

ANNUAL REPORT  
2016-17



**INDIAN POLLUTION  
CONTROL ASSOCIATION**



**THE KEY TO A  
GREENER  
PLANET IS IN  
YOUR HANDS**



## DIRECTOR'S MESSAGE



It gives me immense pleasure and pride to represent IPCA as a dynamic organization in which the entire team, consisting of dedicated, motivated and committed people not only transform the sense of social responsibility, human values and concerns for Environment among themselves but also among the society.

From the last 17 years, IPCA is shining like a beacon of excellence in the province of Sustainable Environment. We, at IPCA, are constantly developing new ideas and practices through collaborative networked learning in the recent past. The year 2016-2017 too was a year of new learning's and innovations. We worked very hard to strengthen our commitments and were successful in achieving sustainability through research as well as through execution of right practices and technologies at the ground level.

In the year 2016-2017, we continued with the implementation of our blueprint for creating a sustainable environment. The development of an ambitious Hydraulic Aerosol Destruction Machine was among the major highlights which have reduced the harmful impact of toxic aerosols on workers and environment. Another major achievement was the establishment of Air Quality Testing lab, which is equipped with sophisticated instrument and equipments.

We organized two major international conferences this year, which was attended by various stakeholders from different sectors of the Society. Apart from this, we conceived and executed an Environment Program CHAMP in eight schools of Delhi and NCR; created awareness on source segregation and effective waste management practices in more than 1500 students from different schools; collected nearly 450 tones of Tetra Pak Cartons and channelized the same to the recycling units for its end-of-life solutions; and provided solutions for improved air quality to various sectors of the society.

Like the previous year, this year too, we have continued with our Primary Education Program for the children of Rag Pickers and have provided health care facilities to their families. It's a feeling of proud to mention that 35 nos. of children got admission in Govt. schools for formal education.

Simultaneously, IPCA has been engaged vigorously with stakeholders from all sectors through all possible tools of communication in order to disseminate the learning, knowledge and output of research analysis among them and help them in using this information to address their own challenges and problems.

The research, outreach, and support activities of IPCA have contributed in the Swachh Bharat Mission of our Honorable Prime Minister. We have implemented decentralized Solid Waste Management System in many parts of the country with emphasis on 5R's (Responsible, Reduce, Reuse, Repair, Recycle) approach. IPCA is closely working with the Swachh Bharat Mission in formulating the guidelines at its policy level, at its technology level and also filling the gaps at its service level.

IPCA's efforts and initiative in policies, technologies and services have supported individual, corporate, and community actions and helped them to move along the path of sustainable development. IPCA has the vast support of Students from Schools, Colleges and Universities that worked with IPCA as volunteers, motivator, and interns. Their association has helped us a lot to accelerate our actions and create awareness in the society. Besides our action on ground, we also published research papers, newsletters, articles and edited book on "Urban Crisis in India: New Initiative in Safe Water and Waste Management" with the support of authors and researchers from reputed institutes.

I, along with the entire team take the pleasure of presenting this Annual Report highlighting the achievements and learning of 2016-2017. I congratulate the team for their good work and wish them all the best to continue with this good work in the years to come.

- Ashish Jain (Director)



During 2016-17, the IPCA embarked on a journey of change, designed to meet the challenges and issues of solid waste management and air pollution. IPCA's various initiatives in the area of waste management, air quality management, environment education, primary education, health and hygiene for underprivileged communities have left their footprints. In the year 2016-17 IPCA has made significant contribution in the field of solid waste and air pollution which has strengthened its grip with all the associated stakeholders and it has been able to establish a strong network through its intervention. This year's annual report is structured around the new initiatives undertaken by IPCA along with the brief note on previous projects. IPCA has been working and delivering on ambitious programmes to address some of the key conservation issues faced by the country. The challenges are immense but innovative solutions can also be created and IPCA has been focusing on developing and testing such ideas and solutions. The work outlined in this Annual Report will clearly demonstrate that we are committed to continue finding ways to ensure sustainable and healthy environment for generation to come.

Some of remarkable initiatives & achievements of 2016-17 are:

- More than 100 students from schools of Delhi NCR have been benefited from the awareness campaign/training programs conducted under the Clean and Healthy Air Management Programme for Schools (CHAMP) program.
- 140 children have been enrolled in primary education programme for rag pickers children and are getting benefitted from health camps. 30 students have been enrolled in government schools for formal education.
- Total 452 tons of Tetra Pak cartons have been collected in financial year 2016-17, which have

financially benefitted 555 rag pickers and total 724 people from rag-pickers community benefitted from free health check up program of IPCA.

- 1500 school students from 20 schools of Delhi NCR have been benefitted from the Adobe Household and School Waste Management Education (ASHMAE) to meet its objectives of creating awareness for environment protection and conservation through Reduce, Reuse, Repair, and Recycling of waste.
- Successfully installed and operate Aerosol Destruction Machine and safely disposed 105 Tonnes of Aerosol cans.



## ABOUT REPORT



IPCA is pleased to present its annual report to all its stakeholders. It highlights the current activities, relevant targets and IPCA's approach in achieving those targets in the reporting period i.e. 1st April 2016 to 31st March 2017. The facts and figures has been compiled for the benefit of all the stakeholders, including, civil society members, project partners, regulators, employees and the society at large.

Your comments, clarifications or inputs are welcomed. You can submit your comments, queries and inputs at [ashish@ipcaworld.co.in](mailto:ashish@ipcaworld.co.in)



## ABOUT IPCA



The Indian Pollution Control Association (IPCA) is a not-for-profit, non government organization (NGO) registered under the Societies Registration Act, 1860, Foreign Contribution Registration Act, Section 80G of the Income Tax Act and enlisted with Central Pollution Control Board.

The organization established in 2001 with the support of Indian Institute of Technology, Delhi and comprised of a multi- faceted group of environmentally conscious individuals who are from the business, legislative, legal, engineering, finance, energy and environmental sectors. The diverse group of individuals allows IPCA to reach out to both the public and private sectors and to educate them the importance of incorporating issues such as environmental pollution, education, health and hygiene and self sustainability into project or policy development for India. In the short span of our existence we have achieved several milestones and able to implement decentralized solid waste management and composting facilities at various corporate, institutes, industries and residential colonies.

Our representatives have worked with and successfully managed a number of industrial projects and carried out technical and policy studies for foundations, NGOs, and universities. We provide excellent oversight and management capabilities for our sponsors and work with the community, local NGO's and trusts.



## OUR MISSION

To link natural resource management with livelihood improvements through responsible use of natural resources to advance the welfare of present and future generations. To ensure proper processing of different kinds of waste to generate energy and nutrients for agriculture and also to provide solutions to environmental and climate related problems in urbanization, sanitation, industry, industrial waste and waste water management. To create awareness and giving solutions for consumer protection to encourage sustainable development and also exploring and mainstreaming renewable energy options to mitigate carbon emissions.



## OUR VISION

Economic development of India will be sustainable only if it is pursued in a manner that protects environment. With this vision we are endeavouring to integrate and mainstream natural resource and environmental management concerns into development activities like education of underprivileged, livelihood security of poor and solid waste management by harmonizing the traditional wisdom with suitable policy measures. Our constant efforts are directional towards being:

- A great place to work where people are inspired to their best and equipped with the latest of information and technique.
- A responsible citizen that makes a difference by helping build and support sustainable communities.
- A portfolio that anticipates and resolves environment related issues in a manner that also has a scope for improvisation of living standards of underprivileged who are directly or indirectly associated with us.



## OUR VALUES

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

- **Passion** we are committed in heart and mind to achieve and 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 (2016-2017)

- A** New Project and Initiatives
- Air Quality Management Services (AQMS)
  - CHAMPs project
  - Adobe Household and School Waste Management Education' (AHSWME)
  - UNICEF Study
  - Hydraulic Aerosol Destruction Machine
- B** Existing Projects (in continuation)

- Destruction and Disposal of Industrial Waste
- Garbage Recycling Program
- Health Care Program for Rag-pickers' children
- Primary Education Program for Rag-pickers' children

#### **C** Projects completed in 2016-17

- Awareness Campaign for segregation and collection of Post Consumed Tetra Pak Cartons for Recycling
- Zero Waste Campus at Central Pollution Control Board

#### **D** Conferences and Workshop conducted

- Air-O-thon: Run for Opportunity in Indoor Air Quality (IAQ) at India Habitat Centre on 20th October, 2016
- Environmental Exposures and Preventive Health Care" on 3rd February 2017 at IIT Delhi

## **A**

## **NEW PROJECT AND INITIATIVES**

### **Air Quality Management Services (AQMS)**

Air Quality Management Services (AQMS) a joint venture of Indian Pollution Control Association and Your Own Green Area (YOGA) Creations Pvt. Ltd. was established in 2016 to provide unbiased Air Quality Testing & Consultation services by experts with the help of finest range (Gold standard) of calibrated instruments to "understand the air you breathe and suggest solutions accordingly".

#### **Activities Conducted**

- 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:
  - PM2.5 pollution before, during and after odd even trial in Delhi at independent monitoring station.
  - PM2.5 pollution exposure at different bus stations on ring road in Delhi.
- AQMS has provided all monitoring, testing and consultation services to the PhD research of Dr. Pratima Singh, Assistant Professor, Institute of Home Economics for her study on "Classroom Indoor Environment Quality (IEQ): Its impact on Student's Health Exposure, Concentration and Performance in selected Schools of Delhi".

#### **Achievements**

- A reality check study was conducted during and the post Diwali in 2016 to assess the real impact of increase pollution level in the atmosphere around Delhi NCR region. The full report of the study was telecasted in Electronic media in Total TV network which was widely acclaimed ([https://www.youtube.com/watch?v=xPJXiviZ\\_vQ&feature=youtu.be](https://www.youtube.com/watch?v=xPJXiviZ_vQ&feature=youtu.be), <https://www.youtube.com/watch?v=knJgWwtSVq8&feature=youtu.be>, [https://www.youtube.com/watch?v=\\_2bkB3hg7DE&feature=youtu.be](https://www.youtube.com/watch?v=_2bkB3hg7DE&feature=youtu.be)).
- IPCA was also invited as a panlelist to discuss about the current scenario of pollution in Delhi NCR region.



Clean and Healthy Air Management Programme for Schools (CHAMPS) initiated in August 2016 as a self sponsored project of IPCA and FAQ -India (Forum for Air Quality) with four schools from East Delhi (Arunodaya Public School, S.R. DAV Public School, Laxmi Public School and Arwachin Public School) and four schools from South Delhi (Summerfield Public School, Blue Bells International School, South Delhi Public School and Dr. Radha Krishnan School). This project has been undertaken in the following phases:

**Phase I:** Acquiring basic knowledge about air pollution

**Phase II:** Team Formation- Research and Awareness generation

**Phase III:** Awareness generation and Research activities formed by the grouped students

**Phase IV:** Teams evaluated and awarded by IPCA and FAQ

**Phase V:** Certified Clean Air Champions continue the work

The basic objective of the project was to empower and motivate the children to lead the mission to educate & change attitudinal behaviour of the society towards air pollution and its solutions.

## Activities Conducted



A region wise network of the participating schools has been made where the school students exchange their views, ideas and activities through mails and messages.

In the first phase through classroom session and fun based activity students have acquired the basic understanding of air pollution, its causes, consequences, trends and solutions to the problem. Two half-day trainings were organized using a variety of didactic methods and techniques including presentations, demonstrations, group work activities and audio-visual material. A pre-post test was also conducted to assess whether knowledge of the children on air pollution has increased after the basic training. Based on the urge and their evaluation, the Clean Air Champions were divided into Research and Awareness generation groups in phase II, which enabled them to think collectively about innovative ways to combat pollution through research and generate awareness amongst the people.

- To commemorate National Pollution Prevention Day on 2nd December 2016, IPCA celebrated National Pollution Prevention Day with the CHAMPS from Arunodaya Public School, Summer Field Public School, South Delhi Public School, and S.R. D.A.V Public School, Dayanand Vihar with the

support of Indian Science Congress Association (Delhi Chapter). Poster, slogan and A.V presentation competition was organized in Arunodaya Public School in which 50 students from different schools (East and South Zone of Delhi) participated.



## Achievements



- Creating awareness amongst students through activity, painting, slogan writing competition about contribution to air pollution by the day to day activities.
- Students have their own air pollution catchers and examined under the microscope for dust pollution.
- Students have been empowered to analyze the pollution scenario in current condition and educate the society towards its mitigation.
- Apart from acquiring knowledge on awareness raising and research, students are working on action plans to take measures to decrease exposure and emissions levels and to design their own research

and awareness raising activities.

- Students are conducting awareness raising and research activities at their respective schools while being mentored and monitored by IPCA/FAQ.
- Mentors are visiting the students during the student's activities in order to motivate the students, provide guidance and feedback. Depending on the needs and interests advanced training sessions and/or field trips on specific subjects have also been organized for the prospective students.

## Adobe Household and School Waste Management Education (AHSWME)



The Adobe Household and School Waste Management Education (AHSWME) is a collaborative project of IPCA and CEIS. Experts from IPCA has executed this project. The basic objective of the whole program was to make the younger generation in schools aware about the problems arising due to solid waste that exists around us and to educate and train them to manage their waste in a hygienic and scientific manner. The approach was such that it would motivate the school children to come up with their own ideas to reduce, reuse, recycle and segregate their waste and implement their ideas in form of actions.

The Project aimed to create awareness amongst the 1500 school children on waste management at home and school and instil good waste management practices in the campus and school. These children aged 11 - 15 years were selected for training, dubbed as 'Adobe Waste Managers' and given due recognition by providing them with badges.

The following approach was followed to achieve the project objectives:

- Interactions, distribution of printed material and audio-visual presentations.
- Screening of educative short films.
- Teaching the waste management through practical activities.
- Conducting games and waste related activities for students and teachers.
- Organizing quiz, painting, slogan and 'wealth from waste' competition for the students and conducting waste audit.
- Field visits to sites with facility for composting/ vermicomposting of bio-degradable waste.

### **Activities Conducted**



During the year 2016-17 activities were carried out in the following three phases /visits:

**Phase I:** In the first visit the students were made aware about the objectives of the project , concept of solid waste management and correct practices to be adopted through presentation and movies. The sessions were made very interactive and students were encouraged to ask queries and discuss their views. A question answer session was also organized to assess the understanding of the children

**Phase II:** Children were asked to solve multiple questions answers. Poster and slogan prepared by the students were collected and evaluated. In this phase quiz competition, fun loving game activity was organized in all the 20 schools. The posters, slogan and audit forms were collected from students

**Phase III:** Field Trip organized at sector 54 Ecopark was also conducted to demonstrate the solar panel, vermi-composting site, herbal garden, rainwater harvesting model. Prizes were distributed to the students for the posters and slogans prepared

## Achievements

- In each school the presentations and the movies shown were very much appreciated by the teachers and the students who participated actively in all the sessions.
- The sessions were very interactive and helped in arousing the curiosity of the students. In each session more than 50 students were present most from class V-X.
- At the end of the overall session children pledged to keep the environment clean and were asked to prepare slogans and posters on solid waste management.

Booklets, badges, CDs and an audit forms were distributed to the children. Audit forms were distributed in 20 schools and 1200 responses have come up from different schools. The analysis of the responses has revealed very various dimensions of household & school waste disposal and management.

## UNICEF Study

Formative Assessment Study to understand knowledge, attitude and practices of parents and communities regarding pneumonia and household pollution (HAP) (Technical expert of HAP to the project of UNICEF and Ministry of Health, executing by Ernst & Young).

Dr. Radha Goyal Deputy Director IPCA is the technical expert of the project the project "The formative study to understand behavioural issues related to clean and unclean fuel usage, care seeking by parents/care givers and community on one hand, and knowledge, attitude & practices of service providers (health system) around pneumonia treatment and prevention with in the broader context of indoor air pollution, on the other".

The findings of the study shall inform a national communication framework on pneumonia to create awareness on prevention, especially in the context of Household pollution and care.

The specific objectives of the proposed study are to:

- Identify specific practices, knowledge, beliefs, attitudes, and social norms related to unclean fuels, smoking and hand washing at the household level.
- Understand gender and inequality dimensions in decisions to replace unclean with clean fuels and follow hygiene practices.
- Understand the social and economic inequity determinants of these barriers, enablers, beliefs with respect to clean fuel, clean and hygienic environment and nutrition.
- Identify key audiences and communication approaches and channels to reach the community and health system level key primary audiences and design an appropriate communication strategy framework.
- On the health systems side – to understand the skill and incentive and institutional barriers among the functionaries, convergence (e.g. The Department of Environment, related to household pollution, Ministry of Petroleum, Health, WCD, Drinking Water and Sanitation) to promote clean fuels and cooking practices and to reduce exposure to parental smoking.

## Expected Outcome

The findings of the study shall come up with a national communication framework on prevention and care of pneumonia in children under 5 years of age in the context of HAP.

## Hydraulic Aerosol Destruction Machine



In India Aerosols are widely being used in several applications involving propellants including perfumes, shaving foams, insecticides, pharmaceuticals, paints and inhalers. The emerging customer base for personal care products, entry of multinational corporations in India, expansion of the manufacturing base in this sector, reduction in taxes on cosmetics has resulted in increase in the consumption of aerosol cans in the country.

Aerosol products are self-pressurized packaging form, consisting of a metal, glass or plastic container with a permanently attached continuous or metering valve, and designed to dispense products as sprays, streams, gels, foams, lotions or gases. Sizes range from about 0.1 fluid ounce (2.8 mL) to 33.8 fluid ounces (1 liter). About 52% of the aerosol products (e.g. contains propellants) comprising of traditional ignitable fuel sources such as propane or butane which are highly flammable and have caused many fire accidents. These cans disposed from domestic and commercial sector and collected by the waste pickers, who dismantle the cans manually to take out plastic and metal separately. This process is life threatening for the waste collectors since highly inflammable gas is compressed inside these can. During the process of dismantling this spill over the area and a slight increase in temperature can cause fire or explosion.

In order to reduce the occupational hazard involved in disposal of these cans, IPCA has designed a very innovative solution "Aerosol Destruction Machine". The machine has been designed by IPCA in consultation with M/s SKP Engineering Solutions Pvt. Ltd. for the safe destruction of damaged and expired aerosol containers. This machine works under the principle of hydraulic compression where a lever punctures the aerosol in anaerobic condition, releasing the remaining liquid which gets collected

in separate container. The machine is unique in its design, which protects explosion due to Butane in the aerosol container. The Machine is designed to puncture three Aerosol Containers at one time of either same or different size or capacity. Aerosol Container is punctured with nail made up of non-metallic material in air-tight chamber through hydraulic pressure. Gas content of the aerosol container gets escaped through the exhaust pipe into the air at 20 feet height and dissolved into the atmosphere without any harm and the container also gets compacted upto 90% of its original size. The machine is very cost effective and ensures environmental safe disposal of the cans.

## B Existing Projects

### Destruction and Disposal of Industrial Waste

The project which is in continuation since 2002 was initially operative from three different sites has now being centralized at Mandoli, New Delhi. This centre has well developed infrastructure. It is well equipped with facilities like Hydraulic Aerosol Destruction Machine (ADM), Shredder, Organic Waste Converter Machine and Electric Bailer. The centre receives damaged and expired goods from clients like Reckitt Benckiser India Ltd., Central Warehouse Corporation and many Pvt. Companies from across the country. The main objectives of setting this centre are to reduce risk of untreated disposal of industrial waste and maximum utilization of waste material through different mean of recycling.

#### Mandoli Destruction Facility

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

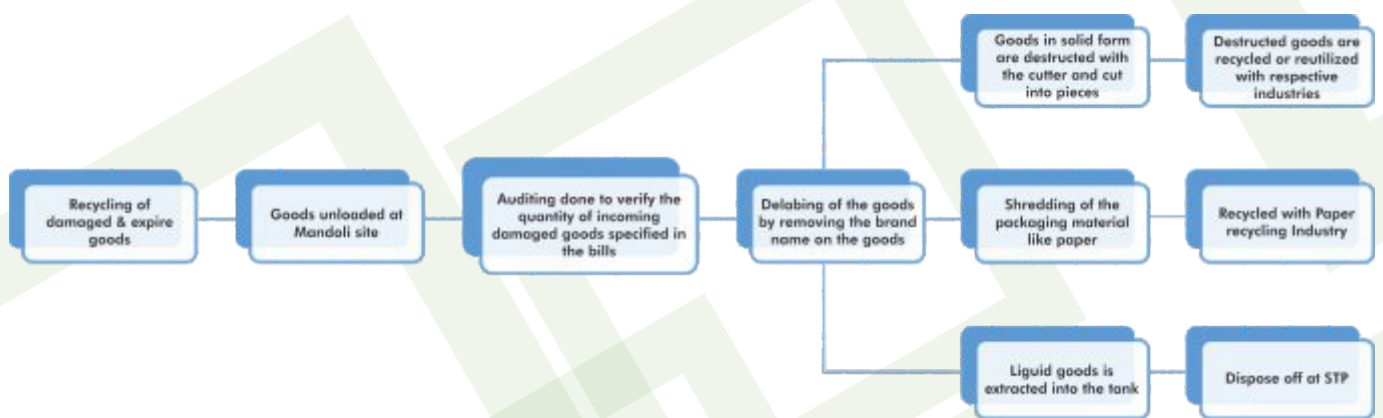


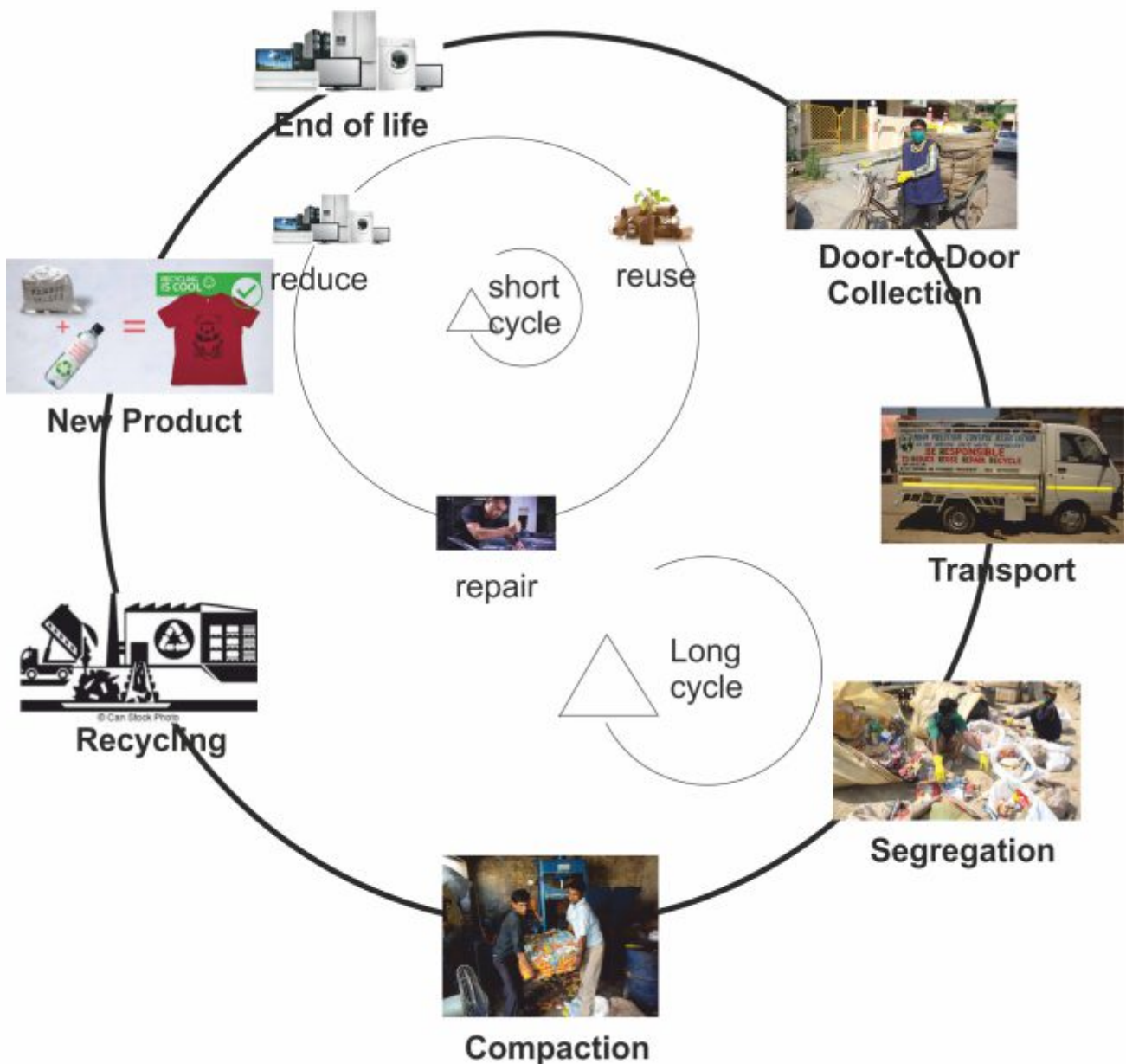
Figure 2: Destruction and Disposal Process of industrial waste at Mandoli

The new centralized set up at Mandoli has bigger 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 aerosol bottle and reduced occupational health hazard of the workers.

### Achievements

- This machine is very cost-effective and efficient it can destruct 90 bottles/hr, which means in 8hrs per day, 720 aerosol bottles are destructed everyday.
- Initiated the process of formalization of the labour each labour now has a bank account, ESI facility and PF account.

## Garbage Recycling Program



The self-sustainable Garbage Recycling Program of IPCA is running since 2004. IPCA provides 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: Door-to-door collection of waste.

Awareness generation and campaigns conducted with the following objectives:

- Stop littering or open dumping of waste.
- Implementing Decentralized Solid Waste Management System.
- Advocating the practice of waste segregation at source.
- Increasing 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.

### **Activities Conducted**

- In the year 2016-17, IPCA has provided its services of door to door solid waste collection to approximately 6,000 households and 10 corporate offices and mall in Delhi NCR. IPCA has deputed a team of approximately 100 workers for the collection and segregation of waste from above mentioned locations.
- 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 aggregators and recyclers to increase their profit margins and helped them to earn more. In one of the study carried out by R&D division of IPCA, it was found out that waste collector is earning Rs. 17,667.17 per month (Rag-pickers: Informal vs formal sector, Vol. I, Issue I, January - March 2015).
- IPCA has conducted capacity-building programs throughout the year to train these waste collectors to do their job. They are also trained on value of various recyclable waste, which helped them to segregate waste more efficiently.
- IPCA has also organized 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.

### **Health Care Program for Rag-pickers' children**

The ragpicker children are vulnerable to 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 of "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 5 different primary education centres in Delhi NCR w.e.f. 15th September, 2015.

### **Aim of the Programme**

This program envisaged with the following objectives:

- To identify malnutrition in children.

- To reduce malnutrition with special attention to underweight .
- To facilitate medical services.
- To improve their physical health with critical examination of each child and their health.



### Activities Conducted

- **Health Check Ups:** One health check up camp has been organized at primary education centre in every month. In each health camps about 30-60 children, who are part of primary education program and which have been inspected by the medicine 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.
- **Dental check up:** Dental check up and systemic examination including, respiratory Peak Expiratory Flow Rate (PEFR); have also been carried out to get the complete health status of every child.
- **Reputed Physicians:** In these camps physicians from reputed hospitals physically examine the children to check his/her general health condition, parameters like Body Mass Index (BMI), Ear, Nose and Throat (ENT), skin, nails, hairs as well as the anaemic condition have also been checked.
- **Preparation of health cards for registered patients:** Health cards have been prepared for

each registered student of the education centres to maintain the record of their health.



- **Preparation of Health Record:** A health record of the nutrition status (access to food), their working conditions, availability of basic amenities (access to clean drinking water and toilets) and sanitary practices followed have been maintained which would help to mitigate the health problems in near future of these children.
- **Distribution of clothes to the ragpicker community:** IPCA also distributed clothes to the ragpicker community throughout the year in 2016; these clothes were donated by IPCA's members and its associates.

## Primary education for rag picker children

IPCA is running the Primary Education program for rag-pickers' children with the support of India development service (IDS), USA since 2013. Currently, five education centres are running in Delhi NCR (two at Indrapuram, three in Noida) with 35-40 children at each centre.

### **Aim of the Programme**

The main aim of IPCA's intervention on primary education of rag pickers was to bring behavioural change, increase their self-esteem and make the ragpicker 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. The program was envisaged with the following objectives:

- To provide primary education through fun learning activities.
- Bringing behavioural changes and inculcating the concept of healthy food habits, health and hygiene.
- Grooming the children for successfully enrolment in a regular governmental education network.
- Ensuring regular attendance of the students.
- Nurturing the creativity and innovativeness of the children through trainings, 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.



### Activities Conducted

- Admissions to Government Schools:** In the five centres established, there are total 147 children out of total 60% are girls. The main objective of the programme is to admit these children in the government schools, mainstream them and give them formal education. Our primary education programme is resulting into better school readiness and helping to reduce the number of drop outs of these children from the government schools. About 30 students (20 students from Indrapuram and Barola) centres have been admitted in different schools like United Public School, GZB and 10 students from April 2016 to December 2016. 30 students got admission in govt. schools. Out of 30 students 53% (16) were girls.

S.N	School Name	Shift	Boys	Girls	Total	Enrolment in schools	Name of the school
1	Indrapuram	I <sup>st</sup>	14	26	40	20	United Public school, Makanpur, Indrapuram(3)
2	Indrapuram	II <sup>nd</sup>	17	18	35		Pratamik Vidyalaya, Makanpurgao, Indrapuram(17)
3	Sarfabad	I <sup>st</sup>	12	13	25	Nil	
4	Sarfabad	II <sup>nd</sup>	10	14	24		
5	Barola	I <sup>st</sup>	13	21	34	10	KCS intercollege Barola, Noida(1)
							Pratamik Vidyalaya, Barola, sector 49, Noida(9)
Total Number of students					147		

- **Exposure visit:** In order to nurture the creativity of the ragpicker children an exposure visit to Indira Gandhi National Centre for the Arts (IGNCA) was organized on 6th and 7th October 2016, where Shri Triambak Sharma a well known Cartoonist (editor Cartoon Watch magazine) taught them to draw cartoons and artworks. 25 students from the centre were taken to IGNCA and six students of the centre were awarded for best artwork. Movies prepared by Sulabh international were showcased so as to make the children aware about the significance of cleanliness and adapting it in their daily lifestyle.



- **Celebration of Events:** Events like Independence Day, Diwali, Children's day were celebrated in which the students were not only distributed sweets and made aware of the importance of the day but also given an opportunity to show their talents through dance, songs and poetries. A drawing completion was organized in children's day where the children participated very actively.



- **Hand Wash Activity:** In the month of September hand wash activity was conducted in which trainings on health hygiene was conducted. Children were taught about personal health hygiene. They were demonstrated how and when to wash their hands, brush teeth properly and other personal hygiene habits.



- **Distribution of shoes:** Shoes have been distributed to the students of the rag picker schools.
- **ID cards issued:** In order to give due recognition to the students ID cards have been issued for the children studying in the different centres.
- **Teacher's training programme:** For the effective implementation of the primary education programme, continuous support and mentoring effort is essential. In consideration of it, teachers training programme is continuously undertaken for building the capacity of the staff.
- **Development of teaching materials/adds:** Special training materials are being developed for teaching the children and to impart a meaningful education to these children. A number of teaching aids have been developed under the programme some of them are : matching sets, counting strings, fractions sets, number concept dominos, fine word boards, picture boards for language enhancement etc.
- **A multi-grade multi-level teaching methodology:** Since students of varying age group study together so a multigrade teaching methodology is adopted which is updated regularly.
- **Activity based learning:** 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 daily bath, comb hair and wash hands.
- All the teaching-learning activities are conducted in a child-friendly atmosphere so they enjoy coming to school regularly.

### Awareness Campaign for segregation and collection of Post Consumed Tetra Pak Cartons for Recycling



IPCA in association with Tetra Pak India Pvt. Ltd. has initiated the project in 2011 for creating awareness for segregation and collection of Post Consumed Tetra Pak Carton for its recycling since 2011. The main objectives of this program are as follows:

- To educate scrap dealers/waste collectors about the value of Tetra Pak's Cartons and convert their response into segregation and collection of Tetra Pak's carton from the Municipal Solid Waste.
- To operate the "Paryavaran Mitra" club for the benefit of scrap dealers/waste collectors' communities and put effort to make scrap dealers or waste collectors as active members of the club.
- To organize various activities to provide direct or indirect benefit to the club members.
- To disseminate knowledge and information about 100% recycling of Tetra Pak's carton and such packaging materials are good for earth.
- To make the system of Tetra Pak carton collection, economically more efficient and sustainable.
- To perform R&D in the field of development of low cost recycling and waste volume reduction technologies.
- Improving the sanitary condition of Delhi NCR through a recycling based waste management approach.
- Promotion of local self-responsibility for a clean environment.

## Activities Conducted

- **Workshop with scrap dealers:** Total 10 workshops were conducted during the year 2016-17 at different geographical locations viz. Shahabad diary, Khadar, Seemapuri, Rithala, Barola, Sarfabad, and Matiyala of Delhi NCR at godowns of scrap dealers in order to increase their awareness on post consumed tetrapak cartons, their recycling potential and how to increase its collection. A total of 470 participants attended these workshops.



- **Health Camps:** Total ten health camps have been organized at different locations of Delhi NCR during the year 2016-17. These were organized at Seemapuri, Shahaba diary, Khaddar, Barola, and Matiyala. A total of 1 123 participants attended these health camps.



- **Paryavaran Mitra Club Meet:** Two Paryavaran Mitra club meet have been organized one on 4th August, 2016 at Just Chill Water Park, Karnal Road Haryana and the second event was organized at Laxmi Public school on 12th December, 2016, to give due recognition to the waste collectors for their contributions to the collection of Tetra Pak cartons. This meet was the congregation of all waste collectors working under IPCA's umbrella. About 46 ragpickers involved in Tetrapak carton collection attended this meet, which gave them a common platform to celebrate together through means of games and fun activities so that they feel elated and recognize themselves as an integral part of the society. The ragpicker/scrap dealers, who have supplied maximum tetrapak cartons were awarded with a prize.



- **Canopy:** Six interactive canopies have been established near the ragpickers' residential place to enlighten them about the need, importance and the revenue earned. Canopy's camps have been organized at Shahabad Dairy, Seemapuri and Khaddar.

### Achievements

- **Total collection:** Total Tetra Pak collection in 2016-17 was recorded to be 452 tones.
- **Beneficiaries Workshop:** A total of 470 rag pickers were benefited from awareness workshops.
- **Beneficiaries of health camps:** A total of 1123 rag pickers were benefited from health camps.
- **Beneficiaries of Paryavaran Mitra Club Meet:** A total of 80 rag pickers/scrap dealers have benefited from Paryavaran Mitra Club Meet.

## Zero Waste Campus at Central Pollution Control Board



IPCA had undertaken project of zero waste campus at "Parivesh Bhawan", the head quarter of Central Pollution Control Board in 2014 which ended in July 2016. The project was envisaged with the following objectives:

- Awareness Campaign on Integrated Solid Waste Management at CPCB Delhi Campus.
- Maintain and operate the vermicomposting unit at CPCB.
- Channelize the dry waste for maximum recycling.
- Reduce the quantity of waste reach to the landfill.

Under this project a composting plant of approximately 2.5 tons/ month capacity had been installed in 2014 under the guidance and supervision of IPCA. IPCA had deputed one dedicated trained manpower to operate the vermicomposting unit at CPCB. Under this project three vermi beds for composting horticultural waste and one worm culturing bed has been established at CPCB.

Windrow composting method has been followed for partial decomposition of horticultural waste followed by final decomposition through *Easinea foetida* worms.

### Activities Conducted

- **Utilization of the compost:** The compost generated through the campus waste was used in CPCB for fertilizing their own garden. It helped to generate awareness amongst the CPCB employees about the concept of waste segregation and reduction. CPCB employees are even using it in their own garden.
- **Facilitating segregation of waste:** Under this project two plastic bins (green colour for organic waste and another blue colored for recyclable waste, each of 60 Ltr. Capacity) and one Tetra Pak bin (60 Ltr. Capacity) were installed on each floor of the CPCB project. Therefore, in total 12 plastic bins (6 green colored and 6 blue colored) and 6 Tetra Pak bins have been installed in CPCB campus for segregating the dry and wet waste.

- **Awareness campaign:** The staff of CPCB were made aware of proper segregation of waste into bio-degradable and non-bi-degradable waste.
- **Recycling of Dry Waste:** IPCA has channelized the process of recycling of segregated dry waste through scrap dealer, who visit the site on daily basis and collect the dry waste for recycling.

### Achievements

- **Empowering the CPCB staff:** The project created awareness amongst the staff of CPCB for waste segregation and composting techniques which empowered them to undertake the project themselves, since July 2016 CPCB implements and executes the project.
- **Adoption of waste segregation practices:** Complete segregation practices are being followed by each staff in CPCB campus through our segregation campaign.
- **Waste Recycling:** 100% recycling of dry waste. Horticulture waste is completely recycled in form of manure, which is being used in campus gardens.
- **Role Model:** The intervention has made CPCB campus a role model for zero waste campus.

## D Conferences and Workshop conducted

### Air-o-thon: Run for opportunity in Indoor Air Quality(IAQ)



Indian Pollution Control Association in collaboration with Prospur Pte limited organized one day international Summit on Indoor Air Quality (IAQ) at India Habitat Centre on 20th October, 2016. This summit was attended by more than 200 participants, representatives. Dignitaries like Dr. T.K Joshi, Director for COEH, Maulana Azad Medical College, Dr. Mukesh Khare, Professor IIT Delhi, Dr. Rakesh Kumar, Director, NEERI were the main speakers of the inaugural session. Besides Dr. Dipankar Shah from CPCB, Dr. Milli Mazumdar from GBCI, Dr. A.B Gupta from MNIT Jaipur, Dr. Arun Sharma from University College of medical science Delhi, Ms Parul Gupta NGT, New Delhi were the eminent members who participated as speakers/ panellists in the summit. Representatives from major air purifier and air testing manufactures like Honey well, Panasonic, Philips, Rave innovation, Eureka Forbes, Healthcare professionals, environmental consultants and other stake holders were also presented in this event.

This summit also gave a learning platform to the students from various institutes and universities across India. The recommendations that emerged from the deliberations and discussion of the summit are:

- A multidisciplinary, integrated and holistic approach needs to be adopted at national level under the umbrella of Ministry of Environment and Forests, Ministry of Health and Ministry of Urban Development with their respective roles and responsibilities and come up with an integrated protocol to combat the problem of indoor air pollution.
- A separate cell needs to be created to look after the issues of IAQ at different levels, i.e. regional, district, state and national levels with the help of multidisciplinary team of experts/professional consisting of architects, engineers, scientists, managers, occupational and public health experts.
- A strong need has been felt for spreading the awareness and to improve the educational curriculum to burst the myths existing about IAP.

## Environmental Exposure and Preventive Health Care



A one day International conference on "Environmental exposure and preventive health care" was organized by IPCA in collaboration with IIT Delhi and supported by IDS and University of Wisconsin-Whitewater USA on 3rd February, 2017 at IIT Delhi with the objective to discuss on the adverse impact and challenges of environmental pollution on different sectors of the society and develop a strategy to prevent pollution induced diseases, improve the health quality of people and promote preventive health care tool to combat the increasing effect of pollution in the environment. To discuss with this problem representatives and dignitaries from United Nations International Children's Fund (UNICEF), University of Wisconsin-Whitewater, USA, IIT Delhi, JNU, Lady Irving College, Bharati College, University of Delhi, Indian Institute of Public Administration(IIPA),CSIR-NEERI, Amity University, Noida, University College of Medical Science, Lok Nayak Hospital, Sodhna Charitable Trust, Gravis, Chintan, Citizens Environment Improvement Society( CEIS), Sonalika tractors, Honeywell, teachers and principals of different schools in Delhi NCR region, presidents and members of Residents Welfare Association (RWA), senior citizen association congregated together at one platform in this conference. Dr. Praven Khobragade, Health Specialist from UNICEF delivered the keynote address of the conference which was followed by two technical sessions and panel discussion. The speakers of this conference were Prof. Arvind Nema, IIT Delhi, Dr. Borra Harish ( Sodhna Charitable Trust) Dr. Prakash Tyagi (Executive Director, GRAVIS), Dr. Arun Sharma (University College of Medical Sciences, Delhi University) Dr. Gazala Habib (IIT, Delhi) Prof. Sameer Prasad (University of Wisconsin-Whitewater, USA) Dr. Shyamli Singh (IIPA, Delhi), Dr. T.K. Joshi, COEH, MAMC, Delhi, Dr. Anuj Sinha, Chairman, National Council for Science & Technology Communication.

The major objectives of the workshop were:

- Understanding the diseases caused by different types of pollutants-Air, Water and Soil.
- Developing ways to combat different types of pollution.
- Developing Preventive measures for controlling the diseases caused by pollutants.
- Understanding the role played by different systems of healthcare-Ayurvedic, Herbal Homeopathic etc in control, prevention and treatment of pollution induced diseases.
- Exploring the existing policies and developing a strategy for prevention of pollution induced diseases.

In this workshop health impacts of pollution was discussed with special emphasis on diseases like diarrhoea, silicosis, cardiovascular diseases caused by aerosol pollution. Concerns regarding the high occurrence of diarrheal deaths of infants and deteriorating condition of healthcare system of the rural areas were also discussed. The conference came up with very robust recommendations to address the concerns raised. The recommendations were broadly on three levels research, technological and policy. A need for action research on various issues pertaining to environmental pollution and healthcare and developing authentic set of baseline data in India, developing mathematical models to set up group of cohort studies in order to establish links between risk factors and health outcomes, need for research on various issues like impact of location, surroundings, workplace, type of pollutants exposed was also very much emphasized. The technologies developed by the institutes should be disseminated and implemented in the ground level. It was also recommended that the existing health care and environment policy should be reviewed to develop new integrated policy having a holistic approach. There is a need to develop strategy to promote sustainable development in the long run, environment conservation and environmental health governance should be incorporated into national developmental plans in a complimentary and integrated way.



## PUBLICATIONS IN YEAR (2016-2017)

During the year 2016-17 the following publications came up:

### A **Research Papers**

Babu, P., Khare, M. and **Goyal, R.** (2016). "Numerical Simulation of Airflow at Platform of an Underground Metro Station in Delhi City, India". Accepted (Paper ID : 949) at Indoor Air 2016, at Ghent, Belgium (3-8 July, 2016).

**Goyal Radha (2016).** "Sampling/Monitoring Techniques for Indoor Environments" at 4 days international workshop sponsored by British Council and Newton Funds to develop the Researchers link between India and UK (UKIERI), on Urban Air Pollution in Indian and UK cities: Characterization and Prediction of Chemically Reactive Air Pollutants" at IIT Delhi (28th November to 1st December, 2016).

Praveen Babu, Mukesh Khare and **Radha Goyal (2017)**, "Exposure of Commuters to Total Volatile Organic Compounds (TVOC) in Underground Metro Station: A Case Study in Delhi City" at International Conference on Environment Management and Sustainability (ICEMS- 2017) at SIES, Nerul Mumbai (4th -6th January 2017).

**Ashish Jain, Radha Goyal,** Shyamli Singh, Lolita Pradhan, (2016) Municipal Solid Waste Management in India: A Case Study of Post Consumed Tetra Pak Cartons in Delhi NCR, IIOAB Journal, Vol. 7/11, pp. 54-59.

### B **Newsletter**

- Indoor Air Quality: An Unsolved Puzzle.
- Solution to Indoor Air Pollution.
- Urban Trees for Better Air Quality



## PARTICIPATED/ SUPPORTED EVENTS/ PROJECTS BY IPCA IN 2016-17

- Clean & Green India 2016, Pullman & Novotel, Aerocity, New Delhi India.
- Waste & Sanitech India 2016 at Pragati Maidan New Delhi.



## AWARDS AND FELICITATIONS

- Mr. Ashish Jain, Director IPCA has been awarded Global Preneurship Icon Award 2016 by Society for Culture Youth & Peace, India for playing a leadership role in encouraging social entrepreneurship.
- Dr. Radha Goyal Deputy Director, IPCA was invited as a keynote speaker of Ventconf conference organized by ISHRAE, Delhi Chapter.
- Mr. Ashish Jain, Director, IPCA has been acknowledged by Indian Institute for Public Administration for his work on solid waste management.
- Mr. Ashish Jain, Director, IPCA has been awarded on National Science Day by Indian Science Congress, Delhi Chapter for his exceptional contribution in the Science and Technology.

- Indian Pollution Control Association has received Certificate of Excellence from Ministry of Information and Broadcasting and National Film Development Corporation Ltd. for participating at the Swacch Bharat Short Film Festival Competition.



## PROJECT PARTNER OF IPCA

- Tetra Pak India Pvt. Ltd.
- Citizen Environment Improvement Society.
- India Development Service (IDS), Chicago, USA.
- Prospur Pte. Ltd.
- Dept. of Civil Engineering, IIT Delhi.
- Indian Institute of Public Administration (IIPA), New Delhi.
- Central Warehousing Society.
- Reckitt Benckiser India Ltd.
- India Science Congress Association, Delhi Chapter.
- Forum for Air Quality.
- Your Own Green Area Creation Pvt. Ltd.
- HCL Technologies Ltd.
- SKP Engineering Solutions Pvt. Ltd.
- Khatema Fibres Ltd.
- Development Links Foundation.



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