



Confederation of Indian Industry

BEST PRACTICES MANUAL PULP & PAPER INDUSTRY

VOLUME 10



FOREWORD

The Indian Paper industry has been highly competitive. Competition, as we know, is not only from our competitors within India, but also from external players in the form of imports. As you know well, paper that is being imported to our country is at a reduced or 'NIL' duty, under various "Free Trade Agreements".

To combat such competition, we need to produce a quality product at a competitive cost and deliver the same "on time".

We also should be proud that we are in an industry where the product and the input raw materials like Wood, Agro Residue or Waste Paper are sustainable, and the process of manufacture is environmentally friendly.



The sector in itself is highly energy- and water-intensive, and therefore has a lot of potential for improvement. These two ultimately lead to a necessity where we all have to closely watch the environmental performance of the mill.

We have to do everything possible to reduce our energy consumption and maximise green energy usage to meet our energy requirement.

Some parts of our country are going through a tough drought situation. It is therefore our responsibility to consume less water for every tonne of our production.

It is in this respect that this conference, viz. PaperTech 2019, assumes great significance. The conference will focus on Energy, Environment and Water related issues of our industry.

I am happy to inform you that in this conference, there will be more than twenty technical paper presentations covering the above subjects, and it is also proposed to release a "Best Practices Manual" covering the best practices adopted in various paper mills, which will be useful to other paper mills.

I really appreciate the efforts and help provided by various paper mills in sharing their data for publication in the Best Practices Manual.

I thank all CEOs of the paper mills for their guidance and support for this wonderful programme.

My hearty congratulations to the working group who have taken enormous pains to put together all best practices and convert the same into a very useful manual.

I am sure that the Best Practices Manual, which is now going into its 10th year, has been continuously benefiting and inspiring paper mills to learn and implement new practices. CII will be happy to hear from the units about such implementations, and to take valuable suggestions to further improve them. These "Best Practices" will go a long way in helping our paper mills conserve energy, water, etc., and also become more and more environment friendly.

Sanjay Singh

Chairman, Paper Tech 2019

Divisional Chief Executive, ITC Ltd., PSPD

PREFACE

Paper Industry is one of the key manufacturing industries in our country, which contribute significantly to the GDP. Paper is a noble product that not only helps spread literacy among the masses but is a very strong medium of communication. Just like many other manufacturing industries, our industry also faces many challenges.

The following are opportunities which, if focused on, can help us face some of these challenges:

- Optimal utilization of resources like Energy, Water and Raw Materials.
- Converting waste to wealth.
- Environment Management.



PaperTech is a great forum which brings like-minded engineers and technocrats together in finding innovative ways to tackle these concerns. "World Class Energy Efficiency in Paper Sector", which is one of the thrust areas of PaperTech, is an excellent initiative taken up by CII with the support of all the stakeholders. It provides the much-needed platform and support to all of us in handling these issues. The activity, now running in its thirteenth year since inception, has come a long way in serving and benefiting all of us.

This initiative follows a unique model of "Learning through Sharing". It engages all stakeholders and creates a conducive environment where we all meet, deliberate on, and share our knowledge without inhibitions, to achieve the common objective.

The activity has given us immense benefits, be it the improvements in the operation of our plants and machineries or creating awareness on the latest trends and technologies. The platform has attracted many international agencies like Swedish International Development Agency (SIDA) and Swedish Energy Agency (SEA) to work with us. Their association with us has given us detailed insights into international technologies and best practices adopted by international paper plants.

Perform, Achieve & Trade (PAT) and Renewable Purchase Obligation (RPO) have become the reality. We now have Mandatory Energy Audits in place. On the one side, the regulations have created many opportunities, indicating areas of improvement, but at the same time, they pose many challenges to the plants for compliance. This forum has created an opportunity for us to interact amongst each other and also interact with the Government agencies like Bureau of Energy Efficiency to understand regulatory aspects better, and prepare to meet the requirements.

"The Best Practices Manual", which is being released every year, showcases our efforts and implementation of project ideas in our plants. All these ideas are technically feasible and commercially viable, and have very high replication potential. These ideas can be fine-tuned to meet individual requirements. I am thankful to all the technology suppliers and plants for coming forward and sharing these case studies.

I wish that everyone connected with our industry gets an opportunity to go through these manuals, evaluate the case studies, modify the ideas to suit their respective plants, and explore the possibility of implementation. A thoughtful implementation will definitely give you the desired benefits.

I wish you all the very best.

A S Mehta

President, IPMA & President & Director, JK Paper Ltd.



ACKNOWLEDGEMENT

We wish to express our sincerest regards to the working group on “Make Indian Pulp & Paper Industry World Class” for their invaluable contributions.

We deeply express our sincere thanks to the following paper plants for sharing the technical information for the identified best practices:

- Seshasayee Paper and Boards Limited, Erode.
- Tamil Nadu Newsprint and Papers Limited, Karur.
- Emami Paper Mills Ltd., Balasore.
- ITC Ltd., Kovai.

We would also like to express our gratitude to the following technology suppliers for providing case studies:

- Forbes Marshall.
- ETA Purification.
- Turbotech Precision Engineering Pvt Ltd.
- Retas Enviro solutions Pvt Ltd.
- Elof Hansson India Pvt Ltd.
- Chargewave Energykem Pvt Ltd.

We also sincerely thank the following committee members for their contribution to bringing out the “Best Energy Practices Manual, Volume 10”.

- Dr T G Sundara Raman (Enmas Pulp & Paper Projects Ltd.).
- Mr. Ganesh Bhadti (Vice-chair Papertech 2019, & Vice President - Technical, Seshasayee Paper & Boards Ltd.).



EXECUTIVE SUMMARY

The Indian Pulp & Paper industry has taken several efforts in the recent past for improving its environment performance. However, energy, water and environment continue to be the key issues for the sector. The available quantity and quality of water for the paper plants even pose challenges for regular operation.

The recent government regulations such as "Perform, Achieve and Trade" and "Renewable Purchase Obligation" have given additional fillip to the efforts taken by the industry for improving their energy efficiency levels and utilisation of renewable energy sources. At the same time, these regulations also have posed many challenges to the industry for meeting the requirements.

The Indian paper sector has reacted to the challenges positively, and taken initiatives to address the issues related to energy, water, utilisation of renewable energy and environment performance.

Against this background, CII-Sohrabji Godrej Green Business Centre has been promoting the concept of "Make Indian Pulp & Paper Industry World Class" with the support of all the stakeholders in the Indian Pulp & Paper sector for the last 12 years.

The main objective is to facilitate continuous performance improvement in energy, water and environment, and help them in achieving the world class standards. This has been taken up through the following:

- Visit to the best operating pulp & paper industries in India and identifying the best practices adopted in various sections.
- Compiling the best practices in the form of a manual for information sharing amongst the paper plants.
- Identification and transfer of technologies suitable for Indian paper plants and adoption of the same.

DEVELOPMENT OF "BEST PRACTICES MANUAL"

The 10th edition of the Best Practices Manual has been developed with the support of various stakeholders. Apart from focusing on energy, water and environment performance, the 10th edition has a special focus on energy, environment and chemical leasing concepts

The manual was developed based on the information collected from actual implementation of projects from leading Pulp & Paper plants and technology suppliers from India.

A separate discussion paper on "Circular Economy" has also been presented at the end of the manual, to introduce the concept. International case studies from the Pulp & Paper sector also have been included to highlight its importance, and strategize the need for the same in the Indian paper sector.



*TECHNOLOGY
SUPPLIERS*

CASE STUDY 14: MODULAR RAINWATER HARVESTING SYSTEMS (RAINMAXX TANKS)

BACKGROUND

The concept was developed in the situation that normal rainwater harvesting solutions could not be an option, owing to different factors like depth of the tank time for construction, etc. The RAINMaxx concept of rainwater harvesting solution is basically a 100% recycled PP modular-based tank used for rainwater harvesting. These modular tanks are used to collect, store and infiltrate rainwater for later use. The modules are designed in such a way that it conserves rainwater at its optimum level when executed. It aids self-sufficiency and helps the overall environment. The concept is developed by Retas Enviro solutions Pvt Ltd.

Table 15: Comparison of Modular & Conventional Tanks

S. No	Criteria	Modular Tanks	Conventional Tanks
1	Time for Installation (Tank)	This process takes merely 1 to 15 days, irrespective of tank size.	30 days to months to lay out PCC, Brickwork, Plaster, Steel framework, Roof RCC.
2	Effective detention volume (Storage Capacity)	Above 95% of tank Volume.	Reduced Tank Volume.
		Very compact, optimal space utilisation.	Free board space (0.5 to 2) meters.
3	Space utilisation	Top surface may be used for parking lots, children's play area, gardens, sports field.	Generally located where land use is demarcated as unusable.
			Requires overdesigning of cover slab to accommodate lawn or parking lot at surface level.
4	Load Bearing Challenges	Load bearing capacity of Rainmaxx tanks are very high up to 45 tonnes/ Sqm without requiring any structural design or special load bearing.	Architects/ Structural Consultants involvement is must and contractor work quality are essential to ensure load bearing of cover slab and structure.
5	Environmental Impact	Material is made up of 100% recycled polypropylene.	Virgin Material, Sourcing Boulders and pebbles is a challenge, effecting our eco system.
		Eco friendly and hence qualifies for green rating.	
6	Reduce/ Extend Tank size	Tank size could easily be reduced or extended or even relocate as per future use.	Requires construction of new tank, if future land requirement changes.

7	Life and Material Standardization	Modules, Geotextile and waterproof liners are lab tested based on technical parameters.	Life with good quality work is 15 - 20 years. Poor quality work may cause the project to fail.
		Long shelf life.	Quality assurance is a challenge.
8	Aesthetics	Does not affect aesthetics of the property, rather helps to improve the same.	Non-aesthetic.
9	Seasonal Challenges	Could be installed between rainfall events, as 1 or 2 days are sufficient for installation of tank generally.	Work completion dependent upon good weather. Monsoon season can stall work.
10	Safety Aspect	Completely underground and no easy access to storage space.	Manhole access to hollow storage space.
		No risk foreseen.	Accumulation of poisonous gases owing to deterioration of organic elements inside tank.

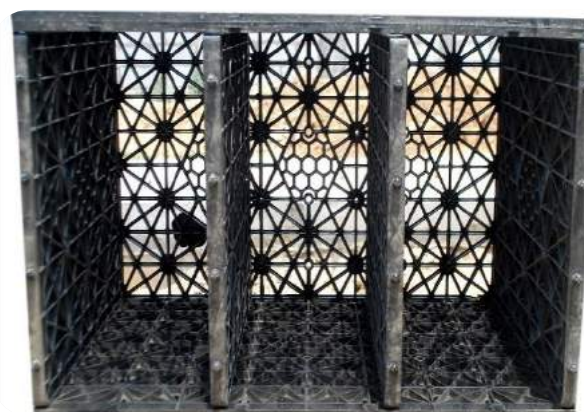


Figure 20: RainMaxx Module

PROJECT DESCRIPTION

The RainMaxx modular tank concept was developed for a capacity of 344 m³ for one of the suppliers in Agra. A total number of 6 RainMaxx tanks were installed with one recharge well each. Capacity of each recharge tank was different depending on the area. Installation of all the six tanks was completed in record six days' time.

Sectional photograph of the rainwater harvesting system is as shown:

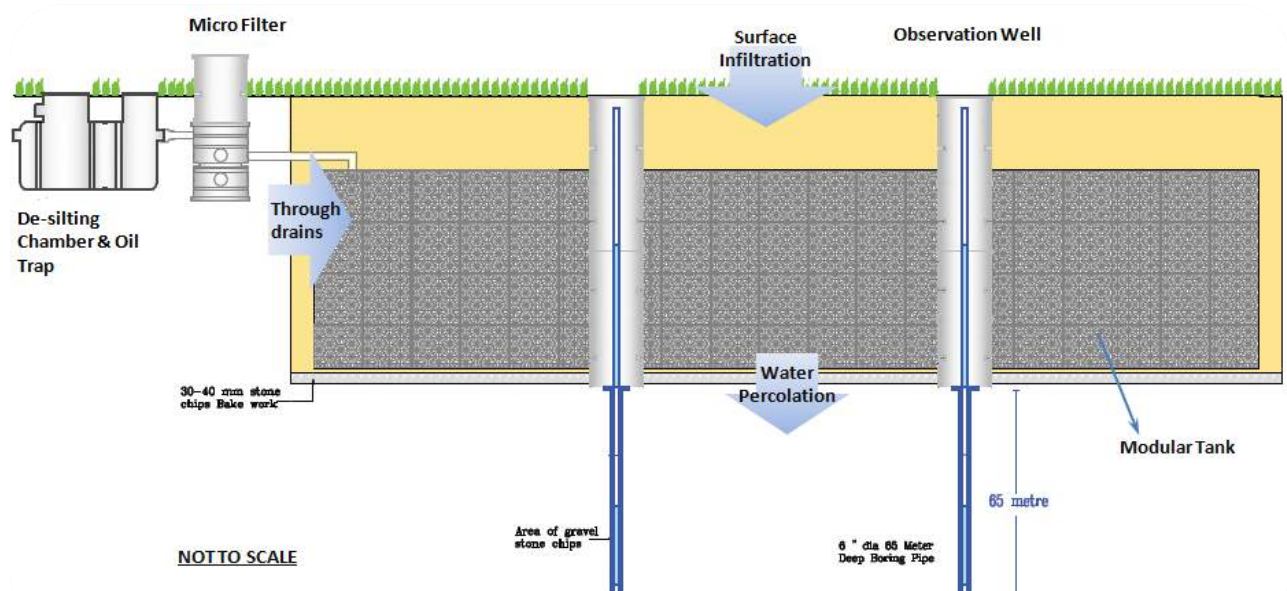


Figure 22: Site Installation



Figure 21: Actual site installations

Some of the project features include:

- ❖ Considering the large volume of suspended matter anticipated in the runoff and to ensure efficient functioning of RWH system, an advanced dual-step external filtration system was developed to address the sediments issue specific to urban conditions and for achieving high quality water stored in tank as also for recharged to groundwater. Desilting chamber along with micro-filter has also been installed to take care of the above aspect.
- ❖ The supplier has designed point solution so that water travel the minimum area. This saved a lot of excavation and other civil costs. Also, because storm water is travelling minimum area, quality of water was also better as compared to earlier design.
- ❖ It is recommended to install butterfly valve near the external stormwater drain to prevent water from entering inside the premises.

BENEFITS

For an annual rainfall capacity of 700 mm & 26-27mm/h, the savings estimated were:

- ❖ Total Recharge through 6 Modular tanks: 3.32 Lakh litres/ hour
- ❖ Total Recharge annually: 90 Lakh litres.

REPLICATION POTENTIAL

The RainMaxx concept has been implemented and RWH units of Retas are operating successfully in various parts of the country. The RWH scheme with its Modular construction can very well be replicated in all Indian Pulp and Paper mills to generate sources of fresh water input, especially in areas with space constraints & constructional issues.

CONTACT DETAILS

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About CII

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering industry, Government, and civil society, through advisory and consultative processes.

CII is a non-government, not-for-profit, industry-led and industry-managed organization, playing a proactive role in India's development process. Founded in 1895, India's premier business association has around 9000 members, from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 300,000 enterprises from around 276 national and regional sectoral industry bodies.

CII charts change by working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness and business opportunities for industry through a range of specialized services and strategic global linkages. It also provides a platform for consensus-building and networking on key issues.

Extending its agenda beyond business, CII assists industry to identify and execute corporate citizenship programs. Partnerships with civil society organizations carry forward corporate initiatives for integrated and inclusive development across diverse domains including affirmative action, healthcare, education, livelihood, diversity management, skill development, empowerment of women, and water, to name a few.

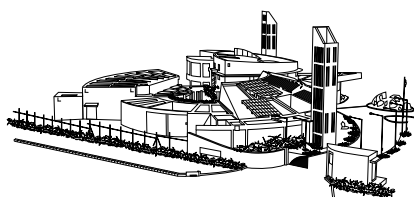
India is now set to become a US\$ 5 trillion economy in the next five years and the Indian industry will remain the principal growth engine for achieving this target. With the theme for 2019-20 as 'Competitiveness of India Inc - India@75: Forging Ahead', CII will focus on five priority areas which would enable the country to stay on a solid growth track. These are – employment generation, rural-urban connect, energy security, environmental sustainability, and governance.

With 66 offices, including 9 Centres of Excellence, in India, and 10 overseas offices in Australia, China, Egypt, France, Germany, Singapore, South Africa, UAE, UK, and USA, as well as institutional partnerships with 355 counterpart organizations in 126 countries, CII serves as a reference point for Indian industry and the international business community.

About CII-Godrej GBC

CII-Sohrabji Godrej Green Business Centre (CII-Godrej GBC) was established in the year 2004, as CII's Developmental Institute on Green Practices & Businesses, aimed at offering world-class advisory services on conservation of natural resources. The Green Business Centre in Hyderabad is housed in one of the greenest buildings in the world and through Indian Green Building Council (IGBC) is spearheading the Green Building movement in the country. The Green Business Centre was inaugurated by His Excellency Dr. A. P. J. Abdul Kalam, the then President of India on 14 July 2004.

The Services of Green Business Centre include- Energy Management, Green Buildings, Green Companies, Renewable Energy, GHG Inventorization, Green Product Certification, Waste Management, and Cleaner Production Process. CII-Godrej GBC works closely with the stakeholders in facilitating India emerge as one of the global leaders in Green Business by the year 2022.



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