

*harmony*

JUNE 2017 ₹ 40

# celebrate age

The magazine for silver citizens

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## THE ENVIRONMENT ISSUE

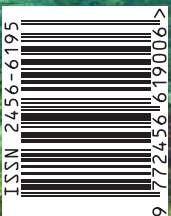
**GREEN REVOLUTIONARY M S Swaminathan**  
**FOREST SAVIOUR Chandi Prasad Bhatt**

&

**Ullas Karanth | Ayyappa Masagi**  
**Jyoti Mhapsekar | 'Solar' Suresh | NGO Kanika**

+

**EXCLUSIVE COLUMNS**  
**RANJIT LAL & JAGDISH KRISHNASWAMY**





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# Lucky 13

I've always considered 13 a lucky number. Perhaps it's because I got engaged on 13 December! Whatever the reason, the number has an incredibly positive association for me, making *Harmony's* 13th anniversary that much more special.

Our theme this month is also close to my heart. Two years ago, it was an honour for the Reliance Group to be chosen as the first founding partner (with myself as ambassador) in India for the Global Goals Campaign, which seeks to promote the Global Goals adopted by the UN General Assembly for sustainable development.

That said, our engagement with the environment goes back much further—and deeper. As chairperson of the Group's CSR initiatives, I have been witness to its concerted efforts to build more sustainable communities through efforts in areas ranging from affordable energy and agriculture to water harvesting, sanitation and ecological conservation.

This magazine, too, has taken great pride in recognising unsung eco-crusaders who have given their time and abilities with little recognition or reward. In fact, our efforts to honour 'ordinary people doing extraordinary things' as part of the Harmony Silver Awards resulted in bringing many of them to centre-stage.

Among them have been water warriors Chewang Norphel of Ladakh, Anupam Mishra of Delhi and Laxman Singh of Laporia in Rajasthan, who applied innovation and ingenuity to tackle water scarcity; Delhi's Yogeshwar Kumar who generated hydroelectricity from village streams to light up the northern Indian hinterland; Kambel Chulai of Meghalaya, who developed a low-cost, eco-friendly crematorium; Hirbai Lobi in Junagadh, Gujarat, who helped the women from her marginalised Siddhi com-



Dabboo Ratnani

munity market an indigenously produced vermicompost; Bhausaheb Santuji Thorat in Sangamner, Maharashtra, whose Dandkaranya Movement turned a drought-stricken region into a lush forest; Dr Ganesh Devy from Tejgarh, Gujarat, who proposed the idea of a 'Green Economic Zone' as an alternative to the Special Economic Zone for Adivasi communities; and Dr Sekhar Raghavan in Chennai, who invented dry-composting toilets.

The journey of these real heroes, and those we feature this issue, finds resonance in our own voyage these past 13 years: commitment to a chosen cause; battling the odds in the belief of an idea; and an unflagging zeal to inform, inspire and motivate the maximum people. I thank Team Harmony for walking this road with me with purpose and passion. And you, our readers, who impel us to be the best we can be, so we can give you the magazine you truly deserve. Gratitude—and keep reading!

## A Harmony for Silvers Foundation Initiative

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Publisher **Dharmendra Bhandari** Editor **Tina Ambani** Executive Editor **Arati Rajan Menon** Assistant Editors **Sai Prabha Kamath, Rachna Virdi**

Special Correspondent **Sriekha Pillai** Chief Sub-Editor **Natasha Rego** Design Consultant **Jit Ray**

Studio Manager & Photographer **Haresh Patel** Senior Graphic Designer **Dattaguru Redekar** Production Manager **Rohidas Advakar**

Business Development: Consultant **Shrenik Mehta** Senior Manager **T M Vijaydas** Manager **Vikaran Chauhan** Assistant Manager **Vijay Singh**

Website Coordinator **Ajit Nair** Editorial & Marketing Coordinator **Johnsi Nadar**

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WEB EXCLUSIVE [www.harmonyindia.org](http://www.harmonyindia.org)



#### MUSICAL CRUSADE

*Mohan Gopal Hemmadi has been bringing the greats of Hindustani music to Hyderabad by organising concerts and festivals*

**FOR SUBSCRIPTION ASSISTANCE CONTACT:** HarmonyCare, Living Media India Ltd, A-61, Sector 57, Noida (Uttar Pradesh) - 201301.

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**Fax:** (0120) 4078080; **Kolkata:** 033-22827695 **Fax:** 22828949; **Bengaluru:** 080-2212448, 22213037, **Fax:** 2218335;

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**Total number of pages in this issue of Harmony-Celebrate Age, including covers: 84**



# column one

It's that time of year! June is an anniversary month, a time to celebrate the past, toast the present, and gear up for the future. Indeed, being future-ready is an imperative—not just for individuals but the planet as a collective. The fear, however, is that we could have compromised our tomorrows by the recklessness of our yesterdays.

Fortunately, there is a silver lining—committed change-agents who have dedicated their lives to a sustainable future. We are proud to spotlight these eco-warriors in time for World Environment Day on 5 June.

At the vanguard of our green brigade are M S Swaminathan, the architect of India's agricultural revolution, and Chandi Prasad Bhatt, the force behind the Chipko Movement. Joining them are tiger expert Ullas Karanth, who has brought precision to wildlife conservation; water harvester Ayyappa Masagi, who has slaked the thirst of swathes of dry land; Jyoti Mhapsekar, who has wrought a seismic shift in waste collection while empowering slum women; 'Solar' Suresh, who has harnessed the power of the sun to great success; and the women of NGO Kanika, who are espousing 'sustainable menstruation' by producing low-cost, biodegradable sanitary napkins.

There's more. Ecohydrologist Jagdish Krishnaswamy updates us on the rights of a river while writer Ranjit Lal, with his trademark wit, introduces us to the animal planet. Speaking of fauna, we also take a breathtaking safari through Jim Corbett National Park. Read us, write to us; stay connected! On behalf of Team Harmony, I thank you for sharing our journey.

—Arati Rajan Menon

Everybody has to pass through three stages of life: childhood, adulthood and old age. I feel old age is the most beautiful of all and so it is called the golden age. So why not enjoy it with full enthusiasm? Here are some lines I've penned on old age; I would like to share them with your silver readers:

Loneliness is not the curse that you think it to be,  
It is a state of mind made by you.  
Always be positive, alert, adjustable and active,

And keep yourself physically and economically independent.  
With your grey hair you look grand, graceful and dignified,  
Enjoy the rest of your life by relaxing and exploring.  
Devote your life to social work, health and God,  
Do it now—organise your activities.  
Love your family and yourself,  
Devote your time to others.  
Appreciate what others do for you,  
God will always be with you.  
Enjoy the years left to you,  
Every moment is a grace, a bonus—utilise it fully.

**Mohini Lalvani**  
*Mumbai*

This refers to your cover feature "The World According to William Dalrymple" published in May 2017. It was interesting to read about the historian-writer-critic-curator-photographer's fascination with history and the way he juggles all these roles. His views on the specific claims on the Kohinoor diamond in his latest book, the JLF experience, his love and passion for India and the bond he shares with his wife provided beautiful insights into his life and times. It was nice to know that living in India for the past 30 years has changed his life completely. Thanks Team Harmony for publishing such enjoyable stories.

**Razia Khan**  
*Junagadh*



I am a born and bred animal-lover. From growing up with generations of German Shepherds to all the rescued stray animals you can think of, animals have always been a part of my life. Now, in my retired life, these four-legged creatures still have their way in my home, keeping me company and fit and active. Running after two little dogs and four cats—three *gunda* tomcats and one cottony female—is no mean feat. I have also connected with a group called Care For Animals in Mysuru. The members are all young, still in school or just started college. It's nice to see how passionate they are about fostering injured strays and finding homes for the rescues as I watch over them like their grandmother. So when I read about Mahendrabhai Srimali's shelter for disabled strays in the

May issue of *Harmony-Celebrate Age*, I deeply related to his dedication to animals. And that little brown-eyed fella staring out from the picture really stole my heart!

**Selma Pinto**  
Mysuru

Following the success of our Caretakers Enrichment Programme (CEP Series 1) for professional caretakers, Dr V S Natarajan Geriatric Foundation rolled out the CEP Series 2 for relatives who double up as caregivers for the ailing elderly. More than 100 caregiving relatives participated in the inaugural programme that was held on 28 April at the Indian Officers' Association Auditorium, Chennai. Apart from lectures by eminent doctors, there was an open-house session attended by participants as well as the faculty, spawning many useful take-home messages. Besides that, volume 3 of Dr V S Natarajan's pocketbook series *Unnavu Muraiyai Matruvom* (let's change our food habits) was also released by eminent Siddha practitioner Dr G Sivaraman. Both the programmes were well-received by the audience; to reach out to more benefactors, we will be turning them into a monthly programme. We extend our gratitude to *Harmony-Celebrate Age* for consistently publishing news about our activities. It is kind gestures like these that motivate us to do more for the welfare of the elderly community.

**Dr V S Natarajan**  
Chennai

I'm an 18 year-old studying journalism and mass communication in Chennai. Last month, I was in Mumbai to do an internship at a publication house. As my *choti dadi* (paternal grandma's younger sister) and her husband live in Mumbai too, I stayed with them for a period of four weeks. Like most new-generation families,

mine is a nuclear family woven by the thread of an instant and busy schedule. Before leaving for Mumbai, my mother gave me a list of dos and don'ts while dealing with the silver couple. My presumptuous mind had imagined them to be lazy and inactive all day. Deep down, I imagined my stay to be dull and boring.

I was glad to have been proven completely wrong! My experience over the month was so different. I got to learn so much from the couple—despite being in their 70s, their zest for life simply amazed me. They would get up early, go for walks, play badminton and stay active throughout the day. They also played scrabble every day and insisted I get good magazines for them to read. Obviously, there was no better magazine than *Harmony-Celebrate Age* for that!

## CONTRIBUTORS



**Jagdish Krishnaswamy** is an ecohydrologist and landscape ecologist. He is a senior fellow at the Ashoka Trust for Research in Ecology and the Environment (ATREE), Bengaluru. He also holds a B Tech in civil engineering from the Indian Institute of Technology - Mumbai, an MS in statistics and decision sciences and a PhD in environmental science from Duke University, North Carolina,

USA. He has contributed to the establishment of instrumented catchments for long-term monitoring in the headwaters of the Western Ghats. Krishnaswamy has worked with civil society, state and central governments on conservation of the Western Ghats and is focused on understanding the ecological flow requirements in India's rivers and streams. He is currently a member of the Central Wetlands Regulatory Authority.



**Ranjit Lal** is the author of over 35 books—fiction and non-fiction—for children and adults who are children. His abiding interest in natural history, birds, animals and insects is reflected in many of his books: *The Crow Chronicles*; *The Life and Times of Altu Faltu*; *The Small Tigers of Shergarh*; *Bambi, Chops and Wag*; *Birds from My Window*; *The Birds of Delhi*; *Wild City*; etc. His book *Faces*

*in the Water* won the Crossword Book Award for Children's Writing 2010 and the Laadli National Media Award for Gender Sensitivity 2012. His book *Our Nana was a Nutcase* won the Crossword Award for Children's Writing 2016. As a journalist, he has had over 1,500 articles and photo-features published in the national and international press and currently has a column—'Down in Jungland'—in *The Indian Express*' 'Eye'. His other interests include photography, automobiles, reading and cooking. He lives in New Delhi.

I got them two copies and saw them engrossed in reading. Indeed, I sat and read them too. Ever since, I've been impressed with both my silver relatives as well as the magazine that writes about silvers living independent lives. I'm also happy that my preconceptions have been shattered; kudos to all the active silvers!

**Nush A**  
Cochin

### HITS OF THE MONTH

Our most-read stories in May 2017 on

 [www.harmonyindia.org](http://www.harmonyindia.org)

1. In search of self
2. Weight and watch
3. Serving the divine



inside

**P14:** Marathon moments

**P20:** Meet the vegan

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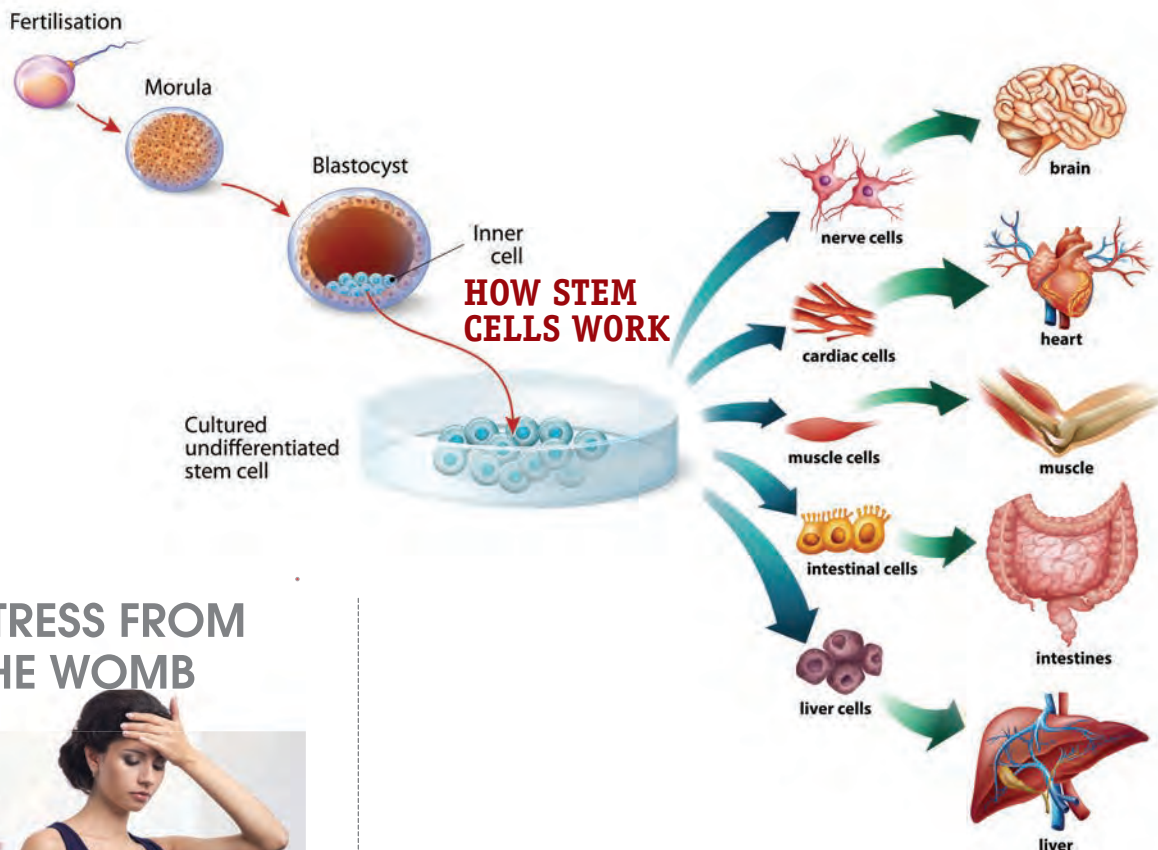
## MARATHON ALERT

Here's some irony for you. We know that participating in sporting fixtures is fantastic for the physical and mental well-being of silvers. Yet, according to a study by Harvard Medical School, **events like the marathon can actually be dangerous for elders in the cities in which they are held.** After analysing the marathons in Boston, Chicago, Honolulu, Houston, Los Angeles, Minneapolis, New York, Orlando, Philadelphia, Seattle and Washington DC, the team found that ambulances and private vehicles, across the board, took longer to get elders to hospital, leading to a greater risk of death. "That doesn't mean we shouldn't have marathons," Anupam Jena, part of the research team, tells website [wsj.com](http://wsj.com). "A marathon is a large public event, which brings joy to many people. Cancelling that would not be the right idea. Our study is to raise awareness of the unintended consequence of these events that we should aim to remedy." The study is published in the New England Journal of Medicine.



# FAT CHANCE!

A STUDY IN JOURNAL *STEM CELLS* CONTENDS THAT ADULT STEM CELLS COLLECTED DIRECTLY FROM HUMAN FAT (ASCS, OR ADIPOSE-DERIVED STEM CELLS) ARE MORE STABLE THAN OTHER CELLS—SUCH AS FIBROBLASTS FROM THE SKIN—AND CAN BE USED IN ANTI-AGEING TREATMENT. THIS IS TRUE EVEN FOR CELLS COLLECTED FROM OLDER PATIENTS.



## STRESS FROM THE WOMB

Photographs by 123RF.com



According to a new study by the University of Heidelberg in Germany, the stress experienced by mothers during pregnancy could influence the genetic makeup of their children, even leading to premature biological ageing and associated age-related diseases. The study is published in journal *Neuropsychopharmacology*.

## Blood's bounty

As always, science is stranger than fiction. Researchers from Stanford University in California have proven that **young blood can heal old minds**—in mice, for starters. When they injected elderly mice with blood plasma every four days for two weeks, they found that the mice injected with plasma from human umbilical cords showed the best improvement in memory



and learning tests followed by the mice that received blood from young adults. Meanwhile, the mice that received blood from silvers showed no improvement whatsoever. What's more, they isolated a protein in the umbilical cord plasma called TIMP2 that is related to cognitive skills and diminishes over time. This study opens the door to new ways to boost TIMP to delay cognitive ageing—and yes, finding palatable and sustainable ways to develop umbilical cord plasma as a therapeutic agent. Their study was published in journal *Nature*.





# PENSION PLUS

**G**ood tidings for pensioners! According to media reports, the Cabinet has taken certain decisions concerning modifications in the 7th Pay Commission recommendations that are likely to benefit over 5.5 million pre-2016 civil, defence and family pensioners. One key decision relates to disability pensions for members of the armed forces. The

Government has agreed to retain the percentage-based regime of disability pension implemented after the 6th Pay Commission rather than adopt the slab-based system recommended by the 7th Pay Commission report and widely criticised by the armed forces. Further, the military service pay and pay matrix have been extended from 24 years to 40 years. The benefits of all the proposed modifications will be effective from 1 January 2016.

## 67.2

### HOW OLD IS OLD?

Well, South Koreans believe the age a person can be considered old is 67.2, according to a survey conducted by private think-tank Hyundai Research Institute.



### BRAVO BHOPAL

There's a silver lining to the redevelopment of Bhopal railway station. Before handing the station over to a private contractor, the city's rail division has started the installation of elevators to make the station more accessible for silvers and the differently abled.



Photographs by 123RF.com

## THE FLIGHT CLUB

*Travel to your summer vacation in style. National carrier Air India has reduced the age for senior citizens' concession from 63 years to 60 years. Eligible Indian nationals who are permanent residents in the country will get a 50-per-cent discount in economy class on the*

*basic RBD (reservation booking designators) fare on all domestic sectors. You just need to present a valid photo identity card with the date of birth (Aadhaar, passport, driving licence, voter ID, etc) at the time of booking. The revised age limit has been implemented with immediate effect.*



# Yellow fever

**W**e have grown bigger, and how! A sea of yellow swept Sree Kanteerava stadium on 21 May at the 4.2-km Senior Citizens' Run supported by Harmony at TCS World 10K, Bengaluru.

Familiar faces turned up in record numbers, while first-timers tested the waters. The race, flagged off by veteran Kannada actor Narayana Swamy Srinath along with Miss Earth 2010 Nicole Faria, witnessed around 1,100 enthusiastic silvers make a sprightly statement. For many, such as 77 year-old Pandurang Kamath, it was an occasion to indulge in some fun, laughter and mirth as his large circle of friends looped through the track in a spirit of camaraderie.

Sixty year-old debutante Latha Jayaram was "blown away" by the experience and promised to be back with family and friends next year. "This is my sixth year," said president of

Karnataka laughter clubs P Sadashiv. "Over the years I have only seen the numbers go up. This year, particularly, has been incredible." It was a sentiment that resonated across the marquee. The fun continued after a round of refreshments when director of LIC Housing Finance T V Rao (**bottom left**) gave away prizes to the lucky dip winners.

The event was sponsored by BIG 92.7 FM, Jagadish Advertising, OOH division of HUL, Procam International, Reliance Communications, Amplifon India, Jain Farms, Enrich Salon, VLCC Wellness and Syndicate Bank. A special thanks to B P Rao and K Raghu, former presidents of the Institute of Chartered Accountants of India; C K Mathew, former chief secretary, Government of Rajasthan; and chartered accountant S Upendra, who supported the event; and to Shivalingappa Kubasad (**bottom right**) for maximising silver participation.





**GLIMPSES INTO THE PRE-EVENT CELEBRATIONS OF THE 10TH EDITION OF SENIOR CITIZENS' RUN SUPPORTED BY HARMONY AT TCS WORLD 10K, BENGALURU**



Mangal Chand Jain (right) of Jain Farms with Anantharam Varayur of Manasum Buildtech



C K Mathew, former chief secretary, Government of Rajasthan, with his wife



B P Rao, past president, ICAI (left); and S Upendra, practising chartered accountant







## The Aditya Birla Group: Transcending business

A US\$ 41 billion (₹ 2,50,000 crores) corporation, the Aditya Birla Group is in the League of Fortune 500. It is anchored by an extraordinary force of 120,000 employees, belonging to 42 nationalities, operates in 36 countries. Over 50 per cent of its revenues flow from its overseas operations. The Group has topped the Nielsen's Corporate Image Monitor 2014-15 and emerged as the Number 1 corporate, the 'Best in Class', for the third consecutive year.

### Beyond Business -

#### The Aditya Birla Group is:

- Working in 5,000 villages globally. Reaching out to 7.5 million people annually through the Aditya Birla Centre for Community Initiatives and Rural Development, spearheaded by Mrs. Rajashree Birla.
- Focusing on: Health Care, Education, the Girl Child, Sustainable Livelihood, Women Empowerment, Infrastructure and espousing social causes.

### Highlights- Health-Care

- Over a million patients treated at 5,000 medical camps and our 20 hospitals.
- The Aditya Birla Hospital at Veraval in Gujarat, also caters to the marginalised.
- More than 1,200 children have learnt to smile again as they underwent cleft lip surgery.
- More than 5,000 physically challenged persons were provided with artificial limbs making them self-reliant.
- We have helped immunise 90 million children against polio over the last 6 years.
- Alongside, we are engaged in a major project with Vision Foundation of India to provide sight to 6,600 blind people.
- We have installed 50 Reverse Osmosis Plants (RO) which provide drinking water to villagers near our units.

- In our endeavours towards open defecation-free villages, we have helped set up over 22,000 toilets, partly leveraging Government schemes for the social sector. In 50 villages, spanning over 2,000 households in Jammu & Kashmir, we have provided 2,010 toilets.

### Education

- At our 48 schools across India, we provide quality education to 45,000 children. On the anvil are 3 more schools. Merit Scholarships are given to 32,000 children from the interiors. Over 28,000 children in the hinterland of India are being taught conversational English to build their confidence.
- We support schools for the differently-abled in Gujarat, Karnataka, and Odisha.
- We are transforming 20 schools in Rajasthan into model schools.
- We foster the cause of the girl child by supporting 40 Kasturba Gandhi Balika Vidyalyayas (residential schools for girls).
- Over 3.5 lakh school children (Grade V to XII) in 31 remote blocks of Madhya Pradesh, Rajasthan, Maharashtra and Odisha have been provided with solar lamps.
- We have set up the mid day meal kitchen in the Keonjhar district of Odisha, facilitating the provision of mid day



# BRAIN FOOD

EATING A MEDITERRANEAN-STYLE DIET COULD BEAT THE EFFECT OF AGEING ON THE BRAIN AND, BETTER STILL, KEEP BRAIN PATHOLOGY AT BAY. A STUDY CARRIED OUT AT THE UNIVERSITY OF EDINBURGH, SCOTLAND, FOUND THAT **A MEDITERRANEAN DIET, COMPRISING LOTS OF FRESH FRUITS, SALADS, OLIVE OIL AND THE OCCASIONAL DRINK, SLOWED THE LOSS OF BRAIN VOLUME USUALLY ASSOCIATED WITH AGEING.** AND INDIVIDUALS WHO LOVE FRIED FOOD, RED MEAT AND CHEESE ARE MORE PRONE TO DEVELOPING ALZHEIMER'S AND SOME TYPES OF DEMENTIA. RESEARCHERS STUDIED THE MRIs OF 400 EDINBURGH RESIDENTS AGED 70 TO 76 OVER THREE YEARS, TO SEE HOW THEIR BRAINS CHANGED AS THEY MOVED FROM MIDDLE AGE TO EARLY OLD AGE. THE MRIs SHOWED THAT THOSE WHO CONSUMED A MEDITERRANEAN-STYLE DIET HAD HALF THE RATE OF BRAIN SHRINKAGE COMPARED TO THE OTHERS. THE STUDY WAS PUBLISHED IN JOURNAL *NEUROLOGY*.



Photographs by 123RF.com

## EGG-STRA HEALTH

Eggs have always been blacklisted as a rich source of cholesterol but here's a new way of looking at this much-maligned food source. A recent meta-analysis has found that **eggs are not associated with coronary artery disease.**

This is in keeping with the *2015-2020 Dietary Guidelines for Americans*, published by the US government, which say that while eggs are high in dietary cholesterol, they are low in saturated fat, a compound responsible for raising blood cholesterol levels. This observation supports a 2016 Finnish study conducted on 1,000 men that found eggs do not increase the risk of coronary artery disease. What really matters is how you prepare your eggs and the foods you combine them with. So have them poached, boiled or make an omelette and have with lean foods, fruits and vegetables. Why all the fuss over eggs? Apart from being lip-smacking good, they are a very rich source of vitamins and nutrients, such as high-quality protein.







Courtesy: Dr Nandita Shah

# Whole again

**S**ometimes, the simplest solutions are at our fingertips; we just need to see them. For **Dr Nandita Shah**, 58, the answers to healthy living are contained in a glass—provided it is brimming with a concoction of raw spinach, bananas and other fruits blended together.

But this is no detox concoction you can get in a trendy juice bar. It means raising a glass to a holistic lifestyle choice. “We take better care of our cars than we do of our body. We invest in good fuel to keep our car in great shape and run without trouble. But we neglect our body. Remember, the car is replaceable but not the body,” remarks Dr Shah, who was recently conferred the Nari Shakti Puraskar 2016 by the Government of India for her work in health and nutrition. Dr Shah, who founded SHARAN (Sanctuary for Health and Reconnection to Animals and Nature) in 2005, has been based in Auroville in Tamil Nadu for the past 18 years. Through her work, which involves conducting workshops, lectures and seminars in India and overseas, she has been helping people connect with animals, plants and nature in general, to heal themselves and the planet.

While still a student, Shah had got admission to a medical college but chose to pursue homeopathy; she joined CMP Homeopathic Medical College, Mumbai, in 1976. For the next 20 years, she practised homeopathy in Mumbai and taught advanced homeopathy all over the world, before moving to Auroville in 1999.

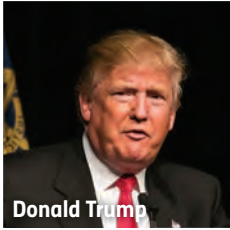
“As a doctor, it pains me to see more and more people getting lifestyle diseases at a young age,” she says. “Teenage girls are troubled with premature puberty, polycystic ovarian disease, hypothyroid and even diabetes. Young men are obese and sick all the time. Young married couples suffer from diabetes, hypertension and infertility. Breast cancer is no longer rare in women in their 30s and 40s.”

A holistic lifestyle means turning vegan and Dr Shah rues that large-scale industrial production units, especially poultry, are on the rise in India. “What humans do to animals to get what they want eventually comes back to humans. When you put an animal through pain and stress, its adrenaline comes back to us through their body fluids or flesh.” She says she gave up milk after learning that cows as young as two years old are artificially inseminated and calves are separated from their mothers so the mother’s milk can be sold to humans. “Have you ever heard the loud cries of a cow when their calves are separated from them? How can we do this to any mother on the planet?”

As baffling as it may sound, Dr Shah says a healthy lifestyle arises from a sense of compassion. She explains, “After turning vegan, I made the connection that we are all connected. I believe I can inspire many more to get on this journey and help people, animals and the environment. Could there be a better way to live?”

—Jayanthi Somasundaram





Donald Trump



P T Usha



Leila Seth

## BIRTHDAYS

Filmmaker **Mani Ratnam** turns 62 on 2 June.

Actor **Dimple Kapadia** turns 60 on 8 June.

US President **Donald Trump** turns 71 on 14 June.

Australian-American actor and producer **Nicole Kidman** turns 50 on 20 June.

Athlete **P T Usha** turns 53 on 27 June.

Boxer **Michael (Mike) Gerard Tyson** turns 51 on 30 June.

## IN PASSING

The world's oldest person **Emma Morano** passed away on 16 April in the northern Italian town of Verbania. She was 117.

Actor **Vinod Khanna** passed away on 27 April in Mumbai after a battle with cancer. He was 70.

First woman judge on the Delhi High Court **Leila Seth** passed away on 5 May. She was 86.

Actor **Reema Lagoo**, 59, died of cardiac arrest on 18 May.

James Bond actor **Roger Moore**, 89, died of cancer on 23 May.



Dinodia Photo Library

## OVERHEARD

“It would be nice if someone sent me a contemporary play with an old person in it that wasn’t just about old age. Also, I cannot understand why creative writers do not find women interesting, even contemporary ones. Men are still almost invariably the dramatic engine, women on the sidelines. But being in one’s 80s can have its advantages. I once said blithely that when I finished being an MP I was going to form an old people’s robbery group. Everybody ignores old people so we could shoplift and burgle till the cows come home! It still comes as a shock to me when somebody stands up and offers me their seat on the bus or the Tube.”

—Oscar-winning actor and former politician **Glenda Jackson**, 80, to Radio Times

## MILESTONES

- Actor **Hema Malini** received the Kala Shri Award for Excellence for her contribution to cinema at the Dadasaheb Phalke Film Foundation Awards held in April in Mumbai.
- Veteran Telugu filmmaker **K Viswanath** was honoured with the Dadasaheb Phalke Award for his contribution to Indian cinema at the 64th National Film Awards held in April in New Delhi.
- Antimining crusader **Prafulla Samantara** of Odisha won the Goldman Environmental Prize for 2017 in April. The ‘Green Nobel’ prize, instituted in 1989, is given to activists for their contribution in protecting the environment and communities. The prize money is estimated to be ₹ 1.25 crore.
- Freelance journalist, film scholar and author **Shoma Chatterji** was bestowed the Lifetime Achievement Award at the Indywood Media Excellence Awards held on 5 May at Kolkata Press Club.

**NULIFE** is an aspirational way of life for senior citizens and is poised to change the senior living sector in India

# SENIOR LIVING THE TIME HAS ARRIVED IN INDIA

**NuLife, India's world-class resort residences for seniors at Kamshet – Lonavla, designed by world-renowned architect, Perkins Eastman, USA**



Elevation view

The senior living sector in India is poised for a significant growth in coming years. Today, senior living communities have become the need of the hour and India warmly welcomes the concept of senior living communities.

After extensive research, Gagan Properties conceived NuLife, India's first world-class resort residences for seniors. Spread over 14 acre, NuLife is a senior living retreat of international standard at Kamshet near Lonavla, with a tag line, 'GROW YOUNG'. At NuLife, seniors can age gracefully in unity with nature, blessed with soothing weather and a pollution-free environment.

**For more information on Gagan NuLife,  
call 9325063333 or visit [www.gagnulife.com](http://www.gagnulife.com)**

The first phase of NuLife project is getting ready for fit-out with 1 & 2-BHK apartments starting at Rs 43 lakh

Aerial view

## Active life

At NuLife, every day is a new day. Residents choose their own activity, making for a perfect day.

## Socialisation

NuLife ensures a bustling, relaxing and refreshing life with recreational activities. The community building is a common place where seniors from all walks of life live, share and connect.

## Recreation

NuLife residents define their own dynamic lifestyle, nurture hobbies, pamper themselves or just chill.

## Healthcare

NuLife, in association with Oyster and Pearl, has a hospital with ICU inside the complex with dedicated doctors, nurses & pharmacy. This ensures that the best professionals look after your medical needs.

## Design and details

Larger doorways, no-step entries and wider corridors, panic alarm system in rooms, reduced glare lighting, slopes for parking and sidewalks, anti-skid flooring are amongst the many details of design that have been thoughtfully incorporated.





YOGA RX BY SHAMEEM AKTHAR

# Take a chair

Overcome your inhibitions in a difficult pose or intensify your practice with this prop



## YOGIC MOVES

**Modified upward plank pose (purvottanasana) with chair**

Sit on the edge of the chair with your palms flat on the sides or front, depending on the chair seat space. Press into the palms. Focusing on the arms, lift hips high off the chair. Your feet should remain on the ground throughout. Hold for five



seconds. Then, gently lower your hips back to the chair seat. Repeat five to 10 times. After a regular practice of this for few weeks, intensify the pose by lifting the hips high,

then moving them off the chair seat forwards, holding them up for five seconds. Then, release back to the base. Do this a few times. Your breathing should be normal throughout. **Benefits:** This pose helps build arm muscle tone, upper back strength, and mental and physical stamina, and boosts breathing.

The chair as a yoga prop has been popularised by the Iyengar school of yoga. The more commonly used ones, somewhat modified, are steel, foldable ones. However, you can use any firm chair for most of the yoga asanas that use this type of prop. However, for specific poses that have been modified for this prop—such as the headstand (*sirsasana*), wheel (*chakrasana*), and inverted rod pose (*viparitadandasana*)—it is best to use a specifically designed chair. As with any prop, you must ideally have an expert to guide you. While using the chair, ensure the legs are firm. While using it for many poses, you may need to back it against a wall for further firmness, especially if the floor is slippery.

Some of the poses that complement the use of a chair are the plank poses, in their variations, such as the plank (*setuasana*) or the upward plank (*purvottanasana*). The advantage of using the prop is that it helps you lose your inhibitions over a tough pose without compromising on the muscular demand or intensity. In advanced versions, using the chair can make the pose even more intense. Other poses for which you may use the chair as a prop include the boat pose (*naukasana*), in which you can prop your feet on the edge of chair for balance; and the bridge lock pose (*setubandasana*), where you can raise your hips really high by resting the feet on the chair seat. Other groups of poses are forward bends and standing balances.

## KREEDA YOGA

**Chitrapurtih (complete the figure)**

Draw a figure partially on a board in front of you. Let the members playing the game look at the half-drawn picture clearly. Now, one by one, ask each person to draw the rest of the figure, but with eyes blindfolded. The one whose image is closest to a completed figure wins the game. For this, the person attempting the drawing must have an awareness of the space on the board and the spatial awareness of how the figure will fit into the board. The game challenges spatial awareness and the ability to be relaxed under stress.

Shameem Akthar is a Mumbai-based yoga acharya. If you have any queries for her, mail us or email at [contact.mag@harmonyindia.org](mailto:contact.mag@harmonyindia.org). (Please consult your physician before following the advice given here)



## HEART TO HEARTH BY PRATIBHA JAIN

A series about silvers who believe nurturing the body and mind is the key to joy

# Efficient, exemplary, extraordinary!

Ajeeta Mehta • CHENNAI



Photographs by D Kalaitrasan

What struck me when I stood in her kitchen was her sheer efficiency—it was neat and tidy, with well-planned cupboards stocking a wide range of ingredients. She deftly placed the jars of ingredients required for the recipe on a tray and proceeded to show me how to make a postnatal broth for my daughter, who had just delivered her firstborn. As she fried the edible resin granules and added the other spices, she kept giving me valuable tips. For instance, “Don’t forget to give her tender coconut every morning. Include carom seeds and *pipramool* [long pepper root] in her diet. And remember to order the *shatavari* powder [a wild asparagus believed to promote lactation and aid female reproductive health] for her.” When the broth was ready, she poured it into a thermos and placed it neatly in a cane basket for me to take to the hospital. Thoughtfully, she added a small jar of home-made *mukhvaas* (mouth freshener made with carom seeds, flaxseeds, dry coconut and sesame) to the basket, saying, “Tell her to chew this between meals.”

Does it sound as if we are old friends? And yet, I had met 57 year-old Ajeeta Mehta, a Gujarati Jain from Chennai, hardly a week ago. Our mutual friend Ashish Singhi insisted I meet her when my husband told him our daughter was expecting a baby. “She is just a street away and you will never find a more friendly and helpful person,” he said. And he was absolutely right. In the next few days, my daughter and I took many important decisions based on Ajeetaji’s advice,





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including the food routine during postnatal care. She also introduced us to the massage lady she had employed for her grandson, fixed the salary, and even appointed her on our behalf.

Some people are like that—angels in disguise! Over the next two months, I discovered that not only was she a walking encyclopaedia on pregnancy and postnatal care but traditional Gujarati cuisine and recipes with leftovers as well. Here are some snippets of my conversation with her.

### IN HER OWN WORDS

I grew up in Mumbai amid my brothers and cousins; all in all, 18 boys. I was more of a tomboy, scared of nothing. I did not do much housework and never learnt sewing or cooking. But I could do anything the boys could. Even when I got married, my mother-in-law did not expect me to cook all by myself. So, unlike most other girls, I did not

"I think real cooking cannot be learnt theoretically. One has to cook depending on ingredients, time and availability"

learn cooking from my mother or my mother-in-law. I started cooking on my own only when my husband and I shifted into our own house three years after my marriage. I coped very well. Such is life—our needs become our inspiration.

### MY KITCHEN DISASTER

The first time my mother-in-law asked me to make *kadhi*, she gave me quite a large quantity of homemade buttermilk. I did not know how to prepare it. So instead of telling her, I started drinking the buttermilk [laughs]! But I did not feel nervous.

I think when you grow up surrounded by brothers, it really makes you confident.

### ATTITUDE TO COOKING

Knowledge is all around us. We have to be open to receiving it and applying the right thing at the right place. I have gained knowledge about pregnancy and postnatal foods through the people around me, books, and from my own experiences. Also, I like to know the health aspects of whatever I am cooking. I believe the more you know about these things, the more confident you become. For instance, in summer, one must soak mangoes as well as lychees in water for half an hour before consuming them. This reduces their heating quality so we can consume them easily.

### KITCHEN TIPS

Nothing ever goes waste in my house. I try and use everything, including the peel and seeds of fruits and veg-



## MUSMUSIYA

(Steamed nuggets with multigrain flour)

A traditional Gujarati recipe with cooked rice and multigrain flour, *musmusiya* is a much-loved dish in the Mehta household. It is ideal for the dry days of Ashtami and Chaturdashi when no fresh vegetables or greens are consumed. This multigrain flour can be stored and kept for months. It is highly nutritious and easily digestible. Ajeetaji uses it in many ways—for making parathas, white sauce and soups.

### Ingredients

- Cooked rice (even leftover rice): 2 cups
- Multigrain flour\*: 1 cup
- Kasoori methi: 2 tbsp
- Chilli powder: 1 tsp
- Coriander powder: 1 tbsp
- Turmeric powder: 1 pinch
- Asafoetida powder: 1 pinch
- Oil: 3 tbsp
- Salt to taste

### Method

Mix all the ingredients gently without mashing the cooked rice. Set this mixture aside for an hour. (You can set aside for just half an hour or even 2-3 hours depending on your convenience). Roll the mixture into 3-inch rolls. Steam the rolls for 10 minutes by placing them in a perforated plate. Allow to cool. You can serve these rolls in a variety of ways. Simply sprinkle oil over the rolls and enjoy them. You can serve them with a sweet or spicy mango pickle. Traditionally, these rolls were served with a spicy mixture of salt, red chilli powder, coriander powder and asafoetida powder. To keep it healthy, simply serve them with plain yoghurt. And finally, as postnatal foods are a favourite topic between us right now, Ajeetaji recommends that these rolls are ideal for lactating mothers—to be served with ghee and sugar!

\*To make the multigrain flour, grind 2 cups moong dal (with skin), 1 cup *bajra*, 1 cup rice, ¼ cup wheat and ¼ cup chana dal into a coarse powder (like *chiroti rava*). Ajeetaji prefers to grind this in the mill. If you are grinding at home, make sure the grains are sundried well.

etables. For instance, do not discard the peels of carrots. Simply wash and boil them, and use as stock for soups. Use the peels of ridge gourd and cucumbers as well as bitter gourds to make chutneys. While rinsing vegetables, remove them from the top rather than draining the water. This ensures that the grit stays at the bottom.

### A FAVOURITE RECIPE

Being summer, it is *aamras* [mango juice]. That too, only with *pairi* mangoes. For 5-6 *pairi* mangoes, I add one alphonso. Soak the mangoes in water and then make the juice. Just add sugar and a dash of dried ginger powder to balance their dosha. There cannot be a better *aamras* recipe than this.

### USING LEFTOVERS

The idea of using leftover dishes is to be creative. I think real cooking cannot be learnt theoretically. One has to cook depending on

ingredients, time and availability. So I make patties, parathas or *muthia* with leftovers depending on all these factors. But I can assure you of one thing—preparations with leftovers are as tasty as original preparations. However, we rarely have leftovers as I prefer cooking just enough for one meal.

### HARMONY AT HOME

I always say I am on a 36-hour job [laughs]! Managing a house is not a joke. But if there is harmony at home, it becomes a wonderful experience. My husband Shailesh and son Ankit pitch in with the housework. My daughter-in-law Niketa shares a wonderful rapport with me. To me, these things are a blessing. And I am happy to give my 100 per cent to whatever I undertake. In 2005, I began catering from home. My clients gave me a very warm response over the years and that was my constant encouragement. I can say that I think with my heart and work with my brain. That combination works.

### WHAT I TRULY CHERISH

The quality of relationships in life is more important than anything else—whether it is wealth or comforts. I lost my father when I was quite young but my brothers and cousins made up for the loss. Later when I got married, I found my in-laws to be truly rich emotionally. My father-in-law could never bear to see me sad even for a minute. My mother-in-law really took good care of me. I think it is because of her that I learnt to be a happy mother-in-law myself. And now, my grandson Hridaan makes my life magical with his innocent presence.

*Pratibha Jain, an author and translator from Chennai, is the co-author of two award-winning books Cooking at Home with Pedatha and Sukham Ayu. Her area of specialisation is documenting Indian traditions through research, translation and writing*



# **‘RISK’**

**DEFINED AS EXPOSURE TO DANGER, HAS MANY VARIABLE, INDIVIDUAL DIMENSIONS. THERE IS ALSO THE REALITY OF COLLECTIVE RISK — UNAMBIGUOUS, UNSPARING AND UBIQUITOUS, CUTTING ACROSS LINES OF ECONOMY, DEMOGRAPHY AND GEOGRAPHY. EVERY YEAR, THE WORLD ECONOMIC FORUM PUBLISHES ITS GLOBAL RISKS REPORT, WHICH ASSESSES THE RISKS TO OUR LIFE AND LIVELIHOOD AS A SINGLE GLOBAL ENTITY. AND THIS YEAR’S REPORT MAKES IT CLEAR THAT INTENSIFYING ENVIRONMENTAL DANGERS TRUMP BOTH POLITICAL AND ECONOMIC CONCERNS AS FAR AS THE WORLD IS CONCERNED.**

# **ECO WWA**





# ARRIORS

Indeed, from water and food crises to climate change, depleting forests and extinction of species to the impact of population explosion and the consequences of migration and frenetic urbanisation, the world is going through an environmental churn that has the potential to become a catastrophe.

However, while some are content to scream 'doomsday' from the comfort of the armchair, others have made it their mission to act. To mark our 13th anniversary and ring in World Environment Day on 5 June, we turn the spotlight on silver change-agents who have made the planet their muse and sustainability their mantra. They are testament to the power not just of an idea but the resolve and stick-to-itiveness to see it through—they are the harbingers of hope for the country, for the planet.



:: cover feature :: **AGRICULTURE**

Architect of the Green Revolution in India M S Swaminathan is not just an advocate of sustainable development but an eco-warrior with his heart in the right place, writes **Srirekha Pillai**

# renaissance man



It's the path we take that decides where we end up. When Monkombu Sambasivan Swaminathan, better known as M S Swaminathan, decided to chuck medical studies to pursue agriculture, it was to have a far-reaching impact not just on his life but that of an entire nation. India's agricultural landscape owes its revival in no small measure to this scientist's ingenuity and insight.

Born as the second son of surgeon M K Sambasivan and Parvati Thangammal Sambasivan of Kumbakonam, Tamil Nadu, in 1925, Swaminathan was seamlessly drawn into the warp and weft of Gandhian ideology that permeated a country struggling to break free of foreign shackles. He grew up seeing his father taking the lead in opening the temples in Kumbakonam to Dalits and burning foreign clothes. However, the turning point was the Bengal famine of 1943, in which over 3 million people died. The scale of the tragedy moved Swaminathan so much that he decided to pursue agricultural research and address the food security concerns of India. Recalling that moment, he tells *Harmony Celebrate Age*, "We were young and idealistic and wanted to serve the nation."

With the lofty intention of wanting to rid the world of hunger and poverty, he joined the Indian Agricultural Research Institute in New Delhi, and later the Plant Breeding Institute at the University of Cambridge. On his return to India, Swaminathan heralded the Green Revolution by introducing Mexican semi-dwarf wheat plants and high-yield varieties of rice, besides popularising modern farming methods. His pioneering efforts transformed India from a food-deficit nation into one of the leading producers and exporters of food grains in the world. Over the years, Swaminathan has worked in collaboration with scientists and policymakers to leave an indelible mark on food security concerns in India and elsewhere in the developing world. Little wonder then, that he was recognised by TIME magazine in 1999 on the 'TIME 20' list of Most Influential Asian People of the 20th Century. The only other Indians to figure on the list were Mahatma Gandhi and Rabindranath Tagore.

Another measure of the life-changing impact of his work is the statement of then UN secretary general Javier Perez de Cuellar, who said while pre-

senting the First World Food Prize to Swaminathan in 1987, "He will go into the annals of history as a world scientist of rare distinction." His work was further acknowledged when the UN Environment Programme termed him the "Father of Economic Ecology". Recently, Swaminathan was also honoured with the Canadian Governor General's Medallion in recognition of his contribution to "improved agricultural practices and rural development in India and abroad".

Not one to rest on his laurels, the 91 year-old still pursues his life's mission by guiding young agricultural scientists and hobnobbing with policymakers. Recently, when Delhi choked with smog created by the burning of paddy straw in neighbouring states, he recommended to Prime Minister Narendra Modi that we commercialise straw by turning it into animal feed, cardboard, paper and other products. On a trip to Delhi, he also prevailed upon visiting

## SWAMINATHAN'S EFFORTS TRANSFORMED INDIA FROM A FOOD-DEFICIT NATION INTO ONE OF THE LEADING PRODUCERS AND EXPORTERS OF FOOD GRAINS IN THE WORLD

Malaysian Prime Minister Najib Razak the need to reserve some land for traditional farming. "Malaysia has been investing in plantation crops such as rubber, cocoa and palm as they generate a high income for farmers," he says. "But they need to cater to their food needs as well."

Swaminathan is married to renowned educationist Mina, whom he met in Cambridge in 1951. The couple has three daughters—Soumya, director-general of the Indian Council of Medical Research, Delhi; Madhura, professor of economics at the Indian Statistical Institute, Bengaluru and the "first woman Rhodes scholar in Oxford from India"; and Nitya, senior lecturer in gender analysis and development at the University of East Anglia, Norwich—and five grandchildren. We met the architect of the Green Revolution, who is also the founder-chairman of the M S Swaminathan Research Foundation, at his office in Chennai, where he was busy juggling professional commitments and interview requests before rushing home to his indisposed wife.

## EXCERPTS FROM AN INTERVIEW

Photographs courtesy M S Swaminathan



**India is moving from an agrarian society to urbanisation. What are the immediate and long-term dangers of this?**

Urbanisation is part of evolution. The US was completely agrarian at the time of the arrival of the Pilgrim Fathers but is 98 per cent urban now. There's nothing wrong with urbanisation per se. However, urban planning is important. While planning cities, factors such as food and drinking water sources, provision of jobs and climate security need to be addressed. Food is the first among the hierarchical needs of a human being. With a massive population such as ours—130 billion at last count—we have to do some serious thinking. Our former president A P J Abdul Kalam advocated Provision of Urban Amenities to Rural Areas (PURA). If we have facilities such as schools, colleges, hostels, hospitals and jobs in rural areas, we can check unplanned migration from villages. Urbanisation and globalisation should not be at the expense of food and nutritional security.

**Climate change is a reality today with India frequently experiencing bad monsoons and drought. How do we tackle this?**

Climate change is a global phenomenon. As a result of global warming,

temperatures are increasing, sea levels are rising and coral reefs are getting destroyed. One of my granddaughters, who studies coral reefs, is saddened by the damage done to them. Every country needs to be involved in mitigation and adaptation. While mitigation helps in reducing greenhouse emissions, adaptation requires adopting a lifestyle that does not exercise a huge demand on land, agriculture, water and so on. We have a great responsibility to ensure that we do not damage the ecosystem any further.

**Would you say that we are selfish when it comes to preserving our ecosystem?**

It's sad that we quite often don't take a broader view. For instance, US President Donald Trump has been pursuing policies that damage the ecology, saying that Americans won't be affected by climate change. He is forgetting that Americans coexist with billions of others. When we talk of environment, we should talk of the common good, which will eventually contribute to individual good.

Incidentally, our ecosystems were defined in Sangam literature—ancient Tamil literature spanning 300 BCE to 300 CE—about 2,000 years ago. There is mention of hill zone, coastal zone, arid zone, semi-arid zone and wet

## CAREER GRAPH

- Director, Indian Agricultural Research Institute (1961-72)
- Director General, Indian Council of Agricultural Research (1972-79)
- Principal Secretary, Ministry of Agriculture and Irrigation, Govt of India (1979-80)
- Member, Planning Commission and Chairman, Scientific Advisory Committee to Cabinet, Govt of India (1980-82)
- Independent Chairman, Food and Agriculture Organization (FAO) Council (1981-85)
- Director General, International Rice Research Institute, the Philippines (1982-88)
- President, International Union for the Conservation of Nature and Natural Resources (1984-90)
- President, World Wide Fund for Nature, India (1989-96)
- President, National Academy of Agricultural Sciences (1991-96; 2005-07)
- Chairman, National Commission on Farmers of India (2004-06)
- President, Pugwash Conference on Science and World Affairs (2002-07)
- Member, Rajya Sabha (2007-13)
- Chairman, M S Swaminathan Research Foundation (MSSRF) (1988 onwards)
- UNESCO Cousteau Chair in Ecotechnology (1994 onwards)



## AWARDS APLENTY

- Shanti Swarup Bhatnagar Prize (1961)
- Padma Shri (1967)
- Ramon Magsaysay Award (1971)
- Padma Bhushan (1972)
- Albert Einstein World Award of Science (1986)
- Padma Vibhushan (1989)
- World Food Prize (1987)
- Tyler Prize for Environmental Achievement (1991)
- UNESCO Gandhi Gold Medal, France (1999)
- Volvo Environment Prize (1999)
- Indira Gandhi Prize for Peace, Disarmament and Development (1999)
- Franklin D Roosevelt Four Freedom Medal, Netherlands (2000)
- Mahatma Gandhi Prize, UNESCO (2000)
- Lal Bahadur Shastri National Award (2007)
- Shining World Leadership Award, Singapore (2007)
- Indira Gandhi Award for National Integration (2013)
- Canadian Governor General's Medallion (2017)



Receiving the World Food Prize

**“WITH OVER 150,000 VARIETIES, RICE IS THE CROP OF THE FUTURE. IN AN ERA OF CLIMATE CHANGE, RICE IS A CLIMATE SAVIOUR CROP; IT’S MORE FLEXIBLE IN TERMS OF ALTITUDES, LATITUDES AND TEMPERATURE”**

zone. Our ancestors had the wisdom to differentiate ecosystems and chalk out management strategies for each of them.

**You've said rice is going to be the crop of the future. What makes it so?**

With over 150,000 varieties, rice is definitely the crop of the future. What makes it the climate saviour crop in an era of climate change is that it's more flexible in terms of altitudes, latitudes and temperature. You can grow rice below sea level and even on high altitudes like the Himalaya. Rice grows well in Srinagar as well as in Kuttanad [Kerala]. We have such a huge variety of gene pool in rice. None of the other crops can do that as they are sensitive to temperature and other factors.

**Should we be investing in less water-intensive crops?**

Given the scarcity of water resources, that's the most practical way forward. I have been advocating more-crop-a-drop methodology. We should use drip and sprinkle irrigation to cut down on water shortage. It's unfortunate that we only think about supply augmentation, without giving any thought to resource management, an important part of sustainable development.

**Being an agricultural scientist, are you conscious about what features on your platter?**

I'm very conscious about what I eat, both for taste and nutritive values. Traditional methods of agriculture,

including the use of cow dung and urine to increase the fertility of the soil, are a great way to ensure healthy food. We have to remember that the output is equivalent to the input. What goes into the soil determines what comes out. The Gloria Land farm at the Sri Aurobindo Ashram in Pondicherry is one of the best organic farms in India.

**Your father M K Sambasivan seems to have been a great influence on you.**

My father was a true Gandhian. I imbibed a lot from him, particularly the concept of *Swadeshi* or self-sufficiency. He told me that nothing was impossible. He would say that the word 'impossible' existed only in our minds, and with discipline and hard work we could achieve anything. He



## **“I WILL BE TURNING 92 SOON. BEING A SCIENTIST, I CAN’T EXPECT BODY CELLS TO WORK THE WAY THEY DID WHEN I WAS YOUNGER. OLD AGE TAKES A DIFFERENT FORM IN DIFFERENT PEOPLE”**

eradicated filariasis [roundworm infection] in Kumbakonam by mobilising people to remove breeding grounds of mosquitoes. He led the opening of temples to Dalits in Kumbakonam. The fight against hunger became my mission and obsession, thanks largely to his influence.

**You took admission to a medical school but dropped out, opting for agriculture instead.**

My father died when I was only 11 years old. My mother was keen that I take over his hospital in Kumbakonam. I was in a dilemma; I wanted to contribute to independent India in the best way possible. I had two options: become a doctor and run my father’s hospital or revo-

lutionise agriculture in the country. I chose the latter.

**How did Gandhian principles influence you as a youngster?**

I was influenced by my parents’ value system. Most often, we get influenced more by non-verbal communication than verbal communication. As I mentioned, my father’s Gandhian principles influenced me in a major way. Similarly, I grew up watching my mother, a very simple lady, spinning her saris from home-grown cotton. That image has stayed with me.

**Tell us about your wife.**

Mina is an educationist. Her areas of interest are education, gender and

early childhood care. She did a master’s in economics from Cambridge Newnham College, a college for women. When she returned to India, she joined as an advisor to the Planning Commission. Later, as a teacher at St Thomas’ School in Delhi, she developed educational methodologies using drama as a means of communication. She’s the author of Integrated Child Development Services (ICDS), an *anganwadi* programme for providing food, preschool education and primary healthcare to kids.

**Where did you meet her?**

I met her in Cambridge in 1951. I wouldn’t say we knew each other. Later, while working in Delhi, we met a few times and realised we shared





During a field visit;  
(left) at a family  
get-together

## THE AGRICULTURE FACTSHEET

- Vedic literature provides some of the earliest written record of agriculture in India. *Rigveda* hymns describe ploughing, fallowing, irrigation, fruit and vegetable cultivation
- Ploughing patterns from the Bronze Age have been excavated at Kalibangan in Rajasthan
- Rice was a domesticated crop along the banks of the Ganges in the sixth millennium BC
- Today, India ranks second worldwide in agricultural output
- Double monsoon leads to two harvests in a year
- The main food grain of India is rice. It ranks second worldwide in rice production
- India ranks fourth in wheat production in the world
- India is the largest producer of sugarcane in the world and the second largest producer of tea
- India is also the largest producer and consumer of dairy in the world. Milk production totals 140 billion litre a year

## ONE FOR THE BOOKS

- *Science and Integrated Rural Development* (1982)
- *Agricultural Growth and Human Welfare* (1992)
- *Sustainable Agriculture: Towards Food Security* (1996)
- *I Predict a Century of Hope Towards an Era of Harmony with Nature and Freedom from Hunger* (1999)
- *Groves of Beauty and Plenty* (2003)
- *Towards a Hunger-Free World* (2006)
- *Environment and Agriculture* (2006)
- *Revolutions: To Green the Environment, to Grow the Human Heart* (2007)
- *Science and Sustainable Food Security* (2009)
- *From Green to Evergreen Revolution: Indian Agriculture* (2010)
- *In Search of Biohappiness: Biodiversity and Food, Health and Livelihood Security* (2011)
- *Remember Your Humanity: Pathway to Sustainable Food Security* (2012)
- *Evergreen Revolution in Agriculture: Pathway to a Green Economy* (2012)
- *Halving Hunger: It Can Be Done* (2013)
- *Combating Hunger and Achieving Food Security* (2016)



With former prime ministers Indira Gandhi and (right) Lal Bahadur Shastri



certain values. That brought us together.

### What are your cultural and leisure pursuits?

I enjoy Carnatic music, Bharatanatyam and reading. My wife is a very good pianist and enjoys Western classical music. Earlier, I used to play tennis and hockey. I was also an avid swimmer. Now, swimming is reserved for those few occasions when my grandchildren

come calling and force me to accompany them.

### What are your thoughts on ageing?

I will be turning 92 soon. Being a scientist, I can't expect body cells to work the way they did when I was younger. Old age takes a different form in different people. Thankfully, my brain is functioning well. However, I've developed weak cartilages, and over the years have struck up a close friendship with my walking stick.



# Himalayan

:: cover feature :: **FORESTS**

**Raj Kanwar** meets veteran environmentalist and social activist **Chandi Prasad Bhatt**, a leading force behind the Chipko Andolan, a movement that brought about ecological awakening among the people of the mountains

It is remarkable for someone born into a family of priests in Gopeshwar—a small village in the backwaters of the Garhwal Himalaya with barely 600 residents—with hardly any education to have become an internationally acclaimed environmentalist and social activist. Chandi Prasad Bhatt's fame does not rest on any research or academic achievement. Rather, his contribution essentially lies in bringing about awareness and awakening among the people of the hills about the imperative of preserving their environment and ecology.

Renowned for playing a vital role in Chipko Andolan, a forest conservation movement that began in the 1970s, he was instrumental in empowering the *aam aadmi* and *aam aurat* in asserting their traditional rights. As Dr B K Joshi, founder-director of the Doon Library & Research Centre and former vice-chancellor of Kumaon University told me, "For Bhatt, environment is not just an abstract concept to be talked and bandied about in seminar halls and drawing rooms but a living reality, inextricably bound with the daily life and struggles of the ordinary hill folk in the rural areas of Uttarakhand and other Himalayan states. He is truly a man dedicated to the Himalaya and preservation of its ecology and environment."



# HERO

It truly was an honour—and a tad daunting—to meet such a man! As I saw Bhatt enter the lobby of Dehra Dun's Hotel Madhuban for our luncheon appointment, I stood up to greet him. He doesn't look 83; attired in loose khadi kurta-pyjama and greyish brown Nehru jacket, the tall, handsome Bhatt, sporting black hair and a grey beard, walked with an easy gait. No handshakes—he greeted me with folded hands and a traditional *namaste*; the 90-minute interview that followed was more like an informal chat. At my bidding, he began to narrate the story of his life.

Bhatt's journey began humbly in Gopeshwar; he was just about two years old and his sister a year older when their father died, leaving the two young children and their mother to fend for themselves. Barring some income from a cow, farming, rent from an ancestral cottage and help from an elderly kin, there was no other source of livelihood. "I did my schooling in the nearby Rudraprayag and Gopeshwar towns. However, I opted not to pursue my college education in far-away Dehradun as our income was not large enough to support it. Instead, I taught Hindi and geometry for a year at a high school in Gopeshwar to contribute my mite to the family kitty. Those were the difficult days," he recalls. He got married in 1955 and that further increased his responsibility. "To meet our living expenses, I took up a job as a booking clerk with the Garhwal Motor Owners' Union [GMOU] that operated a network of bus services in the region." The job brought him in touch with hundreds of tourists from various parts of the country. And it opened his eyes—he realised there was more to life than merely earning a livelihood. It was a true discovery for him.

The year 1956 was a turning point in Bhatt's life when Praja Socialist and Sarvodaya—the Gandhian ideal of 'progress for all'—leader Jayaprakash Narayan with wife Prabhavati visited the area on their way to Badrinath. "I instantly fell under his charismatic spell," he remembers. "I also happened to meet a young Sarvodaya leader, Man Singh Rawat, whose views and sincerity tugged at my heartstrings. I took leave of absence



Addressing participants  
of the Chipko Movement

## THE FOREST FACTSHEET

### THE INDIAN HIMALAYA

- The youngest mountain chain on the planet, believed to be still evolving
- Major supplier of timber, fibre, oil, spices, organic manure, hydropower, etc
- A storehouse of glaciers, providing perennial river systems for settlements, agriculture and industries

Source: *Forest Cover in Indian Himalayan States – An Overview*; Satya Prakash Negi; Forest Survey of India

### INDIA

- Along with Brazil and the US, India is one of the 10 most forest-rich countries, mainly because of the Himalaya
- The Western Ghats and Eastern Himalaya are among the 32 biodiversity hotspots on earth
- According to the *India State of Forest Report 2015*, forests cover 21.34 per cent of India's total geographical area
- According to satellite data analysis and the Food and Agriculture Organisation, India is the third fastest nation in the world in increasing forest cover, adding over 4 million hectare between 1990 and 2010, a 7 per cent increase

**THROUGH THE FOREST CONSERVATION MOVEMENT THAT BEGAN IN THE 1970S, BHATT WAS INSTRUMENTAL IN EMPOWERING THE AAM AADMI AND AAM AURAT IN ASSERTING THEIR TRADITIONAL RIGHTS**

from GMOU and joined Rawat on his tour of several villages."

At the end of that tour, Bhatt became a diehard Sarvodaya adherent and Rawat, his mentor. "By then I had become obsessed with Vinoba Bhave and his Sarvodaya movement. Bhave was to tour Jammu and



**Villagers on a protest march in the 1970s**

**(Right) Agitationists Kedar Singh Rawat and Anusuya Prasad Bhatt are seen embracing a tree to save it from being felled in Sila forest in Kedarnath Valley in 1973**



Anupam Mishra

Kashmir for a fortnight in 1959 and I joined his entourage. It was the experience of a lifetime and I felt spiritually rejuvenated. Then, in response to a fervent appeal by Jayaprakash Narayan for active volunteers in 1960, I made my '*Jeevan Daan*' to the Sarvodaya movement." It was a life-changing decision as '*Jeevan Daan*' turned one into a full-time, lifelong dedicated volunteer to work for the welfare of fellow human beings. However, both his mother and wife were fully supportive of his decision. "Whatever little income then came from our sundry sources was enough for our sustenance," he says. "After that, my life no longer remained my own. I also needed to cut my umbilical cord with the past, so I put in my papers with GMOU, and plunged headlong into what was to become my mission for the rest of my life."

Eager to put into practice the Sarvodaya ideology, Bhatt needed a new entity and platform to carry forward his mission. In 1964, together with a group of dedicated friends, he founded the Dasholi Gram Swarajya Mandal (DGSM), a society for village self-rule. At the time, villages in Garhwal were devoid of meaningful economic activity and lacked employment opportunities, impelling most young people to migrate to the plains. Old parents were dependent on money orders from their sons every month; in fact, newspaper columns had dubbed it the "money order economy". The women tilled the field, shepherded cattle, gathered wood for fuel, fetched water from long distances and, last but not least, looked after the children. It was, to say the least, a tough life. Bhatt's DGSM and its message of self-reliance gave them a ray of hope and they supported it enthusiastically. Little wonder then, that they stood at the vanguard of subsequent movements.

Among other activities, the DGSM organised camps to impart training in village industries, agriculture, horticulture, animal husbandry and

harvesting of forest produce. It also held camps in villages in the Alaknanda River's catchment area with a view to educating women and the youth on the importance of protecting forest wealth and conserving the environment. The first of the tree plantation camps was organised in 1974 by the villagers themselves at Papariyana. Following this, a three-day camp was organised in Pangarbasa forest block to underscore the perils of environmental degradation.

In July 1970, a massive flood of the Alaknanda River had utterly devastated Chamoli district. This, in a way, became the prologue to the Chipko Andolan or Chipko Movement, which was, in years to come, to spread across the Garhwal hills and lay the foundation for community participation in managing natural resources. The impact of the flood was felt right up to Haridwar where the Upper Ganga Canal was completely choked with debris. While the officials called the floods a 'natural calamity', those affected soon wised up to the fact that the floods were manmade.

In April 1973, Bhatt brought about a mass awakening in the Garhwal region against the indiscriminate felling of trees when he led a group of villagers in preventing the contractor of an Allahabad-based sports goods manufacturer from felling 14 ash trees. The felling of the trees in large numbers was also part of the government's policy of auctioning forests for commercial exploitation. Customarily, whole blocks of forests used to be auctioned to private contractors, euphemistically called forest lessees. This custom had begun near the end of the 18th century when the British Indian government auctioned specified trees in a forest block to earn revenue and meet its growing requirement for sleepers for railway tracks.

Initiated and spearheaded by DGSM, a non-violent protest was held in Mandal village, emulat-



ing the Gandhian method of Satyagraha. Women and men came out in hundreds to participate by hugging the trees, preventing them from being axed—the Chipko Andolan was born. The same year, in December, the villagers stopped the contractor from felling trees in another area. With this unusually revolutionary yet non-violent stratagem, the movement spread quickly. Gaura Devi, a woman pioneer, led another large protest by women in Reni village in Joshimath block of Chamoli district on 25 March 1974. There were several such instances all over the Garhwal and Kumaon divisions.

These developments were serious enough to jolt the government from its slumber. To placate the agitators, the state government appointed a fact-finding committee under the chairmanship of Dr Virendra Kumar, a Delhi botanist and authority on the Himalayan ecosystem. Besides Bhatt, the local MLA and the block *pramukh* were also members. In its report, the committee accepted the arguments of the Chipko activists about the causes leading up to the denudation of the terrain. It accordingly recommended that no felling of trees for commercial purposes be allowed in the 1,200-sq-km area of the Alaknanda basin.

This is considered one of the biggest achievements of the movement. Further, on 25 November 1974, the state government constituted the Uttar Pradesh Forest Corporation to undertake scientific exploitation and more effective conservation of forests. This meant that forests would no longer be auctioned to private contractors. Other positive outcomes included a Forest Protection Act, which came into force in 1980; a 50 per cent reservation for women in forest panchayats; and the involvement of DGSM activists in decision-making on tree felling.

“Development ideas such as the protection of environment, the traditional usufruct rights of indigenous people, encouraging participation by women and Dalit families in the decision-making processes and using indigenous knowledge in promoting self-reliance have all been successfully executed by Bhatt’s Dasholi Gram Swarajya Mandal,” points out Dr Ravi Chopra, managing trustee of the Himalayan Foundation in New Delhi and former director of the Peoples’ Science Insti-

tute, Dehradun. “The fact that this revolutionary change was brought about at the initiative of the grassroots people with little or no formal education, funds or other help from the outside world makes the achievement truly exemplary.”

Despite the many international and national accolades such as The Raman Magsaysay Award (1982), Padma Shri (1986), Padma Bhushan (2005) and Gandhi Peace Prize (2013) that have come his way for this achievement, Bhatt retains his self-effacing demeanour even today. Fifteen years since he handed over the formal reins of DGSM to his younger comrades and disassociated himself from its day-to-day functioning, he remains actively involved in its activities and regularly participates in the forestry and environment-related camps it organises. An active participant in seminars and conferences on Himalaya-centric

**“GOPESHWAR HAS BEEN BOTH MY JANMABHOOMI AND KARMABHOOMI. MY WHOLE BEING IS DEEPLY ROOTED IN ITS SOIL”**

and environmental-related subjects all over the country, Bhatt is currently writing his memoirs. “Bhatt is perhaps the only grassroots environmentalist who actually practices what he preaches,” says Avdhash Kaushal, chairman, Rural Litigation & Entitlement Kendra, Dehradun. “He has stuck to his roots and did not move to greener pastures like most of his ilk. Today, he stands head and shoulders above all of them.”

Indeed, Bhatt continues to live in his native Gopeshwar with his wife. “Gopeshwar has been both my *janmabhoomi* and *karmabhoomi*,” he says. “My whole being is deeply rooted in its soil.” With his five children (three sons and two daughters) well-educated and settled, he looks forward to the summer vacations when his children and the grandchildren come visiting. “It is now my earnest ambition to spend the rest of my life in making sure that the Himalaya’s environment is not only preserved but further enriched for the benefit of our future generations.”

**“Dad, don’t hit the umpire like last time.”**

**“Don’t get injured.”**

**“Leave the muddy shoes outside.”**







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:: cover feature :: **WILDLIFE**

# JUNGLE BOOK

One of the foremost authorities on tigers in the world, Ullas Karanth has given the art of wildlife conservation in India a scientific makeover, writes **Srirekha Pillai**

*Tiger, tiger, burning bright  
In the forests of the night,  
What immortal hand or eye  
Could frame thy fearful symmetry?*  
—William Blake

**R**arely has an animal exercised such pull and power on the collective human psyche as this magnificent beast. Paeans have been penned, shrines built and folklore spun around it. A mascot for endangered animals, the tiger has been able to reclaim lost ground in India, thanks in great part to the path-breaking scientific approach of Bengaluru-based wildlife conservationist K Ullas Karanth. His invention of using camera traps to estimate tiger populations has been incorporated

by the National Tiger Conservation Authority in its tiger census methodology. In fact, the Indian programme of the New York-headquartered Wildlife Conservation Society (WCS), initiated by Karanth in 1988, has played a significant role in tiger recovery efforts in the country. Today, over 70 per cent of the world's wild tigers are found in India, although the country is home to less than 25 per cent of its habitat.

Director of the India programme of the WCS and the founder of Centre for Wildlife Studies—a non-profit trust based in Bengaluru for conservation of wildlife and wild lands—Karanth's love affair with the big cat goes back to a childhood spent in Puttur in Dakshina Kannada district of Karnataka. Born to Jnanpith-winning Kannada writer





Photographs courtesy: Ullas Karanth

Receiving the J Paul Getty Award for Conservation Leadership from WWF chairman Bruce Babbitt

Kota Shivaram Karanth, who was also known for his social activism and environmental zeal, it was but natural that Karanth veered towards nature and animals. “My father had a mini zoo at home,” he says. “I remember seeing peafowl and hare. Earlier, we had sambar, blackbucks and chital. People from all over Puttur came to see them.”

*Hulivsha* or the tiger dance, the centrepiece of Dasara celebrations in Dakshina Kannada, also fascinated a young Karanth who would follow the dancers painted in patterns of ochre, white and black moving to the crescendo of drumbeats through the dusty roads of the village. As a five year-old, when he saw a tiger for the very first time at a circus, Karanth was hooked. “Influences come from different directions,” he notes. “We have a strong animistic element in the culture of Malenad. There are shrines to the tiger, the gaur and other animals.” Karanth also grew up on stacks of nature books and Jim Corbett’s tales of man-eaters found in his father’s library.

Meanwhile, the first edition of ornithologist Salim Ali’s *Book of Indian Birds*, gifted by one of his aunts, initiated him into bird-watching. Later, while training to be an engineer at the National Institute of Technology at Surathkal, Karanth read the founding father of wildlife conservation George Schaller, credited with the first scientific

study of tigers. “When I read him, it all came together. I realised conservation was science, just like engineering. At that point, I decided to work towards being a wildlife biologist.” To understand the broader issues and challenges of conservation, Karanth started accompanying his cousin, senior forester Shyam Sunder, to the jungle. During these trips, he also befriended K M Chinnappa, a forest ranger who taught him how to track animals and read signs and sounds of the jungle, such as a crackling twig or the flight of birds.

After working as an engineer for almost five years, which left him feeling “stifled”, Karanth finally bought a farm north of Nagarhole National Park, and started farming for a living. He used the opportunity to renew ties with nature, visit the park and engage in conservation advocacy. He also started writing and publishing on natural history and undertook wildlife surveys. In 1986, at the age of 36, Karanth earned admission to

## BOOKING IT

- *The Way of the Tiger* (2001)
- *Tigers* (2001)
- *Monitoring Tigers and Their Prey* (2002)
- *A View From the Machan* (2006)
- *Camera Traps in Animal Ecology* (2010)
- *The Science of Saving Tigers* (2011)
- *Science and Conservation of Wildlife Populations* (2017)

## HIGHLIGHTS

- The WCS-India programme is the longest running scientific study of tigers covering the largest tiger population in the wild, globally.
- Karanth and his collaborators have pioneered the development of new techniques such as photographic capture-recapture sampling, tiger and prey spatial occupancy modelling, line-transect estimation of prey numbers, faecal DNA-based individual identification—all of which are now applied globally.

## KARANTH’S INVENTION OF USING CAMERA TRAPS TO ESTIMATE TIGER POPULATIONS HAS BEEN PATH-BREAKING



## **“I SEE INDIAN WILDLIFE AS A HALF-FULL CUP NOW. AS A 10 YEAR-OLD BOY, I USED TO WORRY TIGERS WOULD GO EXTINCT IN MY LIFETIME AS ANIMALS WERE BEING HUNTED DOWN AND FORESTS WIPED CLEAR FOR AGRICULTURE”**

**Training  
young wildlife  
biologists**

**(Right)  
Receiving  
the Padma  
Shri in 2012**

the University of Florida's Wildlife Ecology and Conservation Programme. When he graduated, Schaller selected him to build the WCS programme in India.

Buoyed by the exposure to the latest research methodologies in the US, when Karanth returned to India, he tried to instil a scientific spirit in the way wildlife was monitored in the country. “We were censusing tigers by identifying paw prints and tracing tracks. Though Corbett and other skilled naturalists had occasionally recognised some tracks, the census had no basis in science.” Karanth suggested putting cameras triggered by wildlife sensors in the forests to take photos and identify tigers through stripe patterns. “Stripes differ from tiger to tiger and from side to side. To identify an individual tiger, you need images of both sides,” he elaborates. “We have built some sophisticated pattern-matching software to do the first screening, so that eyeballing can be limited to the final few.”

Karanth is known for pioneering the use of camera traps in studying prey-predator relations. The capture-recapture sampling—taking a sample of animals, marking and releasing them; taking a second sample after a few days with both marked and unmarked animals; and using that ratio to estimate the total population—introduced by Karanth in India was far more reliable than the ‘pugmark’ census which demanded every tiger be identified and counted. Besides the tiger, this method has since then been used to estimate populations of leopards, jaguars, snow leopards and cheetahs worldwide. Karanth has also championed the use of occupancy sampling by simply counting tiger signs—developed by him and American statistical ecologist Jim Nichols—to estimate spatial distribution of tigers across larger regions. His scientific approach has helped arrive at a far more accurate picture of the tiger population in India.

Chief wildlife warden of Rajasthan G V Reddy credits Karanth with pioneering the use of scien-



tific tools in wildlife conservation in India. “Karanth is a passionate conservationist who has fought and convinced the system to change its approach towards wildlife monitoring,” he says. “The tiger census practised today is based on the camera-trap methodology he introduced. Our approach earlier was intuition-based; he has brought in the scientific edge.” Admiring Karanth for putting into practice “whatever scientific knowledge he has gathered”, Reddy also applauds him for “building a core of science-based wildlifers to carry on his legacy”. For his efforts, Karanth has received accolades aplenty, including the Padma Shri (2012); the Salim Ali National Award for Conservation from the Bombay Natural History Society (2008); J Paul Getty Award for Conservation Leadership from the World Wildlife Fund (2007); the Sanctuary Asia Lifetime Achievement Award (2007); and the Sierra Club International Earthcare Award (2006).

However, Karanth’s struggle to make science acceptable in the field of wildlife conservation hasn’t come easy. There have been repeated attempts to stall his research. Ruining the lack of a professional wildlife culture in the country, Karanth observes, “The need for hard science in conservation is not appreciated in our country to this day.” He recalls how his work was targeted for the first time in 1990, when the death of some tigers was wrongly ascribed to radio collars on them. He got the stay vacated in the Supreme Court. “I have never compromised on what I believe in,” he says.

Concurring that being the glamorous leader of the pack, the tiger has a huge advantage over other endangered animals, Karanth observes that it has its flipside too. “It’s the same cultural resonance of the tiger that drives the oriental medicine market, with massive smuggling rings thriving on tiger parts and bones.” Besides the tiger, Karanth’s team also strives to protect endangered species such as the Asiatic elephant, lion-tailed macaque, leopard, dhole, and the great pied hornbill, among others.

Identifying illegal hunting as the greatest threat to wildlife in India, the 68 year-old says, “If we can stop that, we will have four times the number of wildlife we have now.” He is also concerned about the targeted hunting of high-value species such as rhinoceros, tigers and elephants in protected areas. That said, Karanth says things have come a long way since his childhood when there were no conservation laws. “I see Indian wildlife as a half-full cup now. As a 10 year-old boy, I used to worry tigers would go extinct in my lifetime as animals were being hunted down and forests wiped clear for agriculture.” He suggests reconciling conservation with development by spatially separating lands for conservation, urbanisation and agriculture.

“He is a visionary with few equals in this field,” says wildlife and conservation filmmaker Shekar Dattatri, who has

## Endemic species

- Almost 33 per cent of plant species are endemic to India, not to be found anywhere else in the world
- Among the 44 species of mammals endemic to India are the Nilgiri tahr, wild ass and the lion-tailed macaque
- The 55 species of birds endemic to India are found mostly in the Western Ghats, eastern India along the mountain chains and the Andaman and Nicobar Islands
- There are around 187 endemic reptiles and 110 endemic amphibian species in India.

## Tigers

- According to the World Wildlife Fund and the Global Tiger Forum, the number of wild tigers in 2016 has gone up to 3,890 from 3,200 in 2010
- India is home to 70 per cent of tigers in the world
- The oldest Bengal tiger fossil was found in Sri Lanka, and it has been dated back 16,500 years
- A full-grown male Bengal tiger can weigh up to 420 pounds.

worked with Karanth for over 20 years. “Karanth has the ability to see both the big picture as well as the intricate details of complex conservation issues. He is also one of the few wildlife scientists I know who is also an active conservation practitioner.”

Today, Karanth is also assisted in his work by daughter Krithi, who is a conservation scientist with a focus on assessing patterns of species distributions and extinctions, impacts of wildlife tourism, consequences of voluntary resettlement, land use change and understanding human-wildlife interactions. The dad-daughter duo has an easy professional relationship, having even published papers together. His regret, however, is that he was hardly there for her when she was growing up. His wife Prathibha, a speech pathologist who has developed a system for dealing with autistic children, had to virtually bring her up singlehandedly as he was “a weekend husband, out in the wild mostly”.

An avid reader, comfortable with anything from fiction to economics and philosophy, Karanth also loves to spend time with his grandchildren, aged 10 and two. A little known fact, though, is that he paints. “I’m a reasonably good painter. For lack of time though, I haven’t been able to pick up a paintbrush for years now,” he says, admitting that he loves to sketch wildlife. As for any threat to his life in the wild, Karanth adds in a lighter vein, “I’ve darted tigers, caught and tranquilised them. I cannot say I’ve been in a risky situation. I think I run a greater risk when I drive every time from Bangalore to Nagarhole on the highway.”

# WALK ON WATER

WATER  
:: cover feature ::

Photographs by J Ramaswamy

Ayyappa Masagi uses traditional means to restore water to parched earth. People in drought-prone areas call him a Modern Messiah, reports **Chitra Ramaswamy**

**L**ike most children in the rural heartland of India, Ayyappa Masagi used to perform a ritual that was linked to his family's survival, at the tender age of six. He would wake up at the crack of dawn and walk 3 km to the neighbouring village, by his mother's side, to fetch water—every single day. When they got there, the sleepy child would clamber into a 20-ft-deep sand pit, at the risk of being buried alive should it cave in, and draw water from its mingy depths. Despite this risky ordeal, the pit would usually yield only one pot of water, which the boy would carry all the way back home.

The difference between other children and Ayyappa was that this scrawny kid from Gadag district in

Karnataka was destined for greatness. The daily struggle for water, for his mother and the other women in his village, left a profound impact on his vulnerable mind, and he vowed to solve the water problem in his village when he grew up.

This was no childish promise. The Bengaluru-based Masagi has since transformed 26,000 hectare of dry land into wetland across the country, rejuvenated thousands of lakes, ponds, wells and borewells, and implemented rainwater harvesting projects in over 170 industries in and around Bengaluru and in villages on the Karnataka-Andhra Pradesh border. His success has also prompted foreign governments to approach him to replicate his water conservation methods in their countries.

Masagi, whose early life was defined by poverty and scarcity, had a naturally inquiring mind and he grew up to be a mechanical engineer. He combined textbook knowledge with traditional wisdom and simple technology to devise simple but effective water conservation and water harvesting solutions for drought-prone regions.



A social entrepreneur honoured by the Ashoka Foundation, Masagi has been turning barren, brown landscapes into lush green orchards and fertile fields across India for 15 years. With no fancy equipment or machinery, and with just a series of trenches, pits, channels, boulders, gravel and sand, it seems water springs wherever he goes. His extraordinary ability to produce water from the parched earth has earned him nicknames like Water Warrior, Water Gandhi, Doctor of Dry Borewells and even Modern Bhageeratha, after the mythical king who brought the River Ganges to earth from the heavens.

“The earth is the world’s largest God-given tank. It absorbs water, filters it and sends it to the bores and wells. We have tampered with this process and robbed the earth of its water,” says the 60 year-old social entrepreneur and author of the book, *Bhageeratha: War On Water Crisis*. Masagi’s entire body of work is based on a very simple principle: “Collect it, filter it and put it back into the earth. The earth has to be recharged with every drop of water that you use rather than allow it to run waste,” he reasons.

His arsenal of techniques includes the construction of lakes to harvest rainwater and recharge borewells; installation of seepage-type borewell-recharging units; infiltration wells; stream-water harvesting; pit-based rainwater harvesting; tree-based agriculture; soak trenches and pits; *patta* bunding; compartment bunding; plastic mulching; inter-basin water transfer; reuse of grey water; and other systems.

To fulfil his childhood promise, Masagi first educated himself and enrolled with the Industrial Training Institute. He soon found work with Bharat Earth Movers Ltd as a fitter. To further qualify himself, he joined evening college and obtained a diploma in mechanical engineering. This was followed by a 23-year stint with Larsen & Toubro (L&T) in Bengaluru, where he rose to become a manager.

But his life’s ambition required him to tread a very different path. In 1994, he bought a 6-acre plot in his ancestral village and used it as a laboratory to develop his creative ideas on water conservation. “I built a hut on the plot and pursued farming on the weekends,” he shares. “Initially, I reaped a rich harvest, then I went through a period of drought and then floods washed away my hut. I spent the night up on a tree when I got a brainwave as I helplessly watched huge quantities of precious rainwater flow into the sea.”

Thus, Masagi’s tryst with building trenches, lakes, bunds and soak pits began, to channel rainwater into the water table and use natural means to store it for use



## MAKE A DIFFERENCE

Many of us take our water supply for granted. If you are inspired by Ayyappa Masagi’s work, here’s what you can do to conserve water:

- Take a bucket bath instead of a shower
- Use small mugs instead of big ones
- Opt for grey-water harvesting, which reuses water from showers, baths, basins in bathrooms and washing machines for various household applications such as watering gardens and flushing toilets
- Wet commodes before use, to make them slippery. In this way, 2 litre rather than 10 litre per flush is enough to rid them of dirt
- Put bricks inside toilet tanks to reduce the capacity of water being flushed
- Use bottle irrigation for potted plants. Here, fill a 2-litre bottle with water and invert it into the pot so that its open mouth is bored into the mud. The roots will suck in the water as and when they need it as plants take in only as much water as they need. This ensures that water is not wasted and plants get what they want. Once the bottle empties, refill it
- Install roof-water harvesting for your home

**MASAGI FEELS THE REAL PROBLEM IS NOT WITH WATER OR RAIN BUT THE ATTITUDE OF PEOPLE — COMMUNITIES, POLITICIANS AND BUREAUCRATS**

## HOW DIRE IS THE WATER CRISIS?

in times of scarcity. As more and more creative ideas filled his head, he was finally ready to take the plunge. Masagi took early retirement from L&T in 2002 to hone his water management conservation and start using it to help rural communities across India.

A big part of his mission has always been to spread awareness on water management and, towards this end, he had organised a motorcycle rally called *Jaladhaare* (meaning 'force of gushing water') across Karnataka in 2002. While on this rally, he stopped at a villager's home to ask for a drink of water. "I heard a woman's voice from inside saying she could give me water for any other use except drinking," he recalls. "It hurt me so much that I intensified my work in this field."

As he pressed on with his mission, Masagi's work drew the attention of the Ashoka Foundation, the international organisation that promotes social entrepreneurship. Through its Ashoka: Innovators for the Public initiative, the foundation honoured Masagi with a fellowship in 2004, the very springboard he needed to launch his Water Literacy Foundation (WLF), which he set up a year later.

With this, he was able to take his work to a new level and was soon approached by a variety of clients, including farmers, schools and industries. For instance, when the water table on the premises of the Vedanta Academy in Coimbatore dipped alarmingly, it approached WLF to implement borewell recharge techniques and build a lake. Under WLF's guidance, the school adopted five different water management systems to harvest rainwater and recharge its borewells. It also implemented grey-water harvesting techniques. The result was magical: the school's dry open well, which had not yielded a drop for a decade, is now brimming with water. Not only is it used daily, the well also automatically refills.

The year 2008 was an important one for Masagi—that's when he set up a for-profit company called Rain Water

India is the second most populous country in the world—with more than 1.2 billion people—but water supply and sanitation are still serious concerns in many parts of the country. With the population expected to rise to 1.6 billion by 2050 and demand for water increasing, the crisis is becoming even more acute. According to programmes conducted by Water.org, an international NGO and pioneer in offering solutions to global water crises, 77 million people in India lack access to safe water. The World Bank estimates that 21 per cent of communicable diseases in India are owing to the use of unsafe water. And a report in *The Economic Times* points out that it is not only rural areas but even urban cities that face such scarcity—in fact, 22 Indian cities face a water shortage. However, there is hope by way of efforts in water management in drought-prone areas. Apart from initiatives led by the Government, UNICEF and the community, individual water crusaders like Ayyappa Masagi play an important role in installing water conservation techniques to save water.

Concepts. He runs this company on a cross-subsidisation model, where the profits he earns from his commercial clients are used to subsidise the work he does with poor and parched rural communities.

As his reputation spread, many industries sought Masagi's expertise, including multinationals like Pepsi, Bisleri and Wipro. "In 2011, ACC Cements approached us to set up rainwater harvesting systems. We built 18 infiltration wells, an artificial lake and a sump. One of their borewells, which had run dry years ago, sprung to life in just 15 days. The water quantity in their active borewell doubled as the water table rose considerably," recounts Masagi. Oddly enough, 17 dry borewells belonging to neighbouring farmers too began to yield water. This is why he has a reputation for producing water seemingly out of nowhere!

A year later, Masagi worked his magic at the Bisleri unit in Devanahalli, Karnataka. The company's borewells were drying up and it was a serious problem. "Ayyappa



One way to make a difference is to adopt grey-water harvesting, which basically means recycling and reusing bathwater and kitchen run-off.

Dr Vaman Acharya, retired chairman of the Karnataka State Pollution Control Board, is familiar with Masagi's work and applauds his grey-water separation technique. "The idea of segregating grey water and reusing it by creating separate pits is sound and logical," he says. "As the source of this water is bathing, washing and cooking, it contains only soap and detergents, which are not highly contaminated. The water that percolates through these pits ultimately goes into borewells. To prevent this from happening, grey-water separation at source is highly recommended."



## THE WATER FACTSHEET

Masagi built an artificial lake with a borewell re-charging unit on our property, with the capacity to hold 23 lakh litre of water,” recalls senior manager G N Vishwanath. “He also installed a rainwater harvesting system, whereby we harvested rainwater runoff from the Bisleri plant, highway rainwater and runoff from neighbouring properties. The project was a stunning success. Within a year, the borewell yield increased from 3,000 litre to 5,000 litre of water per hour. The static level also increased from a depth of 100 ft to 80 ft from ground level.”

That said; our water doctor doesn't believe in only fixing problems; he wants to teach people to overcome their own challenges. To this end, Masagi has been conducting widespread water conservation and management campaigns across India. He started in 2008, during the United Nations Year of Water, when his WLF kicked off educational campaigns by celebrating the Rainwater Festival in schools in Hubli and Dharward cities in Karnataka.

Apart from exposing students, teachers and parents to the dire need for water management, Masagi's awareness campaign also encouraged schools to develop a curriculum that includes water recharging methods; models to teach children to save, harvest and re-use water; and ways to put these to daily use. Simple yet catchy, his approach to spreading water literacy includes songs and couplets he has composed himself; he screens documentaries; writes articles; gives field demonstrations and lectures; and conducts workshops.

Masagi has also started Water Literacy on Wheels, where he travels to remote corners of Karnataka to make farmers water-literate. Armed with a laptop, CD and booklet on water-harvesting instructions, he goes from village to village, talking about his projects to farmers and state government officials at farmers' festivals.

Masagi feels the real problem is not with water or rain but the attitude of people—communities, politicians and bureaucrats. “While wealthy people spend several crores of rupees on building palatial houses, they are indifferent and unwilling to spend a few thousands on installing recharging systems

- A UN report predicts that by 2025, nearly 3.4 billion people will be living in ‘water-scarce’ countries and the situation would become grim in the next 25 years
- As per the Ministry of Water Resources, India has 18 per cent of the world's population but has only 4 per cent of total usable water resources
- 65 per cent rainwater runoff goes into the sea, which is a major wastage
- In India, agriculture sector is the biggest user of water followed by domestic sector and industrial sector
- As per the Safe Water Network report, India ranks a dismal 120th out of 122 nations for its water quality; and 133rd out of 180 countries for its water availability
- According to *Water.org*, 77 million people in India lack access to safe water
- The Central Pollution Control Board states that at least 650 towns and cities in India lie along the banks of polluted rivers
- 17 per cent of rural women in India have to walk over a kilometre to reach the nearest water source
- The availability of water has reduced from 6,042 cubic metre in 1947 to 1,545 cubic metre in 2011
- A dripping tap can waste up to 20,000 litre of water every year

**“THE EARTH IS THE WORLD'S LARGEST GOD-GIVEN TANK. IT HAS TO BE RECHARGED WITH WATER THAT YOU USE RATHER THAN ALLOW IT TO RUN WASTE”**

that would give them a permanent solution. On the other hand, slum dwellers and villagers do not have the financial capacity to install them. Financial constraints continue to be a constant factor too.”

Water scarcity is a universal challenge and our modern messiah is now advising foreign governments on how to manage their scarce water resources. Among these are the governments of the Northwest Province in South Africa, and Angola and Botswana, also in Africa. “To enable water-efficiency in India, integration between urban, rural, industrial and agricultural sectors is essential,” he emphasises. “Instead of large-scale river-linking or damming projects, simple techniques at a micro-level for self-sufficiency will change the situation. Who says there is a water crisis? If we adopt simple methods, India will be a water-surplus nation by 2050.”

# Waste not

In Mumbai, Jyoti Mhapsekar is working towards an unusual utopia—zero-waste management—while empowering slum women, writes **Natasha Rego**



Photographs courtesy: Jyoti Mhapsekar

**E**ighteen years ago, NGO Stree Mukti Sanghatana (SMS) staged a skit in a slum in Chembur, aimed at spreading word of a day-care centre for 25 little girls in the vicinity. Titled *Mulgi Zali Ho* (It's A Girl Child), the skit by Jyoti Mhapsekar was meant to urge women to keep their kids at the day-care centre while they earned their daily wages.

Mhapsekar, the 69 year-old founding president of SMS, had no idea then that this gesture would lead to empowering thousands of slum women in Mumbai. It also started a revolution of sorts, in waste collection in this metropolis.

"We had already been working with women from economically backward strata for about 20 years but we did not know that the women of that slum were primarily waste pickers at the Deonar dumping ground and street-side garbage bins," says Mhapsekar, recollecting that fateful day.

That realisation inspired SMS to launch the Parisar Vikas programme, now with 3,000 members, which trained waste pickers in the collection, seg-

regation, composting and disposal of waste from housing societies, corporate campuses and hospitals across Mumbai. Apart from helping them find employment in this way, SMS also empowers them with life skills, offers them regular health-care, and provides educational facilities to their children, especially the girl child.

"When we learnt these women were waste pickers, we decided to meet more of them," Mhapsekar recalls. But finding them was a challenge. "We had to hang out near garbage bins where a couple of women would be working and ask them to take us to their community. That way, we acquainted ourselves with about 2,000 of them over the next couple of years and surveyed them. We wanted to know who they were and where they came from."

SMS discovered that these women were unskilled Dalit migrants who had fled drought-prone Marathwada. Eighty-five percent of the waste pickers they had surveyed were women, many of them single, which made them primary bread-winners. Apart from earning a pittance from waste picking, they were prone to respiratory dis-



## THE WASTE FACTSHEET

eases, skin infections and rat bites, for which they received no medical attention. Their survey also revealed that these women were an ever-growing force in an ever-growing city; if the NGO was to empower this invisible workforce, they would also have to capitalise on the garbage itself.

“When we started Parisar Vikas, we thought we’d only have to work with the women. But for true liberation from waste picking, we realised we would have to start learning about garbage too!” says Mhapsekar, a former librarian by profession. So, SMS educated itself on garbage segregation and its members attended composting workshops. It then educated the women about government schemes, childcare techniques, nutrition, sanitation, girls’ education and age of marriage.

The NGO also engaged an expert to train the women in zero-waste management. “As they couldn’t forego even a day’s earnings, we gave them a stipend,” says Mhapsekar. “We needed to wean the women away from the dumping grounds and garbage bins. By the year 2000, SMS had trained about 1,000 women in waste segregation, dry-waste collection and composting.”

The challenge then was to find these women formal employment via contracts with housing societies, to maintain zero-waste premises. This involved door-to-door collection of segregated waste, maintaining a compost pit in the compound, and sending dry waste for recycling. It also meant convincing individual, middle-class households to segregate their waste at source. This is a hurdle Mhapsekar still deals with today. “One of the first housing society contracts we got was at Makarand Sahaniwas in Mahim,” she shares. “Some of our supporters living there had a tough time convincing their fellow members.”

Arun Kumar, CEO of Apnalaya, another NGO that works with marginalised communities in Mumbai, including waste pickers, remarks: “The municipal corporation may not be doing its part to ensure that waste is segregated and collected, but when it comes to citizens, the mindset still relies on the age-old caste system; we assume that there will always be ‘someone else to pick up my rubbish.’”

“As affluence increases, garbage also increases. But the middle class feels it is the business of the

- According to the India Environment Portal, run by the Centre for Science and Environment (CSE), India is the world’s third-largest garbage generator, after the US and China, generating 169,800 tonne of garbage per day
- Maharashtra, which is the state that produces most garbage in India, generates almost 15 per cent of the country’s trash (26,820 tonne per day)
- Mumbai, which produces 9,000 tonne of garbage per day, is the city that generates most waste in India
- Indore in Madhya Pradesh has been ranked the cleanest city according to the Swachh Survekshan 2017, which takes into consideration waste segregation at source and integration of waste pickers into the system
- In February, the Tirunelveli Corporation received the ‘Best Corporation Award’ by the Centre for its efficient collection and disposal of segregated waste

### MHAPSEKAR’S ULTIMATE OBJECTIVE WITH SMS IS TO WORK TOWARDS ERADICATING WASTE PICKING ALTOGETHER

poor and lower caste people to take care of it. I would attend general-body meetings of housing societies to meet the residents and dispel their concerns,” says Mhapsekar. “Even if they were interested in managing their waste, they would be worried that the compost would smell. So I would make a speech, screen a film and distribute pamphlets on garbage.” After much convincing, four housing societies in north-east Mumbai made deals with SMS—the organisation had to take care of the business transaction and assign trained women to each society.

Although this was an encouraging start, there were a few stumbling blocks. In those days of scant mobile connectivity, keeping track of so many women came with certain hiccups. Mhapsekar recalls the time when the women did not show up to work at one large housing society. “Our phones were ringing with the voices of angry residents and we had no idea why they were *all* absent. So we went to their homes and found that someone had died and everyone had stayed back to show support. We had learnt a valuable lesson that day, that each group needed to contain women from at least two different slums.”

In 2004, SMS took the next step and began to organise the women into cooperatives under the



Parisar Vikas programme. They began to call the women 'Parisar Bhaginis.' By now, their activities had expanded to Wadala on one side and Bhand-up on the other, and the housing society contracts were transferred directly to these cooperatives. "We wanted them to take independent charge of the business transactions," says Mhapsekar. "We would only step in to negotiate the deals."

Today, SMS has 10 cooperatives, with about 50 members each, maintaining zero-waste properties at 70 housing societies in Mumbai, as well as a residential colony of the Reserve Bank of India. The corporates they work with include Sony, Voltas, Godrej, Bajaj and Cap Gemini in the city.

In fact, in December 2016, Vijaynagar Cooperative Housing Society in Andheri, under the wing of SMS's Ramai Cooperative, won the ICICI Bank Swachh Society Award for its zero-waste premises. The Parisar Bhaginis also collect the non-medical dry waste from six hospitals and two malls and transport it to the five dry-waste sheds they acquired through a government welfare scheme. Those who are not in the cooperatives belong to one of SMS's two federations that comprise 1,500 self-help groups that enable the women to borrow money from each other instead of moneylenders.

Over the years, many women have been promoted to positions of supervisor and trainer, and now handle the contracts, in addition to training fellow waste pickers. One of the first members to join SMS, Susheela Sable has come a long way from drought-prone Marathwada. The 50 year-old president of one of the federations, who was waste

## THE PROCESS OF WASTE SEGREGATION\*



picking since the age of 10, has become a spokesperson for waste pickers at climate-change conferences across continents. In 2009, she addressed the Copenhagen Climate Change Conference in Denmark for the first time. "I like to give them a picture of our situation and dispel certain myths. It is true that there are so many slums in India... but as waste pickers, what sense does it make to keep our own surroundings dirty when it is our duty to clean up the city!" she points out.

As for Mhapsekar, who was awarded the Nari Shakti Puraskar by President Pranab Mukherjee in 2015, the ultimate objective of SMS is to work towards eradicating waste picking altogether, something that can happen only if Mumbai segregates its waste at source, i.e. at home, and disposes of it in a scientific and sustainable manner, as laid out by the Central Government's Solid Waste Management Rules of 2016. "Yes, legislation has been introduced but, on ground, everything remains the same," rues Apnalaya's Arun Kumar, whose

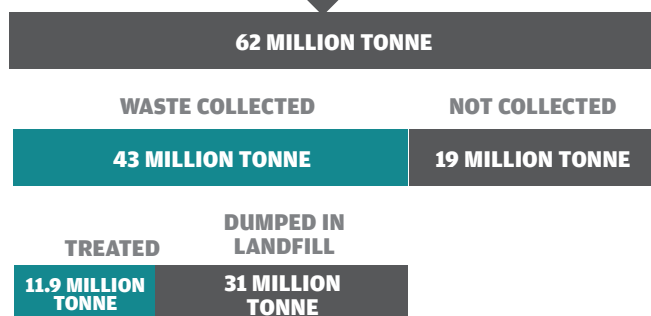
During a training session at a slum in Mumbai

(Right) The Parisar Bhaginis in front of a dry waste collection truck



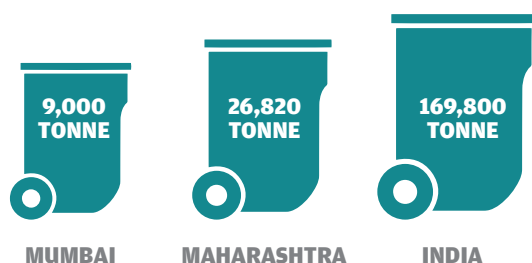


## WASTE GENERATED IN INDIA PER YEAR



Source: India Environment Portal

## TOTAL WASTE GENERATED PER DAY



Source: India Environment Portal

BREAKING IT DOWN	
MATERIAL	DEGENERATES IN
FOOD WASTE	3-4 weeks
PAPER	1 month
CLOTH	5 months
WOOD PIECES	10-15 years
LEATHER	40-50 years
IRON	50-100 years
ALUMINIUM	200-250 years
PLASTIC	1 million years

Source: The Environment and Resources Institute

organisation works with about 500 waste-picker families near the Deonar dumping ground. "There is increasing pressure on residential colonies to segregate their waste. But then we see municipal collectors dumping it all into one truck. There is no systemic effort to ensure that garbage is segregated, the process is decentralised, or that anyone who violates the rules is punished."

The 2016 rules also ordered the integration of informal waste pickers into the city's collection of residential solid waste. But both Mhapsekar and Kumar are reluctant to give the municipal corporation many points for this. Making matters worse is that the city has only three dumping grounds, of which the "mountain" at Deonar should have been closed 50 years ago. So it will be a while before Mumbai can be considered a clean and green city.

"However, if that day does come, 25,000 waste pickers will be out of work," says Mhapsekar. "So they should be given alternative skills, like sorting in dry-waste sheds, and we must ensure their future generations do not fall into the same cycle." There are stories of hope in this regard. For instance, some women, like Mangal Thorat, have made use of the opportunities SMS provides to turn their life around. When her son, enabled by SMS's education programmes, wrote his Class 10 exams in 2010, the former waste picker joined him and completed her Class 10 exams too. She went on to become a part-time nursery school teacher and part-time trainer with SMS.

With the NGO's reach spreading to neighbouring municipalities, Mhapsekar's mission with SMS is almost coming to an end. "I turn 70 in two years and it will be time for me to take a backseat," she says. "But next year, we want to extend the concept of zero-waste campuses in colleges. To catch them young, we're going big, with poster exhibitions, films and street plays. We'll also take a mobile garbage exhibition, which the EU helped us set up."

Regardless of how much longer she stays at the helm, Mhapsekar is always thinking up ways to achieve SMS's ultimate goal. Clearly, there's no time to waste.

**"AS AFFLUENCE INCREASES, GARBAGE ALSO INCREASES. BUT THE MIDDLE CLASS FEELS IT IS THE BUSINESS OF THE POOR AND LOWER CASTE PEOPLE TO TAKE CARE OF IT"**

# Ray of Hope

cover feature :: **ENERGY**

'Solar' Suresh from Chennai is helping people switch to a green source of energy, one kilowatt at a time, discovers Chitra Ramaswamy



**W**hen Cyclone Vardah made landfall in December last year, the city of Chennai plunged into darkness and went without water and electricity for five days. Yet one home remained unaffected. At their home in Kilpauk, D Suresh and his wife had electricity and even surplus running water. Why, they had enough to even help their neighbours. "Our friends and neighbours were charging their cell phones and filling water at our home," recalls the 73 year-old.

Suresh's home is an oasis of abundance in the centre of a city known for power cuts, scorching heat and erratic rain. Creepers wind themselves around tall bamboo trees that lean against the compound wall of his property, which houses a large, two-storey bungalow. And, here and there, you notice 15-inch circular pits fitted with pipes that channel stagnating water into the soil, so that the groundwater is regularly recharged.

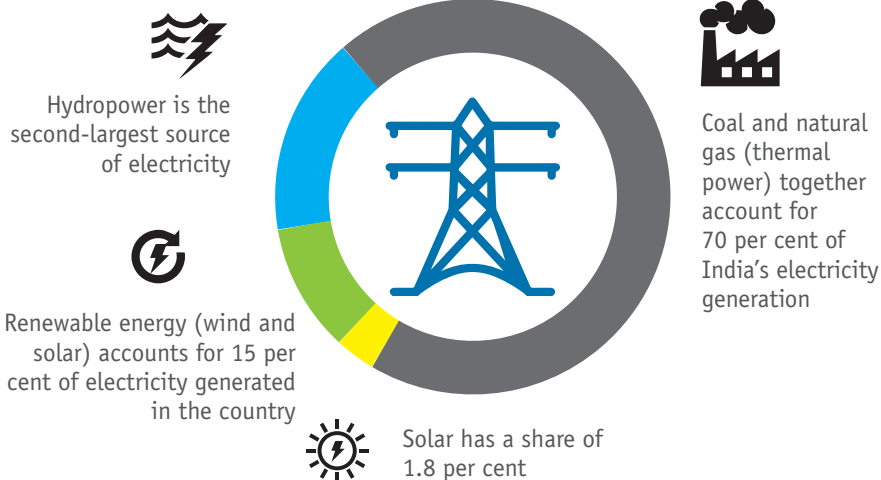
The backyard of his home boasts a mini orchard, with mango, guava, gooseberry and custard apple trees scattered all over. Tucked neatly into a corner here is a small tank that makes up part of a rainwater harvesting system. An organic filtration system purifies the water through layers of pebble, charcoal and sand before it is stored in a sump. Elsewhere on the property, a larger tank announces 'Biogas System' in bold, white letters. However, the technology Suresh is most noted for—it has even earned him the nickname 'Solar' Suresh—lies in two sets of solar panels that gleam on an open terrace under the Chennai sun. It is this system that kept Suresh's home running after the cyclone even as the city struggled to get back on its feet.

Suresh is a retired CEO, businessman and lecturer who is lending his knowledge on decentralised renewable energy systems to anyone willing to make the switch. In the past three years, he has directed the installation of solar power panels in three offices, six schools and seven households





Photographs by J Ramaswamy



## SURESH'S HOME IS AN OASIS OF ABUNDANCE IN THE CENTRE OF A CITY KNOWN FOR POWER CUTS, SCORCHING HEAT AND ERRATIC RAIN

### THE ENERGY FACTSHEET

- India ranks highest among the top five off-grid solar markets in the world, according to the *Off-Grid Business Indicator Report* by the Solar Energy Foundation
- As per the Census of India 2011 and *Wasteland Atlas of India 2011*, the total solar power capacity in the country stands at 748 GW, which is more than twice of the country's total installed power capacity
- According to a Bridge to India study, India's total installed solar capacity has crossed the 10 GW mark, a major milestone for the sector
- The Ministry of New and Renewable Energy aims to achieve 100 GW solar capacity by 2022, comprising 40 GW rooftop and 60 GW large and medium-scale grid-connected projects
- Tamil Nadu has the highest installed capacity in the Indian solar market, followed by Rajasthan, Andhra Pradesh, Gujarat, Telangana, Madhya Pradesh and Punjab
- The world's largest solar power plant spanning 10 sq km is situated at Kamuthi in Tamil Nadu. It packs 648 MW of power with a capacity to power 150,000 homes
- Bloomberg New Energy Finance reports that 91,000 households have been electrified by solar-powered devices, such as solar lanterns and off-grid home systems, as of March 2016

across Chennai, Hyderabad and Bengaluru. He also drove the installation of biogas plants in some residences in Chennai, in a retirement home in Hyderabad and kitchen gardens in Chennai.

Suresh's own home is the product of a lifetime's worth of experiences coupled with a series of fortunate events. One thing led to another over 20 years, finally transforming his home into a model system for the household.

As CEO of a textile company in Tamil Nadu, he frequently travelled to Germany for work, between 1987 and 1997. "I saw so many rooftop solar plants in a country that has a lot less sunshine than ours," he recalls. Although the idea took firm root in his mind, it would be more than a decade before he could perfect the technique and find a vendor to install solar panels on his own terrace.



In the meantime, Suresh kept himself busy. He made a significant contribution to the reduction of waste generation at work. His work also took him on field trips to various regions in Gujarat. While travelling in Kutch, he noticed an abundance of rainwater harvesting systems in many residential colonies.

If he couldn't set up his solar panels because India still didn't have the technology, he decided to instead have a rainwater harvesting system installed at his home in Chennai. In 1997, after attending a presentation at a local Rotary Club meeting—given his IIT-IIM background, Suresh insisted on thoroughly understanding the mechanisms—he set it up at home.

By then, Suresh felt the time was right to act on his plans to install a solar power plant at his home, an initiative that would eventually define his public identity. Designing the system was the first step but more challenging was finding a suitable vendor for his custom-made project as the big players were not interested in projects involving a few kilowatts. He eventually did and, five years down the line, in January 2012, Suresh installed a 1kW solar power plant on the terrace of his bungalow.

“This was sufficient to power the lights, fans, TV, computer and a double-door refrigerator in my home,” he says. A year later, he added another panel of 2kW, and with the additional power thus generated he was able to also run a mixer, washing machine, air-conditioner and water pump. “By 2015, my entire house, except the water heater and

## GO SOLAR

- Solar power is a natural, inexhaustible, non-polluting source of energy. In a word, it is unlimited, so you don't need to watch your consumption
- The cost of installation is only a one-time investment; once recovered, solar energy is free
- A solar system requires low maintenance—cleaning once every six months
- Central and state governments offer subsidies for off-grid installation of solar panels by commercial enterprises

**“DURING THE CYCLONE, PEOPLE WHO SOUGHT OUR HELP TO CHARGE THEIR MOBILES AND TAKE WATER FROM OUR HOUSE MARVELLED AT OUR SOLAR SYSTEM AND MADE ENQUIRIES ON ITS WORKING. YET WHEN THE CRISIS PASSED, THEY FORGOT ALL ABOUT IT”**

oven, was running on solar power. Both these appliances require totally different technology,” he explains.

“It costs ₹ 80,000 to ₹ 100,000 to install a 1kW capacity system,” he reveals. Then, he asks, “When you buy a washing machine, air-conditioner, car or TV, do you calculate the return on investment? Then why do it for solar? Look at the comfort and convenience you enjoy! During the cyclone last year, people who sought our help to charge their mobiles and take water from our house marvelled at our solar system and made extensive enquiries on its working. They expressed a desire to install it in their terraces. Yet when the crisis passed, they forgot all about it.”

But over the years, word of Suresh's solar installations have spread and enquiries for similar set-ups started coming in. So now he spends his time designing workable models for independent bungalows, apartments, hospitals, educational institutions, offices, factors and other businesses, free of charge, while setting up his customers with potential vendors, at least in cities where he has the contacts.





Bengaluru-based Kethan Maniar, a construction and packaging materials dealer, was one of his clients. With Suresh's expertise, he installed 3kW solar panels at his office; with them, he runs eight computers, six fans and 20 LED lights. Satisfied with the result, he converted to solar at home a year later, all under Suresh's supervision. "It was an incredible experience in terms of vastly reduced electricity bills," he says. "Since the solar installation, we consume a lot more energy because we use all the modern gadgets—from a microwave oven to hairdryer, washing machine, three air-conditioners and a water pump. We live more comfortably now with reduced health problems. Besides, our medical bills too are lower now. My mother's asthmatic bouts have eased and my wife, who is prone to migraine headaches especially after a hairwash, can freely use the dryer on her hair in spite of power cuts, thanks to the solar system."

Hyderabad-based Kiran Mody, who generates 4,000 units of power a month, took Suresh's help to install a 30kW solar system at his home in November 2016. "I have a two-storey bungalow and use most modern gadgets, including a microwave oven, a mixer-blender, water heater and six air-conditioners, besides lights and fans. So my monthly consumption is about 6,000 units. With the solar installation, I now save 70 per cent on electricity bills. As the panels are low-maintenance and have a life of 20-25 years, I am sure to get back my investment within five years."

Indeed, Suresh jumps at the opportunity to introduce people to solar panels wherever he sees the potential. When his wife, an educational institute builder, published her book through Margham

Publications in Chennai, he urged the proprietor, M Narayanan, to switch to solar at his printing press. So, with an 8kW installation that he put in place in June 2016, the proprietor generates 30 units a day and is able to meet half his monthly electricity needs. "The best part is that I do not shell out a rupee to maintain the panels, except to mop them every fortnight," says Narayanan.

"People from Assam, Bhubaneswar, Rajasthan, Satara, Kolahpur and other places call me to install solar systems there. But I haven't identified vendors in these places and the ones in Tamil Nadu are not inclined to travel outside the state to install them," rues Suresh. In fact, he has taken his mission one step further by opening up his home to school students on field trips, delivering lectures in colleges and judging science presentations at educational institutes around Chennai. And when a child's experiment catches his eye, he is quick to take them under his wing. Among a few students who he is mentoring is a Class 9 student who has developed a system to recover the heat produced by air-conditioners and refrigerators to generate electricity—right in Suresh's ballpark!

For Suresh, interacting with young minds is an enriching experience as the questions come at him from the most unexpected of places. "When I made a 15-minute PowerPoint presentation at a primary school here in Chennai, a girl in Class 3 asked me how we would dispose of the panels once the solar system had expended its life. I was stunned at her grasp of the subject," recalls Suresh in amazement. Rest assured, the silicon panels are recyclable.

**On a tour around the compound, Suresh points to the kitchen garden that he maintains on his terrace (left), and rainwater harvesting tank in his backyard**

**Opposite page: The modified switchboard for the solar-powered electric system**




:: cover feature :: **SUSTAINABILITY**

Photographs by Sivaram V

# CLEAN PERIOD

A group of women in Thrissur, Kerala, is trying to make 'sustainable menstruation' a reality, reports **Renu Ramanath**





Vasanthi Gopalan  
(in white and red sari)  
with her team members

## THE SANITARY WASTE FACTSHEET



### 9,000 tonne

of sanitary waste (432 million pads) is generated every month and 108,000 tonne of menstrual waste is produced every year in India

### 500 years

is the time taken for disposable pads made of synthetic materials to decompose

### 150 kg

of non-biodegradable absorbents is thrown away by an average woman every year

### 80%

or more of sanitary waste is flushed down the toilet or dumped in a landfill

**V**asanthi Gopalan and her colleagues couldn't have found a better way to celebrate International Women's Day last year. On 8 March 2016, this group of silvers from Thrissur in Kerala rolled out their first batch of low-cost, biodegradable sanitary napkins, a product that is transforming the lives of women who use it.

Labelled 'Soukhyam', or 'well-being' in Malayalam, these sanitary napkins are the result of a dream backed by the determination to see it through, says 78 year-old Gopalan, founder of the NGO, Kanika, and wife of the late Dr K Gopalan, former vice-chancellor of Cochin University of Science and Technology.

Given the increasing concerns about the chemical components that go into making industrial sanitary napkins, especially dioxins (a toxic chemical used in the bleaching process), Kanika's initiative comes not a moment too soon. It is also part of a social revolution taking place across the country, especially rural India, where the focus on menstruation and women's hygiene is slowly gathering momentum (*see box 'Breaking the taboo'*).

The idea took root when Gopalan read a news item in a local newspaper two years ago. It featured Arunachalam Muruganantham—the 'Sanitary Napkin Man' of Tamil Nadu—who made waves when he launched eco-friendly sanitary pads in 2006. Muruganantham invented the technology to make biodegradable sanitary napkins after much trial and error, even suffering the pain of being called a 'pervert'. His Coimbatore-based company Jayaashree Industries has since sold his cost-effective machines across India and even overseas. "We supply machines and raw materials [wood pulp] to about 20 places in Kerala—both NGOs and individuals—as well as overseas," says Kannan, a trainer at Jayaashree Industries. "Our raw material comprises wood pulp that is imported. We had also collaborated with Akhilesh Yadav, former chief minister of Uttar Pradesh, to initiate a project on menstrual hygiene in rural areas."

Kanika was inspired to follow in Muruganantham's footsteps. "We mulled over the idea for a year," says Gopalan, seated in her residence in Chembukkavu, a suburb of Thrissur. A year later, in 2015, the women of Kanika contacted Muruganantham to obtain the technology from



## A STEP-BY-STEP PROCEDURE FOR MAKING ECO-FRIENDLY SANITARY NAPKINS



him. He supplied them with the raw material and arranged for two people to set up the unit in Thrissur.

The biggest roadblock for the women was raising funds as they were adamant about not taking a loan for their venture. Around 20 of them, therefore, contributed their own funds, and collected ₹ 500,000. They also sought the support of the National Bank for Agricultural and Rural Development (NABARD) and the District Industries Centre, Thrissur, which trained them in running a small-scale industrial unit.

The next challenge was to find a suitable workspace. That's when one of Kanika's members, Nandini Venugopal, invited them to use the space on the terrace of her home in Peringavu, a suburb of Thrissur. "We started production in that makeshift room and came out with our first batch of napkins in 2016," says Gopalan, who adds that they continue to use the same workspace at a monthly rent of ₹ 5,000.

Gopalan shares that the raw material, mainly gel cotton and wood pulp, comes from Jayaashree Industries. It is turned into a mixture and poured into moulds. The mixture is then compressed into long strips, sealed with degradable material and sterilised before being wrapped and packaged. Priced at ₹ 43 for a pack of 10 napkins, the

### WHY ECO-FRIENDLY SANITARY NAPKINS

- BIODEGRADABLE
- LOWER COST
- NO CHEMICAL OR TOXIN COMPONENTS
- SKIN-FRIENDLY
- ACCESSIBLE TO RURAL WOMEN
- SOURCE OF INCOME FOR SMALL-SCALE MANUFACTURERS

finished product looks every bit like the commercially produced one. "While pricing the product, we chose to only include the cost of raw material and not our labour," says Girija Kesavan, one of Kanika's members. Around 20 members of the NGO are engaged in making sanitary napkins; as they are silvers, the team keeps their schedule flexible. "We work in shifts and produce around 200 packets a month," says Indira Unni, another active member. "We are happy to work on our own and have thus never thought of expanding by way of employing people or creating job opportunities."

Of the 200 packets produced every month, most of them are distributed free on a charitable basis. "There's very little





## BREAKING THE TABOO

Women's health, sanitation and hygiene have been largely ignored in India, and bringing them into focus has largely been the preserve of private initiatives and global bodies like UNICEF. Just how backward are we in this area?

A 2011 survey conducted by A C Nielsen on behalf of UNICEF in rural Bihar and Jharkhand revealed these disturbing results: only 12 per cent of women in India use sanitary napkins; the remaining 88 per cent use old rags, leaves, newspapers, even sand, during their periods. Lack of menstrual hygiene thus leads to 70 per cent of women suffering from skin infections.

Over the years, NGOs, sometimes along with government agencies, have been trying to make a difference by raising awareness on menstruation and distributing low-cost sanitary napkins in different parts of the country. Some, like Arunachalam Muruganatham and Kanika, have gone a step further and are manufacturing an eco-friendly product.

It was, therefore, a shot in the arm when the Central Government unveiled the Menstrual Hygiene Management Guidelines in December 2015, as part of its Swachh Bharat Mission. These guidelines outline what needs to be done by state governments, district administrations and schools to raise awareness on menstruation.

"The Central Government has taken up menstrual hygiene as a priority issue for improving the reproductive health of women," says Dr Beena K V, Public Health Consultant, Amritha Hospital, Ernakulam. "The Government is now focusing on teenagers. More and more NGOs are supporting this movement by helping set up sanitary napkin vending machines in many schools in Kerala where students can get napkins priced at ₹ 2 per pad. Some NGOs are also helping set up incinerators in schools."

money coming from the sale of napkins," reveals Gopalan. "Besides, our costs include rent and the electricity bill. However, we are slowly beginning to recover our cost by way of donations from members and well-wishers."

Word about the quality and low price of Soukhyam sanitary napkins is slowly spreading and the venture has started to attract some regular buyers, including the women in their own families. "There are two men who buy some packets to be distributed in their neighbourhood, through Kudumbashree units [a community organisation run by the Kerala government]," adds Gopalan.

As for the women who use them, they say the product is life-changing. Bindu R, 37, who works with Kanika in her free time, reveals, "Before I switched to Soukhyam, I had been using the traditional cloth pad regularly, and commercial pads when travelling. Now, I find these napkins very comfortable. Except for the blue plastic shield, all the other materials used are natural. The only drawback is that Soukhyam's napkins don't have wings. But we are now trying to incorporate this design element."

Shameem A T, an accountant, is very grateful to this small band of women change-makers. For years, she had been suffering from a skin rash, an allergic reaction to almost

all the brands of sanitary napkins produced commercially. When she switched to Soukhyam four months ago, she was astonished. "Earlier, every month, I would visit the skin specialist and gynaecologist," she says. "The eco-friendly nature of these handmade sanitary napkins has caused the allergy to subside."

It's not only women like Shameem whose lives are enriched. Gopalan points out that Kanika's Soukhyam venture is in keeping with the motto of the NGO: 'Life begins at 50'. It is meant to give meaning to the silver women of Kanika, which started as the Thrissur chapter of the All India Women's Conference, six years ago.



## EXCLUSIVE COLUMN

# Rights of a river

Jagdish Krishnaswamy calls for a paradigm shift in the management of our rivers

**T**he rights of nature have been part of many spiritual and cultural discourses and texts for over a thousand years in India and elsewhere. In the face of large-scale appropriation and modification of natural processes, resources, natural spaces and destruction of ecosystems, especially in the past few hundred years, the focus on the rights of nature and natural entities has recently been renewed in India and abroad because of a few key developments.

Ecuador was the first country to recognise the rights of nature in its Constitution by including a chapter, *Rights for Nature*. The country redrafted its Constitution in 2007-2008, which was subsequently ratified by a referendum by the people in September 2008. Rather than treating nature as property under the law, *Rights for Nature* articles acknowledge that nature, in all its life forms, has the "right to exist, persist, maintain and regenerate its vital cycles. And we, the people, have the legal authority to enforce these rights on behalf of ecosystems". The ecosystem itself can be named as legal defendant, although local communities can also intervene.

This was followed by New Zealand, where, for the first time in the history of nations, on 16 March 2017, a river was granted the same legal rights as a human being. After the longest legal battle in the country's history, Te Awa Tupua, a river revered by the Whanganui Maori tribe, was recognised as a living entity with all the rights, duties and liabilities of a legal person. Two custodians—one from the government and another from the tribe—have also been appointed for the river.

Just five days after this judgement, on 21 March, the High Court of Uttarakhand made a landmark judgement by declaring the Ganga and Yamuna as living entities. In sharp contrast to the New Zealand case, the court allowed the director-general of the Namami Gange project, the Uttarakhand chief secretary and the advocate general of the state of Uttarakhand, who are government functionaries with no

civil society representative, the right to represent the rivers. However, the court is likely to entertain petitions filed on behalf of the river by any citizen or institution. Any further development will be watched very keenly by all those worried about threats to the river from development projects.

Any alert observer who has had the opportunity to walk, pray, bathe, boat in, or camp by undeveloped and unpolluted rivers in India will appreciate the complex spatial and temporal dimensions of our Indian river heritage. The diurnal, seasonal and inter-annual cycles and variability, and shaping of the flood plains and valleys by thousands of years of monsoonal flows and sediment from hills and mountains, have created ecological, cultural and economic opportunities that change and evolve, but need continuous replenishment from flowing water and the sediment it carries.

Like many other countries, India has had to abstract water and transform many rivers to support irrigation, hydro-power, industry and the needs of growing cities and towns, and will continue to do so. Our rivers are currently undergoing and proposed to undergo massive transformations of their hydrology and ecology that, if not modified or mitigated, will convert many of them into utilitarian conduits and canals for conveying regulated water and transport of goods, and potentially destroy or degrade their geomorphologic and ecological attributes. Between river linking and the inland waterway schemes, the unique attributes of these rivers will be severely challenged by activities such as abstraction and inter-basin transfer of water, massive dredging of sediments, removal of islands, and large-scale concretisation of river banks.

Our national anthem mentions two of our rivers by name: a tribute to their distinct cultural, spiritual, geomorphologic and ecological attributes. To convert such diversity and complexity into mere channels for conveying water and goods could impair their ability to sustain these rivers as living and breathing ecosystems. The narrow vision of engineers and developers that is sucking the water, sand





## CONTINUOUS FLOW OF WATER AND SEDIMENT IS INTEGRAL TO THE CONSERVATION OF ENDANGERED SPECIES SUCH AS THE GHARIAL AND SOME WATER BIRDS IN THE CHAMBAL RIVER

Jagdish Krishnaswamy

and the very life out of every river before it reaches the sea for short-term economic gains should be replaced by a scientific, sustainable and socially inclusive approach that respects the river and its inhabitants.

Some might argue that many of our rivers are already regulated by dams and barrages, and so further transformations may not be problematic. This paradigm is flawed because we have observed that with whatever regulated flow and the sediment that is available, the rivers are still able to sustain biodiversity and ecosystem services for people downstream. For instance, at Son in Madhya Pradesh, one of the last few remaining breeding sites for the endangered Gharial and the Indian Skimmer, we were able to demonstrate that even the regulated flow from the Bansagar Dam could be adapted to sustain the breeding of both species. So, regulated rivers as well as unregulated ones should have the same rights as injured and physically challenged people, or sometimes more rights under the law compared to healthy human beings.

What might be the 10 legal rights of a river as a 'natural' person in the Indian context, which could be the basis for legal and other interventions by civil society and governments to conserve our last remaining riverine ecosystems? How do we specify the rights of India's few remaining rivers and their ecosystems? How do we ensure their rights to exist, persist, maintain and regenerate their vital cycles? We could make a charter of a river's rights by focusing on specifics. These could include the right to:

- Reach the sea and form estuaries and deltas
- Have ecologically meaningful flows in all seasons including floods and dry-season base-flows
- Maintain natural geomorphologic and ecologically important features such as meanders, mid-river islands and oxbow lakes at least in some stretches

- Carry and deposit sediment for sustaining ecology and environmental functions, including maintaining water quality and habitat for biodiversity and humans
- Maintain its own unique biodiversity without introduction of alien and potentially harmful species
- Minimum standards of water quality along the entire length fit for bathing, swimming and maintaining diverse fish communities
- Have sufficient fish to sustain artisanal fisher folk who reside on banks
- Retain the diverse natural attributes that are of great cultural and ecological significance to people residing on banks
- Have its own distinct geomorphologic, ecological and spiritual identity from headwaters to delta, which should not be disrespected, erased or diluted by insensitive development projects
- To exist, evolve and persist, share waters, ecological and economic wealth in an equitable and sustainable manner for the benefit of all

We need to bring engineers, ecologists, climate, agriculture and water resource specialists together to come up with guidelines to manage regulated rivers and operate dams and barrages to maintain the integrity of rivers. This will need savings of water in all sectors and sustainable extraction of sand. And for the remaining few unregulated rivers, we need careful scrutiny and adoption of precautionary principles before embarking on any development.

The recent judgement on the legal rights of rivers and river conservation projects such as Narmada Seva Mission, launched by Prime Minister Narendra Modi in Madhya Pradesh, offer hope for reviving and restoring India's great rivers. Indeed, the need of the hour is a paradigm shift in our river management policies. It's time to act.

*The writer is an ecohydrologist and landscape ecologist*



## EXCLUSIVE COLUMN

# Living in harmony

Celeb animals tell **Ranjit Lal** their side of the story on World Environment Day

**A**part from being at loggerheads with each other, we, the human species, seem to be clashing horns with most members of the animal kingdom that share our environment with us. Here, to commemorate World Environment Day, various celebrity animals put their point across and suggest ways by which we can live in harmony with them.

**Harmony:** Let's start with you tigers! You must be happy that your numbers are rising so fast thanks to Project Tiger. There was a recent report that one serial tiger mom has had over 25 cubs....

**Tigers:** Oh sure, and not to mention expressways passing through our bedrooms and vast swimming pools being constructed for us by linking rivers.... Are they also part of Project Tiger? And yes, it's so wonderful in national parks and sanctuaries to be surrounded by 50 or more gypsies, crammed with humans shouting and yelling and exuding clouds of BO and halitosis. All they want is to see us and take selfies: why the heck don't they go to the zoo for that? And let it be known: we do not tolerate selfies. We demand one tourist—preferably all fat—per selfie.

**Sloth bear:** At least they want to see you. No one comes looking for us. That's why we have to charge at them with slavering jaws and demonic roars!

**Chital:** You guys have anger management issues. As for us, all they want is to watch us being chased and being brought down by *Sherji* over there.... They should ban venison too: those guys seriously need to go vegan, like right now!

**Blackbuck:** Yeah, but that's part of the natural system. Look at what happened to us. We gave cheetahs a run for their money, so you humans got rid of cheetahs. Now we have celebrities getting after us. Are you going to get rid of them?

**Harmony:** But you have to admit it hasn't been all bad. Look at the kind of protection rhinos are being given, almost like what the PM gets. Shoot-at-sight orders for poachers and whatnot....

**Rhino:** And why? Because you imbeciles all over the world believe you can have even dizzier honeymoons if you consume our horns and are busy ripping them off us. You've already overrun the world and are supposed to be the smartest of all living things. May we point out: our horns are made of compressed hair and the only thing you get by eating hair is a hairball!

**Elephant:** As for us, you say we're hugely intelligent and have incredible memories and then you pull out our magnificent tusks to carve pretty dolls. I mean one could understand if you took our brains and swapped them for your own pathetic ones!

**Rhino** [grinning]: Not to mention they use your legs for wastepaper baskets and tails for flywhisks. How dignified is that!

**Wild boar** [snorting]: And we're declared vermin. We can be shot any time—even here. And everyone knows how delicious we are! Even we do.

**Tiger** [licking his chops]: Don't remind me!

**Monkeys:** Yeah, but look at you wild boars: a sight for sore eyes what with all those bristles and tusks and rooting about in the mud. But they've declared us monkeys as vermin too. I mean us! For God's sake, we're just like them. Go to a zoo and stand outside the monkeys' enclosure and you won't be able to tell whether the monkeys are outside or inside! We make faces, they make faces, we grunt and glare, they grunt and glare...they smoke and they give us cigarettes and *beedi* and matches....



**Lion:** [Huffily] I think we've been insulted the most! Everyone calls us Indian loins, not Indian lions. Indian loins are wimps; let me demonstrate. [The fellow growled and our correspondent had to rush to the bathroom pretty quick.]

**Harmony:** Now, now, there's no need to get agitated. Cool down *ji*; a glass of sherbet?

**Leopard:** Heh, heh, actually we have plans for you humans. We're moving into the suburbs. You may mob us and beat us but we'll still be coming. Remember, when you're sleeping, we may be sneaking in, licking our chops, thinking about your children and Pomeranians!

**Ant:** You guys are just too big for your own good. Look at us: Trillions of us, weighing more than all humans in the world. And when our armies march.... So if you humans want to live peaceably with us, watch where you put your feet.

**Cockroach:** But hey, first you guys have to stop fighting among yourselves. Not that we mind. Just remember, after Armageddon we'll be the ones inheriting the earth. Now think about that as a legacy! What will folks on other planets think?

**Crocodile:** I don't get why you guys first scream with horror and call us gross and ugly, and then make fancy handbags out of our hides for your ladies.

**Harmony:** So how do you think we can develop a better relationship between us?

**Animals:** Just keep one thing in mind: we run the world. If you get rid of us, you'll go down too. You guys called it MAD, or mutually assured destruction. But if we get rid of you, the world will just go on and be a better place for it. So you can see the temptation for us.

**Harmony:** But there are so many animal and nature lovers in the world, people who have dedicated their lives to studying you and saving you and photographing you, and putting you on National Geographic and Discovery and Animal Planet.

**Animals:** Sure, with programmes called *Animal Fight Club* and *Wild Killers*, and so on. Matters between us will only im-

**“WE RUN THE WORLD. IF YOU GET RID OF US, YOU’LL GO DOWN TOO. BUT IF WE GET RID OF YOU, THE WORLD WILL JUST GO ON AND BE A BETTER PLACE”**

prove when all of you become like us. Then, we'll agree you may have a case. At the moment we're just biding our time. So as you can see, you guys have your work cut out.

**Harmony:** Thank you for this very enlightening discussion. I'm sure we'll be talking about it again, next year, when World Environment Day comes around once more.

123RF.com



*The writer is an author of fiction and non-fiction for children and adults who are children*





A tigress on the move



# BEAUTY AND THE BEAST

The big cat aside, there is plenty at Jim Corbett National Park for those who wish to walk on the wild side, write **Gustasp & Jeroo Irani**

Photographs by Haresh Patel



**T**he chatter of birds and insects filled the silence of the forest as we waited patiently for the star to make his grand entrance. The rays of the rising sun filtered through the trees and cast mysterious shadows on the unpaved road lined with 10 to 12 safari vehicles. With cameras poised and necks craned we waited expectantly for the big moment. And waited.

“Let’s move on,” we whispered to our driver-guide. “But the tiger? He could emerge any minute now,” he protested. “Or not at all,” we interjected. We had been lucky with a prized tiger sighting the previous day on an elephant safari and were keen to meet the other residents of Corbett National Park, one of India’s finest wildlife reserves and the launching pad of the Project Tiger conservation project. We considered ourselves lucky when the tiger, a handsome beast in its prime, emerged growling from the bush and walked a good 10 yards in front of our elephant. It then stopped, turned and snarled its displeasure at us before it strode into the thicket once more, its striped tail waving farewell as it disappeared. But there is more to a Corbett safari than just tiger sightings.

Our driver-guide turned the vehicle, reluctantly we might add, and cruised down dirt roads that snaked across 520 sq km of stately sal forests and rolling grasslands crisscrossed by gushing silver streams and emerald rivers. Later, he would admit that it was a wise move for we were rewarded with close encounters of the amazing kind. A pair of foxes, a curious sambar fawn that did not flee from our approaching vehicle, a jackal scurrying across a wood bridge that straddled a silvery stream, a rare yellow-throated marten leaping over the undergrowth in pursuit of its prey, herds of deer skipping like ballerinas across a grassy meadow, a family of wild boar.... We stopped to let a herd of elephants cross our path and delighted at the sight of a baby manage its little uncoordinated trunk.

The birds, too, were amazing. Bee-eaters plucking insects in mid-flight; kingfishers poised to strike at fish swimming near the surface of a stream; noisy, long-legged lapwings marking out their territory; serpent eagles scanning the forest floor for a breakfast treat; strutting jungle



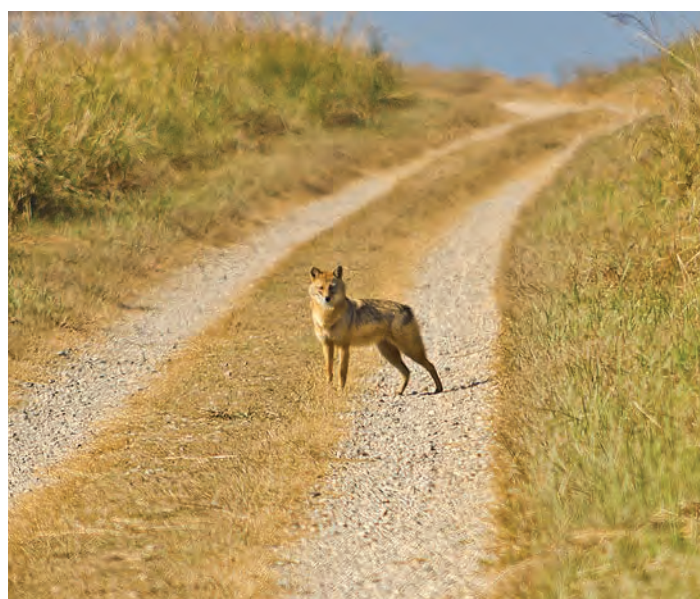
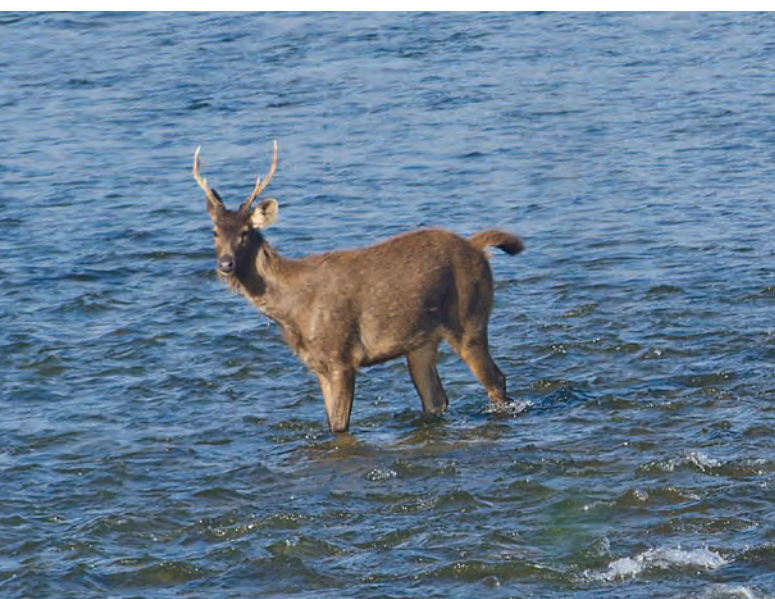
Clockwise from top: A spotted deer strolls across the vehicle pathway; a jackal stops in its tracks as it notices onlookers; a male sambar deer crosses the Ramganga river, the lifeline of the park

fowls with colourful plumed tail feathers; Indian rollers; wagtails; fantails; sunbirds.... Even if there were no mammals, Corbett, which boasts of hosting over 550 species of birds, would be one of the finest birding sites in the country.

When we rolled into the Forest Department’s lodge at Dhikala, located deep in the heart of the park, the camp was buzzing with excitement. A tigress with two cubs had been spotted



**Our driver-guide turned the vehicle, reluctantly we might add, and cruised down dirt roads that snaked across 520 sq km of stately sal forests and rolling grasslands crisscrossed by gushing silver streams and emerald rivers**



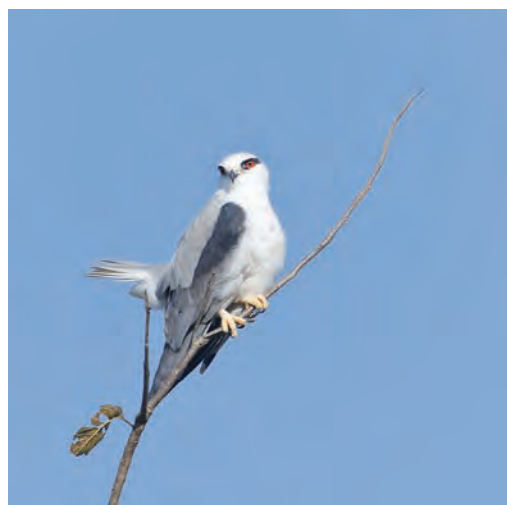


On an elephant safari the previous day, we were keen to meet the residents of Corbett National Park.... On our way we stopped to let a herd of elephants cross our path and delighted at the sight of a baby manage its little uncoordinated trunk





A crested hawk eagle perched on a branch with its kill (left); a majestic black-winged kite keeps a lookout  
Opposite page:  
A wild tusker elephant walks leisurely towards the tourist jeep



just outside its fenced boundaries and there was much jostling and shoving as guests hoped to catch a glimpse of them. At one point, forest guards had to remind three overeager young lads that they were not in a zoo and that death stalked the wilds. Yes, tiger sightings are an all-consuming obsession.

We did get to see big cats up close and personal with only a glass panel separating us from these magnificent beasts. This was at Dhangarhi Museum at the visitor centre at the entrance gate of the park where stuffed tigers and leopards were put on display. Many of these were man-eaters shot by naturalist Jim Corbett, after whom the park is named.

Later, we checked into Leisure Hotel's picturesque Riverview Retreat, located just outside the entrance of the park, which sprawls luxuriously over 8 acre. We sat for a while on the private sit-out of our cosy cottage overlooking the river and then set off on a nature walk along the banks of the river Kosi that flowed outside the resort. A family of turtles sunbathed on an arm of driftwood washed by waters that fielded the reflections of the forest that draped the slopes of the surrounding hills. Brilliantly plumed birds fluttered about, hopping between rocks polished smooth by the river. We crossed a frail wood bridge to the base of a flight of steps that led up to a shrine perched on the summit of a river island.

And then we heard a roar in the depths of the forest on the far bank of the river. Was that the

## FACTFILE

### GETTING THERE

- **By air:** Jolly Grant, Dehradun, is 156 km away.
- **By rail:** The closest railhead is Ramnagar, 10 km from the park.

### ACCOMMODATION

- The Forest Department's rest house at Dhikala is 60 km inside the park. The Forest Department also runs tourist rest houses at four other locations within the park. For details, visit [www.corbettnationalpark.in/forest\\_rest\\_houses\\_popup.htm](http://www.corbettnationalpark.in/forest_rest_houses_popup.htm)
- Leisure Hotels' tented camp, Hideaway River Lodge, is the only private lodge within the park. All private hotels and lodges, including Leisure Hotel's Riverview Retreat ([www.leisurehotels.co.in](http://www.leisurehotels.co.in)), are located on the fringe.
- Senior citizens above 60 years are entitled to 50 per cent discount on entry fee, guided bus trip, elephant ride, room rent and museum charges.

### ELEPHANT SAFARI

Elephant safaris are organised within the park from Dhikala (for guests staying at the lodge) and Bijarani (for other visitors). For more information, visit Uttarakhand Tourism at [uttarakhandtourism.gov.in](http://uttarakhandtourism.gov.in)

growl of a hungry man-eater on the prowl? It was more likely the rumble of thunder but we were taking no chances and hurried back to the safety of our resort. As we warmed our hands around a bonfire that blazed as dusk fell, we realised that Corbett, raw and beautiful, had added our imagination. 🌟



# Extinction

Scotland's national poet  
**Jackie Kay** (born 9 November  
1961) urges readers to make  
amends before life is endangered

We closed the borders, folks, we nailed it.  
No trees, no plants, no immigrants.  
No foreign nurses, no Doctors; we smashed it.  
We took control of our affairs. No fresh air.  
No birds, no bees, no HIV, no Poles, no pollen.  
No pandas, no polar bears, no ice, no dice.  
No rainforests, no foraging, no France.  
No frogs, no golden toads, no Harlequins.  
No Greens, no Brussels, no vegetarians, no lesbians.  
No carbon curbed emissions, no CO2 questions.  
No lions, no tigers, no bears. No BBC picked audience.  
No loony lefties, please. No politically correct classes.  
No classes. No Guardian readers. No readers.  
No emus, no EUs, no Eco warriors, no Euros,  
No rhinos, no zebras, no burnt bras, no elephants.  
We shut it down! No immigrants, no immigrants.  
No sniveling-recycling-global-warming nutters.  
Little man, little woman, the world is a dangerous place.  
Now, pour me a pint, dear. Get out of my fracking face.

*Extinction was featured in 20 original poems on the theme of climate change curated by the UK's poet laureate Carol Ann Duffy in 2015*



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# Step up, act now

William M Briggs suggests ways to go carbon neutral

In an interview, Stephen Wright [American stand-up comedian] shared his favourite joke: *You never know what you have until it's gone, and I wanted to know what I had, so I got rid of everything.* He lamented, "I really like that one, but it didn't really get a laugh."

Every comedian has a story of a beloved joke that never gets a laugh, and of other quips that everybody inexplicably likes.

I tell you this my friends because I worry about you. My number two son and I posted a "story" about Zombie Attacks Increasing Due to Global Warming, and the thing is linked at hundreds, and at a growing number, of websites. But the next day's post—in my opinion, my most hilarious—about people wilfully turning themselves into Soylent Green to battle climate change didn't even rate a chuckle. Many of you even took it seriously! You can't go wrong with Zombies, I guess.

The posting on the Soylent Corporation's government contract to encourage people to Go Home—i.e. commit suicide—to reduce their "carbon footprint" was, of course, a satirical observation on the zany lengths to which people will go when swayed by ideology. But it actually wasn't too far off the mark.

How do I know this? Well, according to this fine article by environmental scientist Brad Allenby, a "recent study from the Swedish Ministry of Sustainable Development argues that males have a disproportionately larger impact on global warming" because "women cause considerably fewer carbon dioxide emissions than men and thus considerably less climate change". So we need fewer men.

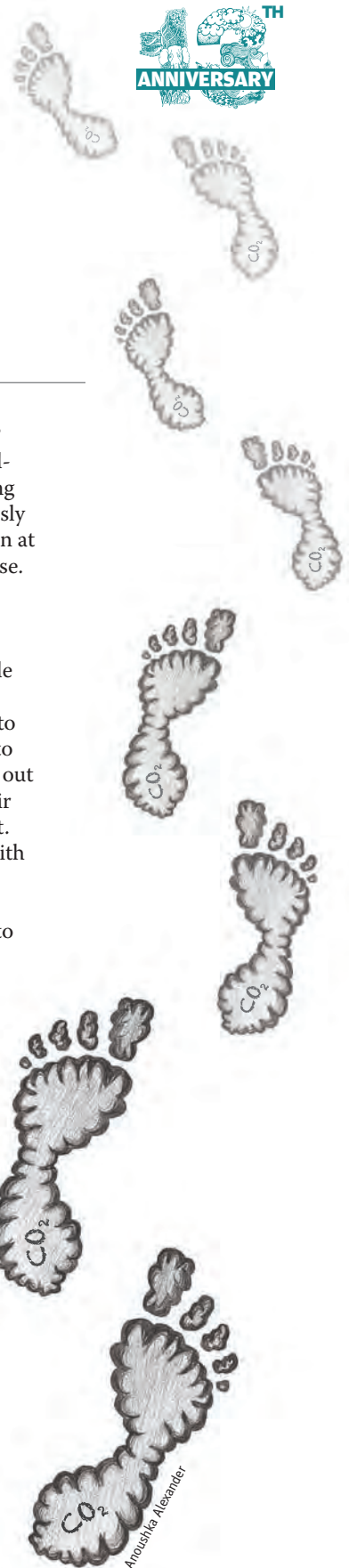
Think the worst of sins is driving an SUV? Not a chance. Being obese and having children also up people's carbon output. Eating meat is bad, too. These behaviours obviously have to be curtailed, if not voluntarily, then at some point by force—force of law, of course.

It might not come to that. There might be enough deeply concerned volunteers to pull the load for the rest of us. Says humble citizen Erik Daehler in an article about how we can all do our part, "You do have to sacrifice. I think a lot of people are going to have to soon assess themselves and figure out that what they give up now may allow their kids to have it, or their kids' kids to have it. It's sort of a selfish relationship we have with the environment right now."

But even reducing your carbon footprint to zero and living a so-called carbon neutral life may not be enough, according to the director of the Natural Resources Defense Council's climate change program, John Steelman. "You can take yourself out of the equation," he said.

Yet another citizen said he won't wait for politicians to act. "Everybody has to realise they have personal responsibility," he said. "They can't just wait for the government or the corporate world to do something about it. If everybody could strive to be carbon neutral, this would be a greater world."


It's never too long these days before reality overtakes parody, so I should take my own advice and leave well enough alone, before somebody *does* think "Going Home" is a good idea.



Anoushka Alexander

Writer, philosopher and itinerant scientist, Briggs is the author of *Uncertainty: The Soul of Modeling, Probability & Statistics*



A photograph of an elderly man with a grey beard and a young girl with dark hair playing in a pond. The man is in the water, wearing a dark shirt, and the girl is sitting on a wooden dock, wearing a white dress. They are both smiling and looking at each other. The water is dark blue and the dock is made of wooden planks.

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## 13 words that turn 13 and have made it into our vocabulary

### Franchise terrorism

*n.* Terrorism carried out by people hired or inspired by, but who have no formal contact with, a separate terrorist organisation.

**Example:** In this new phase of **franchise terrorism**, al-Qaeda has been described as an idea rather than an organisation—"a global movement infected by al-Qaeda's radical agenda", as Mr Tenet put it. Even if its structure has been disrupted by military action, arrests and increased security, it still acts as an inspiration to groups, from Chechnya to the Palestinian territories that have minimal contact with the network.

—Raymond Whitaker, "Bin Laden hunt stepped up",  
Canberra Times, 22 March 2004

### SHOUTING HEAD

*n.* A loud and aggressive person, particularly one who is a television pundit or commentator.

**Example:** In March, Bill O'Reilly, **shouting head** for Fox News, demonstrated his absolute certainty that Americans would find weapons of mass destruction in Iraq by declaring on *Good Morning America*, "If the Americans go in and overthrow Saddam Hussein and it's clean, he has nothing, I will apologize to the nation, and I will not trust the Bush administration again."

—Jonathan Chait, "News Guarantees",  
The New York Times, 14 December 2003

### Social networking

*n.* Using a website to connect with people who share similar personal or professional interests, particularly where the people in the site's database are connected to each other as friends, friends of friends, and so on.

**Example:** The digerati are anointing **social networks**, of which Friendster is the early leader with more than 4 million registered members, with lofty monikers like "Internet 2.0" and "the people web". If the Internet's first stage, they say, was about publishing what people know, this next stage is about exploiting who people know.

—Chris Gaither, "Six Degrees Co", The Boston Globe, 7 December 2003

### Ctrl-Alt-Delete

*n.* A metaphoric mechanism with which one can reset, restart, or rethink something.

**Example:** Wouldn't it be nice if whenever we messed up our life, we could simply press **Ctrl-Alt-Delete** and start all over again?

—"Let it out", The Indianapolis Star,  
8 September 2003

### UNIBROW

*n.* Eyebrow hair that also appears above the nose, giving the appearance of a single, continuous eyebrow.

**Example:** Many men dismiss their own unruly nose hairs, he says, but would be freaked out by a woman with a "full-on nose bush." So get rid of the double standard and trim, he says. And divide and conquer that **unibrow**. Remember, Douglas says, "two eyes, two eyebrows!"

—Brenda Moore, "Men learning it's OK to take care of their looks, feelings",  
Monterey County Herald, 2 March 2004

### Fat tax

*n.* A tax imposed on foods that are deemed to be unhealthy, particularly those that contribute to obesity and other health problems.

**Example:** A recent study in the *British Medical Journal* found that a **fat tax** could help prevent up to 1,000 premature deaths from heart disease a year in the UK. GPs argued that the tax would help to cover the high cost of treating obesity and might change people's behaviour.

—David Charter & Sam Lister, "Junk food under attack by **fat tax**", The Times (London), 19 February 2004



## Podcasting

*pp.* Publishing audio feeds that people can subscribe to and have transferred to an iPod or other digital audio player.

**Example:** Mr Klass's month-old program is hardly a conventional radio show. For starters, it isn't broadcast on any of the nation's airwaves. Instead, Klass transmits his show in a format called **podcasting**, a new Internet-based medium that has the potential to revolutionise the content of traditional radio as well as reshape our listening habits.

—*Stephen Humphries, "Podcast' your world", Christian Science Monitor, 10 December 2004*

## Wardrobe malfunction

*n.* A problem with a part of one's clothing; an error in fashion judgment.

**Example:** Before taking the January News Quiz, please make sure you aren't experiencing a **wardrobe malfunction**. (In other words, check your zipper.)

—*"Of Mars, Tassels and Canad Inns' hotel", Grand Forks Herald, 3 February 2004*

## SUPERCENTENARIAN

*n.* A person who is at least 110 years old.

**Example:** Today, [Opal] Neerman and her family will celebrate her 110th birthday, about as close to immortality as the human species will allow. There are only 45 people living worldwide who are verified to be as old as Neerman. It's an elite club she is joining, the **supercentenarians**.

—*Jeff Kuerth, "I don't feel 110—more like 99," says birthday girl", Orlando Sentinel, 18 December 2003*

Source: [www.wordspy.com](http://www.wordspy.com)

## Hyper-parenting

*n.* A child-rearing style in which parents are intensely involved in managing, scheduling, and enriching all aspects of their children's lives.

**Example:** We live in an age of **hyper-parenting**, where a child is the ultimate validation of an adult's ego and the little time they have to spend with them must be "quality time". There is little room for deviance, boredom or unplanned curiosity in the modern child's routine, especially when the parents return home from long hours at work.

—*Tanveer Ahmed, "When drugs mask our society's failings", The Age, 30 April 2004*

## Living bandage

*n.* A bandage or dressing made from skin cells, particularly cells cultured from a sample of the patient's skin.

**Example:** Thousands of patients with severe burns and long-term wounds could soon be helped by **living bandages** made from their own skin cells, doctors said today. The Myskin bandages, which have taken 10 years to develop, are made by taking a sample of a patient's skin, growing the cells in the lab and then placing them onto specially made discs.

—*Lyndsay Moss, "The bionic bandage", The Evening Standard, 27 April 2004*

## BRICs

*n.* The countries of Brazil, Russia, India, and China viewed as a group of emerging economies with large potential markets.

**Example:** Standard Life believes that, by 2050, China will be the second largest market in the world, with 25 per cent of global capitalisation while India will have 10 per cent. The stock markets of the **BRICs** (Brazil, Russia, India and China) could collectively be as large as the US, Japan, the UK and Germany put together.

—*"Time to be bullish over China stocks", Investment Adviser, 9 February 2004*

## SMARTPHONE

*n.* A mobile phone that includes many of the same features as a personal computer, particularly Internet access and apps such as a calendar and address book, a camera, sensors, and antennae for technologies such as Wi-Fi and GPS.

**Example:** The Internet is crawling with viruses, and now one worm has even inched its way onto wireless mobile phones. The new Cabir **smartphone** worm is thought to be the first pest that spreads itself from phone to phone by means of the bluetooth wireless technology.

—*J D Biersdorfer, "Worms like wireless phones, too", The New York Times, 24 June 2004*

# THE NUMBER THIRTEEN

**THE  
BEGINNING OF  
TEENAGE**

A trecena is a 13-day period used in pre-Columbian Mesoamerican calendars; the calendar is divided into 20 weeks of 13 days each

**IN A RUGBY  
LEAGUE, EACH  
SIDE HAS  
13 PLAYERS  
ON THE FIELD**

13 Archimedean  
solids in geometry

**THERE ARE 13 LUNAR  
MONTHS IN A YEAR**

**THERE ARE  
13 RED AND  
WHITE STRIPES  
IN THE FLAG  
OF THE US,  
REPRESENTING  
THE 13 ORIGINAL  
STATES**

A baker's dozen  
has 13 bread  
loaves (instead  
of the standard 12)

In the standard  
52-card deck of  
French playing cards,  
there are four suits,  
each of 13 ranks

13 is the smallest  
emirp (a prime  
number that becomes  
a different prime  
when its decimal  
digits are reversed)

On a US \$ 1 bill, there are  
13 bars on the shield,  
13 leaves on the olive  
branch, 13 fruits,  
13 arrows and 13 stars  
above the eagle

13 is a lucky  
number in Italy.  
The expression *fare  
tredici* ('to do 13')  
means to hit  
the jackpot



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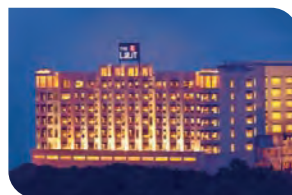
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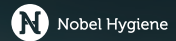
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