

Gokul Study Report

July 23, 2016

1. Introduction and Background

Gokul is a small town in Uttar Pradesh on the east side of the Yamuna River. A general location of Gokul in relation to Mathura and Agra is shown in Figure 1. below. Gokul is located 15 km south-east of Mathura in Uttar Pradesh between [27.45° North Latitude and 77.72° E / 27.45; 77.72](#)ast Latitude. It has an average elevation of 163 m (534 feet). Gokul encompasses a small area of about 2 sq km.

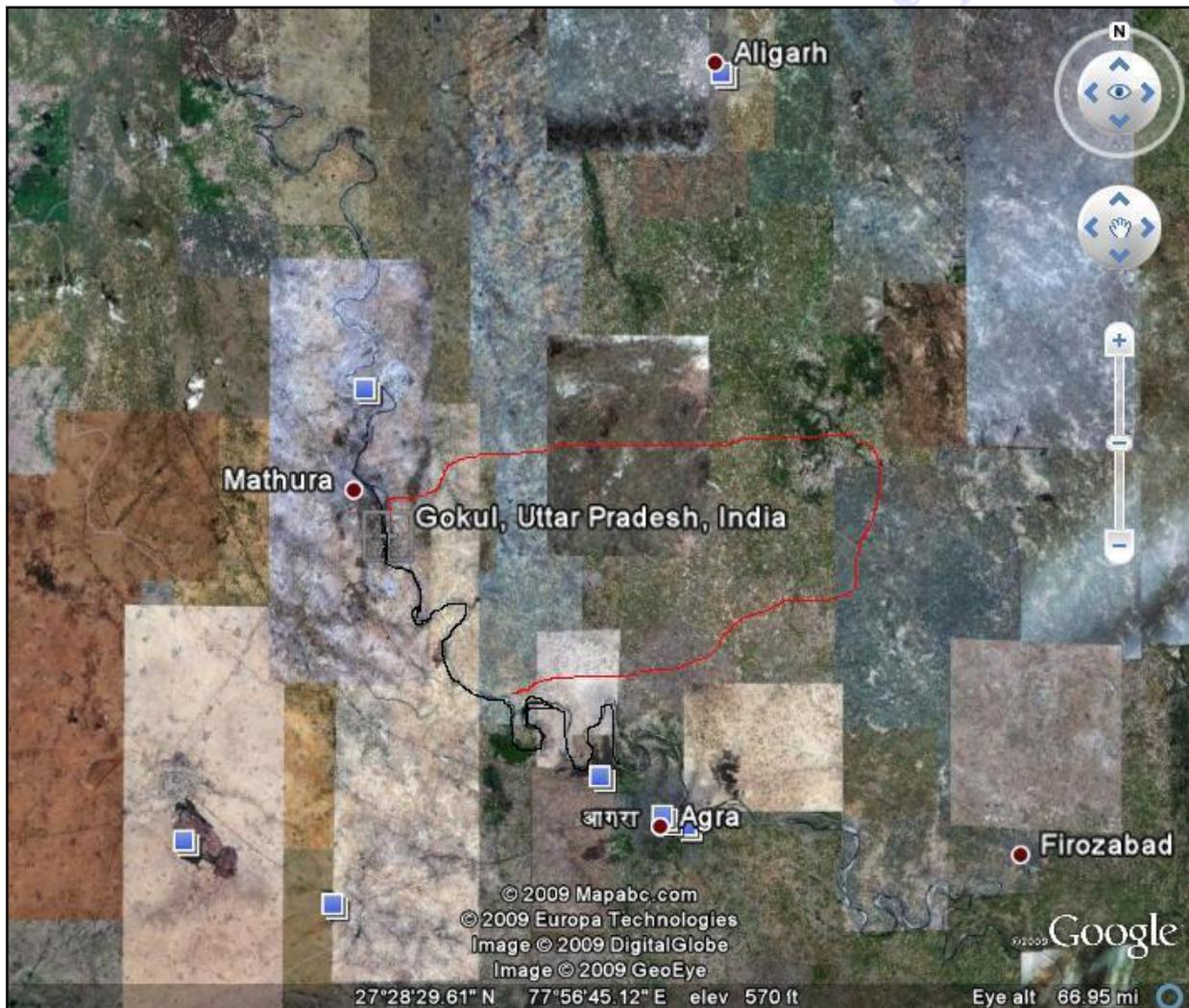


Figure 1: Satellite map of Gokul (courtesy of Google Maps)

According to Vedic Scripture, Lord Krishna was brought up under the care of Nanda and Yoshoda, the first family of the village. Since Kangsha, Krishna's uncle, used to kill every baby born to Devaki, Nanda exchanged his own new born daughter with Vasudeva in order to smuggle Krishna away without raising Kangsha's suspicion. During his stay at Gokul, Krishna spent his time in fun and frolic, though his life did come under threat a few times. He was very naughty as a child, and when Krishna was an infant, and the demoneess Putana came to the village at the appeal of Kangsha. She laced her nipples with poison and tried to breastfeed Krishna. However, Krishna suckled on her until he completely drained her life away.

The river Yamuna used to flow near the village as it still does, and a five-headed serpent known as Kaliya used to live in its waters. Kāliyā was a powerful cobra, who made the river waters poisonous and made the forests barren. Krishna subdued this powerful snake and asked him to leave the area. One of the most famous paintings of Krishna depicts him dancing on the head of Kāliyā in a Nataraja like position, while playing his flute as depicted in Figure 2.

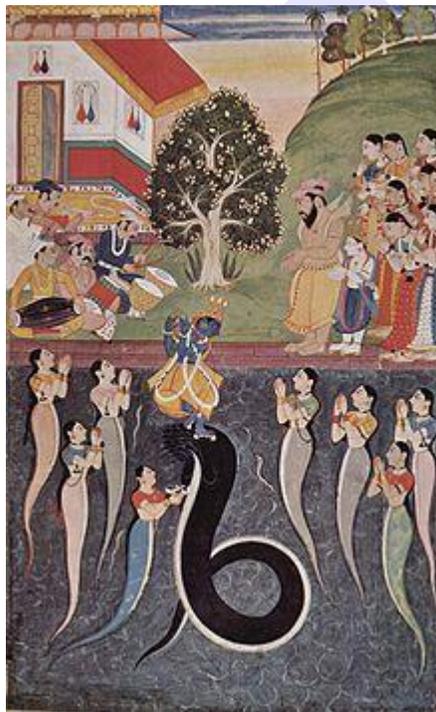


Figure 2.: Lord Krishna on the head of the subdued Kaliya (Cobra) in River Yamuna

Krishna spent his time in Gokul in various playful activities. He used to play the flute, and was very popular with the village girls (known as gopikas). It is at Gokul that Krishna met Radha, his life long love whom he never married.

People roll about in the sand here at a spot called 'Raman Reti' to be blessed by Lord Krishna. Gokul

was popularized by Vallabhacharya as a religious centre during 16th century and later it became an important centre of the Bhakti culture.

1.1 Population

Being a small town, Gokul has a permanent population of about 8000 people. However, during the festivals such as Janmashthmi the floating population rises to as high as 500,000. It is striking to find that Gokul has an average literacy rate of 70%.

1.2 Socio-Economic Profile

Gokul, a major religious town of the country, is home to many temples. It was found that there are approximately 10 major temples with numbers of small ones. Major income is generated through tourism especially during the festive seasons. Only 10 to 15% of the population is involved in agriculture.

2. Purpose of this Study and Basic Concept

As requested by Mr. Ashwin Patel, a study of the existing sewage and drainage system in Gokul was undertaken by S & M Engineering Services (<http://snmengineering.com>) with partial assistance from TechKnow Engineering, LLC of Chicago, who has an office in Delhi, India. Although the study was initially planned to include the following 6 components, but due to the need for a comprehensive environmental analysis to attain sustainability, additional areas, **items 7 and 8** were also **added** in the scope of this study.

1. Existing layout of Gokul in relation to the Yamuna River and the surrounding areas within 5 Kms in a general Map.
2. A detail scaled Map of the Gokul village depicting roads, drainages and existing Sewage system
3. A detail information on the existing water usage, source, and the treatment information on the drinking water supply.
4. A detail information on the existing wastewater discharges including sewage and treatment facilities and their capacities.
5. Proposed analysis and options for developing a planned sewage system for the Gokul area including possible wastewater treatment options with respective costs.
6. A detail report with options and analysis on drinking water supplies, drainage system development, and sewage collection and treatment system options.
7. Look into the Municipal Solid Waste management for Gokul and suggest plans to address problems and issues

8. Study the local Geology of the area and look into possible water recharge and ground water monitoring systems to protect the drinking water supplies (private wells) for the area.

The above work was carried out in close coordination with the Gokul trusts, local municipality, Shri Gokul Vikas Society, and any other organizations as recommended by Mr. Ashwin Patel.

The input from and coordination with the local people and organizations were carried out in every steps to arrive at this final Study Report.

2.1 Project Goals & Objectives

- To achieve minimal land disposal of waste and move towards sustainable production and consumption patterns
- To manage the effective disposal of solid waste, industrial waste and Medical wastes to safeguard public health (**Dutta, 2002**)
- To reduce the volume of waste generated and disposed (Recycling/Reuse)
- To promote the development of a suitable drainage system.
- To assist in developing a planned sewage system for Gokul
- To enhance environmental responsibility and ownership through various awareness programs, including water quality monitoring and vigilance for protection of surface and groundwater for the area.
- To conduct a Yamuna River Reconnaissance and look into the water quality and quantity including seasonal variations, flooding, foaming (observed in January 2010), and other issues.
- To provide complimentary consultation to other communities along the Yamuna River upstream of the Gokul. In order to address the chemical contamination and other water issues a mutually beneficial partnership between the communities/cities along the River need to be built.



2.2 Specific Goals

2.2.1 Solid, Hazardous and Medical Wastes:

2.2.2 Water Resources Management

- Measure water conditions and flow of Yamuna River upstream from the city and at points downstream of Gokul towards Agra (Figure 3 shows a Map showing Yamuna River and Gokul, Dutta 2003)
- Measurements at point source locations suspected of major sources of pollution
- Remove trash and other debris along the river banks (*Picture showing Trash Cleanup on World Water Day 2008 in Agra, India*). This could be done one day after the Janmashthami Utsava.



- Assist with educational program on protecting the rivers water quality
- Develop initial base line data for measuring future progress

2.2.3 Water Resources Planning

The Yamuna Foundation for Blue Water with support from the Rivers of the World Foundation (www.rowfoundation.org) could provide partial help with the following Water Resources planning activities

- Look into best management practices for Temple waste management and wastewater treatment
- Planning provisions for control of non-point (direct runoff) sources of pollution
- Development of water quality planning and management programs
- Identification of Existing Regulations and Volunteer Programs

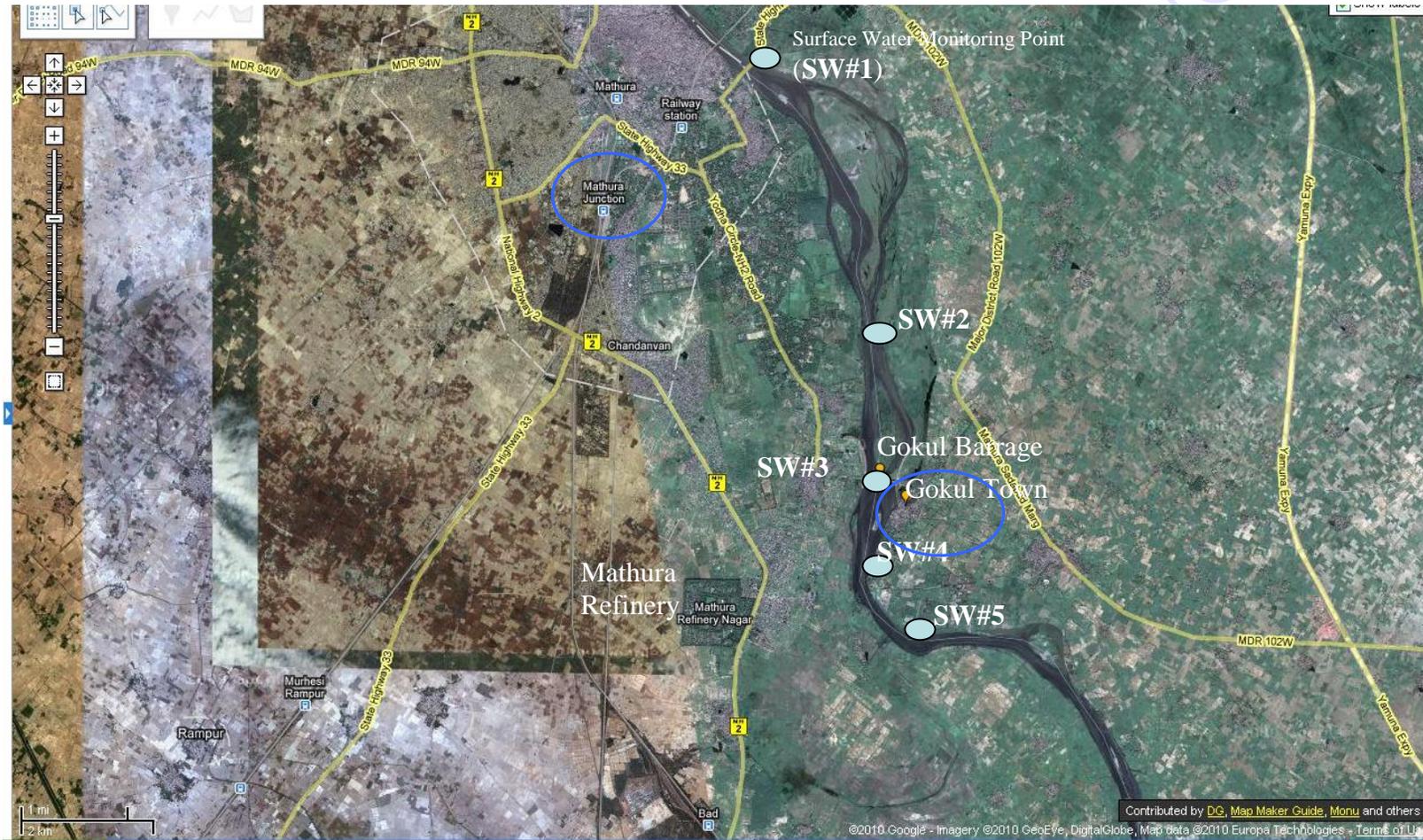


Figure 3. Map Showing the Yamuna River and the Proposed Monitoring points in and upstream/Downstream of Gokul (Map : courtesy of Google, Inc. provided to user Subijoy@gmail.com)

3.0 Map of Gokul Town and Vicinity

There were no maps provided to us from the council. A hand-written rough sketch, without scale was seen available with the Panchayat. A photograph is shown in Appendix A. Although it had some basic historical information written in Hindi, there were no specific scalable/usable data there.

We visited the site on January 15, 2010 at a time when the Solar Eclipse had just started at that location. We had a team of 4 people (Figure 3a. Mr. Subijoy Dutta, Mr. Sumit Dutta, Mr. Dick Lahn, and Ms. Ginny Harris) during the visit. Sumit has keen interest in Eclipse and watched the eclipse with local people there.

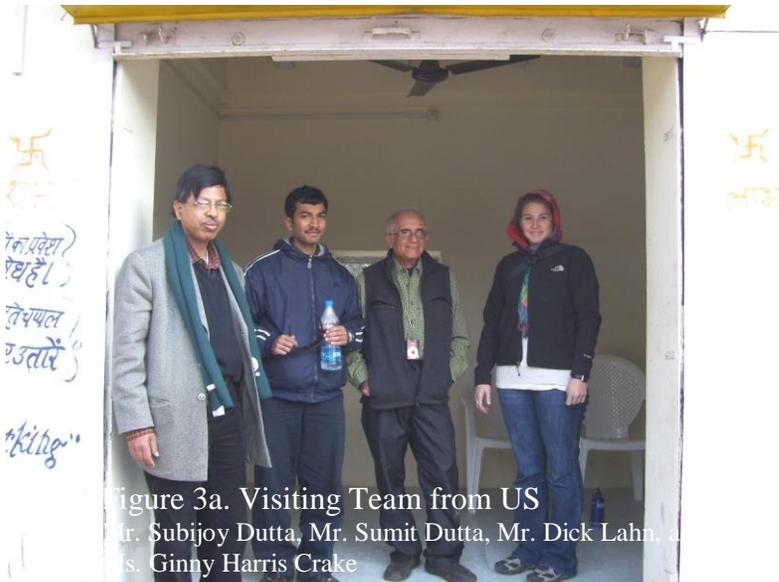


Figure 3a. Visiting Team from US
Mr. Subijoy Dutta, Mr. Sumit Dutta, Mr. Dick Lahn, and
Ms. Ginny Harris Crake

Mr. Pawan Sharma (Figure 4) greeted us there and arranged a place for us to sit down and discuss the project needs and the scope of our data collection activity using a Garmin Global Position System (GPS) there. Our discussion took place at a place marked Gokul2 on the attached GPS Map (Figure 4).

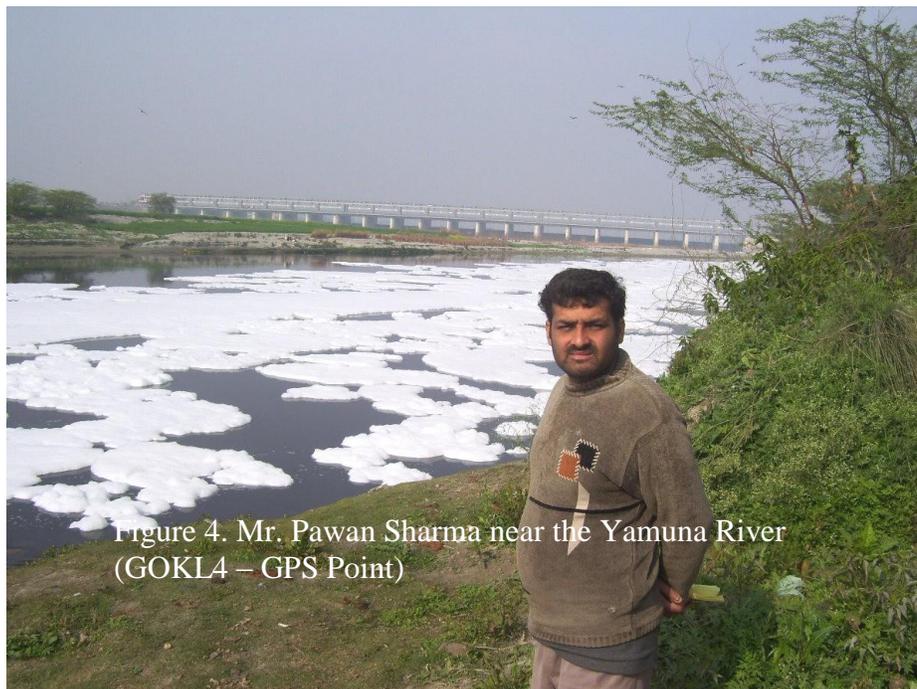


Figure 4. Mr. Pawan Sharma near the Yamuna River
(GOKL4 – GPS Point)

Since data points were needed from the whole area to get some rough elevation for evaluating a suitable drainage and other wastewater treatment systems for the area, we chalked out a plan to cover the whole town from the very central location. With the help of Pawan Sharma we have gathered over 70 data points for the area. The status of wastewater discharges from Gokul area can be inferred from the pictures below.

Water at Yashoda Ghat



Sewage with domestic wastewater



Open Drains("Nallahs")



Main sewage site



4.0 Follow Up Training Camp in Gokul

Feb 20-21, 2011. As a follow up to this study a **training and awareness camp in Gokul, UP** was conducted by Rivers of the World on Feb 20-21, 2011. This was arranged by the Gokul Trust, led by Mr. Sahadeo Singh (87), president of the Trust, Mr. Solanki, Executive Engineer (Delhi) and many others, including Mrs. Pratibha Chaudhry. Through this training camp a suitable solution was planned to be developed to address wastewater issues and proper collection and disposal of wastes in discussion with the local community, municipality, and other authorities.



5.0 World Water Day (WWD) Program

For the past 4 years Rivers of the World volunteers in Gokul are conducting Yamuna River Cleanup programs in Gokul as a part of the WWD program . A few pictures from these awareness activities are below.



WWD 2016 Program in Gokul by the local School children



Water testing at the Gokul site with local volunteers in 2013



Flowers and offerings from the Gokul temples polluting the Yamuna - 2016

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