Report on Urbanization and its impacts on water availability in Aliabad village in Hyderabad

Submitted To: SaciWATERs

INTRODUCTION:

Aliabad village is situated around 30 kilometres from Hyderabad in the Rangareddy district of Andhra Pradesh. It is located near Shamirpet Lake which was used as the source of water for the village and also for the city but with the changing land use patterns and climate change patterns the lake which was earlier 486 ha in 1989 has shrunk to 256.77 ha in 2006. Due to rampant construction activities around the lake, the catchment areas of the lake are blocked and also the capacity to recharge ground water has reduced due to low surface area availability for water to percolate which has resulted in the ground water table level going down. This has posed a huge challenge for people dependent on natural resources for their occupation to survive and has resulted in the transition from primary to secondary and tertiary occupations. Also the development of real estate activities around the lake has put much stress on the already decreasing water resource and lake water is being polluted by effluents released by the industries. So, with increasing scarcity of water, then it might become a cause for the conflict because the social and economic factors will affect the access to water due to which there may arise some kind of competition among different communities regarding access to water. This can also result in a shift in livelihoods as agriculture will no more be a viable option for people so they sell their land and migrate to the cities or get engaged in some different occupation.

a. Background

Aliabad is a village in the Shamirpet mandal of Rangareddy district of Andhra Pradesh. It has a total of 1502 households (key informant interviews) comprising of various castes comprising the Mudiraj, Padmashali, Reddy, Yadavs and a significant proportion of Scheduled Castes.

In Shamirpet mandal the largest users of water are general households for drinking and cleaning purposes and farmers for agriculture and rapidly developing residential and commercial enclaves such as Genome Park, ICICI Knowledge Park and special economic zones (SEZs).

In Aliabad farmers have been depending on Shamirpet Lake for irrigation which brings water to the village through a channel, but since last few years due to insufficient rains

and rapid real estate development on the catchment area of the lake, it has never filled up to the earlier levels and this has resulted in scarcity of water for agriculture. To overcome this problem farmers have installed bore wells up to 400 ft deep to supplement their water needs which has resulted in increased pressure on ground water and a fall in the water table. Now people are facing severe scarcity of water for drinking purposes and this condition has been worsened by the increasing pollution levels in the ground water especially due to the release of effluents by industries located nearthe village. According to the villagers some of these companies pump their untreated wastes into the ground which is causing degradation in the quality of ground water and has made it unsuitable for drinking.

Keeping this fact in mind many people have opened up water purification plants that are based on the principle of reverse osmosis. It serves as the major source of drinking water for the villagers as they are left with no other option than buying and using purified water for drinking purposes.

Our study is done to see how the Shamirpet Lake has transformed over the years and what is various water sources in the village.

Table 1. Village profile of Aliabad (according to 2001 census):

Village Profile					
State:	Andhra Pradesh	District:	Rangareddi		
Sub-district:	Shamirpet	Village:	Aliabad		

Area details	
Area of village (in hectares)	1,051
Number of households	912
Population data based on 2001 census	
Total population – Persons	4,504
Total population – Males	2,451
Total population – Females	2,053
Scheduled castes population - Persons	298
Scheduled castes population - Males	155
Scheduled castes population - Females	143
Scheduled tribes population - Persons	29

Scheduled tribes population - Males	17
Scheduled tribes population - Females	12

Land use (Two decimal) in hectares	
Number of forest land	119.79
Number of government canal	0
Number of private canal	0.00
Well (without electricity)	0.00
Well (with electricity)	2.91
Tube-well (without electricity)	0.00
Tube-well (with electricity)	46.13
Tank	130.79
River	0.00
Lake	0.00
Waterfall	0.00
Others	0.00
Total irrigated area	179.83
Unirrigated area	0.00
Culturable waste (including gauchar and groves)	500.00
Area not available for cultivation	251.38

b. Aliabad : An agriculture based peri-urban village

Maximum numbers of farmers in the village follow their ancestral practice of growing paddy. They do not practice organic agriculture. Cultivation of paddy begins with the onset of monsoon season when field is ploughed and made free of any weeds, simultaneously rice seedlings are grown in the nurseries any new method of seedling growing viz. Dapog method or SRI [system of rice intensification] is not practiced. Rather the conventional method is followed. After 25-30 days of sowing seeds in the nursery, seedlings get ready for transplanting into the field, mostly by manual labour in the main fields after which the fields are flooded with water from canals or bore wells.

Comment [V1]: Revise the statement to frame better

At the maturity of crops they are harvested by harvester or manually, then the uncut roots of previous crops are left to get dried and after some time they are burned so as

to facilitate uprooting of these roots at the time of ploughing. Then the land is irrigated by water and field preparation for next crop cycle begins again.

In Aliabad farmers grow paddy two times a year depending on the source of water. If they have assured supply of water they grow paddy twice in a year and if not the only once a year.

c. Drinking water sources of Aliabad

The various sources of water in the village through which people get water for drinking purposes are:

i. Gram Panchayat supply by overhead tanks through pipeline

Gram Panchayat had built overhead tanks and sumps at two places in the village, near the market there was an overhead tank earlier but due to ever increasing water requirement they constructed another overhead tank just opposite to the road, and other one in the SC colony. They fill these tanks by bore wells and supply water to the nearby areas through direct pipeline connections inside the house or to the common stand post or common taps.

ii. Gram Panchayat installed bore wells at places

These bore wells were installed to supply water to a few houses, generally when electricity is available someone from the households switch on the motor and get water as per their use and then again switches off the motor. These bore wells were operated by the household members themselves and served to small parts of village separately

iii. Individually installed bore wells by villagers in their homes

Some of the villagers who were economically good have installed bore wells inside their houses and get water as per their requirement.

iv. Pipeline from Ramalayam

There is a pipeline at the starting of SC colony that comes from the Ramalayam temple that is across the fields, it supplies water twice a day - morning and evening, some people use this water for drinking purposes as they say it is not as much polluted as the rest of village.

v. Water from purification plants

There are 5 water purification plants in the village they all sell purified water to the villagers mostly for the drinking purposes. Currently they are selling water @ Rs 5/20 litre. Most of peoples in the village have to buy water from these plants as the ground water has become too much polluted and unsuitable for drinking purposes.

Figure 2: New overhead tank

Figure 1: Old overhead Tank

Figure 3: Overhead tank in SC colony

Figure 4: Water at Ramalayam

d. Research problem

How urbanization has affected the accessibility of water in the village?

- How the socio-economic issues affecting the access to water in village?
- How water accessibility affecting livelihoods of people?
- How this problem of water insecurity is being addressed by the community?

e. Objectives

- To understand the current farming practices and irrigation systems in Aliabad.
- To see effects of developmental activities around Aliabad on agricultural practices and water access over time.
- To understand the farmer's perception about climate change.
- To understand the availability and distribution of water in SC colony of the village.
- To study gender issues affecting access to water sources.

f. Methodology:

Methodology involved was based on the research questions:

- a transect walk in the village to observe the different water resources and water supplying systems and to observe how people are involved in different activities for their livelihood.
- individual household survey with questionnaires and we covered nine general households which includes eighteen questionnaires to get the information about the water access.
- We did individual household survey with questionnaires in the SC colony and we covered sixteen households during the field stay which includes thirty two questionnaires to get the information about the water access and whether it is fulfilling their daily needs in the SC colony.
- We had planned to have four Focussed Group Discussions with the farmers to gather information about effect of urbanization on land use patterns, how it is affecting their livelihood and information about the transformations in the Shamirpet Lake. But, as it is the harvesting season the farmers could not turn up for the meeting some times. Hence, we had ended up with three focussed group discussions.
- agriculture field visits every day for some time to understand the current farming practices and to gather the information about water availability for irrigation and about the Shamirpet Lake.
- We had visited to Shamirpet Lake twice to observe the lake and the present condition and to understand the water distribution network from the lake to the fields for irrigation and how it has changed over the years.

1. Farming practices in Aliabad and irrigation systems

Maximum number of farmers in the village follows the ancestral practice of growing paddy. They do not practice the organic agriculture. Cultivation of paddy begins with the onset of monsoon season when field is ploughed and made free of any weeds, simultaneously rice seedlings are grown in the nurseries any new method of seedling growing viz. Dapog method or SRI [system of rice intensification] is not practiced. Rather the conventional method is followed. After 25-30 days of sowing seeds into nursery seedling becomes ready for transplanting into the field, then they are transplanted by

manual labours in the main fields. After this fields are flooded with water from the canals or bore wells.

At the maturity of crops they are harvested by harvester or manual labours, then the uncut roots of previous crops are left to get dried and after some time they are burned so as to facilitate uprooting of these roots at the time of ploughing. Then it is irrigated by water and field preparation for next crop cycle begins again.

In Aliabad farmers grow paddy two times a year depending on the source of water. If they have assured supply of water they grows paddy twice in a year and if not the only once a year.

a. Changes in Land use patterns:

Earlier farmers used to cultivate paddy by using rainwater and water from Shamirpet Lake to irrigate their fields but since last 10 years this all has changed due to erratic rainfall and decrease in water level in the lake and also the growth of industries around the village has affected the land use patterns of the farmers. Earlier whole family of the farmer used to be engaged in agriculture but nowadays due to availability of employment in industries around the village many people are abandoning agriculture. Also due to increasing real estate development in the area land prices has gone considerably high and people are selling their lands to builders. This has caused a change in land use pattern from agriculture to other purposes.

There are still a few farmers left who practices agriculture. The main crop that is grown in this area is paddy some farmers are using drip irrigation to cultivate vegetables and fruits.

Figure 5: Real estate constructions

Figure 6: Irrigated lands

Figure 7: Vegetable cultivation

Figure 8: Barren lands

b. Sources of water

Earlier most of the farmers were dependent on rains and the canals from Shamirpet Lake that brought water to their fields but now this scenario has changed due to insufficient rains and low water level in the lake there is always less water in the canals that is not sufficient for the cultivation of crops.

In order to have assured water supply many of them have installed bore wells in their field but due to ever increasing number of bore wells and constant extraction of water from the ground the ground water level has gone very low and now they have to go up to 400 ft in some places to get water through bores.

Those people who can't afford to install bore wells and also they don't have any other water source are left with no other option than either sell the land or leave it barren. This also one of the reasons for changing land use patterns in the village.

c. Modern technologies in farming

In today's farming without mechanization has become very difficult because of the fact that manual labour not only costs more but is also more time taking as compared to machines. Most farmers in the village are marginal farmers, hence hey can't afford heavy machinery by themselves.

Keeping this in mind they formed a farmers association in the village all the farmers are members of this association. The main function of this association is to look after the needs of all the farmers collectively that is why during the harvesting season they hire the harvester on hour basis and almost all the farmers in the village gets their field harvested by that harvester only. Farmers also hire tractors for ploughing and transporting their product from one place to another place.

Figure 9: Harvesting of paddy by harvester Figure10: Grape cultivation by drip irrigation

d. Unavailability of labour for agriculture

Earlier harvesting of one acre of land used to take one week by hiring labour, which used to involve cutting, making in to small bundles, thrashing and collecting the paddy grains then making the left over hay in to heaps of hay etc...

But now a day's even 10 acres of land can be harvested in one day with the help of machines, this has made the work easy but has also created problems for labour. As they are not required for farm works they moved to the industries in search of employment opportunities this also lead to the labour crisis.

Due to establishment of industries in the locality many people has moved towards industries because agriculture was giving them disguised employment but in industries they were getting year round employment.

Also because of vicinity to Hyderabad there is a huge increase in demand for land to build houses so those who had meagre lands and were working as labourers sold their lands to outsiders and entered into business.

Many people said earlier their whole family used to work in the fields and works at the peak time was shared by the neighbours and they finished all works in turns, but now a day this scenario has changed and all family members don't work in the fields also neighbours don't spare time this has led to a mismatch between small number of

labourers and large demand for them and this caused the increase in wage charges for labours.

Before 20-30 years the farmers used to pay paddy grains as wage, later they started paying money which was very less i.e., sometimes even 25-50 paisa per day.

Gollanakonda Bikshapati a farmer says, “at present the labour charges for women are Rs 150/- per day. Earlier this used to be 10-13 Rs per day (10-13 years before) (they will come on to field at 11.30 and work up to 5.30 which also includes 1 lunch hour).” Hence the farmers are not in a position to pay those high wages to the labour now days hence it is creating the labour problem.

Figure 11: Paddy seedlings in nursery beds

Figure 12: Field preparation

Figure 13: Mature crops

Figure 14: Harvesting by machines

Figure 15: Drying of paddy in sunlight

Figure 16: Burning of harvested fields

Study and mapping exercise of Shamirpet Lake:

Shamirpet Lake is an artificial lake near the village, built during the Nizam era. The lake attracts many birds, making it a good bird watching spot along with a deer park in the vicinity. A resort run by the Government of Andhra Pradesh is located near the lake. The Outer Ring Road also passes by close to the lake. It has a beautiful rocky terrain on its bank is a delight to the eyes. The sunset at the lake is very beautiful. Its distance from the city is an incentive for the weekend picnics. It offers a serene location. The best time to visit this lake is during October to March. Area of Shamirpet Lake is 486 ha in 1989. But 230 Ha of land under water got reduced in 17 years. Shamirpet Lake is also called Pedda chervu. Katta maisamma temple is famous which is on bund of lake. People come there in huge lots especially during weekends.

To have an overall view at the Shamirpet lake follow this link:

http://www.360cities.net/image/shamirpet-lake-1

The current images of Shamirpet Lake are as follows:

Figure 17: Shamirpet Lake in December 2011

Water pollution at Shamirpet Lake:

Figure 18: Cleaning of vehicles in Lake

Figure 19: Pollution in Lake due to waste

Water allocations for irrigation from the lake: The water from the Shamirpet lake is distributed for irrigation mainly to villages -Aliabad, Shamirpet, Jaganguda, Baba guda. The lake has separate gates for allocations to the different villages. Water through one gate irrigates fields of Aliabad and Jaganguda, the water through the other gate irrigates fields of Shamirpet and Babaguda. A farmer Golipalli Sudarshan Reddy an active member of farmers club says "previously 20 years before the lake used to irrigate 5000-6000 acres of land. But now this year it could irrigate only 600-700 acres of land due to deceased rain fall and decreased level in the water in the lake. Generally the water from the lower canal of Aliabad irrigates the fields of Aliabad& babaguda but once the water level comes down, they share half of the water from the canal of Shamirpet as the gate for Aliabad canal is situated at more height than the gate of Aliabad, hence they will share the water from the canal of Shamirpet. This half share of water enters in to common canal and travels some distance and then enters in to the lower canal of Aliabad.

Channels of irrigation from the lake:

The channels are mainly are as follows the main canal (vaagu), upper canal of Aliabad and lower canal of Aliabad, upper canal of Shamirpet and lower canal of Shamirpet.

The upper canal of Aliabad is not under working condition since 20 years. This is not connected to the gate of the lake, but it depends on the excess water overflow from the lake

gets collected from the side catchment area and they pass through under bridge and gets collected and used to pass through this canal to the fields of Aliabad.

The common canal from which the farmers extract water using motor pumps which are used for their fields water from the Aliabad gate flows through this common canal and in between it meets lower canal of Aliabad and the excess water overflow from the check dam at the origin of lower canal of Aliabad continues to flow through this common canal. Shamirpet also used to have the upper canal, but it is no longer in use now. The lower canal of Shamirpet gets water from the separate gate (toomu[1]) and irrigates the fields of Shamirpet and Babaguda. In cases when there is no water coming out from the gate of Aliabad, then they share half of the water which is coming from the Shamirpet gate.

Images for channels:

Figure 20: Gate for lower canal of Aliabad Figure 21: Lower canal of Aliabad

[1] Toomu is local term in Telugu when referred to gate of the lake

Figure 22: Lower canal of Shamirpet

Figure 23: Common canal of Lake

Water access in SC colony:

Availability of water:

1. **Gram panchayat water supply through underground pipe lines which has a separate overhead tank and sump in the colony**

   The SC colony has separate overhead tank for storage and supply of water for the colony through underground pipelines , but many of the streets don't have underground pipelines laid up to their houses. The side pipelines which reach the houses in the small streets from the main pipelines are yet to be constructed. This supply operated by village watermen of gram panchayat.

2. **Gram panchayat installed bore wells in the streets which have common taps**

   Other than overhead tank supply gram panchayat installed bore wells in the streets and people collects water from there. These are operated by the individuals as per their household's requirements.

3. **Water pipeline from the Ramalayam to the starting point of Sc colony**

   A separate pipeline is there from the Ramalayam to the entry point of SC colony which serves as drinking water source for some of the people from the SC colony.

Distribution of water:

Water is distributed as follows

1. Water is supplied through underground pipelines from the overhead tank and some people have individual connections to their home from the main line and some people don't have. Some common point taps are there which are attached to this main pipeline from where some people fetch water for their uses. The water distribution through this supply is in the morning and many of the times it is for duration of 30 minutes.
2. There are some mini tanks and common stand points which have separate bore wells installed by Gram Panchayat which supplies water for the entire period during which the electricity is available.
3. Water from the Ramalayam is supplied in morning and evening hours and it serves as drinking water source for some people as they told that the water from this Ramalayam is less polluted than the Gram Panchayat supplied water but as it is situated at the starting point of the SC colony the people who want to fetch from this have to walk for a long distance.

Figure 24: Water supply from Ramalayam Figure 25: Mini tank in SC colony

Socio-economic factors affecting the water accessibility in SC Colony:

Out of five water purification plants in the village not even one is situated in the SC colony. As the colony is located at one extreme of the village residents have to travel almost one kilometre distance to purchase the filtered water for their drinking purpose. As the price for a 20 litre filtered water bottle increases from Rs 5/- to Rs 10/- if it has to be door delivered. Many of them could spare Rs 5/- with great difficulty, and they cannot spare Rs 10/-.hence, they are travelling to the filtered plants which are located in the main village.

Some people in the colony they could not afford to purchase the filtered water, though they know that the water from the gram panchayat supply is polluted now days but still they are consuming the same water because of their inability to spare money for it. Some people they collect water from Ramalayam pipeline as they could not spare money for purchasing of filtered water.

Commercialization of water:

As the underground water got polluted due to waste from the newly emerged industries in the surrounding area many people find it is difficult to drink water without filtering it. The major reason for the pollution is Surya Vamshi spinning limited (textile/spinning mill) which is located very near to Aliabad. In this company they are not using the effluent treatment plant and instead of that they directly leave the waste from the industry in to the separate deeply installed bore wells for waste disposal. Then commercialisation of water started in the village. Initially three years before two water filtration plants were started with the help of KLR trust which are maintained and operated by individuals. At present there are five filtration plants in the village. Here is a brief introduction about each of the filtration plants if Aliabad.

Water filtration plants in Aliabad

There are five mineral and water purification plants in village Aliabad

1. Sri mallikarjuna water plant :

   This was started in 2008 by KLR trust and maintained by an individual. With an initial investment of Rs 3 lakhs which is shared by KLR and individual in the ratio 50:50. Initially they used to charge Rs 2/- for a 20 litres can. Later they have increased

price to Rs 4/-. Currently as the maintenance and operation charges are increased they are selling 20 litres can at Rs5/- . In summer they will get a collection of Rs 1500/- per day on an average. In winter and rainy season they will get Rs 700- 800/- per day. They have permanent supply to Surya vamshi spinning mills every day 1300 litres at Rs 3/- per 20 litres can

Figure: Sri Mallikarjuna water plant

2. Sri sai mineral water plant:

   They have started this plant one month before with their own investment of Rs 2 lakhs. Their selling price is 20 litres can @ Rs 5/-. They have door delivery service also @Rs 10 per each 20 litres can. As they have entered in to market recently their sales is 30 cans per day each of 20 litres.

3. Neeraj purified mineral water plant:

   They have started it on January 8th 2011 with an own initial investment of Rs 2.3 lakhs. Their selling price is Rs 5/- per 20 litres can .they don't have door delivery service. On an average in summer they sell 200 cans per day, in winter and rainy season they sell 100 cans per day. Recently they have applied for ISO certification also. Previously they used to charge Rs 4/- per 20 litres can but as the maintenance charges are increased currently they are charging Rs 5/- per 20 litres can.

Figure: Neeraj purified mineral water plant

4. Sri Maruti enterprises:

   They have started this plant on November 10th 2011 with an own initial investment of Rs2.5 lakhs. As they have recently entered in to market they are charging Rs 4/- per 20 litre can. They have door delivery service also @Rs 8-10/- per 20 litres can. On an average they sell 20-30 cans per day. Presently they don't have permanent delivery to any companies.

Figure: Sri Maruti enterprises

5. KLR plant:

They have started it in 2009 with the help of KLR trust with an investment of Rs2.5 lakhs. This is located opposite to Gram panchayat. They don't have door delivery service. Previously they used to sell each 20 litre can @Rs 2/-. Currently they are charging 20 litre can @Rs 5/-. Their average sale in winter& rainy season is 100 cans of 20 litres each. In summer they sell 150 cans of 20 litres each.

Figure: KLR water plant.

6. Conclusion

Through our study of the village along with the study of the previous papers on the works done in the village we can say that all the previous systems to supply water to the village for fulfilling the various needs are almost now useless. Earlier the Lake was the main source of water for agriculture purposes and also helped in recharging the ground water level which is used for drinking purposes but later on due to establishment of industries the water requirement increased and insufficient rains did not allowed to fill the lake properly resulting in excess extraction of ground water, not only this some industries and other residential structures that are developed due to ever expanding city dumped their wastes into the lake and groundwater, this caused heavy increase in the salinity levels of the water which made water unfit for drinking purposes.

Earlier main occupation for villagers was used to be agriculture but due to unavailability of water for they have to sell their lands and go to industries for employment and now only a few people are practicing agriculture.

People are more sensitive towards education everybody in the village is sending their children to school as they believe education is the best thing a child can have and it can bring a bright future for them.