existing methods of distribution also involve a lot of wastage of water. In many lanes a single running pipe is handed down from door to door. In others, garbage is dumped near the taps and the borewells.



PROPOSED DESIGN FOR WATER POTABILITY

The proposed design consists of a water filter unit and a water dispenser with a sitting space. The filter works on sunrays and the water dispenser works on scanning the RFID tags on the water bottles owned by the families.

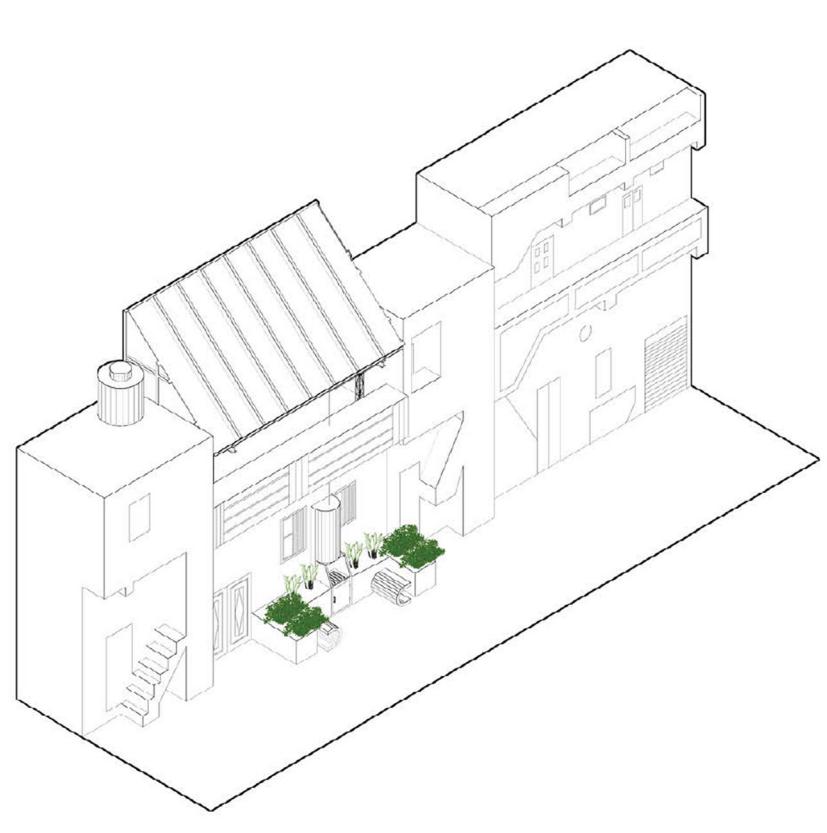


KEHOLDERS



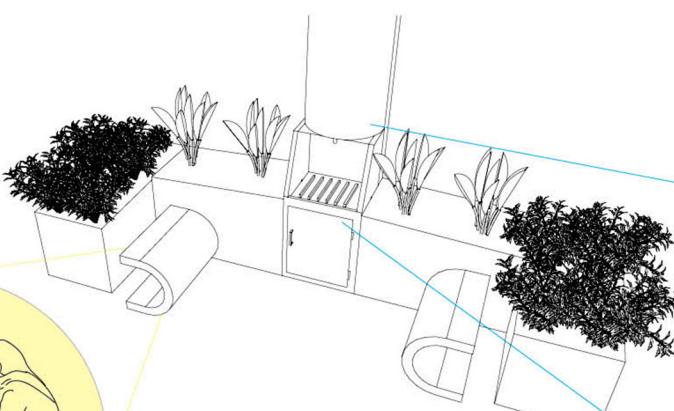
BOREWELL OWNER

The device is owned by the water supplier. The filter is proposed to be set up on the roof of his house.

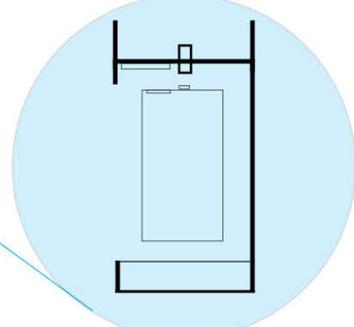


HOUSEWIVES

The housewives would come to collect water from the dispenser in their tagged bottles. The place would also serve as a gathering space for them.



The sitting space near the water dispenser would also act as a gathering space for women.



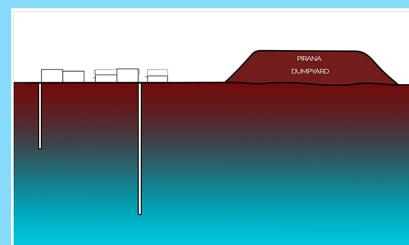
The 15l bottles (one per family) would have RFID tags on them. The dispenser would scan these and hence give water in a controlled manner. The automatic system would rule out the possibility of one family taking more water than the other family.







BACKGROUND
In 2002, following the riots, many communities started living on the outer edge of Ahmedabad. New Faisalganagar is one of the many localities. It is situated dangerously close to Pirana dumpyard. The most urgent problem faced by the residents is that of availability and quality of water that they get from the borewell owners.



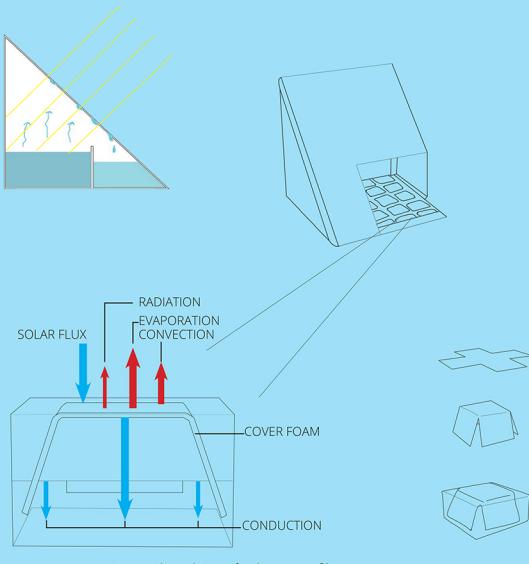
EFFECT OF PIRANHA
Many harmful chemicals from the dumpyard seep into the soil and already low water table of the area. The network of water supply is most players and the mosques in the area also supplies to a small number of source of all the suppliers is ground water. The color and chemicals which lead to the pollution are not known.

Final review

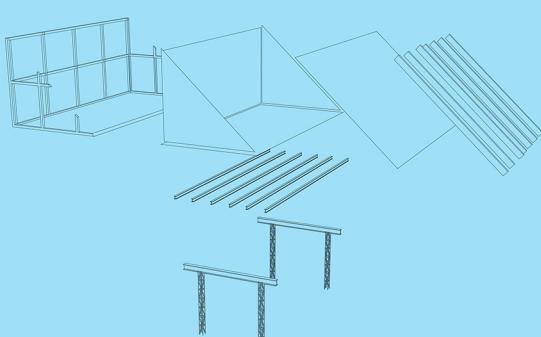
Aim

Our objective is to provide portable water to people of Faisal Nagar. We aim to design a device which is sustainable and cost effective. It should be easily made with locally available resources. Device must be multifunctional which also enhances public gathering. It should reach out to maximum number of people. The device was designed keeping in mind previous attempts at similar ideas and learning from their failures. The aim of this system of multiple such devices is to provide water to a thousand people per day across the site. The principle used in the design is that of the solar still. Due to technical advances the efficiency of the solar still has increased dramatically from its more primitive counterpart. It can be locally manufactured without much technical knowhow from existing materials. A single unit of the solar still can purify 150 l of water per day. For optimum sunlight the solar still is proposed to be kept on the roofs. The houses of the borewell owners are ideal because of the proximity to the borewell and the solar still. By this semi private project, we can create a very healthy impact on the crumbling water network of the area.

Function

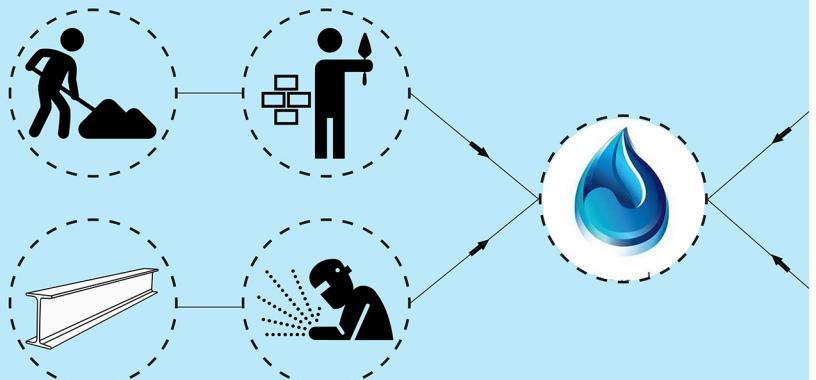


Internal working of solar water filter



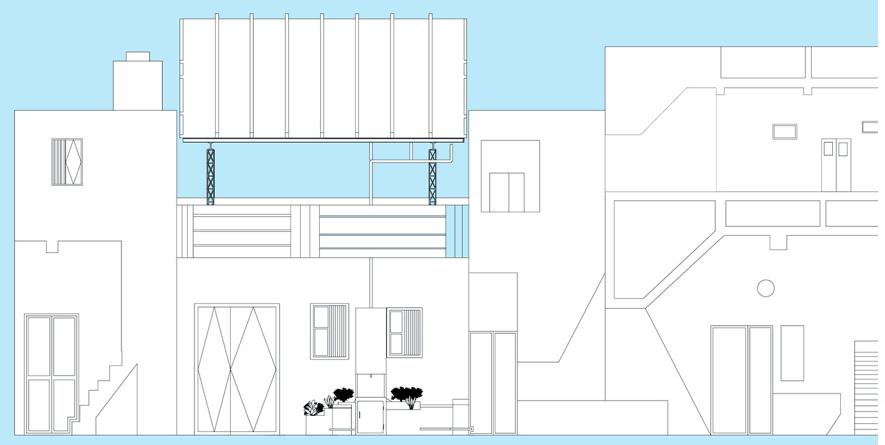
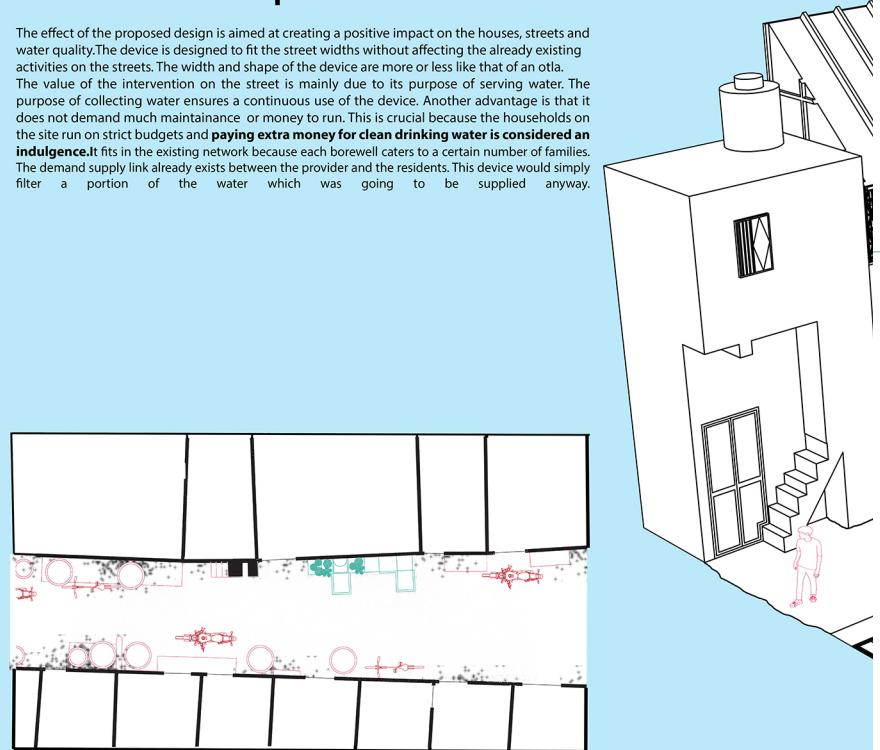
External Structure of Solar water filter

Implementation



Site Development

The effect of the proposed design is aimed at creating a positive impact on the houses, streets and water quality. The device is designed to fit the street widths without affecting the already existing activities on the streets. The width and shape of the device are more or less like that of an otla. The value of the intervention on the street is mainly due to its purpose of serving water. The purpose of collecting water ensures a continuous use of the device. Another advantage is that it does not demand much maintenance or money to run. This is crucial because the households on the site run on strict budgets and **paying extra money for clean drinking water is considered an indulgence**. It fits in the existing network because each borewell caters to a certain number of families. The demand supply link already exists between the provider and the residents. This device would simply filter a portion of the water which was going to be supplied anyway.

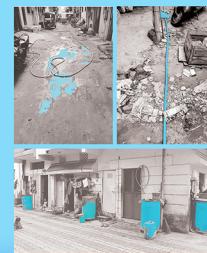


The nearby Piarana area is heavily contaminated by private borewells. The existing water supply is run by private houses. The main source of water is from borewells. The quality of water mostly has a lot of health issues.



WATER DISTRIBUTION

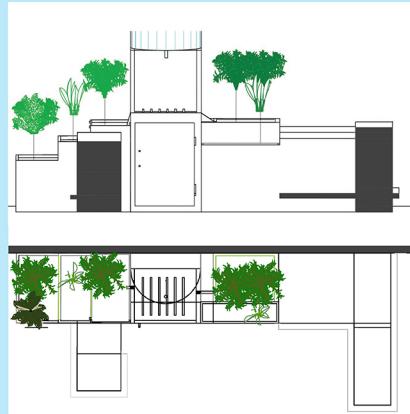
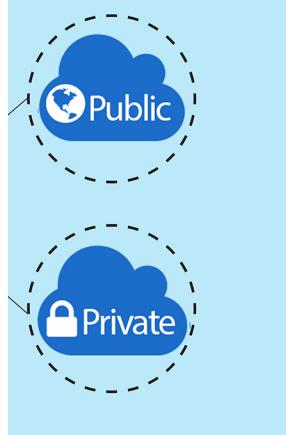
Many borewells in the locality are just 100 feet deep and serve poor quality water. Only a few borewells are more than 160 ft deep and have approved water quality. The existing methods of water distribution also involve a lot of wastage of water. In many lanes, a single running pipe of water is handed down from door to door. In others, garbage is dumped right near the taps and borewells.



Proposed Design And Water Potability

The proposed design consists of a water filter unit and a dispenser with a sitting space. The filter works on sunrays and the water dispenser works on scanning the RFID tags on the water bottles owned by the families.

Space design

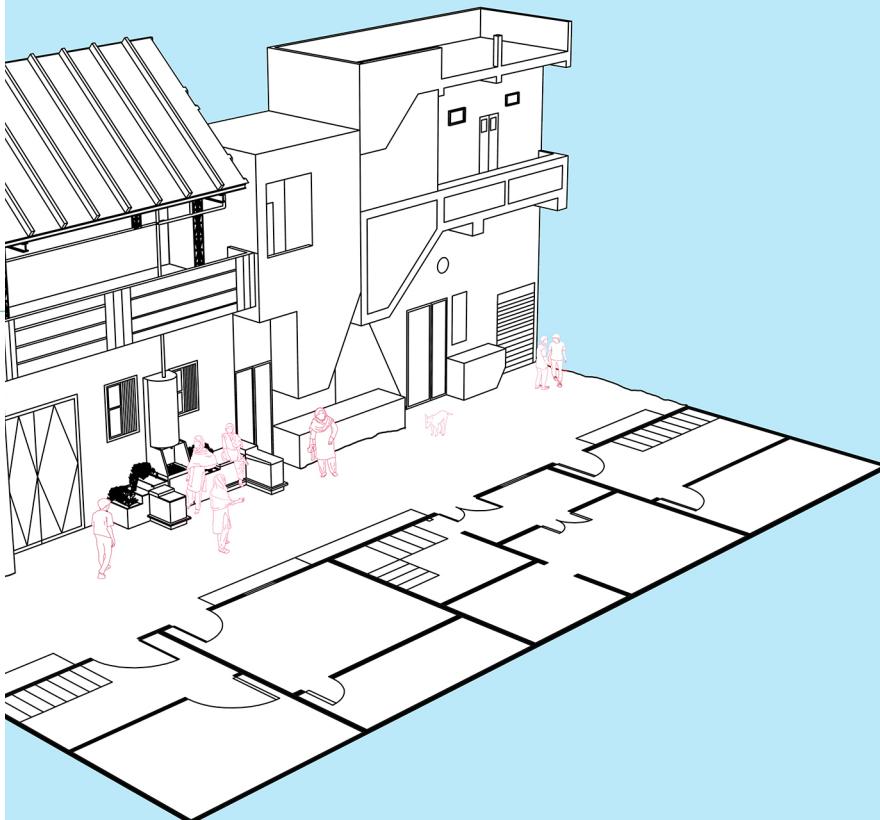
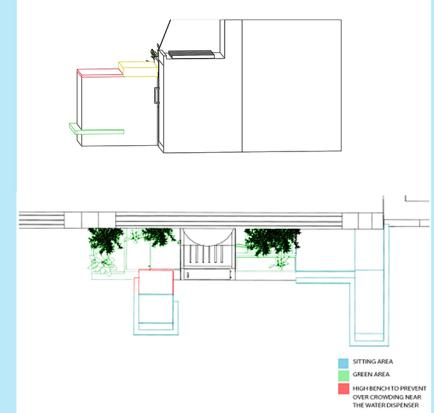


The sitting space around the water dispenser has some plants to create a buffer between the extra water runoff and the street. The water which drains off gets channelised to the flower beds and thus does not create muck on the unpaved road below..

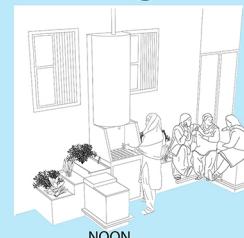
The sitting area near the water dispenser has an unlevelled seating platform. This is done to discourage people from using the sitting space as a table or all to themselves.

The sitting space is provided with foot rests. This would create a comfortable experience and also allow people with different heights to sit comfortably.

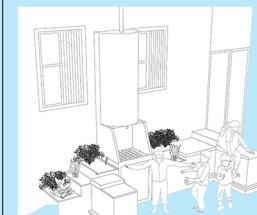
The sitting space has plants closeby. The benches and plants are arranged to ensure clean sitting spaces despite plants nearby. The red platform is kept high so that the area near the water dispenser is free of congestion.



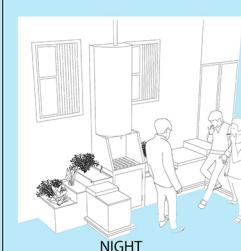
Timing



NOON



EVENING



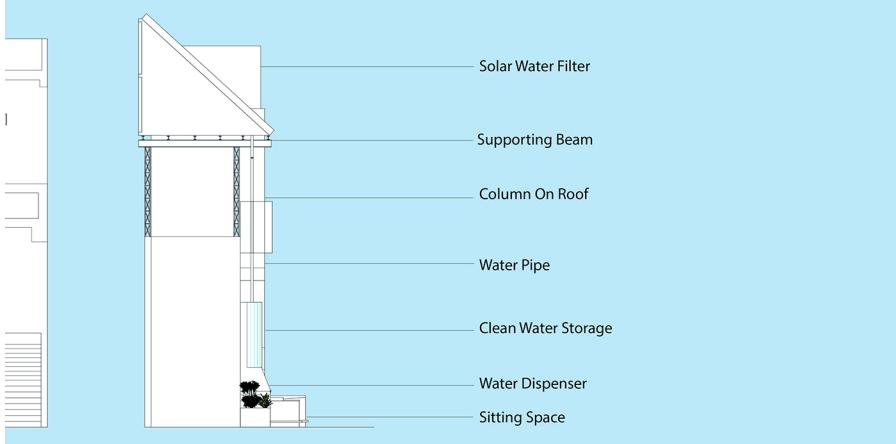
NIGHT

Since the device runs on solar energy, water is available from mid day onwards. That is when the ladies would come to collect water and unwind. It would act as a gathering space for them. The ottas in front of their houses are generally occupied with water storage containers. This place would be ideal for them to meet each other and talk.

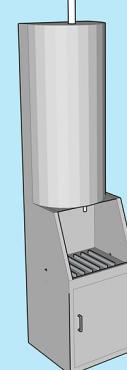
The evenings would have a lesser number of women than during the day because they would be busy preparing dinner. This time the area would be free for children to play. Many times, girls after a certain age and very young kids are not allowed to play further away from their houses. This could act as a playing space for them.

At night, the water dispenser would no longer function, but the sitting area could still be utilised by men, women and children alike. This place would be nearer to the houses than the shops and maidan. Maybe some vendors could specially flock their at night to sell eatables. A chain reaction could be created to attract people to the residential streets at night and thus make them safer.

Distribution



The dispenser has a tap and a scanner to scan the RFID tags on the bottle and give water accordingly. The storage in the water dispenser has a capacity of 250 l of water. The dispenser has outlets for split water to be channelised to the flower beds nearby. The tags and the scanner are a way to rule out the possibility of one family taking more water than the other. The automatic system would tackle the problem of favouritism and informality in the existing water network.



One RFID tag would be stuck on the bottle to be scanned. The tag would operate once a day and would be recharged only after a gap of 24 hours. The tag would act like a censor against water theft and hooliganism. One customised bottle of capacity 15 l would be given to each family with the RFID tag on them. Without the RFID tag the dispenser would not give water.



