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Purpose
To excite entrepreneurs, executives and graduate students about immense opportunities in green business.

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The Next Pandemic Is Lurking in Our Dirty Water

India's lax approach to water pollution is an open invitation to the next pandemic, warns **Mridula Ramesh**, water champion, author, climate activist, entrepreneur and an academic.

Why are we this way? How political expediency has made water reforms the slowest to address the dire need for cleaner water; should we wait patiently for the state to solve our water problems or should we encourage decentralized, local solutions: Where do we look for inspiration? Interestingly, many answers to the above questions are in Mridula's new book **Watershed: How We Destroyed India's Water and How We Can Save It.**

Excerpts of Mridula's chat with Benedict Paramanand, Editor of SustainabilityNext and Founder of Greenlitfest during the 5th GLF Green Dialogues on World Water Day, 22 March, 2022.

- The next pandemic can be lurking in our dirty lakes, open drains and polluted rivers. When we have dirty water all around us, don't be surprised if millions of us are wiped out by a water pandemic just the way Corona pandemic did in the last two years.

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- We should not wait for policies to get us out of this mess. The recent Farm Laws saga has shown clearly that water reforms are not electorally attractive or salient for building resilience. That's why my focus in the book is on how to build decentralized mechanisms.
- It's surprising that even when water is the lead actress of the climate change drama carbon gets all the attention. Today, we have already crossed the climate threshold and water is the key element in it. That's why I wrote this book.
- We need to make climate change conversation accessible. It is still seen as an elite topic. When I became part of climate conversations five years ago everyone was talking only about carbon. No one spoke about water. For India, water is very important given its traditions and the nature of its uneven distribution across the country.
- How can we prevent Green Revolution turning into black? I don't believe in big reform push. What can work is an informal push by putting together a partnership of farmers, NGOs, start-ups, funding agencies etc. That's what a start-up I'm part of is doing right now. **We are working with 3,000 farmers in Punjab** and are using disruptive technologies and business models.
- The change has to begin with every Indian showing respect to farmers in the Punjab-Haryana belt. When we were going around with begging bowls for wheat in the 1960s and 1970s, it is they who made the green revolution possible and have given India the food security it has today. **We owe farmers a debt of gratitude.**
- There is no one silver bullet for solving India's water problems. We have not leveraged our start-ups well enough. the ones who are beginning to do well are using new-age technologies like sensors, internet of things, artificial intelligence and big data. They need all the support and incentives to scale. In fact, they are the **vaccination of hope** for India.
- **Don't wait for heroes to save us.** This is both depressing and also enormously empowering. If we develop the attitude that water is my problem and I will be part of the solution, change will happen and this will have a ripple effect. The I here can be individuals, businesses, panchayats, wards, blocks etc.
- The Waterman of India, Rajendra Singh, has revived 12 rivers. His example shows that **we don't need outside ideas to drive change.** You go there, figure out what works, and then go on to solve local problems. The community approach to addressing our water issues work because the stickiness factor is very high.
- **Water is a positive force multiplier.** Easier access to water can influence a whole lot of other factors. In the villages Rajendra Singh worked the marriage age of girls went up from 18 years to 23 years. Girls started going back to schools and boys were getting brides to come to their village because they had water.
- How do you make your book accessible? **Teaching helps.** I teach climate change at the Great Lakes Institute in Chennai. Also, getting non-science readers to review the manuscript helps.

Water is an unspoken foundation of our lives. It deserves more respect than we currently give. For a start, pay for water. It doesn't come cheap.

Waste-to-Wealth is a Big Myth

By Shekar Prabhakar - Co-founder, Hasiru Dala Innovations

Citizens wonder why their cities are unable to manage the waste problem and take the easy route of blaming corporators. Here are a few lesser-known reasons that are hindering the progress of waste management

The **Swachh Bharat Abhiyan** has brought waste management into everyday consciousness, which is good for all concerned including citizens, waste-pickers/sanitation workers and waste management service providers. However, along the way, a myth has been created right from the Prime Minister's Office to technology providers to a well-known national brand that there is "Wealth in Waste" and therefore there is no need for citizens to pay for responsible waste management. This article is an attempt to unravel the reality of responsible waste management economics.

The first thing to understand is that the end-to-end chain from pickup of waste from the source of generation to the end of the pipe of responsibly processing or disposing the waste is a *negative value* process. Even with today's cutting-edge technologies, the cost, time and labour required to responsibly collect, transport and process waste is *higher* than the revenue that can be generated from transformation of waste into something of value – be it energy, compost, biogas, fuel, recycled to original material, repurposed usage, refurbished products or disposal in scientific landfills.

There is also the issue that since the points in the value chain that generate positive margins are not necessarily integrated with the first mile of collection and transport, the positive value is not shared across the value chain.

The table below gives the different elements of the value chain and its value creation – negative or positive.

Many of the problems that we face today in cities being able to manage waste effectively is this lack of understanding of the economics of waste management. For example, many urban local bodies

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Primary Collection	Negative Value
Secondary Transfer	Negative
Secondary Transportation to Destinations	Negative
Wet Waste Composting (In-situ or Centralized)	Negative
Mixed waste to energy (without tipping fee)	Negative
Mixed Plastic waste to fuel (high CAPEX, unproven at scale)	??
Bio-methanation (Compressed Bio Gas)	Positive
Plastics/Paper/Metal/Glass Recycling	Positive
Low to No-Value Dry Waste (e.g. Multi-Layered Plastic, Mattresses, Rags etc.)	Negative
Domestic/Industrial Hazardous Waste	Negative
E-Waste	Neutral
Bulbs/Tubelights/Batteries	Negative

who take up the responsibility themselves or through tendered contractors' primary collection, secondary transfer and transportation to destinations grossly underestimate the costs involved.

A study of tenders floated by ULBs tenders for door-to-door collection and transport (C&T), the estimated tender value was significantly below conservative costs for the required SLAs (service level agreements) and this without including corporate overheads and profit margin of the service provider. **Since L1 (lowest price) is the basis of decision to award a contractor and estimated value is the guiding price, those who win the tender can make the project viable only if they cut corners or resort to corrupt practices leading to uncollected waste, illegal dumping etc. which is what we see across the country.**

Who Should Pay?

If the above is accepted, then the obvious question is who should pay so that waste can be managed with least to no negative impact on the environment. There are only three stakeholders who can absorb the negative value

1. The waste generator (consumer/communities)
2. The Producer of the products whose consumption leads to waste
3. The Government as waste management falls under its purview

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The Waste Generator

The waste generator should bear part of the cost through what is universally accepted as the "polluter pays" principle and should ideally cover the C&T till destination including any tipping fee charged by the destination – processor or landfill operator. The Solid Waste Management Rules, 2016 allows for the charging of a user fee. To make it equitable, a "pay as much as you generate" pricing model can be implemented like a company has done in Bangalore for bulk waste generators. In addition to paying the user fee, the generator has one critical responsibility – to segregate waste at source into three streams – bio-degradable wet, non-biodegradable dry, and domestic hazardous waste (aka rejects like sanitary/diaper waste, medical sharps). Without this, the costs of segregating down the line goes higher and the percentage of material recovered for recycling becomes lower.

The Producer

The producer should take responsibility for the collection and processing of the waste that the consumption of their products generates. This has been encapsulated in the "Extended Producer Responsibility" (EPR) concept pioneered in Europe and now part of India's Plastic Waste Management Rules 2016 (amended 2018) and eWaste Management Rules 2016. The producers can work with waste management companies to ensure recovery of the waste generated be it the packaging or managing the end-of-life of their products and pay for the costs of the same. This however is only a halfway measure. If the producer wants to make a real impact on the circular economy, they should design their product to produce less waste on consumption if is a consumer non-durable and if it is a consumer durable then repairability and recyclability must be designed in. They must move from minimizing "cost of production" where waste management becomes an externality to be borne by society or government to "cost of consumption" where it is accounted for before the sale is made to the consumer.

The author in the centre of Hasiru Dala team

The Government

The Government has traditionally used tax money either raised through specific garbage/SWM cess or through their revenue from property tax to cover the costs of waste management. As mentioned earlier, since ULBs are not very good at estimating the true costs leading to shoddy work, it is recommend that they implement the policies already in place and monitor the same

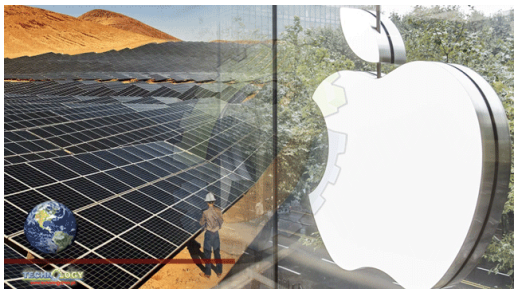
Continued on next page

closely so that the costs can be absorbed through 'user fee' and 'EPR'.

The role of the government should be to implement progressive policies and provide a critical component – land and infrastructure for transfer stations, Dry Waste Segregation Centres (DWCC) (aka Material Recovery Facility (MRF)) and waste to value processing facilities like plastic recycling plants, hazardous waste incineration, low-value plastic to fuel facilities etc.

No discussion on who pays for it is complete without talking about the much-touted Waste-to-Energy (WtE) through burning of the waste to produce electricity. No WtE plants are viable without government subsidy or tipping fees even in the developed countries. Secondly, the waste composition in India has 50% to 65% of wet waste which brings down the calorific value of the waste due to high moisture content. Because of this no plant in India so far has successfully operated in the long run. Finally, the CAPEX per ton is exorbitant making it a non-starter as a solution across such a vast country such as India. But WtE continues to fascinate the powers that be as it is seen as a simple, almost elegant, solution and the high project outlays are another attraction. It is this author's recommendation that if the above is implemented, our cities will be clean as well as help reverse climate change impacts due to irresponsible waste disposal. At the end of the day, sustainability must meet financial viability and understanding the economics of waste management is the first step.

Apple's Green Bond Funds 50 Projects



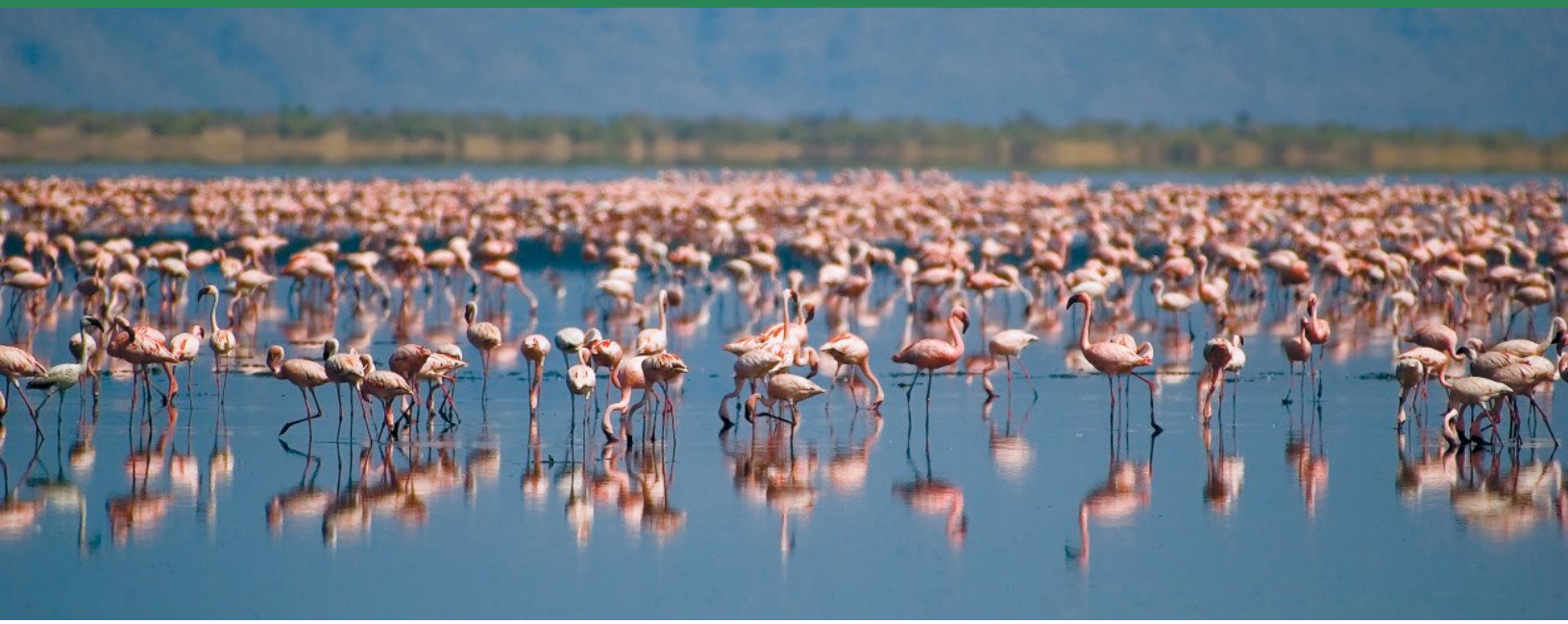
Apple's latest annual **Green Bond Impact Report** states that most of the money has gone towards innovations for carbon neutral materials and clean energy projects, supporting the company's sustainability targets. Proceeds from the bond have funded 50 projects, with over $500 million allocated to sourcing renewable energy, nearly $30 million to low-carbon design, and the remainder in categories including energy efficiency, carbon mitigation and carbon sequestration.

Apple has estimated that projects and initiatives funded by its 2019 green bond will result in the mitigation or offset of nearly 2.9 million metric tons of CO2e, 1.85 GWh of annual renewable energy generation, and 699 MW of newly installed renewable energy generation. Since kicking off its green bond program in 2016, Apple has raised $4.7 billion, and has allocated $3 billion of the proceeds to date.

Apple's most recent issuance was in November 2019, raising €2 billion (approximately $2.2 billion) in its first European green bond offering. To date (as of the end of FY'21 in September 2021), the company has invested $550 million from the 2019 bond, including $220 million in 2021.

More than 70% of Apple's carbon footprint is created from the energy used in the manufacture of its products. One of the company's key focus areas for investment is in programs aimed at enabling suppliers to reduce energy use and transition to renewable energy. A report published in ESG Today shows that Apple's Green bond proceeds allocation in 2021 included investments in training and resources to help guide suppliers in their transition to clean power, and policy advocacy efforts in locations including Japan, Vietnam, and South Korea to help build cost-effective renewable energy markets. According to the green bond report, as of October 2021, more than 175 of the company's manufacturing partners across 24 countries have committed to using 100% renewable energy for Apple products.

https://www.esgtoday.com/apple-allocates-nearly-3-billion-green-bond-proceeds-to-new-carbon-free-materials-clean-energy/



Businesses in Harmony with Nature Last

How nature and businesses are inextricably connected needs to be acknowledged and understood. In fact, it is the essence of sustainability

R Gopalakrishnan, a prolific author and a highly successful business leader, says he learnt the nuances of management and life by observing nature closely. He attributes his success as one of the most successful professional business leaders of the modern India to his fondness for looking for business and life lessons from unusual places. He documented his learnings in **The Case of the Bonsai Manager – Lessons for Managers on Intuition published by Penguin in 2009.**

Presented here are excerpts from his talk **'What Business Can Learn from Nature'** at the first Green Literature Festival held in December 2021. **Greenlitfest (watch here)**

India is a fertile land for start-ups and has seen 42 unicorns in 2021 alone. Their exuberance and fierce competition notwithstanding, start-ups have the advantage of choosing their path. He is against growth at any cost and wants business goals to be in harmony with the environmental sustainability.

He believes that the laws of nature apply to companies. Those with good business philosophy and a strong sense of identity out-survive the ones with dramatic valuations. It is after all a game of choice. Outcomes are different for entrepreneurs whose philosophy is to make the quickest buck in the fastest time from those that believe in making a small contribution to change the way society operates while booking profits.

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Mr. Gopalakrishnan, after retiring as a Director at Tata Sons, has taken to advising corporates. Among numerous examples he shared, the one on Tata Chemicals is heart-warming.

In 2007, Tata Chemicals was exploring the world to find sources to mine natural soda ash. Synthetic soda ash is taken from seawater while natural soda ash appears as a deposit that can be mined. It is much less energy intensive and is considered a green soda ash. The hard-boiled chemical engineers of the company zeroed in on Lake Natron in Tanzania to mine soda ash. After about $5-10 million investment, extensive research and multiple trips to Tanzania, the company board was keen to start mining. Just as the company decided the venture was good for all stakeholders, it stumbled onto the fact that Lake Natron was a nesting site for rare Little Flamingoes.

Tata Chemicals decided against the venture to save the Little Flamingoes. Of course, the engineers were shattered. The investment was written off and the project was abandoned, much to the disappointment of the Tanzanian government because the investment was a massive $450 million. A link in the natural order of things, however, was left intact.

Awareness of nature and how it connects with business is earthy natural common sense, says R Gopalakrishnan, who has served on the boards of several companies including the Tata Chemicals. **Managers pursue growth for the sake of growth, often ignoring the consequences.** Here's the list of several lessons that entrepreneurs and managers can learn from nature:

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Compete, Cooperate and Collaborate

The fittest survive in nature and in business. Nature is extremely competitive and so are businesses. Nature thrives on co-operation as it should be among businesses and industries. Employees who are competitive at individual level and collaborative at a team level write business success stories.

(**Here** is a story of Blue Jays and Robins for a lesson on cooperation and collaboration.)

Norms are Good. Exceptions are Inevitable

Simple everyday things like a bird adapting to a new situation or figuring out new ways to tap different sources of food, hold valuable lessons for those willing to learn. Nature has rules but very graciously accommodates exceptions. It is for us to correlate, says Mr. Gopalakrishnan.

While the sun rises in the east and sets in the west for a vast majority of us, for a tiny minority in Norway nothing could be further from the truth. The sun does not set for six months, and when it does, it does not set in the west. The land of the midnight sun has its own cosmic rhythm.

The ability to have rules and yet accept exceptions is an important, but ignored, trait. The rules of nature are often bent to accommodate exceptions with ease. A tolerance towards exceptions and respect for rules is what we all need to learn.

Finish the Unfinished

The human mind naturally remembers the unfinished task better than the finished. Now, all matters related to climate are unfinished tasks and we remember them as a constant ringing in the ear that refuses to quiet down. What we lack, however, is the willingness to listen and act. According to Mr. Gopalakrishnan, "What's happening with climate change is nature prodding you to complete your unfinished task."

We have unfortunately been brought up by a pedagogy which ignores or, worse, belittles our intrinsic abilities like intuition. "I think it is about time we realize these aspects do not compete with but complement science."

Adaptability Trumps Size

Nature values adaptability rather than size. Businesses value size rather than adaptability. Cheetah is a case in point. It is a superb hunter despite its size because of its adaptability. Its ability to quickly change directions gives it an enviable edge.

In the business world companies collapse if they don't have the flexibility to adapt.

(Learn **here** about the amazing flexibility of Octopus)

The Case of the Bonsai Manager is Mr. Gopalakrishnan's 20th book. Check out his books and writings here https://themindworks.me

Sustainable Supply Chains – India takes a cue from global players

Amidst the global concern for climate change and rising temperatures, organisations are being assessed for their social and environmental impact on their supply chains. Big businesses are expected to assume responsibility for how their manufacturing and supply affect the planet and its people. Hence, companies are adopting decarbonisation strategies and pushing for greener business solutions, leading to the supply chain becoming more environmentally responsible.

The global transportation sector is a major polluter, and in 2020, it produced approximately 7.3 billion metric tonnes of carbon dioxide (CO2) emissions. Most delivery trucks use diesel since that is the affordable fuel option, but using diesel increases the carbon footprint by releasing 13 per cent more CO2 into the atmosphere.

Smart warehouses that use energy management systems for efficiency, use of electric trucks, green sourcing to achieve carbon-neutral supply chain, and digitisation and automation are some of the measures global logistics majors are adopting to ensure environmental sustainability.

Indian logistics companies, in their effort to reduce carbon emissions, are turning to technology to minimise fuel wastage by introducing GPS-enabled toll payments. Other initiatives such as using electric vehicles for at least 30 percent of their shipments and solar roof-tops for warehouses are on the anvil to ensure green practices. **The central government too is planning to promote LNG as an alternative fuel and to set up 1,000 LNG stations over the next three years owing to its lower cost and lesser emissions.**

Click **here** to read the full report by Neeraj Bansal, COO-India Global, National Leader – Supply Chain Re-alignment, KPMG in India.

Grasim, Toyota Kirloskar win TERI-IWA-UNDP Water Sustainability Awards

AKAH, Parmarth, BP figure among awardees

The **TERI-IWA-UNDP Water Sustainability Awards** (WSA) 2021-22 were given away on 22nd March, the World Water Day.

SFD Nagda unit of Grasim Industries Ltd received the Award under the 'Water for All' category and Toyota Kirloskar Motors in the Water Users in Industrial Sector category.

In her special address, on March 22, 2022 at the TERI-IWA UNDP Awards event held in New Delhi, Ms Shoko Noda, UNDP Resident Representative in India, UNDP, said it is estimated that **nearly 700 million people will be displaced by water scarcity by 2030.**

The TERI-IWA-UNDP Water Sustainability Awards (WSA) have been instituted to encourage the achievement of the SDG on water by reducing water footprint among stakeholders. According to Dr S K Sarkar, Senior Director, TERI, the WSA is among the rare awards where all the targets of SDGs are recognized.

The United Nations Sustainable Development Goals recognize water as the key element of sustainable development by setting a dedicated global goal for water. Goal 6 of SDGs, further specifies targets to be achieved by 2030.

The TERI-IWA-UNDP Water Sustainability Awards aim to encourage the achievement of the Sustainable Development Goal on Water by way of reducing water footprint among various stakeholders through the adoption of the 'water neutrality' approach.

The awards are spread over multiple categories and domains within the water sector, and hence recognizes the role of multiple stakeholders.

Awards in detail: At Nagda, Grasim's CSR-driven social projects are currently operational in 55 villages, of which 16 have been selected as model villages aimed at holistic development through integrated implementation of development initiatives.

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Toyota Kirloskar Motor, according to the company, has reduced freshwater consumption in its Bidadi plant in Karnataka by 90 percent in the production processes. **The average groundwater level at TKM has increased from 90 ft in 2014 to 45 ft in 2021, the company said.**

AKAH awarded: The Aga Khan Agency for Habitat (AKAH) has won a Certificate of Recognition as runner-up for Excellence in Participatory Water Management.

In the winning project, AKAH has developed a digital platform by which villagers can better manage and conserve groundwater resources. **The Web-GIS based tool, which includes a mobile application and notification advisory system, integrates real-time primary data, remote-sensed data and secondary data to map the quantity and quality of water resources.** Users can input data and access analysis for specific watersheds and areas of interest. With up-to-date information on current groundwater levels and quality they can forecast scenarios for future changes to enable informed decision-making, according to an official release.

In Maharashtra, villagers help the AKAH team to collect details from the Gram Panchayat (village council)-owned well. PC: AKAH India

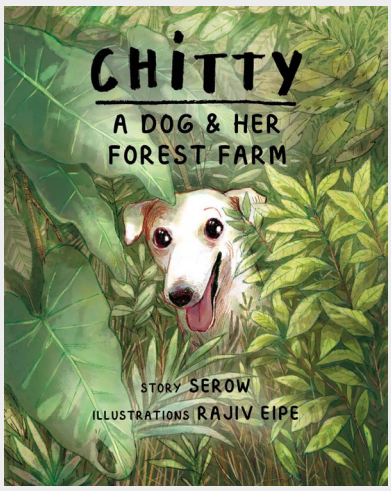
The award for 'Water Champion (Institutional)' was given to Parmarth Samaj Sevi Sansthan, a Bundelkhand-based non-governmental organisation for its work in the drought-prone region and enabling enhanced community participation through initiatives such as forming Jal Saheli groups among rural women.

Other winners in the multiple categories are: Dhosa Chandaneswar Bratyajana Samity (Category: Sanitation for All); Bharat Petroleum Corporation Limited (Category: Wastewater Treatment & Safe Reuse); NIIT University (WUE Water Users in Domestic Sector); Sugarcane Breeding Institute Team (WUE Water Users in Agricultural Sector); Watershed Organisation Trust (WOTR) (Excellence in Participatory Water Management); WWF-India and Bashettihalli Kere Samrakshna Samiti (Protect and Restore Community Water Structures); Swiss Development Corporation (Promoting Water Cooperation); Maithri Aquatech Private Limited (Innovation in Water Technology).Water for All: Options for Safe, Sustainable and Resilient Future was released during the event. The call for applications for next year's WSA will be open soon.

BOOKREVIEW

A Dog-eyed View of Nature

By Rati Girish



Making sense of the natural world through the eyes of a dog

Chitty: A Dog and her Forest Farm by Serow and published by Kalpavriksh, is a book about a dog that finds her forever home on the author's farm, deep in the Western Ghats. For a dog from the city, she carries none of the urban airs, and settles into her new life at the forest farm quickly!

Chitty loves going on long walks and chasing langurs. She often comes back home with forest fruit splattered on her face and enjoys leaping to eat termites – a protein-rich snack in the monsoons. The poignant tale takes us through Chitty's life – from when she first arrives at the farm and settles in with the author's family to when she finally merges with the land she so loved. Expect tears at this point.

For dog parents, any book or movie featuring a dog is an open invite to imagine our fur baby in the role of the protagonist. My children and I immediately wondered what our dog would do if he lived in a forest. Would our city-slicker be as brave as Chitty, when confronted with a snake? Would he know what to do when violent thunderstorms raged and the house shook? This book made us talk about the effects of climate change, whether animals have a sixth sense about danger and the integral role they play in the fragile ecosystem.

At first glance, this might seem merely like a story about a dog, but it is so much more. This book is a wonderful way of talking about life in a forest and the unique ecosystem of the Western Ghats – the fertile land, its wondrous treasures, and its seasonal mood swings. Serow deftly weaves in little details such as the starry night sky and the torrential rains that are common to the region. Meanwhile, Rajiv Eipe's gorgeous illustrations transport readers into the heart of the forest where we can hear the dried leaves underfoot and feel the wet, moist monsoon air. Each page is a work of art. Highly recommend reading this book and adding it to your collection!

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SN is by far India's most read digital magazine that covers articles/reports on Green Business, Green Products, Social Entrepreneurship, Green Literature, Green Technology, among others. A Children section was added in mid 2021.

SN launched India's first Green Literature Festival (www.greenlitfest.com) in December 2021.

For SN to grow and stay relevant it needs to transition from a grant-self-funded model to a community-funded as well as a sustainable for-profit business model. Your timely and generous support will truly help its mission.

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