


SUSTAINABILITY IS OUR GOAL
ANNUAL REPORT 2017-18



“ Never doubt that a small group of thoughtful, committed citizens can change the world; Indeed, it's the only thing that ever has.”

-Margaret Mead





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Director Message

The year 2017-18 has proved to be an important landmark in the journey of IPCA. We have worked even harder this year to maintain our mission of sustainability. We, at IPCA, not only tried to inculcate sustainability in our new initiatives, activities and projects but also scaled up our skills, knowledge, resources and operations to the next level. Like always, policy as well as technology development related issues were reflected in all our projects and programs. Throughout the year, we have been engaged with corporate sectors, ULBs and State Authorities so that linkages can be established between recycles and processors. At grass root level, we were engaged in monitoring air pollution, data analysis, creating awareness, and extended our outreach through various publications.



I feel proud to announce that we have conceptualized and initiated India's first joint EPR (Extended Producers' Responsibility) project 'We Care' for managing multi-layered plastic waste. We created a network of more than 1500 waste collectors in eight states of India and collected approx 680 MT of post consumer multilayered plastic waste. A consortium was formed with major brand owners which helped us in bringing them on common platform for the implementation of EPR. The success of this project wouldn't have been possible without the support of government agencies/regulatory bodies like CPCB and MoEF & CC which provided us direction and guidance whenever required.

Another very successful and innovative project 'SORT' (Segregation of Organic waste for Recycling and Treatment) was initiated this year and is being implemented in 6 residential colonies of Delhi/NCR. The aim of this project is to decentralize solid waste management systems which is very much required at this point of time. It gives me immense pleasure to mention that our team has done marvelous job in engaging communities for source segregation and composting of organic waste through Aerobin. We have achieved a successful segregation rate of 90% which is commendable.

Apart from managing issues related to solid waste management, we made efforts in finding solutions related to air quality, especially, indoor air quality. Our Air Quality Monitoring division has monitored various residential buildings, schools, commercial building like hospitals, shopping malls, theaters, auditoriums, corporate and government offices, etc, and worked out doable solutions to improve their indoor air quality.

I take pride to announce that this year IPCA has increased its outreach by organizing national conferences and successfully delivered interactive and meaningful dialogues to the society. Through Air-O-thon (series of conferences) organized in Chennai, Delhi, Jaipur and Mumbai, we have been able to highlight various effects, causes and solutions of indoor air pollution. This is the first of its kind in bringing the focus of researchers, academia, industries, policy makers, government bodies, NGOs, youth to discuss the quantum of issues related to indoor environment.

We all must agree that we are living in an age where decisions and policies have to be subjected to intense scrutiny, particularly with respect to their impact on environment. It is the responsibility of knowledge-based organizations like IPCA to ensure that we are not only analyzing and disseminating insights on problems that deviate from the attainment of sustainability but also come up with solutions that are now critically important with respect to policies, technologies, development of institutions and human skills that would serve human society adequately in the years ahead.

Through its various projects and programs, IPCA is striving hard to occupy a small yet relevant space in the global setting of knowledge and application driven society. Our faith and commitment, centered on sustainable development arises from our conviction that human society has to bring rapid and sustainable transformation for moving towards the path of sustainability and development.

This annual report will give the glimpses of activities accomplished during the year 2017-18 and would also talk about our achievements and failures that have helped us to plan our future goals.

At the outset, I would like to thank our mentors, staff, members, funders, partners, associates, volunteers and well wishers for their unstinting support and guidance in our mission to improve the current status of environment through uplifting the social and moral status within our society.

ASHISH JAIN
DIRECTOR, IPCA

About the Report

“The greatest threat to the planet is the belief that someone else will save it.”

India is presently sitting on a ticking time bomb of WASTE which will harm the human fraternity in a manner, unimaginable. Current systems for managing this waste are helpless as it is being generated at lightning speed and impacting the environmental and public health largely. IPCA is not leaving any stone unturned in making the environment sustainable in India. During 2017-2018, IPCA continues its journey of change which was started 17 years ago in the field of waste and air pollution management and its control. Working in close quarters with the community and the industry stakeholders, the team at IPCA is working rigorously to ensure reduced burden on city's landfills. This year's annual report is structured around the new initiatives undertaken by IPCA at grassroots levels leading to policy making. Our representatives have worked with and successfully managed a number of industrial projects and carried out technical and policy studies for foundations, NGOs, universities and government institutions. We provide excellent oversight and management capabilities for our sponsors and work with the community, local NGO's and trusts.

Some of the remarkable initiatives and achievements of 2017-18 are:

- IPCA formulated the first Action Plan in compliance with CPCB on Extended Producer Responsibility (EPR) in sync with a Plastic Waste Management Rules, 2016. About 683MT of non- recyclable Multilayer Plastic (MLP) waste was collected from 8 cities across India and sent for its end of life processing by IPCA.
- IPCA has launched India's 1st Joint EPR Initiative WE CARE for collection and recycling of Multilayered Plastic Waste as per section 9 (1&2) of Plastic Waste Management Rules, 2016; on 28th November 2017.
- IPCA created a network of 1500 waste collectors across Delhi in 2017-18 and conducts training sessions for waste collectors in order to brief them about source segregation, the process of waste management and its benefits.
- 135 children have been enrolled in primary education program for waste collector's children, out of which 27 students got successfully enrolled in government schools for formal education.
- IPCA has implemented a decentralized waste management system for organic waste by launching new technology bins 'AEROBINS' in six societies of Delhi NCR. AEROBINS are high tech bins which convert wet waste into compost in the societies where they are installed.
- 40 Training and Capacity building programs were conducted by IPCA for various projects in 2017-18.
- Mr. Ashish Jain, Director, IPCA was appointed as an expert member by Central Pollution Control Board(CPCB) for Plastic and Solid Waste Management and Dr. Radha Goyal, Deputy Director, IPCA has been appointed as an expert member of the constitution committee on Indoor Air Pollution of Ministry of Environment, Forest and Climate Change (MoEFCC), Govt. of India.
- As part of its outreach programs, IPCA organized a series of Conferences on Air Pollution, titled “AIR-O-THON” in four states of India i.e. Delhi, Maharashtra, Rajasthan and Tamil Nadu and an international conference on "Creating Resilient Families and Communities" in Delhi.



MT683

Multi-Layer Plastic
Collected & Processed



135

Ragpickers' Children
Got Educated



1500

Informal Sector Benefited



40

Training & Capacity
Building Programmes



OUR MISSION

- To improve livelihood through the responsible use of natural resources for the welfare of present and future generations.
- To ensure proper recycling / processing of different kinds of waste to produce other useful consumable products.
- To provide solutions to environment and climate-related problems.

OUR VISION

Sustainable Economic Development of India in a way that it Ensures Environmental Protection.

OUR VALUES

Our values serve as a compass for our actions and describe how we behave in the environmental world.

- **Passion:** We are committed with heart, mind and soul to achieve and to serve the best.
- **Accountability:** If it is to be, it's up to me.
- **Integrity:** Be real and holistic in approach.
- **Leadership:** The courage to shape a better future by revolutionizing the present.



Projects and Activities (2017-2018)

A. New Projects and Initiatives

1. Campaign for Awareness about Pollution and its Remedial Measures.
2. Waste Efficient Collection and Recycling (We CARE).
3. Segregation of Organic Waste for Recycling and Treatment (S.O.R.T).
4. Status of Woven Bags Waste in India.
5. Study on Plastic Waste Management in Nasik and Kalyan.
6. Air Quality Management System (AQMS) Projects.

B. Existing Projects (in continuation)

1. Garbage Recycling Program.
2. Destruction and Disposal of Industrial waste.
3. Health Care Program for Rag pickers' Children.
4. Primary Education Program for Rag pickers' Children.

C. Conference and Workshop Conducted

- AIR-O-THON Series was conducted at National level in four cities in India.
- Conference on "Creating Resilient Families and Communities" on 19th December 2017 at IITD Campus.



A. New Projects and Initiatives

1. Campaign for Awareness about Pollution & its Remedial Measures November 2017 - April 2018

Campaign for Awareness about Pollution & its Remedial Measures is a collaborative project of IPCA and Citizens Environment Improvement Society (CEIS) and Quality Needles to create awareness related to environmental pollution & its remedial measures among school children. The project aims to train and sensitize 500 school children from 10 Schools on various aspects of environmental pollution including identification of various kinds of pollution (air, water, noise, solid waste and land pollution) and its source, monitoring of pollutants, altered approach to reduce its impact on individuals.

Objective

The key objective of the campaign was to motivate students to come up with their own ideas to improve and conserve our environment and implement their ideas in form of actions.

Project Activities

The campaign was designed for children aged between 13 -16 years who were imparted training in a workshop spread over two days.

The awareness and training were imparted through interactions and practical demonstrations during workshops to a group of 50 students and each participant was dubbed as 'Environment Managers' and provided with badges accordingly.

A number of ways, which were adopted to achieve the above objectives and meet the challenges, were:

- (a) Interaction, distribution of printed material and audio-visual presentations.
- (b) Screening of educative short films on environmental pollution.
- (c) Games for students and teachers related to Environment Management activities.
- (d) Quiz, poster and slogan competition for the students.
- (e) Field visits to Eco Park to show them real-life causes and solutions of pollution.

Phase I: The first phase of the project was the introductory phase for the students and they were made aware about the objectives of the project, people and organization involved in the execution of the project followed by an audio - video presentation on environmental pollution. Short animated videos and other informative short videos were displayed during phase I to enhance student's knowledge through a different mode of communication and to bring their interest to the subject. Students took assignments on environmental pollution in the form of poster making or slogan and poem writing. A handbook on "Nature Conservation through Pollution Control", pamphlets and badges were distributed to each student and illustrative chart on pollution and its guideline were handed over to school administration during the first visit in Phase I. 10 Indoor Air Purifying Plants were also distributed to each school as a token of appreciation.



Phase II: Field visits were organized at sector 54 Eco park, Noida to demonstrate the solar panel design, vermi-composting site, herbal garden, rainwater harvesting model to the children. Children participated in the quiz competition and prizes were also distributed to the students for the posters and slogans prepared.





Outcomes

- The project has been executed effectively in all the 10 schools as per the proposed time line.
- The program has helped in increasing the interest of the school students towards the remedial measures of Environment Pollution.
- Trained students have learned most aspects of various types of pollution, issues related to them and their remedial measures.
- These trained students have been empowered to help schools in implementing environment improvement measures whenever required like monitoring school cleanliness, placement of adequate number and kinds of a dustbin in optimum positions to eliminate littering, avoid burning of all kinds of waste, maximum use of public transport, use of bicycles etc.



2. Waste Efficient Collection and Recycling (WE CARE)

The project WE CARE is the first joint EPR (Extended Producer Responsibility) initiative in India under Plastic Waste Management (PWM) Rules 2016, which was launched to manage the Multi-Layered Plastic (MLP) waste.

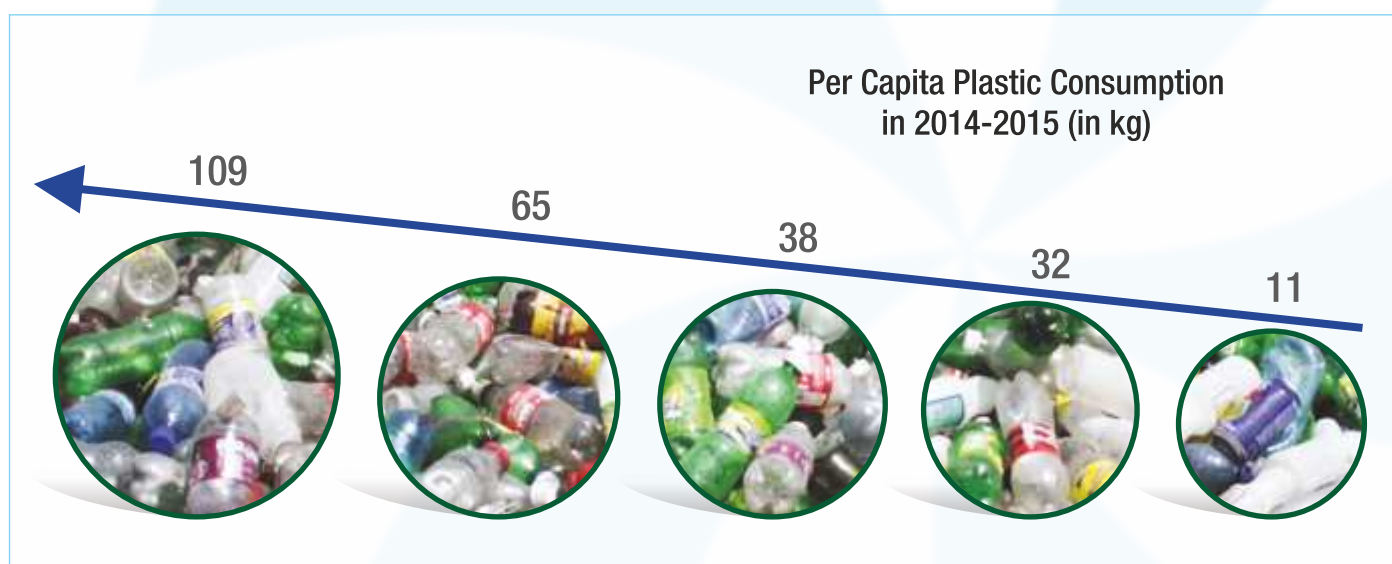
As per the PWM Rule, 2016 framed by Ministry of Environment and Forest & Climate Change (MoEFCC), Govt. of India, the producers and brand owners are responsible to develop a mechanism of collection for their post-consumption packaging waste and launched a project WE CARE. This rule emphasized on EPR to a producer and brand owner of plastic waste for the environmentally sound management of the product until the end of its life.

Considering the above challenge, IPCA formed a consortium (Comprising of PepsiCo India Holding Pvt. Ltd., Nestle India Ltd., Perfetti Van Melle India Private Ltd., Dabur India Ltd., Dharampal Satyapal Ltd.) in consultation with Central Pollution Control Board (CPCB) and East Delhi Municipal Corporation (EDMC) and launched a project WE CARE to collect and segregate MLP waste with the help of waste collectors and to send it to either waste to energy plant for energy recovery or cement plants to be used as a fuel. The cities identified for the pilot phase of this project were Delhi, Noida, Gurugram, Ghaziabad, Faridabad, Chandigarh, Mumbai and Dehradun.



Objectives

- To develop a collection, segregation, & processing mechanism for MLP waste.
- To develop a network of waste collector/segregator/waste dealers/traders for the collection of MLP.
- To explore efficient technology and methods for processing/recycling of MLP.
- To improve the social and economic status of Rag-picker's communities.
- To encourage people to participate in source segregation of waste for the betterment of our environment.



Project Activities

The launch of the “WE CARE”

India's first joint EPR initiative “WE CARE” was launched on 28th November 2017 by Commissioner, EDMC and Additional Director, CPCB at Waste to Energy Plant of IL&FS Ltd. The launch was joined by the dignitaries from government, NGO, institutes and the industrial consortium partners.



Networking with Waste Pickers Communities

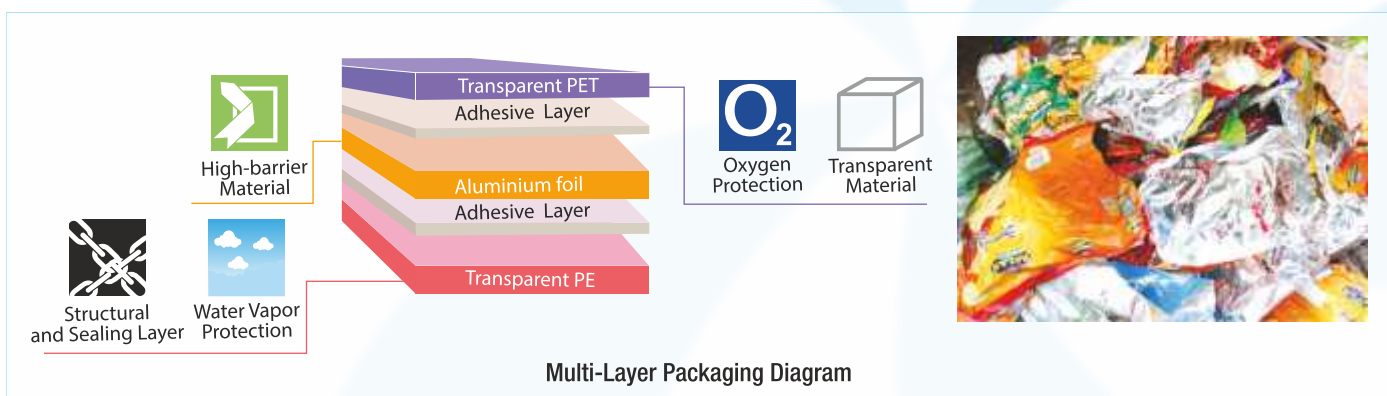
IPCA has identified different clusters of waste pickers across the various cities in India and started creating awareness among them about the needs and benefits of MLP collection and segregation. Prior to WE CARE initiative, no section of waste pickers was segregating MLP because there were no buyers and the entire MLP waste was either dumped to landfill/roadside/river/drains/open space or burnt, thereby increasing the environmental burden on landfills in terms of air/water/land pollution.

Through this initiative, IPCA has developed a network of around 1500 waste collectors across India and has also created a constructive linkage between the waste collectors, scrap dealers and recycles.



Education and Awareness Program

IPCA used various informatory modes like street plays and workshops to generate awareness and educate the waste collectors about MLP. IPCA has conducted 25 street plays and 12 workshops at the various project locations where they were educated about MLP and also informed about steps to be taken towards their personal health and hygiene.





MLP Collection and Processing

IPCA has collected 683.135 Metric Tonne (MT) of MLP from 28th February 2018 at all the project locations, with the support of network of approximately 1500 waste pickers, who are actively working in the field of collection and segregation of MLP and have dispatched the entire collected material to East Delhi Waste Processing Company Ltd. at their Waste to Energy Plant, Ghazipur, Delhi, Geocycle Ltd at their cement kiln plant at Gagal, Himachal Pradesh, and Deluxe Recycling Pvt. Ltd., Thane, Maharashtra.

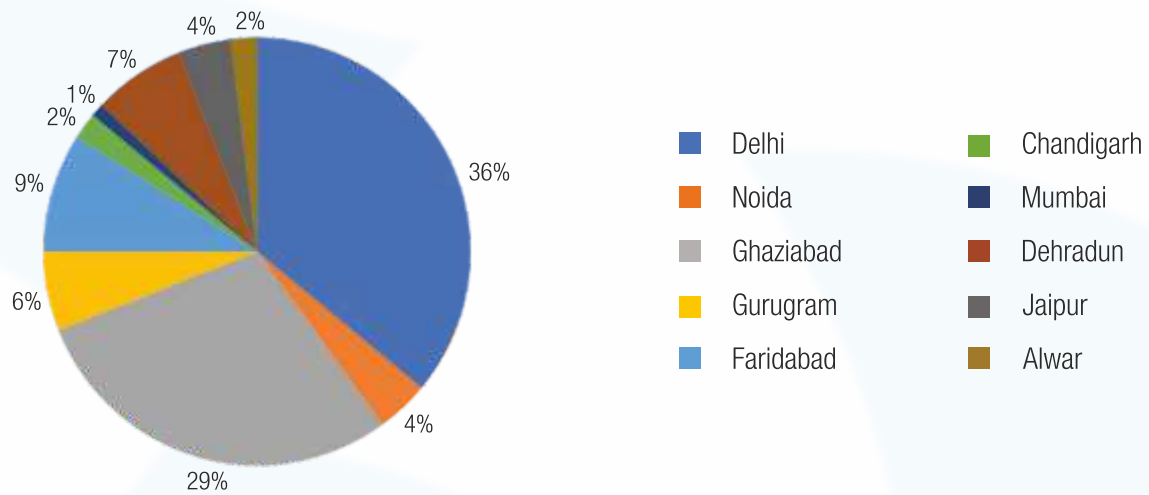


Liaison with Key Opinion Leaders (KOL)

IPCA got plenty of guidance and ideas from these KOL, which helped to improve its action plan and helped its reach to more and more people. IPCA has signed an agreement with EDMC, East Delhi Waste Processing Company Ltd., ACC Ltd. and Ambuja Cement Ltd., Geocycle Ltd., and Deluxe Recycling Pvt. Ltd for processing, co-processing and recycling of plastic waste.

Outcomes

- Created a large network of approximately 1500 waste collectors.
- Collected and dispatched 683.135 MT of MLP waste for its treatment to waste to energy plant and cement plants.
- Resulted in mitigating CO₂ and equivalent gas emissions by 2,73,000 kg, equivalent to 8,68,660 kWh of energy which can be used in various application.
- Helped in increasing the monthly income of each waste collector by INR 3190 over their regular income.
- The project is going to be implemented on Pan India level.



MLP Collection in Eight cities of India: Project WE CARE



**Eliminated
2,73,000 Kg CO₂ and
Equivalent gases**

3. Segregation of Organic waste for Recycling & Treatment (S.O.R.T.)

December 2017- Present

Delhi NCR, like many other cities in India, suffers from inefficient Solid Waste Management. Every day it generates more than 20,000 MT of solid waste, out of which 50% is an organic waste, 35% is a recyclable waste and the remaining 15% is an inert waste. Due to unsystematic and improper waste collection and disposal, the whole city is gradually turning into a dump yard. The main problem of waste management in Delhi NCR is lack of waste management plan and lack of involvement of different stakeholders in the waste management system.

Considering the above problem, IPCA has proposed a solution to reduce waste by source segregation and composting of organic waste. In this perspective, IPCA in association with Swarn Lata Motherson Trust has launched a Project “Segregation of Organic Waste for Recycling and Treatment (S.O.R.T.)” in Delhi NCR on 1st December 2017 for a period of 1 year to solve the problem of Solid Waste Management in Delhi/NCR.



What is Aerobin?

Aerobin is a device which convert organic waste into compost in such a way that it does not create any odour and other environmental hazards and prepare compost in a very hygienic and environment friendly way.

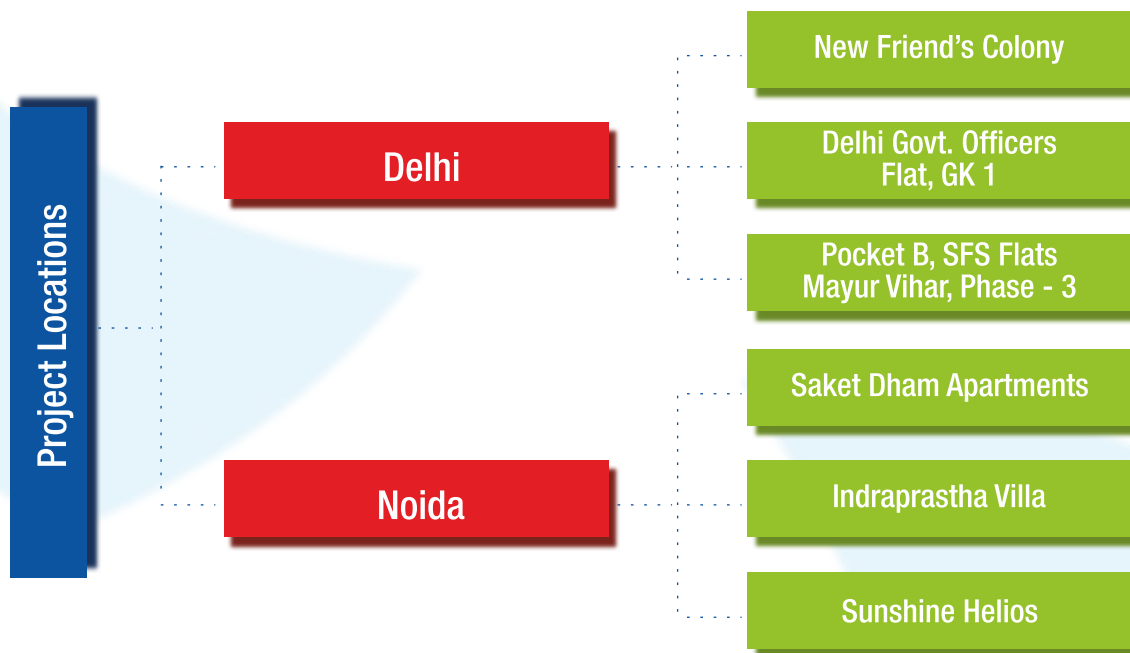
Objectives

- To motivate community participation in qualitative segregation of waste at source to increase the recycling rate of the waste material.
- To get segregated waste at source (residences).
- To enable operation of Aerobin for composting of organic household waste to minimize the pressure on landfill or informal dumpster.
- To educate waste generators/consumers on efficient waste management.
- To promote local self-responsibility for a clean environment.
- To improve the social, economic and environmental status of life of people.

Project Activities

- Identification of Project Locations.
- A Survey was conducted for the identification of the installation sites of the project S.O.R.T.

Following are the societies which are selected under the project:



Training programmes for different stakeholders (Residents, Servant/Maids and Waste collectors)

Training sessions for various stakeholders (Residents, Servant/Maids and Waste collectors) were organized at various project locations to educate them about the source segregation as wet and dry, the importance of source segregation, health & environment related issues and safety measures during segregation of waste.





Workshops in Schools

Children are the flag bearers of our future and play an important role in the economic and holistic development of the country. Keeping this in mind, workshops and sessions were organized in schools to educate students about the importance of source segregation, its impacts on environment and health issues of waste collectors. This will help in inculcating the habit of waste segregation from their young age only.



Street Plays

To make education and awareness interesting, street plays were organized at various project locations by a professional team of IPCA. It helped in the sensitization of people regarding waste segregation and the advantages of it. It was organized so as to receive maximum numbers of attention and to spread awareness at a larger scale.



Youths Volunteering/Corporate Volunteering for Awareness (Residential areas, Shopping Malls, Commercial complexes)

For the 100% waste segregation, IPCA has tried to reach every stakeholder in the chain. Students from various universities such as Lady Irwin College (DU) and National Industrial Training Center are conducted door to door campaign at residential areas, commercial complexes etc. In which they visited every household and made them aware of various aspects of source segregation.



Installation, Operation and Maintenance of Aerobins

Aerobins have been installed at all project locations and at each location waste collector is appointed as an “Aerobin Operator” in coordination with society representatives.

Incentives are provided to the Aerobin operators which are helping them in additional income. Safety tools are also provided to the operators which will help them in operating Aerobins safely and properly.



Harvesting of Compost

The compost from the Aerobin is harvested in a cycle of 40 days. Harvested Compost were handed over to the Resident Welfare Association (RWAs) to be utilized for the betterment of the society's landscape.





Visit to Eco Park

With a purpose of awareness generation amongst the residents about the sustainable waste, management visits were organized at Eco Park, Sector-58,Noida. During these visits, they have demonstrated the process of vermi - composting to make them realize that composting through Aerobin is much more hygienic and requiring very less space than vermi - composting. They were also introduced to various medicinal and air purifying plants.



Outcomes

- ✓ Most of the residents have started keeping two separate dustbins for wet & dry waste in their houses for segregation of waste.
- ✓ It was observed that more than 70% of the residents were segregating their waste at source.
- ✓ It was motivating to witness almost 90 % of waste segregation at Indraprastha Villa and New Friend's Colony.
- ✓ Around 7310 residents in Delhi and Noida are being benefited from the SORT project.
- ✓ Around 150 kg/day of waste is prevented from reaching the landfills.
- ✓ This practice produces compost which is an environmentally sustainable organic fertilizer that helps in improving the water holding capacity of soil, nutrients and makes the soil & plants healthy and strong.

4. Status of Woven Bag's Waste in India (Feb 2018 - Present)

IPCA (Indian Pollution Control Association) with the association with Ambuja Cements Limited and ACC Limited decided to conduct a survey to study the current scenario of post-consumed HDPE/PP woven bags so that these two organization would have a better idea to find alternate recycling solution with new techniques to reduce or eliminate the HDPE/PP woven bag's wastes and to create sustainable supply chain of bags in India.

Objectives

- To study the current scenario of post-consumed woven bags.
- To conduct a qualitative and quantitative study of post-consumed woven bag waste.
- To study the supply chain of woven bags.
- To explore the possibility of a sustainable supply chain.
- To identify the existing technology and recycles for the recycling of Woven bags.

Project Activities

Identification of the location

For this preliminary study, four major metropolitan cities were selected from each zone of India to get a uniform idea about the quantitative and qualitative status of PP/HDPE woven bag's waste.

Identification of stakeholders

The stakeholders for the project were granule maker, Bag manufacturers, workers cement filling units, wholesalers, retailers, Builders, contractors, masons, waste collectors, waste traders, bag segregation, primary recycles, secondary recycles (Blow moulders), workers at Dhalaos and workers at the landfill.

Secondary Data Collection

After the identification of the stakeholders for the Preliminary study, the secondary data have been collected by the project team from the internet. The secondary data collection includes:

- Reviewing different research papers and reports to collect authentic data.
- Contact details of the stakeholders.



Questionnaire Preparation

Questionnaires were prepared for different stakeholders in the consultation with IIPA and IIT-Delhi for the collection of primary data.

Survey

Field Survey will be conducted by the IPCA team to gather data from stakeholders of different metropolitan cities to understand the supply chain management of HDPE/PP woven bags and cement bags.

Expected Outcome

- To understand the entire supply chain management of HDPE/PP woven and cement bags in the different metropolitan cities of India.
- To find alternative recycling technologies to make the existing supply chain more sustainable
- To reduce or eliminate the HDPE/PP woven bag's wastes in India.



5. Study on Plastic waste management in Nasik & Kalyan (Nov 2017)

Owing to large urbanization zone and the proximity to greater Mumbai, Kalyan Dombivli and Nasik are trying to enhance the quality of services, expand the infrastructure and accelerate its economic growth.

A study on Plastic Waste Management was carried out during November 2017 and submitted to Jindal Poly Films Ltd. The objective of the study was to assess the current status, challenges, and opportunities in the collection of Plastic waste in the city of Kalyan and Nasik in Mumbai.

Objectives

- To assess the current status of the Plastic Management System in Nasik & Kalyan.
- To identify the challenges in managing the Plastic Waste.
- To identify the percentage of Multilayer Plastic (MLP) in Plastic Waste.
- To identify the opportunities in the collection of Plastic Waste.

Project Activities

Interaction with various stakeholders in the waste management industry

The team of IPCA visited Municipal Corporations office to understand the city overview of the waste management chain. They also had an interaction with waste traders, Ragpickers, Local NGOs, and NMCs.

Assessment of Quality and Quantity of Waste

A survey was conducted to analyze and identify the quality and quantity of waste generated in both the cities. Various dumping sites were visited to assess the amount and the type of waste generated in every part of both the cities. Special attention was given to identify the percentage of plastic waste among all the collected waste.

Visited various waste processing sites

To understand the supply chain of the waste, various processing sites were visited and a survey is conducted. A Supply chain of Nasik and Kalyan was developed after the interactions and understanding of the waste processing cycle.

Outcomes

- Survey of city waste reveals 55% wet waste and 45% dry waste. Plastic waste is estimated to be 20-25% of the dry waste.
- Solid Waste Management System in Kalyan is very poor and unorganized Waste is simply collected, transported, compacted and dumped on the dumpsites.
- Dumping site Nasik city is managed by MAILHEM-IKOS based on PPP Model.
- No waste processing facility is available in Kalyan city.



- Rag-pickers community are scattered in Nasik (in small groups) like in near Phule Nagar, Panchvati, Ganj-mala, and Shanti Nagar in slums.
- Few NGOs in Nashik are working in the field of Solid Waste Management. SEVA (Social Empowerment for Voluntary Action) is one of them which is working on labor empowerment and their rights in Nasik. Shanta Bai Ghule Nagrik Seva Sehkari Sanstha is working on compost conversion at a small level.



6. Air Quality Management Service (AQMS) Projects

AQMS division was established in the year 2016 at IPCA in with the aim to provide unbiased Air Quality Testing & Consultation services and to understand the air we breathe and suggest solutions by experts with the help of finest range (Gold standard) of calibrated instruments and their knowledge. It works at investigating, identifying and providing performance measurement solutions by taking on a difficult problem and providing tools for further improvement in air quality. AQMS is committed to provide a comprehensive solution for improving the indoor air quality in residential, institutional, commercial and corporate houses in urban regions of India. AQMS strictly follows National Ambient Air quality standards (NAAQS), India, WHO, ASHRAE standards for air quality monitoring and testing using most advanced and accurate instruments. The company's air quality monitors are annually calibrated, tried and tested by TSI, USA, TESTO Co Ltd., Envirotech Instruments Pvt. Ltd. As the shift towards scientific instruments for air quality monitoring accelerates AQMS is setting the standard for others to follow.



Project Activities

AQMS is being supported by Forum of Air Quality-India (FAQ-India) in designing the awareness programs backed with continuous research on air pollution. AQMS team has successfully completed following studies in 2017-18:

IAQ testing in FICCI building, Federation House at Tansen Marg, Delhi

The Indoor Air Quality Monitoring was conducted at FICCI, Delhi to evaluate the performance of air purification system installed in the Air Handling Units (AHU). A pre-post installation study of IAQ was done with the consideration of various parameters such as:

Particulate Matter 2.5 (PM2.5), Total Volatile Organic Compound (TVOC), Bioaerosol, Formaldehyde, Ozone and Carbon Dioxide (CO2). The final report was submitted to the FICCI with the performance evaluation of the air purification system with respect to pollutant parameters identified and tested in the study with certain recommendations on the basis of performance evaluation.

Indoor Air Quality Monitoring at 3 offices of Dalmia Bharat Limited, Delhi

AQMS carried out testing and analysis of Indoor Air for Dalmia Bharat Ltd. Real-time samples of CO2 and PM2.5 were collected for testing and analysis. The final report and results were submitted with the recommendations with respect to the air quality at Dalmia.

Developing air purification technology (R&D) with Samsung (ongoing...)

The aim is to achieve heating and cooling mode in an air purifier. For this, a detailed study and technological review are conducted using Peltier Thermoelectric modules. Different types of heaters were experimented for achieving the desired effect.

Chamber studies and CADR calculations of various Air purifiers (Samsung, Sharp, Ongoing.)

Partner with CPCB, Govt. of India in developing protocols and guidelines for Air Purifiers in India.



Indoor Air Quality Monitoring at different locations

Instrumentation at AQMS

AQMS is committed to provide a comprehensive solution for improving the indoor air quality in urban regions of India. AQMS strictly follows National Ambient Air Quality Standards (NAAQS), India, WHO, ASHRAE standards for air quality monitoring and testing using most advanced and accurate instruments. A range of calibrated equipment are used to measure the IAQ pollutants (PM2.5, CO2, VOCs/Formaldehyde, ozone, NOx) in order to ensure the highest levels of accuracy possible, some of these have been provided below:



**TSI Dusttrak
Aerosol Monitor**



**Envirotech
APM 433**



**Handy Dust
Sampler**



Spectrophotometer



**Lutron
Tachometer**



**Anemometer
AM-4201**



**Testo IAQ
Monitor**



**Ion Science Tiger
TVOC Monitor**

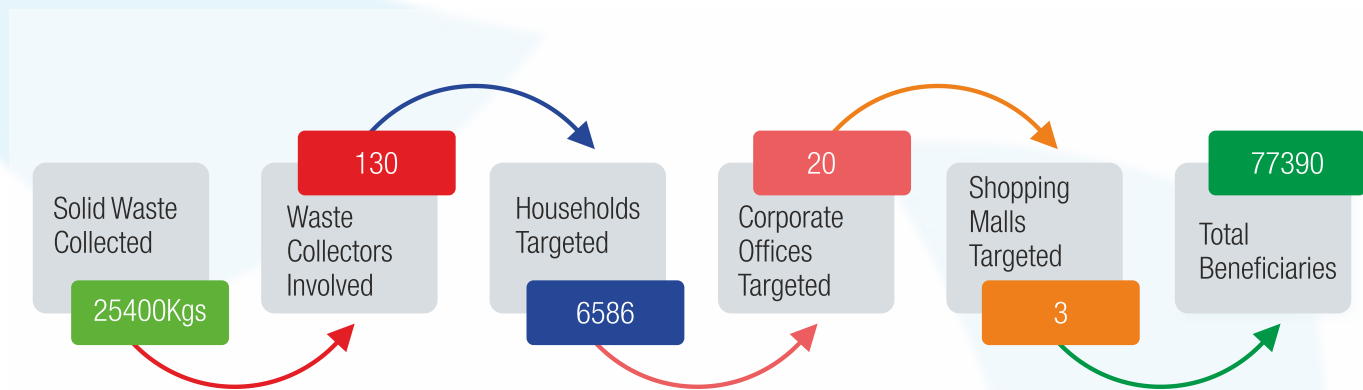
B. Existing Projects (in continuation)

1. Garbage Recycling Program

The self-sustainable Garbage Recycling Program of IPCA is running since 2004. IPCA provide services of door-to-door collection of solid waste and its management to the residential, commercial and corporate sector.

Under this program, IPCA provides waste management services as well as conducts awareness campaigns.

Services provided: a Door-to-door collection of waste.



Objectives

- Stopping littering or open dumping of waste dumping.
- Implementing a decentralized Solid Waste Management System.
- Advocating the practice of waste segregation at source.
- Increasing the rate of recycling of waste.
- Reducing the quantity of waste reaches to the dump yard or landfill.
- Increasing per capita income of waste pickers.
- Promoting recyclable and recycled waste.

Project Activities

- In the year 2017-18, IPCA has provided its services of the door to door solid waste collection to approximately 6,586 households, 20 corporate buildings, 3 shopping malls and 1 institutional building in Delhi NCR. The total number of beneficiaries under this program are 77,390 in 2017-18.
- IPCA collects 26,400 kg of solid waste per day from Delhi - NCR. In this collection program, 130 ragpickers are actively involved from IPCA.
- IPCA provides 365 days services to its clients for the collection of waste and this program has helped in establishing zero littering areas in the IPCA's service area.
- The network of the waste collectors working with IPCA has been linked to waste aggregations and recycles to increase their profit margins and helped them to earn more. In one of the studies carried out by R&D division of IPCA, it was found out that waste collector is earning at least Rs. 19,234 per month
- IPCA has conducted capacity-building programs throughout the year to train these waste collectors to do their job. They are also trained on the value of various recyclable waste, which helped them to segregate waste more efficiently.
- IPCA has also organized an awareness campaign for the source segregation of waste in association with clients on different occasions and worked to increase the rate of recycling.
- New recyclers have been linked to the existing supply chain to give more sustainability to the program.

2. Destruction and Disposal of Industrial waste

The project which is in continuation since 2002 and has well-developed infrastructure with well - equipped facilities like Hydraulic Aerosol Destruction Machine (ADM), Shredder, Organic Waste converter machine and Electric Bailer. The center receives damaged and expired goods from clients like Reckitt Benckiser India Ltd., Central Warehouse Corporation and many Pvt. Companies from across the country.

Objectives

- To reduce the risk of untreated disposal of industrial waste.
- To maximize utilization of waste material through the different mean of recycling.
- To provide Safety equipment to workers are provided to safeguard them against any mishaps.

About Mandoli Destruction Facility

This destruction facility is located in the eastern part of the capital and has a covered area of 10,000 sq. m. for stock and destruction of damaged goods. There is a well-developed infrastructure at Mandoli managed by a team of trained people. The following facilities are available at the site for the destruction of the industrial damaged and expire goods received from across the country. The steps involved in the complete destruction processing include the following:

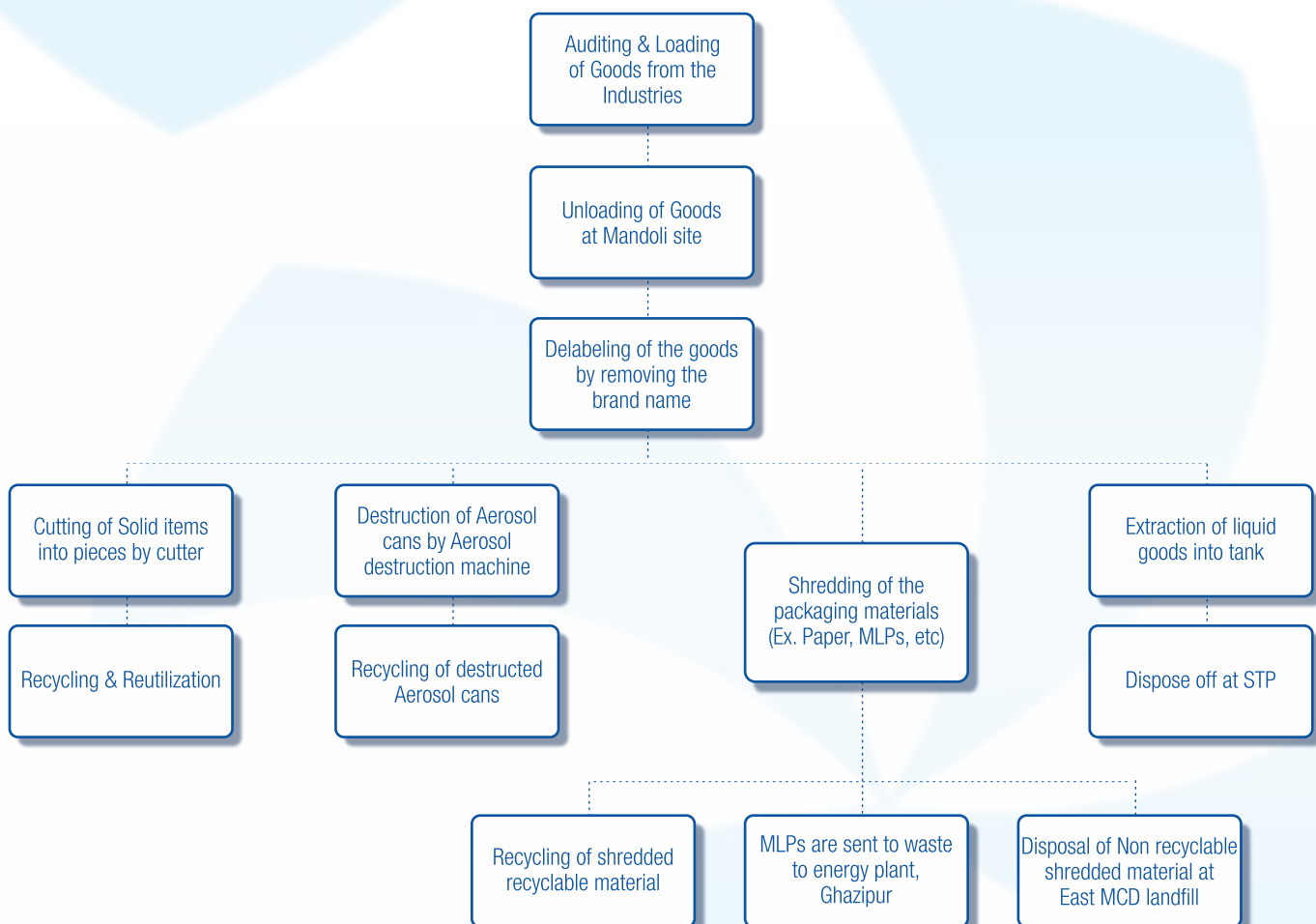


Figure 2: Destruction and Disposal Process of industrial waste at Mandoli



The new centralized set up at Mandoli has larger space and has enabled more efficient monitoring. New hydraulic aerosol destruction machine has been established in this unit, which is fully automatic, unlike the previous manual machine. This machine has an airtight chamber, which prevents leakages of gases into the environment and thus reducing exposure to the workers. This machine has eliminated the risk of the fire accidents during the destruction of the aerosol bottle and reduced occupational health hazard of the workers.



3. Primary Education Program for Rag picker's Children

IPCA is running the Primary Education program for rag picker's children with the support of India development service (IDS), USA since 2013. Currently, three education centers are running in Delhi NCR (two at Indirapuram, one in Noida) with 35 - 40 children at each center.

The main aim of IPCA's intervention on primary education of rag pickers was to bring a positive behavioral change, increase their self-esteem and make the rag pickers' children socially responsible citizens of the country and break the chain of being "future rag pickers" and prepare them to choose their profession as per their own wish.

Objective

The program was envisaged with the following objectives:

- To provide primary education through fun learning activities.
- Bringing behavioral changes and inculcating the concept of healthy food habits, health and hygiene.
- Grooming the children for successful enrolment in a regular governmental education network.
- Ensuring regular attendance of the students.
- Nurturing the creativity and innovativeness of the children through training, exposure visits and interaction.
- To improve lifestyle and social status of rag picker community and stop any child from becoming rag picker without his/her own choice.

Project Activities

Admission to Government/Private Schools

In the three centers, there are a total of 130 children and out of the total, 60% are girls. The main objective of the programme is to admit these children in the nearby government or private schools mainstream them and provide the formal education. Our primary education program is resulting in better school readiness and helping to reduce the number of dropouts of these children from the schools. About 27 students have been admitted in different schools.



Celebration of Events

Various events like Republic Day, Diwali, Holi, Children's Day were celebrated during the session 2017-18 in which the students were taught about the importance of the event through the cultural program and interesting games activities and healthy refreshments were also served during the events. During the programmes, children showed their talents through dance, songs, poems, drawing competition etc. in which they participated very actively. Prizes, Diya, colors and gifts were also distributed at respective festivals.



Distribution of Shoes

Shoes distribution in association with DNAMO NGO was organized for rag picker's children to inculcate the habit of wearing shoes. They were made aware of the harmful effects of working barefoot.



Plantation Drive

To develop a connection between students with nature and our environment, a plantation drive was conducted at the education centers. Through this, they were able to gain knowledge about the plantation and its importance for our surroundings.



Co - Curricular activities

In order to develop physical and mental fitness of children, to enhance their hidden talent and also to improve their other capabilities such as focus/motivation/stress management etc., IPCA conducted various co-curricular activities such as Stress relief activity, physical exercise, games etc.



Distribution of clothes to the rag picker community

IPCA also distributed clothes to the rag picker communities. These clothes were donated by IPCA's members and its associates.

Teacher's training program

For the effective implementation of the primary education program, teachers training program is continuously undertaken for capacity building of the staff. This training program includes the development of some special training materials to impart a meaningful education to these children such as matching sets, counting strings, fractions set, number concept dominos, fine word boards, picture boards for language enhancement etc. For the development of civic sense, hygiene and cleanliness, activity-based learning is imparted to the children that encouraged them to cut their nails habitually, take a daily bath, comb hair and wash hands.

Outcomes

- 25 number of students were enrolled in Nursery class in Government/private schools.
- This initiative leads to dissemination of primary education to 130 children at Indirapuram and Barolacenters.
- IPCA celebrated 8 events for various festival occasions.



4. Health Care Program for Rag picker's Children

The rag picker children are vulnerable to a number of infectious diseases due to their frequent exposure to unhealthy conditions and lack of awareness about health care and hygiene. IPCA advocates the concept "a healthy society of young children contributes towards clean and healthy India" by undertaking the initiative of "Health Care Program for Rag-pickers' with the financial support from India Development Services, USA, which is in continuation with the existing "Primary Education Programme for Rag picker's Children" at 3 different primary education centres in Delhi NCR w.e.f. 15th September 2015.

Objectives

- To identify malnutrition in children.
- To reduce malnutrition amongst children with special attention to their being underweight.
- To facilitate medical services being availed by these children.
- To improve their physical health with a critical examination of each child and their health.

Project Activities

Health Check - Ups

One health check - up camp was organized at each primary education centre every month. In each health camps about 30-60 children, who are part of the primary education program have been inspected by the medical professionals. Children were examined and provided free medicines including de-worming pills as per the prescription from medicinal professional.



Distribution of medicines

During the health camps multi - vitamins and medicine for de - worming have also been distributed to all the children.

Reputed Physicians

In these camps physicians from reputed hospitals physically examined the children to check their general health condition, parameters like Body Mass Index (BMI), Ear, Nose and Throat (ENT), skin, nails, hairs, teeth as well as the anaemic condition have also been checked.

Preparation of health cards

Health cards have been prepared for each registered student of the education centres to maintain the record of their health.



Glimpse of Health Camps at Primary Education Centers

C. Conference, Workshops and Seminars (2017-18)

AIROTHON SERIES (2017-18)

AIROTHON, a joint event of IPCA and Prospers Pte. Ltd. conceptualized in the year 2016. The success of the first event of AIROTHON 2016 “Running for the opportunities in Indoor Air” allowed us to take the event to other metro cities of India. Four conferences have been conducted in 4 metro cities of India under AIROTHON Series 2017-18, starting from Delhi on September 20, 2017, followed by Mumbai (30th November 2017), Jaipur on January 20th, 2018 and Chennai on 16th February 2018.

Objectives

- To understand the regional air pollution-related issues and problems associated with air quality management.
- To analyze and understand the market of IAQ and its solution providers.
- To create a network for exchanging ideas and to foster the multi-disciplinary collaboration.
- To search for the comprehensive and sustainable solutions to improve the IAQ in urban buildings.
- To encourage the market to work on the development of sustainable solutions.
- To create healthy and environment friendly buildings relying on sustainable IEAQ technologies.

Stakeholders, who have participated in the series were:



Glimpses of AIROTHON Delhi Edition - 20th September 2017



Glimpses of AIROTHON Mumbai Edition



Glimpses of AIROTHON Chennai Edition



Glimpses of AIROTHON Jaipur Edition



Conference on Creating Resilient Communities and Families

One day International Conference on "Creating Resilient Communities and Families" was jointly organized by IPCA and Department of Humanities and Social Sciences of IIT Delhi on 19th December 2017, at Bharti Building, IIT Delhi. This was the 4th conference of IPCA with the support from IDS, USA and University of Wisconsin White water, USA.

About

Individuals, families, and communities in developing countries are prone to “shocks” which can seriously impair their health and financial well - being. Shocks can be triggered by natural and man - made disasters, the spread of disease, climate change and pollution, migration, and even changes in government policy. Vulnerable communities are particularly susceptible to shocks, often suffering serious financial losses and debilitating injury or disease as a result. In some instances, shocks can be severe enough to unsettle an entire community and result in higher mortality rates. Support for post-shock activities is often very expensive to provide, slow to reach the needy families and communities, and not certain to result in full recovery. A more meaningful approach is to help vulnerable communities become resilient to shocks. Therefore, the aim of the conference was to build an understanding of how we can help communities become more resilient and to implement projects on the ground to make a difference.

As an outcome, the one - day conference with all eminent speakers and participants have tried to explore the following important information and knowledge to plan for action in this direction:

- Size and forms of shocks
- Role of policies/codes/regulations
- Variance among stakeholders
- Dealing with complexity
- Forms of resources
- Total cost to the community
- Learning by the community

We sought input from diverse fields of engineering, healthcare, sociology, the sciences, management, and economics. The discussions were enriched and given greater external validity through the participation of academics, NGOs, government policy members, international developmental agencies and even community representatives in this conference.

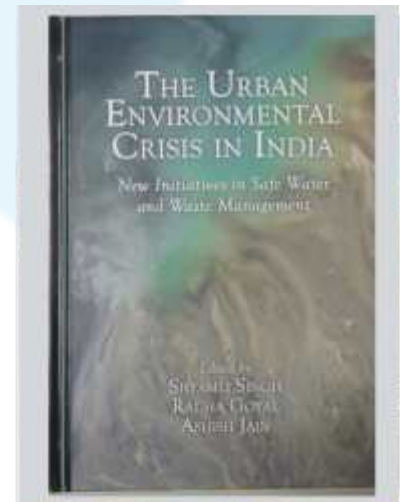


Glimpses



D. Publication (2017 - 18)

1. Shyamli Singh, Radha Goyal and Ashish Jain (2017), "Environmental crisis in urban India: a new initiative in water and Waste management" Cambridge Scholar Publishing House, U.K. ISSN no.
2. Radha Goyal, Ashish Jain and Shyamli Singh (2018), " Sustainability, Health and Environment: A case study of Waste Management Sector" chapter 19 of the book, titled, " SUSTAINABLE MATERIAL FORMING AND JOINING" CRC Press, USA (ISSN yet to come).
3. Radha Goyal and Ashish Jain(2017). " Sustainable Building Design: From Energy Centric to Occupant Centric Approach, Published in Newsletter of Bombay Chamber of Commerce and Industry.



E. Participated/Supported Events/ Projects by IPCA in 2017 - 18

Participated in Plaste India in Ahmedabad



G. Board of Members



Prof. Padma Vasudevan



Prof. P.K. Sen



Ashish Jain



Ajay Garg



Dr. Shyamli Singh



Amit Jain



Aarti Kaushik



Dr. Radha Goyal



Pragma Kaushik



Madhuri Nanda



Dr. Nidhi Pasi



Pratibha Nair



H. Project Partner

 cpcb			 For a zero-waste future
			
			
			
			
			
			
	Forum for Air Quality	AERATE Health Care Solutions Pvt. Ltd.	APT TECHNOLOGIES





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