

ANNUAL REPORT  
(Scientific)

2007 – 2008

A Compilation of Progress Reports

on

Research Projects

Under the Following Scientific Disciplines

- *WATER MANAGEMENT*
- *AGRI-BIOTECHNOLOGY*
- *ENVIRONMENT*

Vigyan Bhavan  
GSFC SCIENCE FOUNDATION  
Vadodara

## Message

The Annual Report is a compilation of the progress of work done under each major discipline during the year 2007 – 08. Through the course of this year some of the in-house projects especially in the fields of water management and agri-biotechnology have come to end, and some new projects sponsored as well as in-house ones have either been initiated or have been considered for implementation. It is noteworthy to mention here that Science Foundation was again selected to receive the sponsorship from the Ministry of Environment and Forests, Government of India to carry out the project on the Solid Waste Management as a part of National Environment Awareness Campaign.

It is also worth mentioning that the Department of Scientific and Industrial Research under the Central Ministry of Science and Technology has accorded renewal of recognition as Scientific and Industrial Research Organization to GSFC Science Foundation for a period of three years from April 2006 to March 2009.

I am sure that GSFC Science Foundation will continue to pursue its research interests in the defined disciplines and will also make an attempt to explore new avenues/ areas of research in line of current requirements and will launch an awareness drive through different promotional activities to fulfill its objectives.

Vadodara  
*August 30, 2008*

*Dr. Y. P. Singh*  
*Jt. Administrator*

## *Acknowledgement*

GSFC Science Foundation has identified Water Management, Agri-biotechnology and Environment as thrust areas for its research activities. The current report has the compilation of the progress of research activities undertaken during the year 2007 – 08 in the areas of Water Management and Agri-biotechnology.

We take this opportunity to thank the following dignitaries and organizations for their encouragement and support in advancing the objectives of the Science Foundation:

- The Chairman, Members of Governing Council and Trustees of Science Foundation
- Joint Charity Commissioner of Gujarat
- Ministry of Science and Technology, Government of India
- Department of Scientific and Industrial Research (DSIR)
- Council of Scientific and Industrial Research (CSIR)
- Department of Revenue and Income Tax
- Gujarat State Fertilizers and Chemicals Limited (GSFC), Vadodara
- Gujarat Green Revolution Company Limited (GGRC), Vadodara
- Institutes participating with Foundation's research projects

*Vadodara*  
*August 30, 2008*

*Dr. K D. Bhatt*  
*Member Secretary*

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# *Water Management*

## Annual Report (Scientific) 2007 – 08

- ⊕ Impact of Developmental Activities on the Groundwater Quality in the City of Vadodara – A Case Study
  
- ⊕ Roof Top Rainwater Harvesting & Well Water Recharging
  
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Water Management Group  
GSFC Science Foundation  
Vigyan Bhavan  
Fertilizernagar

1. **Title: Impact of Developmental Activities on the Groundwater Quality in the City of Vadodara – A Case Study**

2. **Summary :**

This project is sponsored by the United Way of Baroda, Vadodara. The project is of three year duration and was initiated in June, 2005. Under the scope of project activity, it is proposed to study the impact of developmental activities on the groundwater quality in the city of Vadodara, district Vadodara, Gujarat state. Vadodara city measures about 150 sq. km in area and has a population of about 15 lakh. Like other progressive districts, Vadodara too has witnessed stupendous growth in the industrial & agriculture sectors. With the increase in the population, a corresponding expansion in the city limits has been observed with the city boundaries stretching & accommodating the suburban areas. City of Vadodara is also known as an industrial hub with range of industries from dairy products to engineering and from pharmaceuticals to chemical industries. Moreover, city is bound by the industrial zones viz. Makarpura GIDC in the south and Gorwa GIDC in the northwest. Also, some industrial units like Nandesari in the northwest and Halol in the northeast direction are located on the fringes of the city. Through this study, it is proposed to evaluate the pollution levels in the groundwater of industrial and residential units for selected harmful elements and reason out the causes responsible for that. Also, this empirical study would help in establishing a pattern of concentrations with respect to seasonal variation. After analyzing the possible impacts of the developmental activities and establishing a probable link with the source (s) over a period of 24 months, the study would then attempt and focus on the remedial measures through the suitable & area specific rain water harvesting technique(s). This will not only help in abating the pollution concentrations but will also augment the dried up or mined groundwater resources, which have, in fact, become the very sources of pollution at places. The study will incorporate the regular sample collection and monitoring of the concentration levels of some selected highly polluting and hazardous elements from both the mentioned units for pre-monsoon and post-monsoon seasons and based on the emerging trend of variation in their respective concentration levels, the source identification will be attempted to justify the concentration variation and accordingly some rehabilitating measures in terms of water harvesting will be recommended as corrective measures. This study will also include the PRA survey, in the selected sample areas, though on a limited scale, to understand the effect of pollution, its severity and its after-effects.

### **3. Objectives :**

1. To study the seasonal variation in the groundwater quality with respect to specific metal contamination both in the domestic & industrial areas & attempt to identify the source of pollution
2. To suggest the appropriate rainwater harvesting techniques to address the problem of contamination thus arisen

### **4. Background :**

Science Foundation registered with the United Way of Baroda (UWB) as a member in 2004,, which is basically an NGO and an umbrella organization of more than 100 NGOs working in the different fields of research & development. Under its current project programmes, UWB has identified the following themes to carry out work on:

a. health; b. literacy; c. old age home; d. women empowerment; e. environment etc.

As a member organization, Science Foundation applied for the research funds to carry out the mentioned project study in the area of environment. The study has subsequently been approved for the funding by the UWB. The study proposes to carry out the chemical analysis of groundwater samples to understand the quality parameters and further correlate them with the current developmental practices both at domestic as well as industrial levels. For this purpose, the city of Vadodara was divided into a grid of 3 X 3 km blocks for the sake of uniform water sample collection pattern. There are 30 such blocks of which 22 fall under the residential category and 8 under the industrial category. In view of the basic objective of the project, three groundwater samples were collected from the residential blocks whereas five samples were collected from the blocks falling in the industrial zone to have a comprehensive sampling to tap the possible sources of pollution, if any.

### **5. Brief Achievements of the Previous Year :**

Under the third and fourth phases of project activity, groundwater samples from the selected hydrograph stations were collected. Phase III samples were

subjected to chemical analysis. An interim report on the status of the groundwater quality using the analytical data was submitted to the funding agency. The sample collection under the fourth phase of activity has been completed.

## 6. Progress of Work:

### (6.1) *Experimental*

The samples collected under phase IV were analyzed for Chloride, Total Dissolved Solids (TDS), Chromium, Arsenic, Cadmium, Manganese, Lead, Iron and Zinc (Table : 1).

### (6.2) *Results and Discussion*

Like Phase III, in Phase IV also, groundwater samples from the selected few hydrograph stations were collected which repetitively exhibited higher concentrations during almost all three phases of project activity. In total, groundwater samples from the 25 hydrograph stations were collected and subjected to chemical analysis.

The comparison of the analytical results of the concentration levels of groundwater samples of Phase III with Phase IV indicates effect of dilution only partially i.e. concentration levels of only few groundwater samples showed lowering of values in the post-monsoon season sampling. In case of chloride, it is observed that as against 36% samples, which had shown higher concentrations than the maximum upper limit i.e. acceptable limit prescribed by the BSI in Phase III (pre-monsoon), 28% have shown higher concentration levels in Phase IV (Fig. 1). However, other 20% of the samples have commonly recorded higher concentration levels under both the phases. Further, at some places, very high to high (10 times) concentrations of chloride have been recorded confirming thereby the contamination of groundwater. Interestingly, as compared to industrial areas, more number of samples, collected from residential areas have exhibited higher chloride concentration. In case of TDS, a large number of water samples have exhibited high to very high concentration levels both in Phase III and IV (Fig. 2). In view of medium to high range of salt content (from 1000 ppm to 2000 ppm) of groundwater, it has been found unsuitable by the residents for

drinking purposes or used but after mixing with the water supplied by the municipal corporation. For heavy metals, none of them could be detected in Phase IV indicating the impact of dilution.

In general, overall impact of dilution during Phase IV has been observed though, at different levels for different elements.

(6.3) Implementation/ Field Trials/ Scale -up

The analysis of the samples collected under phase IV is under progress.

(6.4) Feedback from the End User and Scope for Future Consideration

Keeping in mind the apprehensions of the residents and industrialists, especially surveyed respondents, during the first phase of work, it was decided to part with the analytical results of each phase with all of them in order to gain their confidence. During the PRA survey, it was observed that at many places, people use corporation water for drinking purposes and bore well and/ or hand pump water for other domestic uses or in case of short supply of corporation water, citizens mix that water with the bore well water and then use it for drinking purposes. In fact, hand pumps installed by the corporation, which covers larger parts of the old city area, are all labeled with a declaration about the unsuitability of source water for drinking purposes by corporation.

**7. Conclusion :**

At the end of fourth phase activity, it may be noted that overall groundwater has high TDS concentration. However, only after the comparison of the results of all four phases, actual water quality picture would be emerged and hence it will then be possible to deduce the possible source of contamination.

**8. Plan for the Next Year :**

To synthesize analytical data and compile them for the final report.



1. **Title :** Roof Top Rainwater Harvesting & Well Water Recharging

2. **Summary :**

At Vigyan Bhavan Complex of Science Foundation, a roof top rain water harvesting plan has been implemented. The basic objective of this study is to collect the rainwater from of portion of the terrace area (approx. 3500 sq.ft) and divert the collected & filtered water to the existing but not-in-use open shallow well through a series of collection, settling and filtration chambers. This project has a demonstration value for those who wish to adopt the technology for better results. Also, apart from that, the water that is being collected will create an additional storage in the well which could be utilized for gardening, cleaning and washing purposes.

The well water samples are being collected at a regular interval to monitor & analyze the improvement in quality of water and study seasonal changes for the same. The laboratory analysis has shown a definite improvement in the water quality due to dilution effect. In fact, the current quality reports indicate a good deal of improvement in the quality of well water.

In the last monsoon, about 3,20,000 litres of rainwater could be harvested. It is assumed, through year long continued monitoring of the well water level and fluctuations, that the water channels of well are connected with some unknown cavity or a water body or a reservoir.

However, since this project was initiated as a demonstration model project with the basic purpose of showcasing the technology, after a span of about five years, the management of the Science Foundation decided to discontinue the project data monitoring & analysis as previous project reports have already established the usefulness of the project and how it has benefited the organization in terms of improvement in water quality.

# 1. Title : Rain Water Harvesting & Well Recharging (I & II)

## 2. Summary :

In June 2004, on the World Environment Day, GSFC in consultation with Science Foundation inaugurated two rain water harvesting & open well recharging schemes in the GSFC campus. Both the schemes were subsequently implemented before the onset of monsoon in that year.

As proposed under scheme I, the storm water from the canal draining towards Bajuwa village was to be harvested and drained into an open well situated near the demonstration (Karachia) farm of GSFC. The storm water was to be recharged through a 450 m long pipe of 600 mm diameter. However, in view of the distance & well location feasibility, an open well in the demonstration farm has been selected and recharged. It is estimated that about 1.00 lakh litres of water have been recharged through open well in year 2007. Science Foundation has been monitoring the water quality of the well.

Under scheme II, an open abandoned well in Amrakunj Sector, behind 8-type of quarters in Fertilizernagar Township has been selected for recharging by diverting the storm water from one of the drains (Fig. 2). It is estimated that approximately 1.40 lakh litres of water was recharged during the monsoon of 2007.

In addition, in order to capture the maximum amount of rainfall runoff from the GSFC Township Campus, storm water harvesting scheme was implemented. The scheme involves installation of three percolation wells, each 25 m deep and separated by a distance of 20 m, in a graded filter media of 1 m thickness and extending 100 m in length. The scheme has been implemented in the main storm water drain line of GSFC to achieve the objective.

This project was a part of GSFC's (parent company) rain water harvesting & conservation initiative, which was technically supported by Science Foundation. However, after three years of successive & successful performance study of these water harvesting structures, as directed by the management of the Science Foundation, the project was considered as completed and monitoring of these structures was discontinued.

# 1. Title: Master Plan for Rain Water Harvesting in GSFC

## 2. Summary :

With a view to make GSFC a model rain water harvesting industrial unit, a water harvesting committee was constituted by the management of GSFC and Science Foundation was nominated as one of the member to provide mainly technical guidance in selection, implementation and monitoring of the water harvesting structures.

In the first phase, six water harvesting structures were implemented with the objectives of addressing the water logging conditions in the residential areas, capturing the maximum amount of storm water run off and increasing the conservation/ recharging capacity of the water harvesting structures. Out of these six structures, two structures, which were already available in the form of open ponds, were considered after minor repairing work, two more new ponds were dug out and two percolation wells were installed in the residential areas.

Records of water level and rainfall were maintained and it is believed that about 95,00,000 litres of water could be harvested through these structures.

## 3. Objectives :

Rain water harvesting projects have been undertaken to develop GSFC as a model water secured industry and also in order to fulfill the regulatory requirement of Gujarat Pollution Control Board for an industrial unit. The objective is to recharge the storm water through the available and created water harvesting structures.

## 4. Background :

Since GSFC Science Foundation has successfully implemented the rain water harvesting schemes at Kotar Land Development Project site, at its own building premises as well as at number of other project sites, GSFC involved Science Foundation for its own water conservation programme. Accordingly, the necessary technical guidance for implementation of

different water harvesting schemes including selection of sites was provided by the Science Foundation.

## 5. **Brief Achievements of the Previous Year :**

Six water harvesting schemes at different locations in GSFC campus were implemented and through the water level survey data during the last monsoon, it was noted that about 95.0 lakh litres of water could be harvested.

## 6. **Progress of Work :**

### (6.1) Experimental

Water levels in each of the schemes have been recorded and on the basis of performance of each water harvesting unit during the last monsoon, necessary modifications in the design have been incorporated to enhance the water harvesting capacity. After continued harvesting of storm water, the impact on the groundwater table will be ascertained in terms of water quality and quantity.

### (6.2) Implementation/ Filed Trails/ Scale -up

Only after the performance evaluation of these structures during the monsoon of 2008, the structures will be further scaled up, if found necessary. Also, some additional structures will be planned to cover the entire industrial area.

### (6.3) Feedback from the End User and Scope for Future Consideration

Same as above.

## 7. **Conclusion :**

The water harvesting schemes implemented by GSFC have been able to harvest the rain water.

**8. Plan for the Next Year :**

Necessary changes/ modifications, if required will be introduced in the current structures as well as some additional water harvesting structures will be planned before next season.

**9. Expenditure :**

Borne by GSFC Ltd.

**10. Team Members :**

Dr. K D. Bhatt

Member, Task Force Team

## *Agri-biotechnology*

## Annual Report (Scientific) 2007-08

- ⊕ Development of *Tricoderma Harzianum* Based Biofungicide

Biofungicide Unit  
Gujarat Green Revolution Co Ltd.  
Fertilizernagar

1. **Title:** Development of *Trichoderma Harzianum* based Biofungicide

2. **Summary :**

Gujarat Green Revolution Company Ltd. has obtained renewed license for extension u/s 9(3b) from Central Insecticide Board and Government of Gujarat and we have initiated the production and sale of Sardar Ecogreen since 20.6.2008. The renewed manufacturing license is valid for the period 29.5.08 to 28.5.09.

Production of Sardar Ecogreen 2.00% WP having *Trichoderma harzianum* (strain NBRI-1055) was stopped in January 2008 when period of validity of the license referred above had expired. Biofungicide production is carried out at Fertilizernagar and is despatched to GSFC depots for sale in the state of Gujarat. Manufacturing is done using know how from National Botanical Research Institute (NBRI), and marketing is done by Gujarat State Fertilizers & Chemicals Ltd. (GSFC). Demand supply chain of the product is maintained throughout the year. Process is initiated to take up the above activity in GSFC.

3. **Project Background and Objectives :**

The project was sponsored by the Science Foundation with a objective to take up the production of the Biofungicide of the tried & tested technology. Further, the objective was to establish a timely demand supply chain so that the product is made useful to the farmers.

4. **Production :**

The ever-growing need of using biological means to combat prevalent fungal diseases, literature distribution and demonstration trials were conducted in the previous years. As a result of continuous efforts the target of meeting the demand generated in the market could be met in the

year 2007-08. The attention was focused on actual generation of demand from the farmer. Farm information centers compiled the demand from various areas and the same were transferred through marketing head office to the production unit at Fertilizernagar.

Commercial success of the production unit depends on prevention of contamination that requires skilled techniques. Sugar rich culture medium; fungal inoculums and culture environment are all conducive to the growth of pathogens. The production work was carried out as per the “know-how” made available from N.B.R.I. Maximum care was taken to maintain sterility and carryout aseptic operations of culture maintenance and transfer the same for solid state fermentation.

The production schedule was prepared based on demand. The packing size of 250 grams, 500 grams and 1 Kg. was prepared. There are several process steps to be followed before the final packaging. These steps are the part of guarded know-how transfer obtained from NBRI – Lucknow. The despatch schedule is planned and accordingly logistic arrangement was made Acknowledgement receipts from the recipient sales depot were obtained and billing was done accordingly. Statutory requirement of Excise duty and Sales tax/ VAT were paid.

## 5. Brief achievements of the previous year :

### ACHIEVEMENTS

PRODUCT	PRODUCTION		DESPATCH	
	2006-07	2007-08	2006-07	2007-08
Product packing	Production (in Kg)	Production (in Kg)	Despatch (in Kg.)	Despatch (in Kg.)
250 g	4700	1400	5450	1400
500 g	5500	2400	5670	2500
1 Kg	19800	26600	17570	29230
<b>Total</b>	<b>30000</b>	<b>30400</b>	<b>28690</b>	<b>33130</b>

## 6. Progress of Work :

### (6.1) Experimental

Regular counts of finished product, counts of material under process used and shelf life counts of the stored boxes were taken.

Quality control tests like:

Microscopy & staining,  
Total microscopic count – Neuber's chamber,  
Total viable count – Plate count (CFU/ ml),  
Detection of pathogenic organisms,  
Counter check (weight check),  
Moisture content.

Antagonistic activity is clearly seen in the plate. Where growth of pathogenic fungi is restricted by *Trichoderma*.



### (6.2) Demonstration/Field Trials

Field trials are conducted with the help of marketing channel of GSFC in various agro climatic conditions of Surat, Rajkot and Gandhinagar in Gujarat.

Crops like **Ground nut, Cotton and Paddy** were tested by the application of Sardar Ecogreen.

Percentage increase in yield to the average of 15.58% was noted

Product development activities

- 1). Experiments are undertaken to use other substrates for solid state fermentation.
- 2). Shelf life studies of samples from existing and new combinations are being done.

### (6.3) Market response

This year equal response to the last year was noted. There was steady demand of Sardar Ecogreen and feed back suggested the demand shall continue to be generated in the coming year. Field personnel have made efforts to popularise the product. Farmers are made aware about the product at village level by conducting evening meetings and literature distribution all over Gujarat.

## 7. **Conclusion :**

The product has performed well and there is constant demand of the product. It would be a great help to the farmers if such biological agents are supplied at proper time and awareness is imparted to the users.

## 8. **Plan for next year :**

We wish to maintain our production capacity and generate awareness amongst farmers about the use of "Sardar Ecogreen". We shall maintain all other promotional activities to increase the sale of product. Gujarat Green Revolution Company has decided to discontinue production of Sardar Ecogreen and hand over production facility to GSFC. However efforts in this transition process is in progress.

9. **Expenditure :**

*R&D Expenditure*

Rs. 7,000 Demonstration expenditure (Mktg.).

10. **Team members**

- 1) Mr. Samir J. Patel (Sr. Agro Development Officer)
- 2) Mr. Kamal P. Bachani (Sr. Microbiologist)
- 3) Ms. Anjali K. Khare (Supervisor – Biofungicide)
- 4) Mr. Dhaneshwar K. Dave (Field Attendant – Agri-biotechnology)
- 5) Mr. Gurung Madanbahadur. A Helper – (from polymer unit)

*The Team reports to*

Shri N. B. Acharya – Mgr. (BP&MIS)

↓

Shri Navin. Shah – DGM (AD&AS)

↓

Shri Shyamal.. Tikadar – Jt. Managing Director (GGRC)

↓

Shri P. K. Taneja – Chairman and Managing Director (GGRC)

## *Environment*

## Annual Report (Scientific) 2007-08

⊕ Kotar Land Development Project

⊕ Solid Waste Management

Environment Group  
GSFC Science Foundation  
Vigyan Bhavan  
Fertilizernagar

# 1. Title : Kotar Land Development Project

## 2. Summary :

The basic objective of the project is to develop a block of ravine (Kotar) waste land into a model green belt and demonstrate the overall improvement in the environment conditions through plantation of tree saplings as well as through water recharging & conservation model. The total project area is 18.04 acres of which 9.37 acres is a leveled/ plain land and 8.67 acres is a Kotar land.

Since the initiation of the project, a total of 16500 number of plants of different variety have been planted of which 13286 are teak plants, about 460 plants like Neem, *Babul* are naturally grown. The other varieties consist of *Goras Amlī*, *Saven*, Date Palm, *Kasid*, *Pendula* and *Acasia Mengium*. Few varieties of medicinal plants have also been grown. The plantation has been carried out in a phase wise manner covering the terrace or flat areas as well as sloppy areas. In the last phase i.e. phase V, plant varieties like Bamboo, *Ketki* Cactus have been planted along the boundary line to basically check the infiltration of animals.

A demonstration recharge well model has also been installed in the low lying area to collect the storm water and augment the groundwater conditions. Both soil & water samples are being collected every year to assess the change in the quality parameters. An initiative to measure the rate of soil erosion has also been undertaken since last two years and weekly records are being maintained.

Apart from this, certain specific measures are being taken/ initiated from time to time to check the slope erosion, specially during the monsoon period. However, during the last monsoon, in view of incessant & high intensity rains, a high degree of damage was observed at the site and as a result, a good number of trees were uprooted and slopes were eroded, breaking even the connecting approach roads. Later on, the uprooted trees were sold off and slopes were restored through debris filling. Additionally, bamboos were planted on the restored slopes to check/ slow down the rate of slope erosion in future.

As directed by the Science Foundation management, the 'Forward Selling' of the tree plantation was explored in consultation with the Forest

Department officials and in view of following, it was advised to handover the project back to GSFC :

- (a) Purpose for which the project was taken up (demonstration purpose), has long been served through organization of visits of students, farmers, NGOs etc. and the ravine waste land has been converted into a green belt through integrated practices of agriculture and water management.
  
- (b) Moreover, the decision to harvest the tree plantation was already taken by the management

The project was handed over to the Polymer Unit of GSFC, for initiating further official procedure towards harvesting of teak plants.

NATIONAL ENVIRONMENT AWARENESS CAMPAIGN  
2006 – 2007  
of  
THE MINISTRY OF ENVIRONMENT & FORESTS,  
GOVERNMENT OF INDIA

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*Subject : Solid Waste Management*

FINAL REPORT

1. Name of the Organization : GSFC Science Foundation

2. Nature of Programme :

Sr. No.	Awareness Campaign	Implementation Programme
1	<p>Distribution of Pamphlets on (both in Gujarati and English)</p> <p>(1) The issues of solid waste management in current times; and</p> <p>(2) Vermicomposting as a tool for recycling of kitchen waste</p> <p>in the Fertilizernagar Township covering about 700 residential quarters. Also, these pamphlets were distributed among the senior officials of GSFC as well as in few selected wards of the Vadodara city with the help of Vadodara Municipal Corporation.</p>	<p>Organization of a workshop on the theme of “Solid Waste Management” at GSFC. Four speakers from the varied background i.e. from academia, from NGO , from administration i.e. from the municipal corporation and from the industry i.e. from the GSFC were invited to have interesting and impacting sessions.</p>

2	An awareness drive about the clean environment and green environment in all the campuses of the parent company i.e. GSFC i.e. in the Fertilizernagar Unit of Vadodara, Sikka Unit of Jamnagar and Kharach Unit of Surat	As a follow up of the workshop, it has been decided to plant more number of trees in the townships of all the units of parent company (GSFC) i.e. in the Fertilizernagar Unit of Vadodara, Sikka Unit of Jamnagar and Kharach Unit of Surat
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### 3. Target Group :

Sr. No	Target Group	Number
	<b>A. Workshop</b>	
1	Fertilizernagar Township Residents (mainly lady members)	70
2	GSFC Officials	30
3	NGOs	10
	<b>B. Pamphlet Distribution</b>	
1	Fertilizernagar Township Residents	700
2	Vadodara Citizens	200

4. Area Covered : GSFC Campus including Fertilizernagar Township and some selected wards of Vadodara city/ Dist. Vadodara

5. Duration : 40 days

6. Communication Method : (a) Multimedia presentation (b) Pamphlets

7. Resource persons :

Sr. No.	Name <i>Full Time</i>	Education Qualification	Relevant Experience in Years
1	Dr. K D. Bhatt	M.Tech, Ph.D	12
3	Mr. H. D. Patel	12 <sup>th</sup> pass	8
	<i>Part Time</i>		
1	Shri R. C. Mathur		
2	Mr. R. D. Mehta		
3	Mr. C. S. Shah		

8. Resource Material Used & Produced Under This Programme

- :
- (1) A Series of presentations (power point) on the solid waste management
  - (2) Pamphlets on the issues of solid waste management and recycling of kitchen waste through Vermicomposting (both in Gujarati & English)

9. Media Coverage : (1) Publication in the **Times of India**; dated 30.05.07

(2) Publication in the **Indian Express**; dated 30.05.07

(3) Publication in the **Divya Bhaskar**; dated 30.05.07

(4) Published in the **GSFC Newslines (internal circulation)**; dated 4.06.07

**10. How the Programme was Beneficial to the NGOs & the Target Groups? :**

- A workshop the subject theme was organized inviting the speaker from an NGO working actively on the issues of waste management. Moreover, a few selected NGOs, whose area of activity/ project interests are in line with the current theme of the subject, were invited to participate and interact. It is therefore believed that the NGOs with common areas of work interests will align their activities or may join their hands to achieve a common goal increasing their sphere of activities avoiding the duplication for better results.
- Pamphlets on the issues of issues of solid waste & Vermicomposting as a recycling option were distributed in the township covering every household as well as in the city areas. The township residents have resolved to contribute (per member per member) in terms of man-hours for cleaning up of the Fertilizernagar Township and maintaining it. Moreover, it has also been decided to increase the green canopy cover in all the residential townships of the GSFC in Gujarat to keep the environment clean & green.

**11. Overall Comments on the Impact of the Event in the Region :** Same as above

12. Was Any Problem Faced? : No

13. Suggestions, If Any ? : No

14. Planned Follow-up Activities :

- (1) To take up the activities as proposed above in a phase wise manner
- (2) To encourage each & every resident of Township to contribute towards waste management
- (3) To evaluate the impact of awareness drive to decide whether such campaigns can actually generate the required self-discipline in the people and if yes, then such programmes can be replicated in future in other residential townships for mass awareness

*Other Activities*

## PARTICIPATION

1. Dr. K D. Bhatt, Member Secretary attended a workshop on the occasion of “World Environment Day” organized by World Wide Fund, Gujarat Chapter at Vadodara in on June 05, 2007.
2. Dr. K D. Bhatt, Member Secretary was invited to deliver an expert lecture on “Rain Water Harvesting” at Dharmsinh Desai University, Nadiad on March 06, 2008.
3. Dr. K D. Bhatt, Member Secretary attended XXII – Gujarat Science Congress on th etheme of “Role of Communication and Information Technology in the Development of Science and Technology” organized by the Bhavnagar University at Bhavnagar on March 09, 2008.
4. Mr. D. K. Dave, Field Assistant and Mr. H. D. Patel, Lab Attendant participated in a workshop on “Empowering the Grassroot Level/ Filed Staff in NGOs” organized by United Way of Baroda at Vadodara on March 11, 2008.
5. Mr. C. S. Shah, Administrative Officer participated in a seminar on “Life Excellency through Total Quality Management” organized by United Way of Baroda at Vadodara in on March 13, 2008.

## Participation in United Way Mela- 2008 at Vadodara

United Way of Baroda, an umbrella organization of more than 100 NGOs, organized a three day exhibition event called – ‘United Way Mela’ at the Polo Ground, Vadodara from 16<sup>th</sup> February to 18<sup>th</sup> February, 2008 with the theme of ‘SEVANO SAMVAD’ (Attachment 1). As a member organization, Science Foundation participated in the Mela and displayed the activities of the organization in the areas of water management, environment and agri-biotechnology.

The response of participants was encouraging. The contact details of the interested organizations and their queries have been recorded for the follow up action.