

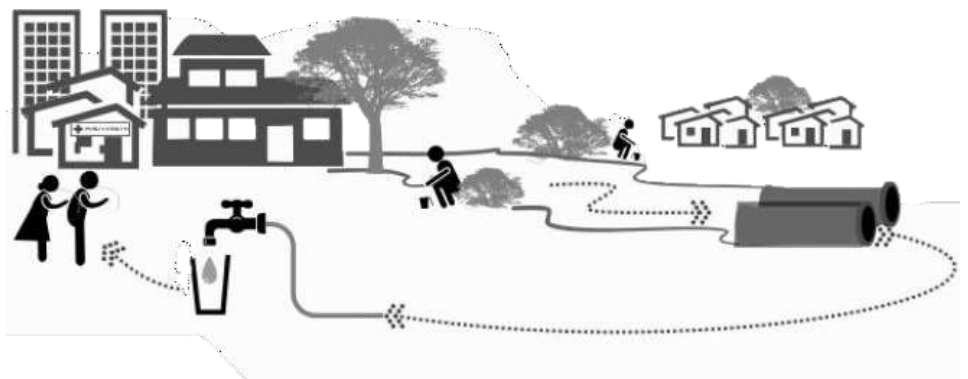
# SIGMA FOUNDATION ANNUAL REPORT

2019 - 2020





# Support for Improvement of Governance and Monitoring Advancement Foundation





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**Support for Improvement of Governance and Monitoring Advancement (SIGMA) Foundation** is a 'not for profit' society. It was established in the year 2014 for serving the society in various ways with the initiative of Dr. M. N. Roy, the Founder-President of the organization. The vision of the organization is a poverty free India with equity and justice, where each child can access opportunities to grow to his/her full potential, enjoy all the rights as citizen and be responsible for making the society better and sustainable. SIGMA Foundation has a mission to improve the wellbeing of the people with sustainability as well as equity. Keeping that in mind, it takes up various activities for improving governance towards enhancing both efficiency and effectiveness of the service delivery towards the poor and vulnerable sections of the society.

The organization has specialization in disciplines related to various social and economic development. Its area of expertise includes Monitoring & Evaluation, application of ICT, Real Time Monitoring through Mobile Telephony and application of GIS, analyses of big data generated through programme MIS and its interpretation for decision support, public health including nutrition, maternal and child healthcare, WASH, management of solid and liquid wastes, management of drinking water supply along with quality monitoring, strengthening Panchayats and decentralized planning, alleviation of rural poverty, natural resources management and improvement of environment. It conducts research in all these fields and is also engaged in capacity building in all the said fields.

The head quarter of the organization is at Kolkata. It has a branch office in Maharashtra and also have representatives in the state headquarters of Assam, Bihar and Jharkhand for coordination of projects taken up in those states. It is capable of taking up projects in any state of the country. The organisation has the experience of working in the states of Maharashtra, Bihar, Madhya Pradesh, Chhattisgarh, Gujarat, Himachal Pradesh, Rajasthan, West Bengal and Assam.



## Our vision

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*“Poverty free India with equity and justice, where each child can access opportunities to grow to his/her full potential, enjoy all the rights as citizen and be responsible for making the society better and sustainable.”*

*To provide possible support to all the tiers of government to be inclusive, effective and efficient for improving their performance and use their resources for enhancing human wellbeing and attaining sustainable development.*

## Our mission

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#### **Dr. M. N. Roy (President)**

Dr. M. N. Roy did his M.Tech from University of Calcutta and PhD in social science from Tata Institute of Social Sciences and studied Sustainable Development in the University of Birmingham, UK. He joined the Indian Administrative Service in 1980 and retired from the same as Additional Chief Secretary of the Govt. of West Bengal in the year 2012. He was President of Riddhi Foundation after retirement till February 2018 and is the Founder and President of SIGMA Foundation from 2014.

He has been a member of many Committees of the Government of India, particularly the Ministry of Rural Development and the Ministry of Panchayati Raj. He is a member of the Indian Statistical Institute and the International Water Association and the Indian Science Congress Association.

#### **Mr. Dilip Ghosh (Vice-President)**

A former member of the Indian Administrative Service, Mr. Dilip Ghosh worked mostly in the areas of Health, Nutrition and Child Development and Rural Decentralization. He retired as Secretary to the Government of West Bengal. He headed a number of Government and external agency-supported projects on decentralization and rural livelihood implemented by the Government of West Bengal. He was a member of the 5th State Finance Commission of West Bengal after his retirement from service in 2012. He has been an honorary adviser to Viswa Bharati University and Rabindra Bharati University.

#### **Mr. Tapan Kumar Majumdar (Secretary)**

Mr. Tapan Kumar Majumdar is also a retired IAS officer and he retired as Joint Secretary to the government of West Bengal. He has a long experience of working in District Administration besides overseeing the performance of important flagship programmes of the Public Health Engineering Department and the Panchayat & Rural Development Department of the government of West Bengal.

#### **Mr. Nirmalya Sarkar (Treasurer)**

Mr. Nirmalya Sarkar is an FCA and has served Government of West Bengal for 34 years in West Bengal Audit & Accounts Service. He has wide experience in Project/Programme Fund Monitoring & Accounting and accounting of Panchayat Bodies

Other members are Dr Anjali Roy, Dr Urmila Ukil and Mrs Evelyn Banerjee.

**Board of  
directors**



## Our team

SIGMA Foundation is led by Dr. M. N. Roy, who held key positions in the government during his career in the Indian Administrative Services spanning more than three decades. He is assisted by a few other retired IAS and State Civil Service Officers and a team of full-time professionals from various disciplines like Civil, Environmental, Chemical & Electronics Engineering, Earth Sciences with specialization on water quality and geohydrology, Nutrition, Environment Sciences, Economics & several other branches of Social Sciences and Financial Management. It also has a core group of experts from various disciplines including public health/medical sciences, bio-sciences, Information Technology whose services are procured as and when needed. The vision of the organization resonates with every member and they motivate and inspire each other to do their best as a team. One of our greatest strength is our team spirit as we unite every day in doing our best to bridge the gaps in programme implementation through technology driven tools in order to provide our clients with the best results.





The year 2019-20 has been a very successful year for SIGMA Foundation in many respects. It could not only complete all the projects for which the completion date was within 2019-20 but also started several new projects. One major achievement was to develop the Waste Management wing to work primarily for urban waste management. The State Urban Development Authority, West Bengal assigned the responsibility of preparing the micro-plan for Solid Waste Management of 32 Urban Local Bodies (ULB) of the state covering most of the district towns as well as handholding the ULB authorities for proper management of their solid wastes in a sustainable manner. The organization also started a new type of work in rural development by assessing the system of village transformation in Maharashtra, which is being attempted in hundreds of villages facing special problems/ deprivations through an innovative effort by the state government with the support of the corporate sector. SIGMA Foundation also set its foot print in the states of Gujarat and Chhattisgarh during the year by taking up two very important projects, as described in this report. The year also saw a good number of publications in international/peer-reviewed journals by the members of the organization. This is also the year in which members of SIGMA Foundation were being invited for the first time by any foreign University for sharing their works.

I hope the relentless efforts by the team members will help us to achieve more in the coming years.

(M.N.Roy)





## Our growth story

**SIGMA Foundation** was established in the year **2014** for serving the society in various ways with the initiative of Dr. M. N. Roy, the Founder-President of the organisation.

**2014**

**2017**

To strengthen the activities of the organisation, it was registered under the West Bengal Society Registration Act in the year **2017**.

In the financial year **2017-18**, it had completed four projects and five other projects were running in partnership with international aid organisations and NGOs, Government ministries/ agencies, and grassroot development

**2018**

**2019**





SIGMA Foundation completed a total of twelve projects over seven states thereby gaining more experience and sharpening its expertise.

In the financial year 2019-20, SIGMA Foundation has completed 8 projects and a total of 20 projects till the end of the year. It signed two important contracts with State Urban Development Authority and Public Health Engineering Dept., Govt. of West Bengal

**2020**

# Our footprint



-  Head Office
-  Branch Office
-  Having state representatives
-  Experience of taking up projects



SIGMA Foundation has acquired formidable skill in all the fields covering its major activities. It has been working for monitoring and analysis of data captured through MIS of several flagship programmes and the team has gained huge analytical skill for analysis of big data and generating feedbacks for the implementing agencies for identifying and pre-empting areas of failures. Such feedbacks have been very effective in making interventions for course correction. SIGMA Foundation has taken up several socio- economic researches and the experience has been very useful in taking up such works requiring more advance analysis. It is engaged in study of local governance and decentralized planning in some states, which has added to its understanding and analytical capability of local governance research. SIGMA Foundation has imparted training in all the field of its activities and the team is now more experienced and have better skill in training and capacity building in monitoring & evaluation, local governance, decentralized planning, improving sustainability and safety of water and community-based management of water supply, implementation of sanitation programme and nutrition management.





## Our sectoral expertise





SIGMA Foundation have expertise across various segments of work like monitoring and evaluation (M&E), WASH, Panchayat, Decentralised Planning and many more. The organisation has always maintained good relation with its clients. It has also delivered good quality outputs within the proposed time frame. Therefore, work quality, punctuality and moreover the overall support are the keys of choosing us by our clients. The services provided by us are as following:

### **Monitoring and Evaluation**

Monitoring and Evaluation (M&E) of projects and programmes is one of the important services delivered by SIGMA Foundation. It is very capable of designing web-enabled system having GIS backbone where necessary for monitoring. Developing Android run mobile applications for capturing geo-tagged data from the field on real-time is another area of expertise of the organization. Dashboards are designed as a part of the web-enabled system to provide ready feedback as per programme requirement. Locational data captured through GIS where captured are integrated with the MIS to enable making spatial analysis. Assessment of status at baseline in the sectors like WASH, Nutrition, Processes of Local Governance, mid-term evaluation of any project for suggesting appropriate course correction and end-line evaluation at the end of the project are also carried out by the organization.

### **Data Analysis and Interpretation**

The data management and analysis wing of the organization has long experience and proficiency in analysis of big data and helping the programme implementation authority for various decision support. The team has supported implementation of several national flagship programmes like Swachh Bharat Mission (Grameen), Integrated Child Development Scheme etc. in the past. It also carries out disaggregated analysis of national/state wide programmes for bringing out performances across regions and over time for gaining better insight of the programme implementation and guidance for appropriate interventions for taking corrective measures.

### **Sanitation, Nutrition, and Public Health**

The team of SIGMA Foundation is well experienced in providing support to implementation of Swachh Bharat Mission. It has expertise in conducting field surveys, designing tools which can help in making the ODF status sustainable and improvement of Solid and Liquid Waste Management (SLWM). The team is also conversant in monitoring nutrition services and tracking nutrition status of individual child and other associated preventive healthcare measures, particularly those targeted towards women and children.

### **Drinking Water Management and Water Safety & Communication for Development**

SIGMA Foundation has implemented several projects involving drinking water supply management and water quality monitoring system. The organization has expertise in establishing sound water quality monitoring system, monitoring management of water supply projects, aquifer mapping through latest remote sensing technology. It has special expertise in establishing protocols for Good Lab Practice Models (GLPM) and putting in place required arrangement for NABL accreditation for chemical and bacteriological water quality assessment. IEC/SBCC in the context of water supply and sanitation and assessment of existing system of communication for appropriate improvement are the other areas of expertise for these activities.

### **Rural Local Governance, Decentralized Planning & Poverty Alleviation**

SIGMA Foundation has a very versed team for providing consultancy in strengthening governance, particularly at the local level, curriculum designing for training of local government functionaries, development of training materials, strengthening participatory planning process and application of PRA tools and related capacity building. The team members have wide experience in working with Panchayats and designing and supporting institutional strengthening measures across many states of the country. Computerization of the accounts, web-enabled system with GIS backbone for monitoring participatory planning & its outcome and development of grievance redressal system are the other areas of expertise of the team. The team is also experienced in taking up studies related to rural development and poverty alleviation.

### **Training and Capacity Building**

SIGMA Foundation is also highly experienced in providing training in all the streams of activities in which it is engaged with. Training is provided using mostly participatory mode for enhancing learning outcome with the help of training materials like case studies, video clips etc. It has a small training facility in Kolkata office where training is conducted for smaller groups. For larger groups suitable training venue is hired for imparting training.

### **Waste Management and Environmental Sustainability**

This is a new area for SIGMA Foundation. Solid & Liquid waste management, social mobilization for waste management and taking up studies on environment management and suitability are the areas of expertise of the team.





## Projects completed prior to April 2019

1

### **Baseline survey on functioning of VWSCs and VHSNCs in Sagar and Patharpratima Block of South 24 Parganas –**

Client: Naihati ProLife

Starting date: 07.09.2017

Completion date: 30.09.2017

### **Prepare four modules on the role and responsibility of VWSC, VHSNC and Water User Committees -**

Client: Digambarpur Angikar

Starting date: 11.09.2017

Completion date: 30.09.2017

2

3

### **Improve the capacities of monitoring and evaluation officials for better appreciation of MIS data and monitoring & improving Drinking Water Quality in Assam –**

Partner: UNICEF, Assam State Office

Starting date: 30.11.2017

### **Provide support in demonstrating a more effective Gram Panchayat Development Planning (GPDP) process in 12 Gram Panchayats of Tonk district**

Client: Chief Planning Officer, Tonk

Starting date: 30.10.2017

Completion date: 10.02.2018

4

5

### **Develop a sound water quality management system for Assam**

Client: WSSO (PHE Dept., Assam) and UNICEF, Assam

Starting date: 15.3.2018

Completion date: 30.06.2018

**Collecting Baseline Information, Conducting Post-Implementation Monitoring and water sample collection for water quality testing in Sheohar district (Bihar) & Sagar and Patharpratima Blocks of South 24 Parganas**

Client: Water For People

Start date: 14.03.2018

Completion date: 31.08.2018

6

7

**Swaccho –Nirapad Paribesh (Clean and Safe Environment) in Rajnagar Block of Birbhum district (West Bengal)**

Client: Water For People, India

Start date: 1.06.2018

Completion date: 31.08.2018

**Assessment of Management Practice and Functioning of the Rural Piped Water Supply Schemes Maintained by GP/VWSCs as well as PHED in the Districts of Nadia & Hooghly of West Bengal**

Client: PHED, Govt. of West Bengal

Start date: 07.3.2018

Completion date: 07.09.2018

8

9

**SBCC Capacity Strengthening for WASH in Assam**

Client: WSSO (PHE Dept., Assam) and UNICEF, Assam

Start date (month/year): August 2018

Completion date (month/year): January 2019

**Monitoring IEC Activities for SBM Across Five States of India**

Client: UNICEF, India Country Office

Start date (month/year): June 2018

Completion date (month/year): February 2019

10

11

**Assignment name: Quick Assessment Study on Mission Antyodaya GPs**

Client: NIRD&PR

Start date (month/year): January, 2019

Completion date (month/year): February, 2019

**Assignment name: Time and Work study for Panchayati Raj Functionaries in India**

Client: NIRD&PR

Start date (month/year): December, 2017

Completion date (month/year): March, 2019

12



## Projects completed in 2019 - 2020

### **Developing capacity towards concurrent monitoring and supportive handholding to Govt. of Maharashtra to sustain ODF status of rural Maharashtra**

Client: UNICEF, Maharashtra State Office and WSSD, GoM.

Start Date: 16.02.2018

End Date: 30.04.2019

1

2

### **Strengthening GPDP/ Panchayat Initiatives and Knowledge Management in Maharashtra**

Client: UNICEF Field Office

Start Date (month/year): October, 2019

End Date (month/year): July, 2019

3

### **Developing a Strategy for ODF Sustainability in Rural West Bengal**

Client: Govt. of West Bengal and UNICEF, West Bengal State Office

Start Date (month/year): November, 2018

End Date (month/year): July, 2019



4

**Everyone Forever: Water Services and Systems Strengthening:  
Rajnagar and Khoyrasol Blocks of Birbhum district of West  
Bengal**

Client: Water For People India Trust

Start Date: 18.03.2019

End Date: 30.11.2019

**Survey in Patharpratima and Sagar Blocks of South 24  
Parganas of West Bengal and Sheohar in Bihar**

Client: Water For People India Trust

Start Date: 05.08.2019

End Date: 05.12.2019

5

6

**Assessment of the Status of ODF Sustainability and IEC/SBCC  
Interventions in Chhattisgarh**

Client: UNICEF Chhattisgarh Field Office

Start Date: 25.05.2019

End Date: 25.12.2019

**Stakeholder Consultation Training and Monitoring activities as  
part of the ODF Sustainability and ODF Plus Communication  
Strategy and Campaign being developed by JWT for UNICEF**

Client: JWT

Start Date (month/year): October, 2019

End Date (month/year): March, 2020

7

8

**Assessment of performance of in-village piped water supply  
system, WQMS and ICT based monitoring of water supply in  
Gujarat**

Client: UNICEF Gujarat Field Office

Start Date (month/year): June, 2019

End Date (month/year): March, 2020

# 1.

## Developing capacity towards concurrent monitoring and supportive handholding to Govt. of Maharashtra to sustain ODF status of rural Maharashtra with identification of bottlenecks and developing enabling environment

SIGMA Foundation has started supporting the government of Maharashtra in the field of WASH. The support includes monitoring of the progress of SBM(G) through rapid field surveys with special focus on use of toilets and change in sanitary and hygiene behaviour as well as critically looking into the issues of ODF sustainability with improvement of public health indicators. The project area covers 12 districts and 18 Census Towns of Maharashtra. All the districts of Aurangabad Division and the districts of Chandrapur, Palghar, Nandurbar and Amravati are included for conducting regular field visit and collection of both household level and GP level data and to analyse those for giving feedback to the Zilla Parishads as well as the state authorities, i.e., the WSSO and Water Supply and Sanitation Department of the Government of Maharashtra. Each district was to be visited at least once in a quarter and two GPs and 10 to 15 HHs in each GP was to be visited at random to assess ground realities. 20 out of those 39 Census Towns of the districts covered under the project were also to be surveyed regularly to understand the problem of sanitation and waste management in the non-municipal towns. The data captured was also to be analysed to gain knowledge about the issues of sanitation in such areas and suggesting possible measures in overcoming those problems. The IEC activities being performed at the block and GPs and its impact on ODF sustainability was to be also monitored in order to motivate the families for constructing and using the IHHLs. Visits to a few schools, ICDS centres, health sub-centres and PHCs was to be made and the findings were to be shared with the implementing agency as Fact Sheets.

A web-enabled system with GIS backbone (hosted at [mh.swachhgaon.in/watsan](http://mh.swachhgaon.in/watsan)) was developed to guide the field officials by displaying the analysed result on status of sanitation across all the blocks of the state for planning appropriate interventions by respective authorities of the state. The main motive of the initiative was to help all the officials up to block level to go through the web-based analysis on a regular interval, know their performances in comparison to others, internalize the reasons behind any shortfall and to plan for taking specific measures.



# 2.

## Strengthening GPDP / Panchayat Initiatives and Knowledge Management in Maharashtra

UNICEF Mumbai has been working with Rural Development Department, Government of Maharashtra (RDD, GoM) for more than a decade to strengthen the decentralized processes. RDD GoM requested UNICEF to

(a) support a study on Gram Panchayat Development Programmes (GPDP) b) to support SIRD and RGSA cell in the conceptualization of Peer Learning Centres, and c) to support the state government by developing the concept/framework for single registry for a GP.

SIGMA Foundation was selected as a partner to carry out those activities because of their expertise in the in the field of local governance and decentralized planning and it is also experienced on conducting studies on functioning of Panchayats in more than one state as a partner of the National Institute of Rural Development & Panchayati Raj, Govt of India.

The partnership between SIGMA Foundation and UNICEF focussed on the following areas:

- i. Study of GPDP on the ground and ways for strengthening the process
- ii. Conceptualization of Peer Learning Centres & development of a web Portal for sharing research, information and innovation
- iii. A conceptual framework for developing a single registry focusing Panchayats

SIGMA Foundation carried out the study based on both quantitative and qualitative methods of data collection along with the desk review of policy documents. The study covered a sample of 264 GPs to have 95% confidence level. A three-stage sampling method was followed. In the first stage, 2 districts (one with poor performance and another with good or average performance) were selected from each division, further 2 blocks were selected randomly from each district. In the last stage, 11 GPs were selected from each block based on various criteria.

The report was shared with the GoM and UNICEF Maharashtra Field Office.



# 3.

## Rural ODF Sustainability study for West Bengal

West Bengal has made very good progress in providing access to sanitation through Mission Nirmal Bangla (State contextualized Swachh Bharat Mission – Grameen) launched by the Govt. of India. The IHHL coverage of West Bengal has reached 96.3% as on 5<sup>th</sup> October, 2018 while the corresponding figure at the Baseline was 50.4%. the current challenge for the state like many other states of the country, has shifted to universal use, operation and maintenance of toilets on a sustainable basis, adoption of hygienic behavior by everyone in both domestic as well as in public life as well as mainstreaming of second-generation sanitation components into the current sanitation program. Ensuring sustainability of ODF status and achieving higher standards of sanitation and hygiene, termed as ODF Plus, through various interventions will thus require adoption of appropriate strategy by the State Government while the approach for the development of the strategy will require to examine past sanitation programmes in WB including the ongoing SBM (G) and their impacts: assessing current ODF scenario, gaps and strengths in terms of processes applied, different stages of ODF S and ODF Plus the various districts have currently adopted, gaps in technical options, capacity building, policy requirement etc.

UNICEF, West Bengal state office has come forward to provide technical support in this endeavour of the State Government and they have identified SIGMA Foundation, an organization with specialization and experience in the WASH sector, as partner for providing technical support. The following are the expected results from the project

1. Assessment of gaps and strengths of current state contextualized SBM (G)/ MNB implementation
  - a) In depth Review of literature
  - b) Pre-consultation with various stakeholders
2. Support system strengthening through development of State strategy on ODF sustainability.
3. Dissemination and finalization of strategy through a consultative State level Workshop with all Sate and District stakeholders.

After relevant in-depth review of literature and in consultation with various stakeholders, the final report has been prepared and submitted to UNICEF, West Bengal

# 4.

## Everyone Forever - Water Services and Systems Strengthening: Rajnagar and Khoyrasol Blocks of Birbhum District in West Bengal

Water For People India Trust (WFPI) engaged SIGMA Foundation for conducting a Baseline Study on WASH status in Rajnagar and Khoyrasol Blocks of Birbhum District of West Bengal. The broad objective of the study is to understand the current status of access to water in those aforesaid two blocks and to find out the gaps in service delivery for strengthening the water supply services for everyone on a sustainable basis. The study was focused on the following objectives:

- (i) to assess the availability and accessibility of safe drinking water in Households (HHs), AWCs and schools
- (ii) to assess the availability, functionality, usage and condition of the sanitation facility at HHs, AWCs and schools
- (iii) to assess the condition, age, risk factors and serviceability of the water points,
- (iv) to assess awareness on water safety and security, water storage and handling, hygiene practices, linkage between health and sanitation etc.

The Baseline survey covered 2,723 HHs, 241 schools, 292 AWCs, 2,370 water points and 15 GPs. The detailed report was prepared and shared with WFPI after analysing the survey data. The report basically focuses on the gaps in infrastructures to provide universal access to WASH services, usage of the facilities and related barriers including lack of awareness, IEC/SBCC efforts made and related issues, Operation and Maintenance (O&M) of the WASH facilities in schools/AWCs and other public places.



# 5.

## Survey in Patharpratima and Sagar Blocks of South 24 Parganas of West Bengal and Sheohar in Bihar

Water For People India Trust (WFPI) has been working promotion healthy WASH practices under a unique programme called “Everyone Forever” in 2 Blocks (Sagar and Patharpratima) of South 24 Parganas in West Bengal and Sheohar district of Bihar. WFPI focuses on creation of sustainable WASH facilities with equity and establishment of support mechanisms. The interventions were likely to result in improvement in access to WASH infrastructure and related practices at HH level, institutions, functioning of water points, community engagement, quality of water etc.

A detailed survey was conducted by SIGMA Foundation for evaluating the post implementation monitoring status on water and sanitation sectors at HHs, schools and water points (including water quality checking). The survey was carried out through android based application. The water quality was tested on the spot (Iron, Turbidity and Bacteria), and at laboratories (Arsenic, pH). The survey covered 900 HHs, 270 schools, 338 water points and 15 service providers in Patharpratima, 720 HHs, 160 schools, 305 water points and 8 service providers in Sagar and 2,500 HHs, 450 schools, 500 water points and 53 service providers in Sheohar.

The cleaned data was shared with WFPI within scheduled time.

# 6.

## Assessment of the Status of ODF Sustainability and IEC/SBCC Interventions in Chhattisgarh

After the state of Chhattisgarh became ODF the next challenge was to sustain the ODF status and to carry on other post-ODF activities. It was necessary to know the ground realities through a primary survey. UNICEF, Chhattisgarh Field Office extended support to have an assessment of the status of ODF sustainability and engaged SIGMA Foundation as a partner. The project carried out a dip stick assessment of (i) the status of access and use of toilets in the houses and in the village level institutions like the schools and the AWCs and identified the gaps. After identifying the gaps and barriers, possible interventions have been suggested for sustaining ODF status, (ii) strengthening IEC/SBCC activities and (iii) how the GPs can be made a more active stakeholder in sustaining ODF status and delivering WASH services. The study was carried out in five districts namely Surguja, Durg, Bastar, Rajnandgaon and Raigarh. One district was selected from each division of the state to have proper coverage of the entire state in consultation with the Government of Chhattisgarh.

The detailed report and the key findings have been shared with Govt. of Chhattisgarh and UNICEF, Chhattisgarh Field Office.



# 7.

## Stakeholder Consultation Training and Monitoring activities as part of the ODF Sustainability and ODF Plus Communication Strategy and Campaign being developed by JWT for UNICEF

The GoWB requested UNICEF for technical support to develop evidence-based communication strategy and a tool kit with bilingual communication material package in Bengali and Hindi to support communication processes promoting ODF sustainability in the districts which have already achieved it.

State Level Consultation has been successfully completed on ODF sustainability with various stake holders. The consultation was broadly themed into ODF attainment and sustainability, Solid and liquid resource management and menstrual hygiene management. Brainstorming sessions were organised touching various aspects of ODF sustainability such as universal use, sanitary toilet features, enabling long term sustenance, faecal sludge management, upgradation or retrofitting, impact of open defecation on malnutrition, personal hygiene, handling child faeces, toilet facility in public places, institutions and health centres. SLRM focused on plastic waste management apart from solid and liquid waste management. The agenda of menstrual hygiene management captured the aspect of physiological process as well as the unhygienic practices. Each theme was rigorously discussed in open forum detailing the knowledge, attitude, behaviour, challenge and an appropriate SBCC solution. A Message and Tool matrix was developed for easy facilitation of the subject. Monitoring and Evaluation was kept as an important aspect of the training.

# 8.

## Assessment of performance of in-village piped water supply system, WQMS and ICT based monitoring of water supply in Gujarat

SIGMA Foundation has partnered with UNICEF, Gujarat State Office for assisting Water and Sanitation Management Organization (WSMO) of the Government of Gujarat to assess the performance of the In-village water supply schemes and functioning of the Pani Samities for delivery of drinking water to the HHs across all the districts of the state. Also, as desired by the state government, SIGMA Foundation made an assessment of the Water Quality Monitoring and Surveillance System (WQMS) of the state of Gujarat. This assignment included studying efficiency and quality of functioning of the water testing labs at state, district and Taluka level and the system of surveillance to know the water quality across the state. Furthermore, a ICT based system, with collection of data using mobile telephony and a dashboard to view performance, was developed by SIGMA Foundation for real-time monitoring of performance of the In-village water supply scheme.



**WORK IN PROGRESS**

**Projects in  
progress**

**Strengthening Decentralized Participative Planning (DPP)  
in Rajasthan**

Client: Deloitte Touche Tohmatsu India LLP

Start Date: July 2018

**1**

**2**

**Strengthening PRIs in Bihar – Building Institutional,  
Systematic and Technical Capacities**

Client: UNICEF Bihar State Office

Start Date: October 2018

**3**

**Enabling and Skilling Communities for Sustainable  
Operation and Maintenance of Services (Bankura district)  
under the West Bengal Drinking Water Sector  
Improvement Project**

Client: Public Health Engineering Department, Govt. of WB

Start Date (month/year): May, 2019

4

**Preparation of a Manual for O&M for handed and proposed to be handed over PWSSs to the GPs**  
Client: Public Health Engineering Department, Govt of WB  
Start Date (month/year): May, 2019

**Integrated Capacity Building in Aspirational Districts and VSTF Villages of Maharashtra**  
Client: UNICEF, Maharashtra Field Office  
Start Date: 10.07.2019

5

6

**Design and Development of Android-run Mobile Application and dashboard for 2nd Level ODF Verification**  
Client: WSSO, Govt. of Maharashtra  
Start Date: 25.07.2019

**Monitoring and Evaluation (M&E) of BRGF funded Piped Water Supply Schemes (PWSS) for Bankura District covering 14 Blocks**  
Client: Public Health Engineering Department, GoWB  
Start Date: 17.09.2019

7


8

**Baseline Survey on WASH in Namkhana Block of South 24 Parganas of West Bengal**  
Client: Water For People India Trust, SSDC  
Start Date: 15.12.2019

**Preparation of Micro-Plan for Proper Management and Scientific Disposal of Solid Waste of 32 ULBs**  
Client: SUDA, GoWB  
Start Date: 04.11.2019

9





# 1. Strengthening Decentralized Participative Planning (DPP) in Rajasthan

Deloitte Touche Tohmatsu India LLP (Deloitte) is a reputed consultancy organization, which entered into a contract with the Government of Rajasthan to strengthen Decentralized Participatory Planning in Rajasthan. The 24 months long project is supported by the World Bank. Deloitte entered into a sub-contract with SIGMA Foundation on the 12<sup>th</sup> July 2018 to provide technical support in implementation of the project. The team constituted by Deloitte to support the project is headed by Dr M.N.Roy, President of SIGMA Foundation and Mr Debraj Bhattacharya, Fellow of SIGMA Foundation is another member.

The key components of the project was to conduct an “As Is” study to know in-depth about the existing system of preparation of district plan in the state covering all the local governments in rural areas (different tiers of Panchayats) and urban areas (covering different types of urban local bodies). The As Is study was completed in the year 2018-19 and the same was presented before Mr. Ashutosh A. T. Pednekar, IAS, Secretary-cum-Commissioner, PRD and other officers from the department on the 2<sup>nd</sup> April 2020. Based on their feedback the As Is study was finalized and the existing gaps were identified to work out the “To Be” scenario. The next task was to develop a framework for Decentralized Participatory Planning (DPP) for both rural and urban areas and to pilot the same in Dausa district to lead to the “To Be scenario. The DPP framework was developed and shared with the Government of Rajasthan, which was accepted. Based on the accepted framework, the piloting in Dausa district started from June 2019. Several Manuals were developed and the local government functionaries were trained to collect data and prepare plans by the team from Deloitte in which officials of SIGMA Foundation also participated. The draft plans were developed for some of the pilot Gram Panchayats of each block of Dausa during the year. Implementation of the project was affected due to election to the Panchayats in the state during January 2020 and later the onset of covid-19 pandemic, when field work had to be suspended. The project was reviewed from time to time by the World Bank and the Government of Rajasthan. The project will continue in the next financial year also.



# 2.

## Strengthening PRIs in Bihar – Building Institutional, Systematic and Technical Capacities

SIGMA Foundation has been working in Bihar to strengthen the Gram Panchayats of the state for last few years. There are two broad thrust areas – (a) develop the Gram Panchayats institutionally, and (b) strengthen the systemic capacity for supporting the Gram Panchayats for better functioning.

This project was aimed at strengthening the Gram Panchayats to become strong institutions of local government and to sensitize those bodies on various issues of child development so that they improve basic services for the children. Various departmental functionaries at the field level were also sensitized so that they could leverage the Gram Panchayats for improving their departmental services, particularly those related to human development and alleviation of poverty. In a meeting between the Principal Secretary, Department of Panchayati Raj, Government of Bihar and UNICEF on the 17<sup>th</sup> July 2018, it was decided that the process of strengthening the PRIs of Bihar needs to be continued with support from SIGMA Foundation.

UNICEF and SIGMA Foundation followed the exercise and discussed in detail to develop a systematic capacity building intervention through the project “Strengthening PRIs in Bihar – Building Institutional, Systematic and Technical Capacities”. The project was initiated in November 2018. The project was divided into three main project output areas to strengthen the institution of the Gram Panchayats of Bihar through this partnership.

The project was divided into two phases with the first phase starting from November 2018-March 2019 and the second phase from April 2019-April 2020. In the second phase (April 2019- March 2020), the following nine activities were conducted and the completed deliverables have been shared with Department of Panchayati Raj, GoB and UNICEF-Bihar.

- a) Capacity Building and Training of Key Functionaries viz. SPMU and Faculty Members of the Training Institutes at Kolkata
- b) Development of a Child Responsive Index
- c) One day Sensitization Workshop at District and Block Level
- d) Preparation of a Blueprint for Activating the Training Institutes
- e) Preparation of draft ToR for Recruitment of Staff for SPMU
- f) Preparation of Work Manual for Financial Management and IT System at GP
- g) Preparation of draft Work Manual for Executive Assistants (EAs) for GPs and preparation of an Action Plan for their Capacity Building & Training
- h) 6-day Training of Trainers and EAs based on the Financial Management Manual
- i) Preparation of an approach paper for methodology, contents, design etc. for their capacity building



# 3.

## Enabling and Skilling Communities for Sustainable Operation and Maintenance of Services (Bankura district) under the West Bengal Drinking Water Sector Improvement Project

The Public Health and Engineering Department (PHED), of the Government of West Bengal, the implementing agency and the executive agency, is wholly responsible for the implementation of ADB-financed West Bengal Drinking Water Sector Improvement Project (WBDWSIP). The proposed project aims to provide safe, reliable and continuous drinking water in line with government of India's guidelines and standards and with the Vision 2020 of GoWB to about 1.65 million people in selected Arsenic, Fluoride, and salinity affected areas of North 24 Parganas, Purba Medinipur and Bankura districts of West Bengal.

The project will ensure drinking water security through 24/7 piped water supply schemes in the areas covered, strengthen the institutional structures and build the capacities of stakeholders at all levels of service delivery for sustainable operation and maintenance and sustained public health improvement. The outputs comprise:

Output 1 Drinking water infrastructure constructed and upgraded.

Output 2: Institutional strengthening and capacity building for operational sustainability.

PHED has engaged SIGMA Foundation for Bankura district in accordance with the fixed budget Selection (FBS) procedures of the ADB's Guidelines on the Use of Consultants, 2013 (as amended from time to time), for a period of 42 months.

SIGMA Foundation will support (i) implementation of community awareness and stakeholder consultation program, (ii) institutional strengthening and capacity building of the gram panchayats (GPs) to sustainably operate and manage the assets created under the proposed WBDWSIP and provide services to the consumers and (iii) PHED in delivering outputs under the grant component of the WBDWSIP financed by the Japan Fund for Poverty Reduction, as well as outputs under the Gender Equality and Social Inclusion (GESI) Action Plan for the Project. In particular, for institutional strengthening and capacity building of the GPs, SF will support the GPs in preparing themselves for effective implementation of the Government Order on Asset Management and Service Delivery and operate and maintain the GP level water supply distribution system.

SIGMA Foundation has prepared a comprehensive Community Awareness and Participation Plan (CAPP) and a Gender Equality and Social Inclusion Plan and is currently implementing the same.



# 4

## Preparation of a Manual for Operation and Maintenance of handed over and proposed to be handed over PWSSs to the GPs

The Public Health and Engineering Department (PHED), of the Government of West Bengal, have engaged SIGMA Foundation in the preparation of a uniform Operation and Maintenance Manual to maintain the Piped Water Supply System (PWSS) by the Gram Panchayats on their own and in the preparation of a guideline for smooth handing over of the O&M responsibilities of the PWSSs and under WSSO, PHED, Govt. of West Bengal.

The work encompasses the following:

- i) Preparation of a uniform O&M Manual for PWSS for enabling the GPs to maintain the PWSSs by their own as per scope and direction of EIC inclusive of all taxes and charges.
- ii) Preparation of a guideline for handing over of the O&M responsibilities of the PWSSs and under WSSO, PHED, Govt. of West Bengal as per scope and direction of EIC inclusive of all taxes and charges.



# 5.

## Integrated Capacity Building in Aspirational Districts and VSTF Villages on beyond ODF

Government of India (GoI) had launched Aspirational District Program in January 2018. The main target of the program was to transform relatively poorer performing districts quickly and effectively to balance inequitous growth across region. The ranking was based from the inputs from the HH survey. After several round of consultations with various stakeholders, 49 key indicators were chosen to measure the progress of the districts and its ranking. Maharashtra has shown low ranking in spite of developmental initiatives by several agencies. Maharashtra has 4 aspirational districts – Gadchroli, Nandurbar, Osmanabad and Washim.

Maharashtra has established Village Social Transformation Foundation (VSTF) under Rural Development Department to carry on the interventions towards transformation of the villages under the leadership of CMO towards integrated rural development focusing on localizing the SDGs. This organization is currently working in 855 villages across the state.

Further, UNICEF has been working closely with Government of Maharashtra (GoM) for increasing institutional capacities of the local governments and institutionalizing community participation in governance. UNICEF has given emphasis on delivery of equitable, gender responsive services on quality hygiene and safe sanitation, health and nutrition, water resources, skill development and improvement of basic infrastructure at scale for the most vulnerable and deprived communities of all 4 aspirational districts. Hence, there is a need for capturing ground reality of the WASH status, the capacity gap in strengthening WASH in both Aspirational and VSTF districts.

UNICEF engaged SIGMA Foundation to carry out field level assessment of the structure of the proposed interventions to ensure desired transformation of the villages, the process of identification of the interventions, convergence with other sectors.

SIGMA Foundation will prepare the following:

A rapid assessment report on the theory of change of VSTF implementation structure, the functioning including interventions for improvement in delivery of the desired services under WASH.

A report on interventions planned and implemented for attaining the goals of the Aspirational districts in Maharashtra including delta ranking.

A report with focus on the capacity issues in implementation of the VSTF and suggested steps for building capacities.

Monthly reports in the form of field visit reports of concurrent monitoring of WASH situation in project districts with way forward. Further, 2 occasional papers highlighting the observed bottlenecks related to improvement and sustenance of WASH.



# 6.

## Design and Development of Android-run Mobile Application and dashboard for 2nd Level ODF Verification

The state of Maharashtra has been declared as ODF in March, 2018. However, the ground reality shows that there were many HHs without toilet, many HHs had dysfunctional toilet. This implies that there exists gap in ownership of IHHL and also its functionality. The construction defects may be due to the fact that the emphasis was given on the quantity to meet the target, sacrificing the quality issues. In view of this, Government of Maharashtra (GoM) has decided to conduct the second level verification of status of ODF to identify the gaps. For proper monitoring and identification, they had undertaken to conduct survey at household as well as institution level by using android based mobile application.

GoM engaged SIGMA Foundation to develop a mobile application as well as the dashboard. SIGMA Foundation is also responsible for the operation and maintenance of the application.

# 7.

## Monitoring and Evaluation (M&E) of BRGF funded Piped Water Supply Schemes (PWSS) for Bankura District covering 14 Blocks

Drinking water supply in West Bengal is mostly dependent on spot sources. Govt. of West Bengal is in the process of expanding the coverage of piped water supply through installation of new Piped Water Supply Schemes (PWSS). Bankura district had comparatively lower coverage of PWSS and also faced acute water crisis. The state government took up a project to increase coverage of PWSSs in 14 blocks of the district using funds available from the Backward Region Grants Fund (BRGF) of the Government of India. Public Health Engineering Department (PHED) of the state government desired to have an evaluation of the performances of those schemes in terms of delivery of the services to the people. These blocks are Bankura-I, Bankura-II, Bishnupur, Barjora, Chhatna, Indus, Hirbandh, Khatra, Onda, Simlipal, Ranibandh, Saltora, Sarenga & Raipur. PHED engaged SIGMA Foundation for this assessment. The objectives of the study include assessment of the performance of the piped water schemes as compared to the designed parameters, assess the quality of services being received by the consumers, assessment of water quality, extent of participation of the community for sustainable delivery of drinking water supply and ensuring safety of water, gap in capacity of O&M of the schemes, if any, and in that case how the same can be bridged.



# 8.

## Baseline Survey on WASH in Namkhana Block of South 24 Parganas of West Bengal



Sundarban Social Development Centre (SSDC), as a partner of Water for People India, engaged SIGMA Foundation for undertaking a Baseline Study related to WASH (Water, Sanitation and Hygiene) infrastructure and facilities (availability, conditions and usage) in households and institutions (primary, secondary schools) along with use of the facilities, asset analysis of water points, etc. in 7 Gram Panchayats of Namkhana Block. The results from the survey will be used to implement water initiative program in the Block. The broad objectives include: (i) Current status of drinking water sources, (ii) Type of the existing water source, (iii) Accessibility of people to the water point, (iv) Status of water quality testing for drinking water (v) Present water usage trend by the household for various purposes, (vi) Investigating the level of satisfaction of the household from water usage, (vii) Availability, functionality and usage of sanitation facilities at household as well as school level, (viii) Maintenance of household sanitation facilities, (ix) Asset analysis of water points to assess three different risk areas (age of the water system, functionality of water system, physical state of components of the water system), (x) Water quality testing (Turbidity, Iron and Bacteria) of drinking water points.



# 9.

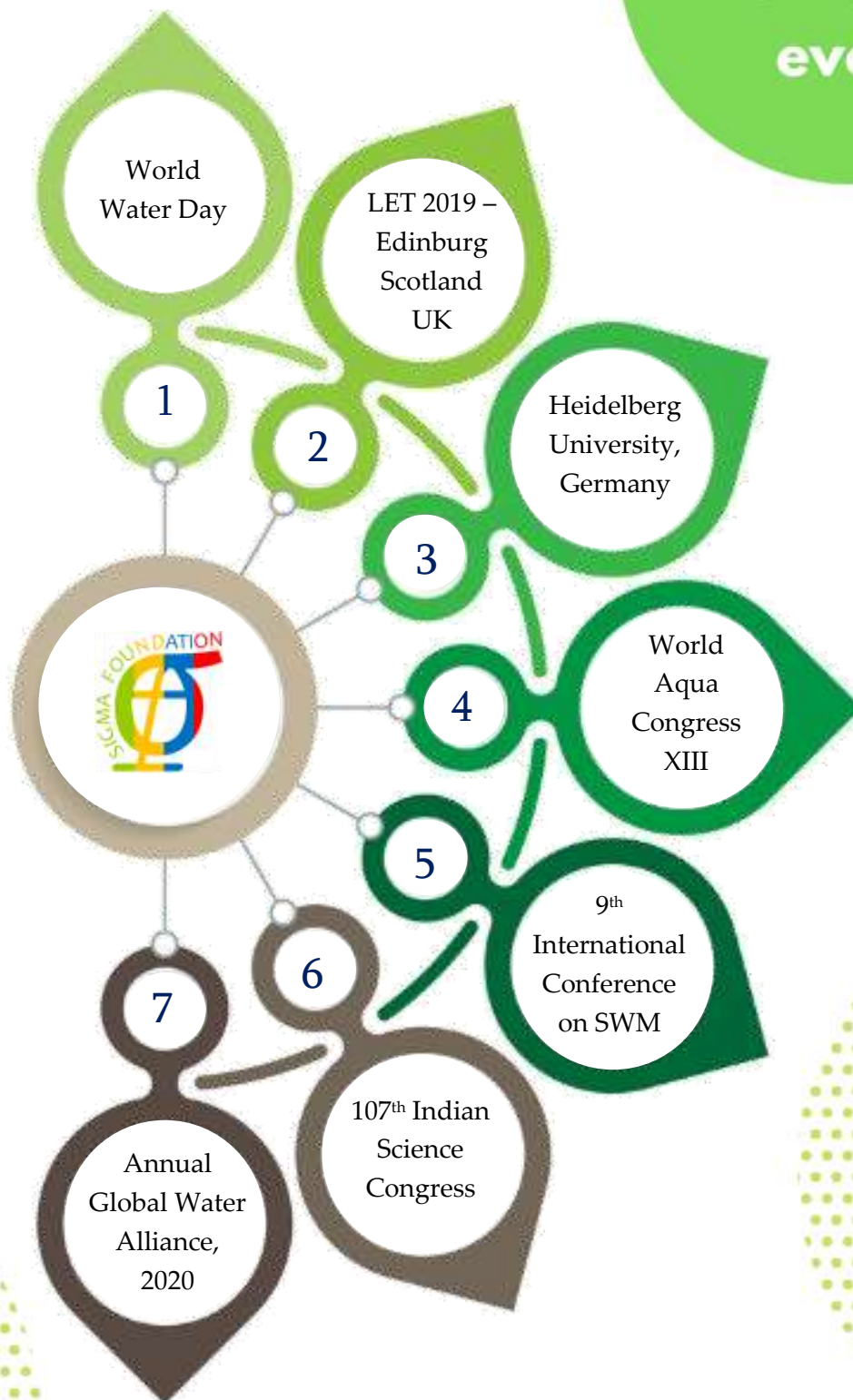
## Preparation of Micro-Plan for Proper Management and Scientific Disposal of Solid Waste of 32 ULBs

As per Sections 63, 95B, 260, 273 of the West Bengal Municipal Act, 1993, removing solid waste in municipal towns is an obligatory function of the Municipal Authority. Government of West Bengal (GoWB) in Urban Development & Municipal Affairs Department (UD&MA) has taken several initiatives to ensure that solid waste is collected by the municipal bodies and disposed of scientifically by them. However, municipal solid waste management (MSWM) is one of the major environmental problems in Indian cities. In the view of importance given to the scientific collection and disposal of solid waste a large no. of legislation, advisory notes and guidelines have been issued by different authorities keeping conformity with the Solid Waste Management (SWM) Rules, 2016 and Plastic Waste Management Rules, 2016. The present need of MSWM includes segregation of waste at source, door to door collection and disposal/transportation of waste, setting up of intermediate storage facilities of such collected waste, ultimate transportation to the disposal ground, segregation, recycling, processing of waste and setting up of sanitary landfill. This entire process requires continuous and extensive awareness generation among community members and generators of MSW and efficient management of the same including collection and scientific disposal. With this objective in mind, SUDA, West Bengal has decided to prepare city-specific concept plan cum action plan for each urban local body (ULB), along with extending hand holding support to them for execution of the plan. SIGMA Foundation has been engaged by SUDA to prepare Micro-plan for proper management and scientific disposal of solid wastes and provide subsequent hand holding support in 32 ULBs in West Bengal. SIGMA Foundation will provide assistance for developing a city-wide concept-cum-action plan on a review of previous plan, current engagement, and assessment of the needs through collection of primary and secondary data for proper management and scientific disposal of MSW.





# SIGMA Foundation in different events





# 1.

## World Water Day

SIGMA Officials celebrated "World Water Day 2019 - Leaving No One Behind" at the grassroots level with the community cluster of FSP, SOS Children's Village, Kolkata (Slum Areas of Rajarhat and Narayanpur). The Team focused on generating behavioural awareness about water safety and security on a daily basis. The concept of reduction in ground water table and recharge of aquifers was intrigued amongst the community to make water security a mass movement in rural India. A successful brainstorming session was organized in the community throwing a light on faecal oral transmission of diseases, public health and role of local governance with on-site demonstration of water quality checking with Field Test Kit support by Tintometer Lobibond Group-a German based Company.



# 2.

## LET 2019-Edinburg Scotland, UK

SIGMA Foundation made a significant mark in International Chapters of Water Research in LET2019- 16th IWA Leading Edge Conference on Water and Waste Water Technologies in Edinburgh, United Kingdom. Significantly, new critical water technology developments are emerging continuously and SIGAMA Foundation is striving to remain updated of the development across the globe.



Bringing innovations, novel technology developments and leading-edge applications from access the industry was the key concern. The program was focussed on the issues, which are of highest concern globally and regionally. The conference embraced this concern with the careful development of each session to create cohesive and interesting discussions on innovative of the most impactful water technology approaches and guarantee the participation of the most significant water technology leaders and specialists of the water industry. This 2019 LET gave us the platform to share and debate with leading researchers in pioneering science, technological innovation and top practices that will provide solutions the emerging water challenges the world is facing.



### 3. Guest Lecture in Heidelberg University, Germany

Dr. M.N. Roy and Dr. Debasri Mukherjee from SIGMA Foundation were invited by Prof. Rahul Mukherjee-South Asian Institute (SAI) for delivering lectures on “water governance and water quality” at Heidelberg University, Germany 2019.





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Lecture Series on Governance and Politics in South Asia  
Department of Political Science

**Drinking Water Safety and Governance of Water Supply Systems in India**  
by  
**Dr. M.N. Roy & Dr. Debasri Mukherjee**

Essentially, 950 million people lack access to safe drinking water. In India, drinking water supply has been a National Flagship Programme for many decades with major emphasis on ensuring sustainability of water availability along with possibility, accessibility, convenience, affordability and equity. Importantly, all water supply systems must have a water safety plan. However, planning and implementation of a comprehensive water safety plan for the rural water supply system is a huge challenge in the Indian context. The country needs to pay much more attention on safety of drinking water through proper treatment of water being supplied for drinking, optimal operation & maintenance, decentralization of management of piped water supply systems and improving its governance and surveillance of the water quality.




**Dr. M.N. Roy** is the President of Sigma Foundation, a Not-for-Profit Organisation based in Kolkata, India. He was a member of the senior administrative services and has more than 30 years of working experience in senior positions in the government, the headed departments in the Government of West Bengal and has wide experience in public policy making, delivery of public services and local governance. His current research interests include water and sanitation, decentralised planning, local governance, monitoring of public programmes and big data analysis. He received his PhD from the Tata Institute of Social Sciences (TISS), India.

**Dr. Debasri Mukherjee** is a Senior Research Officer at SIGMA Foundation. Before this, she was a Research Officer at the Water and Sanitation Support Organisation (WSSO), Public Health Engineering Department, Govt. of West Bengal for eight years. Prior to that, she worked at the UNESCO Kolkata office, The Energy Research Institute (TERI), New Delhi and at the Flooding Mitigation Programme. She received her PhD from the Department of Geography at the Indian School of Geography and specialised in water quality monitoring and surveillance, management of water supply systems and water safety and security plan implementation.

Date: 17 June 2019 (Monday)  
Time: 14:30 - 18:00  
Venue: C.A.T.S, R2 08 01 (H2008.21)  
All are cordially invited

Heidelberg University | Centre for Asian and Transcultural Studies | South Asia Institute  
Public Info Line: +49 622 2710000 | [info@saai.uni-heidelberg.de](mailto:info@saai.uni-heidelberg.de)



## 4. World Aqua Congress XIII

SIGMA Foundation made its mark in WAC XIII as four papers got published from SIGMA Foundation in World Aqua Congress, 2019 which was hosted by Aqua Foundation and inaugurated by Ministry of Jal Shakti, GOI at India Habitat Centre, New Delhi on 30th and 31st October 2019. The same platform awarded the Aqua Foundation Excellence Award, 2019 to Sadhguru for his lifetime contribution towards environment. Four individual publications of Dr. M. N. Roy, Dr. Debasri Mukherjee, Er. Sohini Tarafdar and Mr. Ritaban Maitra was published in this forum.



## 5. 9th International Conference on Sustainable Waste Management towards Circular Economy

SIGMA Foundation left a footprint in 9th International Conference on Sustainable Waste Management towards Circular Economy in KIIT Bhubaneswar where experts on faecal sludge management (FSM), water safety management (WSM) and water quality monitoring & surveillance (WQMS) from 18 countries shared their views on 27th November, 2019. A combined paper on faecal sludge management (Authors: Dr. M.N. Roy, Mr. Soumyajit Basu, Mrs. Sohini Tarafdar & Dr. Debasri Mukherjee) was published in the international forum with ISBN number: ISBN 978-5361-940-4 (e-book).





## 6. 107th Indian Science Congress

SIGMA Foundation upheld the spirit of science in the field of water governance and technology in 107th Indian Science Congress organised by Indian Science Congress Association from 3rd to 7th January, 2020 at University of Agricultural Sciences, Bangalore. The same was inaugurated by honourable Prime Minister of India, Narendra Modi, CM, Karnataka and Hon'ble Minister, Science and Technology. A joint research paper on Water of Dr. Debasri Mukherjee and Dr. M.N Roy was published in this platform.



## 7. Annual Global Water Alliance, 2020

Dr. Debasri Mukherjee, Senior Research Officer, SIGMA Foundation facilitated the Thirteenth Annual Global Water Alliance Conference from January 6th to 7th at Novotel, Kolkata. Dr. M.N Roy, President SIGMA Foundation has been the keynote speaker for the programme. Mr. Ritaban Mitra, Hydrogeologist, SIGMA Foundation also had prominent participation in the forum. A joint research paper by Dr. M.N. Roy, Dr. Debasri Mukherjee and Ritaban Mitra was published a paper in the same. The forum was a meet of eminent researchers from university of Pennsylvania, University of Yale, Philadelphia University USA with the conjoint approach of Institute of Engineers (BESU), West Bengal



## Meetings

1. SIGMA Foundation made an international collaboration with Lobibond Group in Germany during the visit in 2019. The main moto of this collaboration is to get on-site water testing kit for quality affected districts in India with a lesser price, which also helps to create awareness. Importantly, Lobibond is a renowned water technology based organization supplying testing kit for WHO, World Bank, UNICEF and others for more
2. SIGMA Foundation also visited to James Hutten Institute, Dundee, UK in 2019 to meet Prof. Alan Smith, who is working on water quality issues in India more than 10 years. The main motto of this visit was to make international collaboration on water quality and supply management aspects.
3. West Bengal to put first foot forward for Implementation of Jal Jeevan Mission (JJM) holding hands of SIGMA Foundation:

The Jal Jeevan Mission (JJM) aims to provide potable piped water to every rural household in India by 2024. To facilitate the above mission in the country, five 2-day consultative regional workshops have been scheduled to be organised by Department of Drinking Water and Sanitation under Ministry of Jal Shakti with important stake holders and water activists from all the states. West Bengal has been invited to participate in the workshop on 11th and 12th September held in Puri, Orissa with other 6 states (Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, and West Bengal. SIGMA Foundation has been identified amongst the most competent NGOs from West Bengal followed by Ramkrishna Mission Lokshiksha Parishad, PRADAN and Water for People with support of UNICEF. Mr. Ritaban Mitra, Hydrogeologist has been invited to attend the consultation workshop on behalf of SIGMA Foundation to impart his significant contributions on providing a critical picture of existing water supply and demand situation in the state of West Bengal. The discussion will focus on the present innovative practices presently implemented and challenges faced in the State. SIGMA Foundation with its extensive experience of working at community level all over the country is all set to work at the grass root level for water management including creation of local infrastructure for source sustainability under JJM.





4. SIGMA Foundation sets foot in Gujarat to work on Water Quality Monitoring and Surveillance and work towards the improvement of laboratory health status of the state in collaboration with WASMO, Govt. Of Gujarat & UNICEF, Gujarat. The team goes down to grass root level to Debinapur GP of Mehsana Block, the native of our honourable Prime Minister of India, Narendra Modi. A detail meeting was organized with the Principal Secretary WASMO, UNICEF Gujarat State Office and PHED Senior Engineers where SIGMA Foundation took a leading role. SIGMA Foundation also attended the meeting with the Health Secretary Gujarat for future course of action in context on water quality and health aspects.





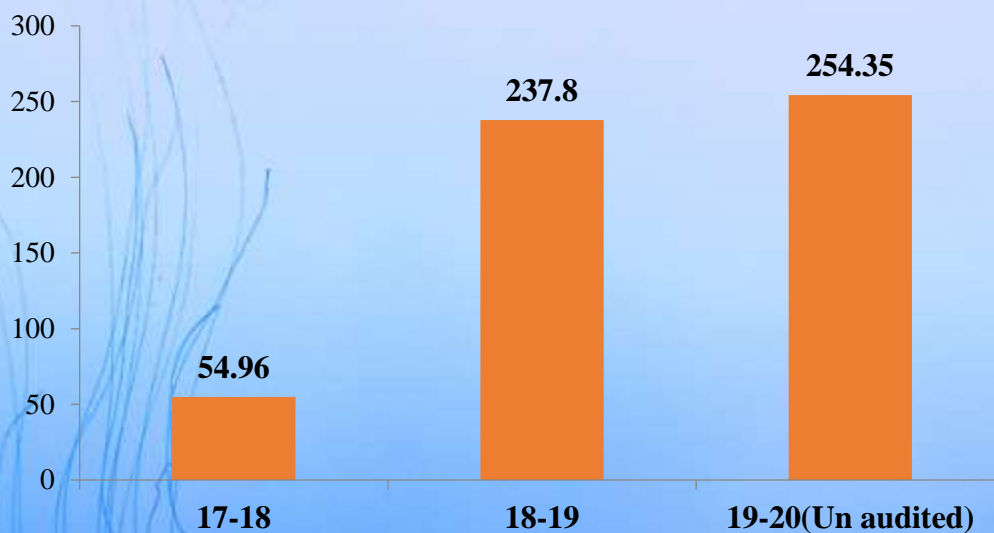
## List of Publications

1. **“Association of Insanitary Practices and Faecal Sludge Management with Drinking Water Quality: A Lesson Learnt from Sheohar District, Bihar”**. Dr. M.N. Roy, Soumyajit Basu, Sohini Tarafdar & Dr. Debasri Mukherjee. Full Paper to be published in Springer October 2020. Abstract published in Proceeding Abstract Book of National Symposium on Sustainable Waste Management (NSSWM – 2019), 20<sup>th</sup> April, 2019, Edited by Prof. (Dr.) Sadhan Kumar Ghosh and Prof. (Dr.) Tapobrata Bhattacharya, ISBN: 978-93-5361-940-4 (e-Book), Page 45.
2. **“Improving Disinfection Method & Monitoring Bacteriological Quality of Water-Lessons from West Bengal”**, Dr. Debasri Mukherjee and Dr. M.N. Roy. Accepted Abstract (Abstract Code 4313981) on 5th February 2019 by International Water Association (IWA) Edinburg Conference from 10-14th June, 2019, UK (Full length paper is going to publish under ISSN series and IWA Book of ‘Water’).
3. **“Digital Water Governance in India-Opportunities’ and Challenges”**. Dr. M.N. Roy. XIII World Aqua Congress International Conference Proceeding Book (Edited by Dr. Sanjay Rana-Impactor factor is 2.250). October, 2019. Vol-II, Page: 371-378
4. **“Application of Digital Sensor Technology for Assessment of Microbial Contamination of Drinking Water”**. Dr. Debasri Mukherjee. XIII World Aqua Congress International Conference Proceeding Book (Edited by Dr. Sanjay Rana-Impactor factor is 2.250). October 2019. Page: 182-188.
5. **“Paleochannel Mapping for sustainable Groundwater management with application of aquifer recharge – An overview”** Mr. Ritaban Mitra, published in edited book in 13<sup>th</sup> World Aqua Conference, held in October 30-31<sup>st</sup>, New Delhi (2019)
6. **“Addressing Nitrate Removal Water Technology Challenges in India through Technology Up-gradation and social engineering”**, Sohini Tarafdar Chatterjee. XIII World Aqua Congress International Conference Proceeding Book (Edited by Dr. Sanjay Rana-Impactor factor is 2.250). October, 2019. Vol-II, Page: 360-370
7. **“Towards Universal and Sustainable Access to Safe & Affordable Drinking Water in Rural India”**. Dr. M.N. Roy., Dr. Debasri Mukherjee, and Ritaban Mitra. 13<sup>th</sup> GWA Conference on Achieving Water, Sanitation and Hygiene (WASH) Sustainable Goals for Developing Country. January 2020. Edited by Global Water Alliance (GWA) Philadelphia USA and The Institution of Engineers (India)-Rural Development Forum.
8. **“Decentralized Water Governance: Mobilizing Community Towards Sustainable Development Goal-6 by 2030”**. Dr. Debasri Mukherjee and Dr. M.N. Roy. Proceeding of the 107<sup>th</sup> Indian Science Congress 2020. Editor Prof. R.B. Singh, Section of Earth System Science, The Indian Science Congress Association Kolkata. Page 113.

## Financial Highlights

In the financial year 2019-20, SIGMA Foundation achieved turnover of Rs. 254.35 lakhs (un audited) compared to Rs. 237.8 lakhs in FY 2018-19. The value of the contracts those were signed during the year was Rs. 902.70 lakhs. The two largest contracts were Rs. 533.89 lakhs (with State Urban Development Authority, West Bengal) and Rs. 172.50 lakhs with WBDWSIP under the PHE Department, Govt of West Bengal and the works are to be continued beyond March 2020. The contract value for the other projects being continued beyond the financial year 2018-19 was of Rs. 28.06 lakhs.

**Annual Turnover (INR Lakhs)**







## Partners in Our Progress

### ❖ **Government Ministries / Agencies**

1. National Institute of Rural Development & Panchayati Raj, Hyderabad, Government of India
2. PHED, Government of West Bengal
3. Government of Rajasthan
4. Government of Bihar
5. WSSO, Government of Assam
6. SUDA, Government of West Bengal
7. WASMO, Government of Gujarat
8. WSSO, Government of Maharashtra

### ❖ **UN Organizations**

1. UNICEF (Assam, Bihar, Chhattisgarh, India Country Office, Gujarat, Maharashtra, Rajasthan, West Bengal)

### ❖ **International/ National Non-Govt. Organizations**

1. Water For People

### ❖ **Corporates**

1. Deloitte Touche Tohmatsu India LLP
2. JWT
3. Innovious Infotech

### ❖ **Grassroot Development Organizations**

1. Digambarpur Angikar
2. Naihati Prolife
3. Sundarban Social Development Centre

## Partner with Us

SIGMA Foundation has acquired a wonderful experience of working with various national and international development organisations, corporate organisations and government departments/agencies. It has a team of more than 30 professionals with expertise as well as long experience in Monitoring & Evaluation, application of ICT in monitoring, Real Time Monitoring through Mobile Telephony and spatial analysis using GIS, analyses of big data

generated through programme MIS and its interpretation for decision support in the fields of water including hydrogeology, water security, water safety and surveillance for water quality monitoring, Monitoring of Water Supply Systems, Sanitation and Hygiene, Management of Solid and Liquid wastes, Public Health including Nutrition, Maternal and Child Healthcare, Child Protection, Local Governance and decentralized planning, Alleviation of rural poverty, Natural Resources Management, Disaster Management etc. We have been maintaining the highest standards of ethical conduct in our work and try to build a strong and long partnership to achieve positive impacts for our clients. We maintain a stringent deadline in delivering our work to clients at the lowest possible cost, thereby transforming the world for the better. To find more about our nature of work and engagement. write to us at [info@sigma.foundation](mailto:info@sigma.foundation).

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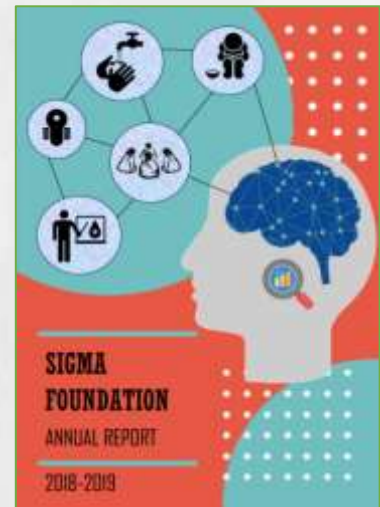
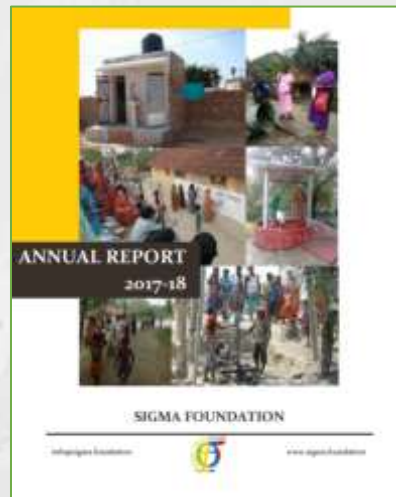
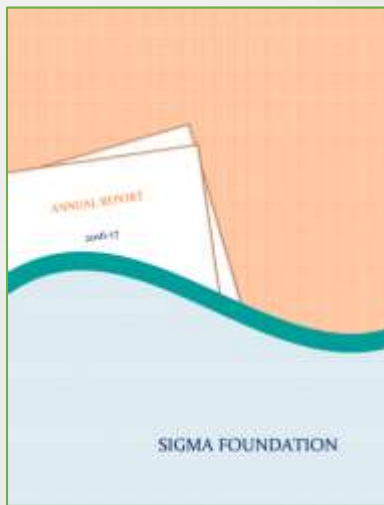
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