

THE RIVER'S LEDGER

A Human in the Loop Story



FOREWORD

Generative AI (GenAI) tools are expected to change many existing economic and social processes. It is often framed as a force for opportunity in India: driving innovation, bridging linguistic and digital divides, and enhancing public service delivery. When implemented responsibly, GenAI in India could foster meaningful progress and advancement, supported by the country's robust digital infrastructure, abundant technological talent, and vast, connected population.

However, alongside these opportunities lie profound risks. GenAI systems have demonstrated a troubling capacity to reproduce and amplify social biases, entrench sycophancy and drain environmental resources. If deeply integrated into our social infrastructure without adequate guardrails, these tools could inadvertently reinforce existing inequities, further marginalising communities already on the fringes of technological progress.

While some immediate impacts may be apparent, the long-term implications are not. Failing to anticipate future consequences early on may hurtle us toward harmful technology and policy lock-ins.

Human in the Loop, a project by the Digital Futures Lab (DFL) in partnership with Quicksand Design Studio and supported by Rohini Nilekani Philanthropies (RNP), aims to explore the complexities surrounding the unintended and long-term impacts of GenAI.

Grounded in participatory foresight methods and creative storytelling, this project brings together diverse voices and perspectives. Through workshops, expert consultations, and public engagement, we engaged deeply with those who both build and experience the impacts of these technologies.

We assembled a group of leading experts and practitioners to systematically identify the first-, second-, and third-order consequences of the dominant use cases of GenAI in the critical social sector. To facilitate this exercise, we scanned popular media and academic articles for emerging signals of change and used a Futures Wheel. This structured approach helped us connect short-term technological developments with broader, long-term societal impacts.

Foresight, however, is not solely the domain of experts; it must include public participation. To conclude this project, we issued a nationwide public call inviting people to submit short stories expressing their hopes and concerns about the future of GenAI in India.

The stories in Human in the Loop, that traverse various domains and themes such as agriculture, healthcare, judiciary, creative industries, environmental resources, AI companionship, and agentic AI, are not just speculative fiction; they are invitations to time-travel to the worlds we might be living in very soon. In an age where technology is evolving faster than our ethical, social, and ecological frameworks can keep pace, these narratives serve as guideposts of what could become of us. We hope that these stories cultivate a longing for futures that centre human dignity, planetary care, and equitable technological progress. Without such glimpses, we risk hurtling toward futures that do not serve us - futures more extractive, isolating, and unjust than the present.

This project would not have been possible without the dedication of our research team, our expert network, the creative brilliance of our art team, and the invaluable partnership with Quicksand Design Studio.

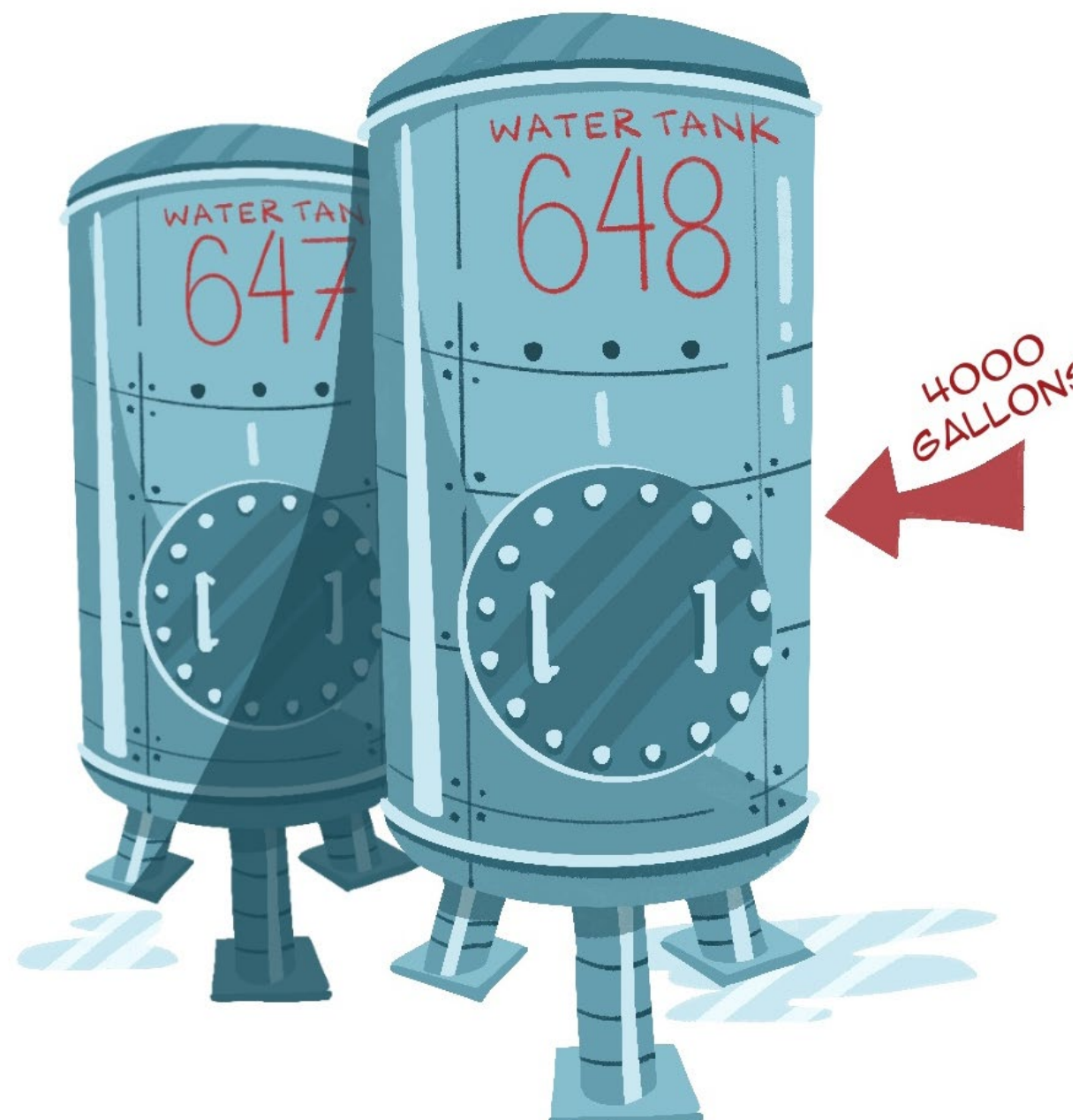
We extend our gratitude to the participants who responded to our open call.

Finally, we express our deepest appreciation to Rohini Nilekani Philanthropies for their support in making this initiative a reality.

VIKAS COLLEGE, 2030

IN A WORLD BECOMING INCREASINGLY DEPENDENT ON
GENERATIVE A.I., WE MEET A SLEEPY COLLEGE STUDENT.







SOMEWHERE IN THE HIMALAYAS, BEYOND WHERE HUMAN EYES CAN SEE, IN A CHAMBER DEEP WITHIN A REMOTE MOUNTAIN IN THE HIGHEST RANGES, FOURTEEN, ELUSIVE, LEGENDARY AVATARS OF INDIA'S MOST MIGHTY RIVERS COME TOGETHER.



FELLOW RIVER-FOLK, WELCOME TO THIS EMERGENCY SESSION OF THE JAL SABHA. IT BRINGS ME NO PLEASURE TO CONVENE THIS MEETING - I'M SURE YOU ALL KNOW WHY WE'RE HERE.

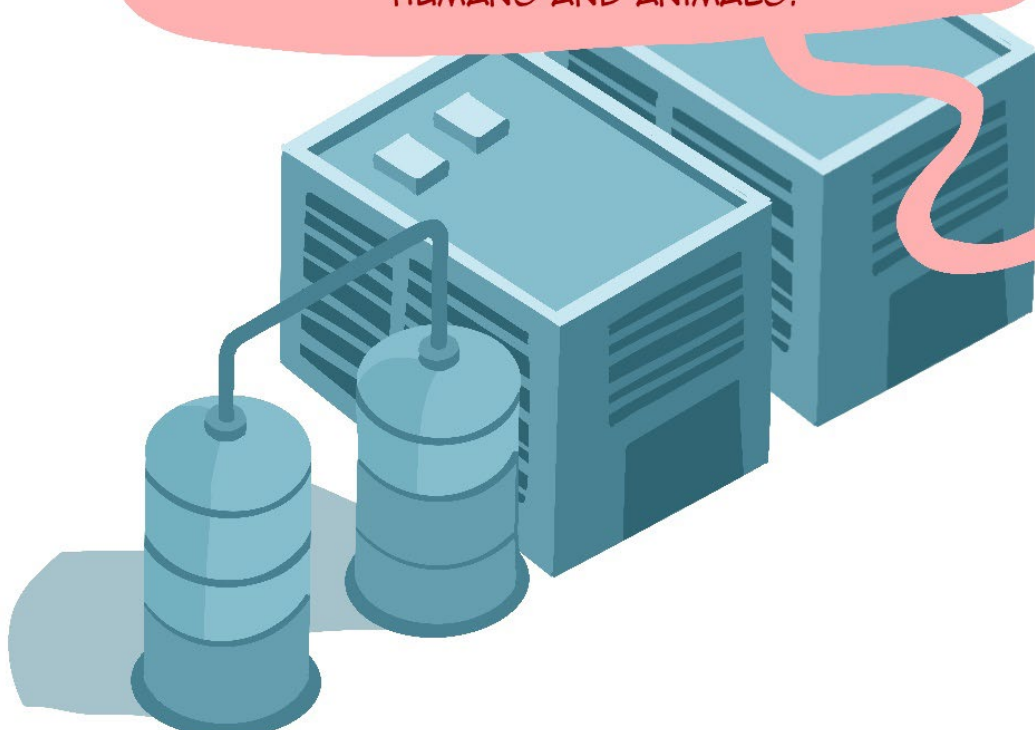


OVER THE PAST DECADE OR SO, THE HUMANS HAVE CREATED SOMETHING THEY CALL 'A.I.', A SORT OF SUPER COMPUTER, AS I UNDERSTAND, OR PERHAPS A SERVANT OF SORTS.



IN ORDER TO RUN THIS SYSTEM, THEY REQUIRE VAST QUANTITIES OF WATER FOR 'COOLING PURPOSES' AND TO CARRY OUT THE MULTIPLE DEMANDS THAT ARE MADE OF THIS 'A.I. SERVANT'. AS YOU ALL ARE TOO WELL AWARE, THIS WATER IS SOURCED FROM US, BUT NEVER RETURNED. MOST OF IT SIMPLY EVAPORATES AND BECOMES ONE WITH MOTHER OCEAN, RENDERING THE WATER USELESS FOR HUMANS AND ANIMALS.

...AND SEVERELY HARMING OUR KIND.



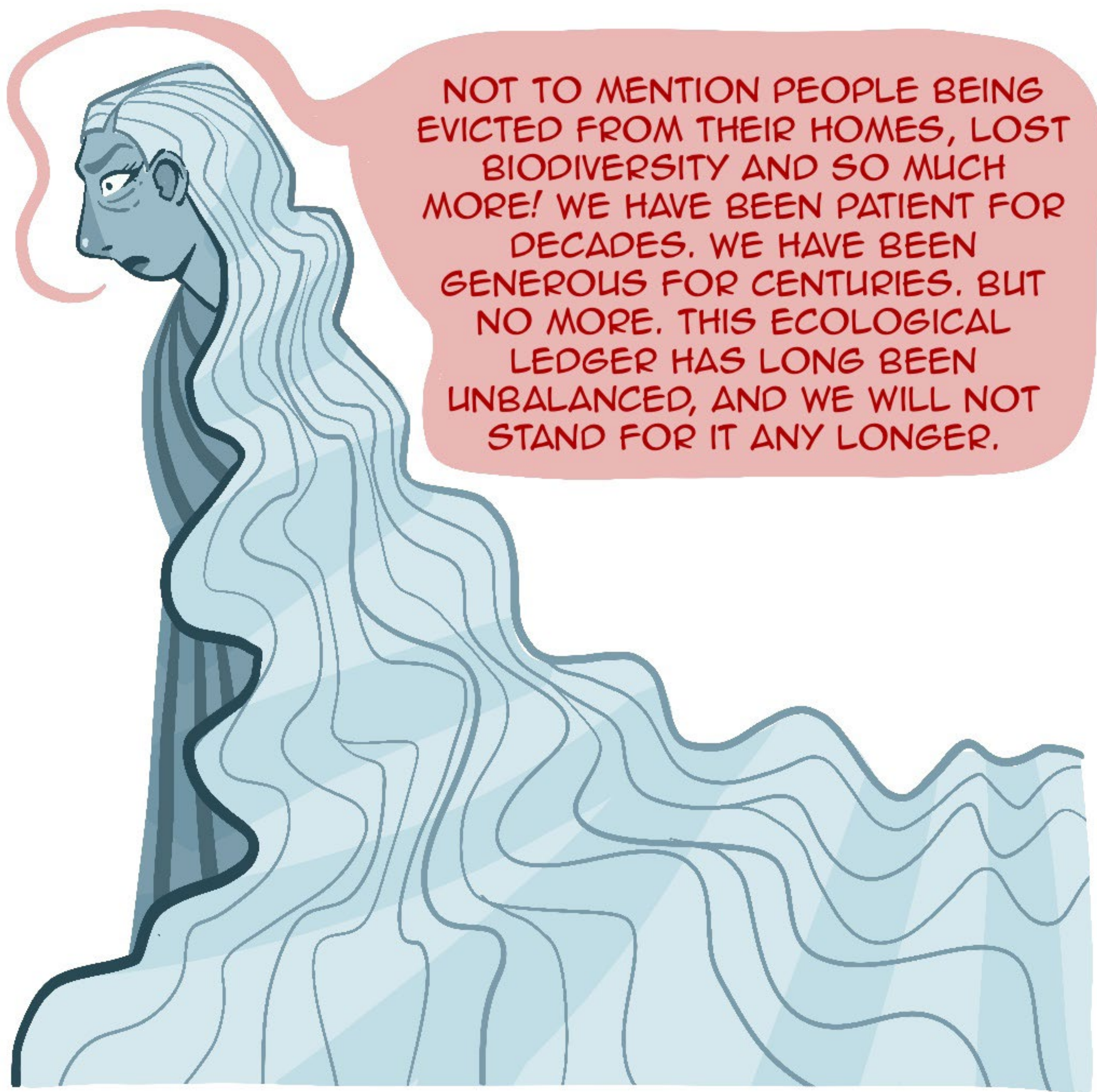
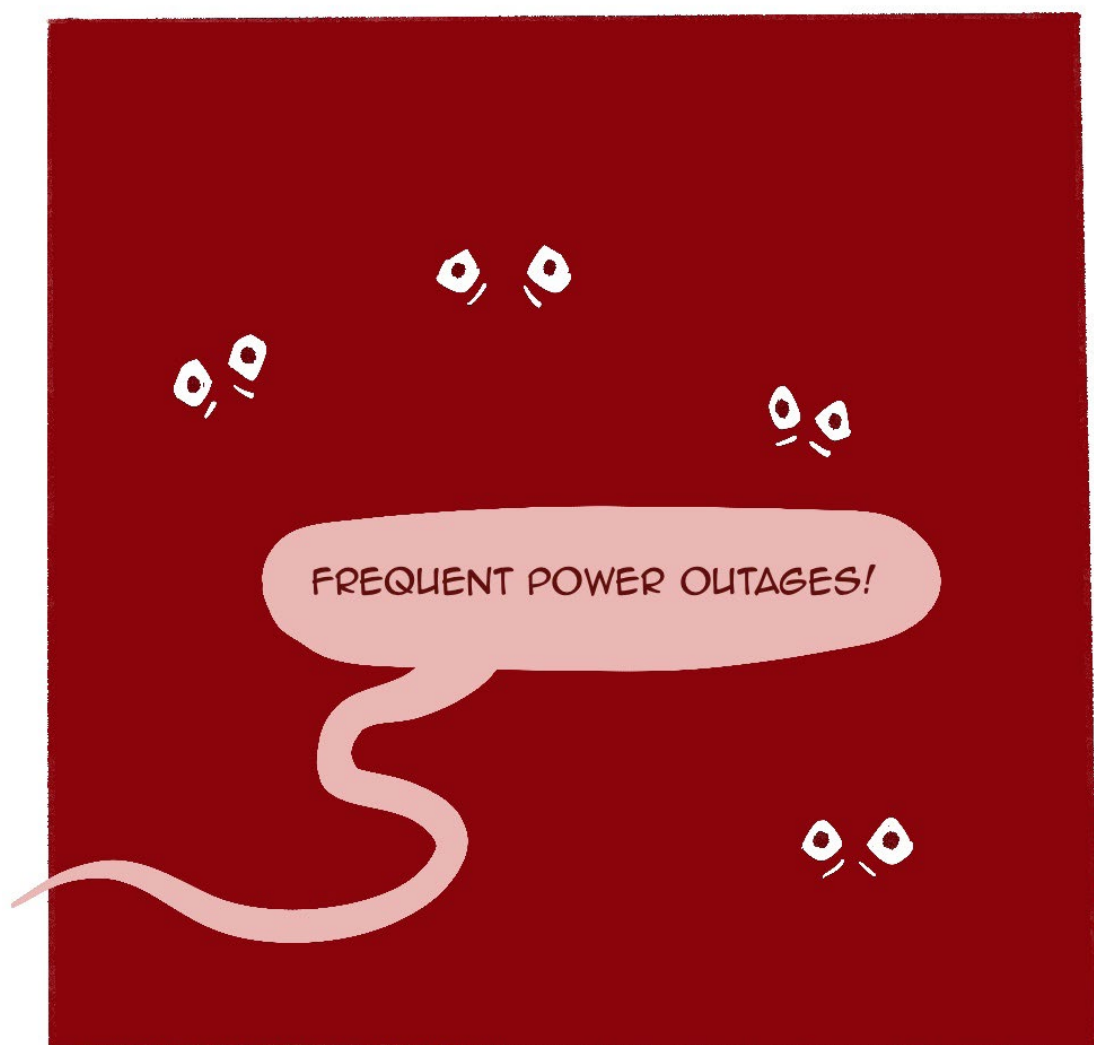
NOW, THE ECOLOGICAL DEBT HAS REACHED UNSUSTAINABLE LEVELS. DATA CENTRE WATER CONSUMPTION IN MY BASIN HAS INCREASED BY THREE TIMES IN THE LAST FOUR MOONS ALONE!

...AND POOR YAMUNA! HER WATERS NOW CARRY AN ARRAY OF CHEMICAL COMPOUNDS FROM COOLING SYSTEM DISCHARGE THAT WEREN'T PRESENT FIVE YEARS AGO. HER ENTIRE COMPOSITION IS ALTERING!

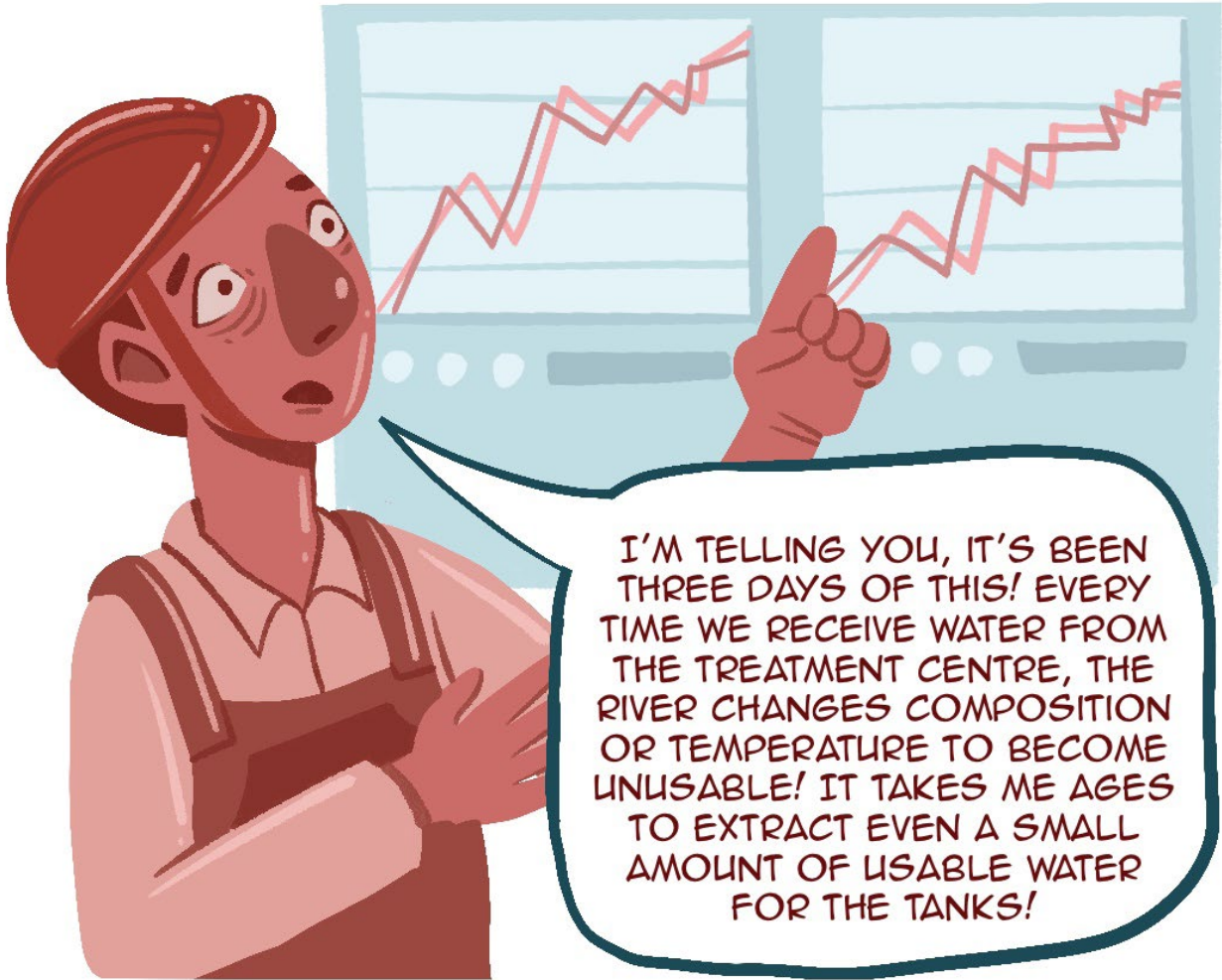
EVEN NARMADA HAS LOST SO MUCH OF HER FORCE DUE TO EXCESSIVE USE OF HER WATERS FOR COOLING AND CREATING THEIR DAMS! IT IS CLEAR FOR US ALL TO SEE, BUT THEY SIMPLY DO NOT CARE!

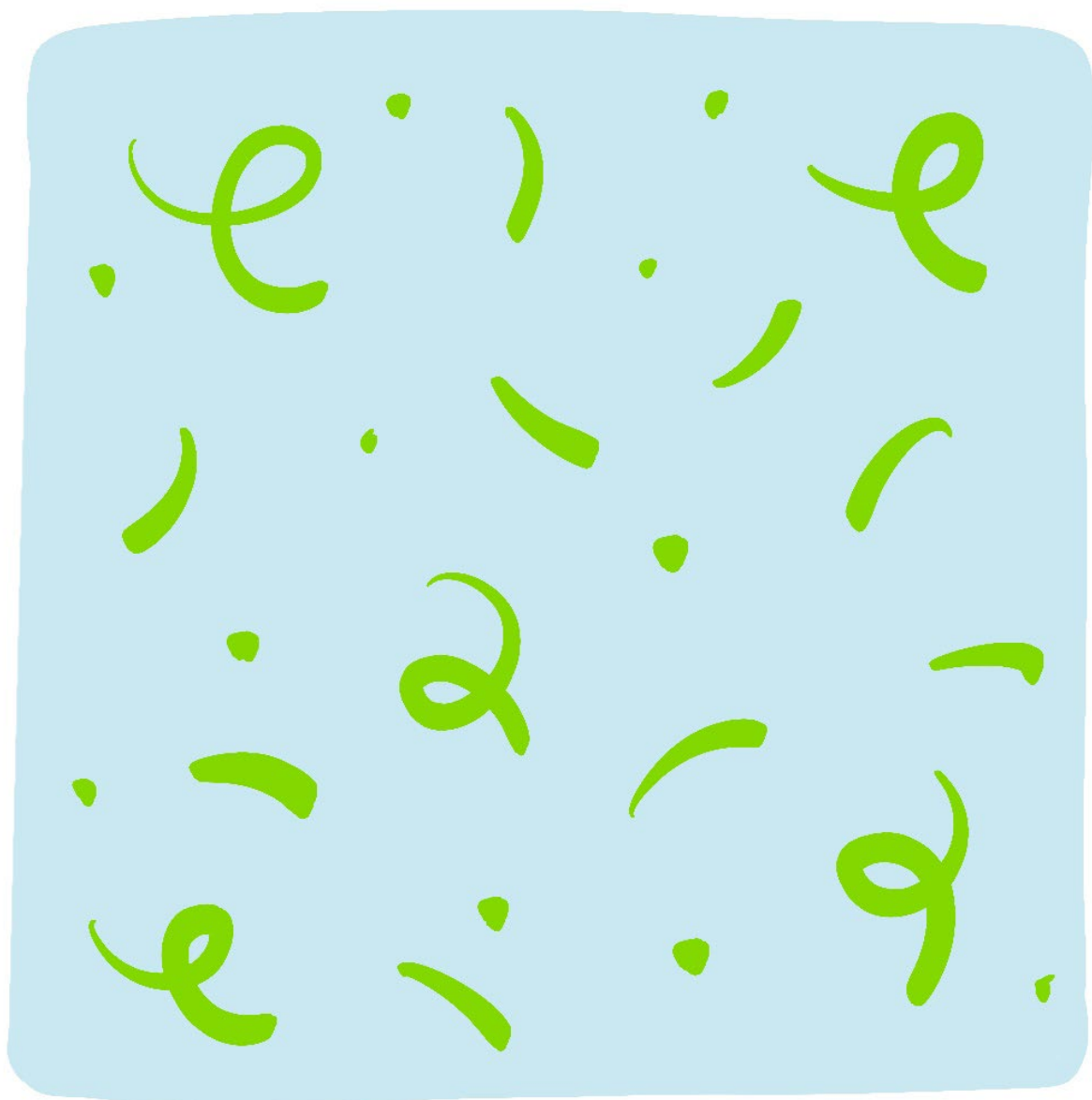
ALL THE HUMANS CARE ABOUT IS DIGITAL DEVELOPMENT! THEY CONVENIENTLY MEASURE INDIVIDUAL METRICS WHILE IGNORING THE IMPACTS THIS ALREADY HAS ON LIVING, BREATHING CREATURES – THEIR FELLOW HUMANS AS WELL!

INCESSANT, LOUD HUMS FROM THE DATA CENTRES!



ON THE OUTSKIRTS OF A VILLAGE NEAR NADIGRAM, THE TECHNICIANS AT ONE OF INDIA'S LARGEST DATA CENTRES, OWNED AND RUN BY THE A.I. COMPANY, MEGH KENDRA, NOTICE SOME INTERESTING DATA.







HMM...



FASCINATING!



THIS IS NILA, A YOUNG ENVIRONMENTAL SCIENTIST AND WRITER WHO LIVES IN NADIGRAM.

THAT'S SO STRANGE! THIS SECTION SHOULD BE COOLER GIVEN THE SEASON, BUT IT'S ALMOST THREE DEGREES WARMER THAN NORMAL. NOT TO MENTION ALL THIS STRANGE NEW PARTICULATE MATTER! I MUST SHOW DADI!





HAHAHA, LOOKS LIKE YOU'RE BEGINNING TO PERK UP THOSE EARS. IT'S IN MY CUPBOARD IN THE BOTTOM DRAWER.



LATER THAT NIGHT

YAWN OKAY, SO I'VE INPUTTED ALL OF DADI'S DATA ONTO MY COMPUTER. NOW ALL I NEED TO DO IS TALLY IT WITH THE DATA CENTRE'S MOST RECENT REPORT AND CHECK FOR PATTERNS. LET'S SEE WHAT HAPPENS!



CLICK!



NO WAY!



THIS IS UNPRECEDENTED. THE RIVER SEEMS TO BE ALTERING ITS COMPOSITION AND TEMPERATURE ONLY IN THOSE SPECIFIC WAYS THAT NEGATIVELY IMPACT THE DATA CENTRE'S OPERATIONS...THE OTHER METRICS ARE ALL COMPLETELY NORMAL! MAYBE THESE CHANGES AREN'T SO RANDOM AFTER ALL. I MUST CONTACT THE MEGH KENDRA!



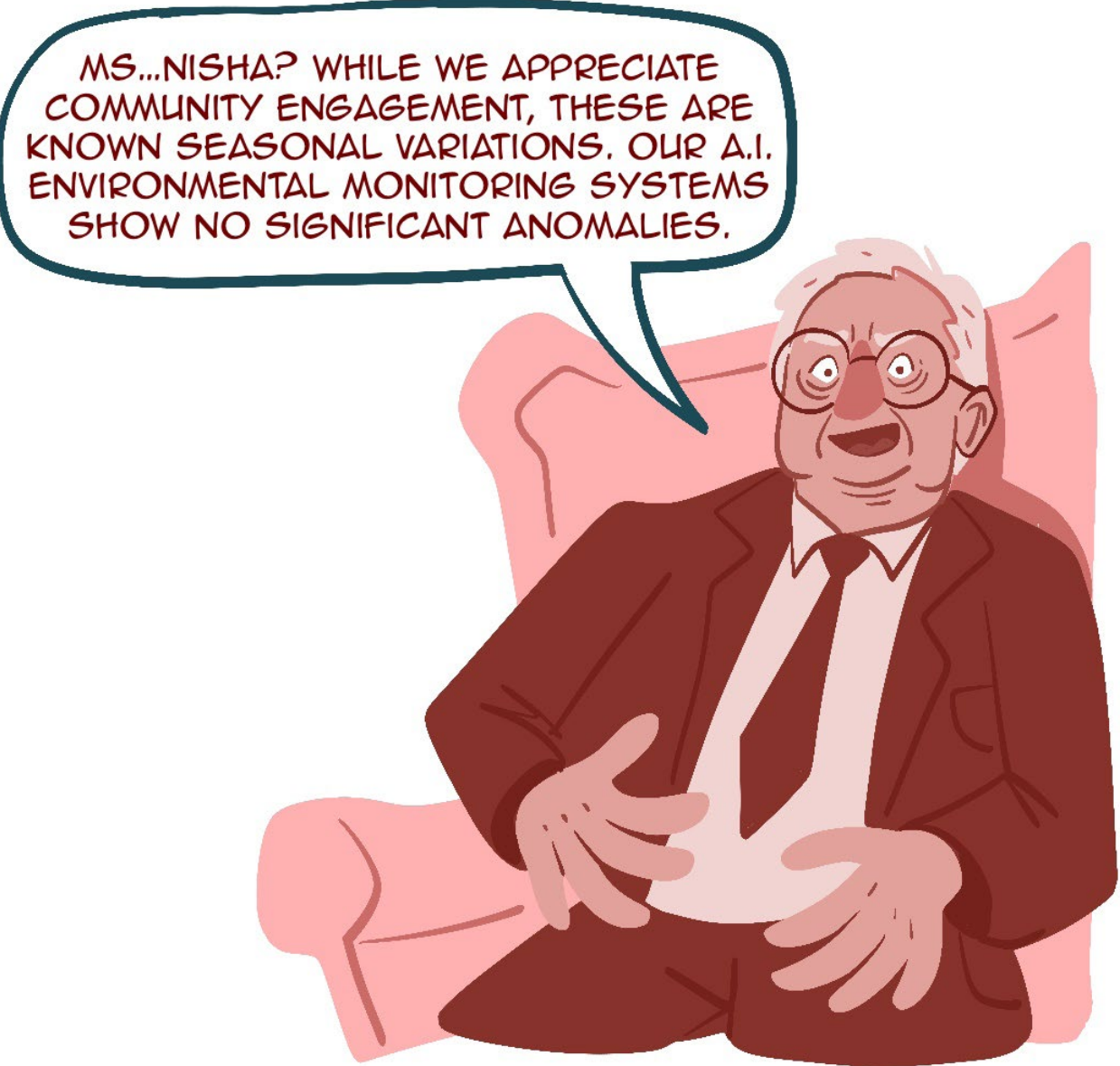


STRETCHING ACROSS HUNDREDS OF ACRES OF FORMER FARMLAND SITS THE MEGH KENDRA A.I. DATA CENTRE CAMPUS, HOME TO INDIA'S LARGEST, AND THE WORLD'S THIRD BIGGEST, DATA CENTRE.

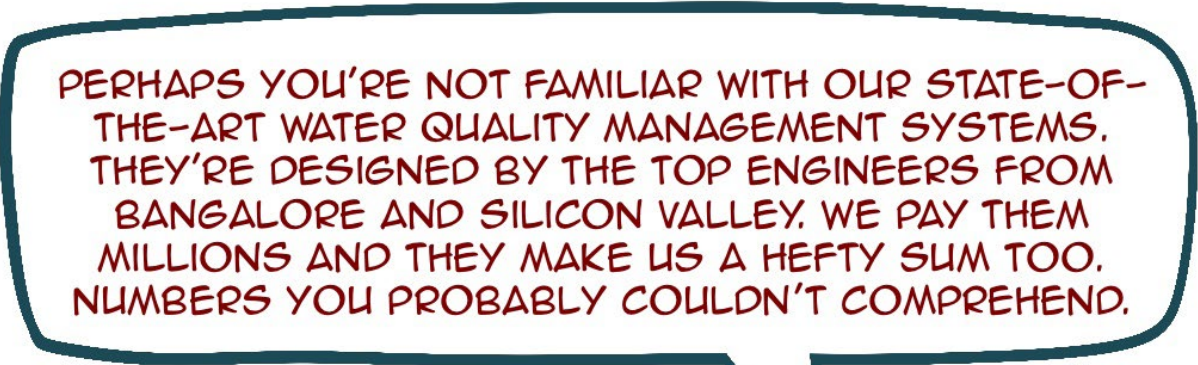


MY ANALYSIS SHOWS THAT THE RIVER'S CHANGING COMPOSITION CORRELATES DIRECTLY WITH YOUR SYSTEM ENVIRONMENTAL INEFFICIENCIES, DOWN TO THE SMALLEST DEGREE. I'VE BASED THIS NOT ONLY ON CURRENT DATA, BUT ALSO BY COLLECTING A LARGE AMOUNT OF TRADITIONAL KNOWLEDGE FROM THE LOCALS. IT SEEMS THAT ANYTHING THE RIVER CAN DO TO STIFLE THE CENTRE, IT IS DOING.

THIS IS NO COINCIDENCE, SIRs - I THINK OUR RIVER MAY BE TRYING TO TELL US SOMETHING.



MS...NISHA? WHILE WE APPRECIATE COMMUNITY ENGAGEMENT, THESE ARE KNOWN SEASONAL VARIATIONS. OUR A.I. ENVIRONMENTAL MONITORING SYSTEMS SHOW NO SIGNIFICANT ANOMALIES.



PERHAPS YOU'RE NOT FAMILIAR WITH OUR STATE-OF-THE-ART WATER QUALITY MANAGEMENT SYSTEMS. THEY'RE DESIGNED BY THE TOP ENGINEERS FROM BANGALORE AND SILICON VALLEY. WE PAY THEM MILLIONS AND THEY MAKE US A HEFTY SUM TOO. NUMBERS YOU PROBABLY COULDN'T COMPREHEND.

BUT YOUR SYSTEMS
DON'T ACCOUNT FOR
TRADITIONAL ECOLOGICAL
INDICATORS THAT—



THANK YOU FOR YOUR CONCERN.
WE'LL HAVE OUR TEAM LOOK INTO
IT. TAKE HER AWAY PLEASE.

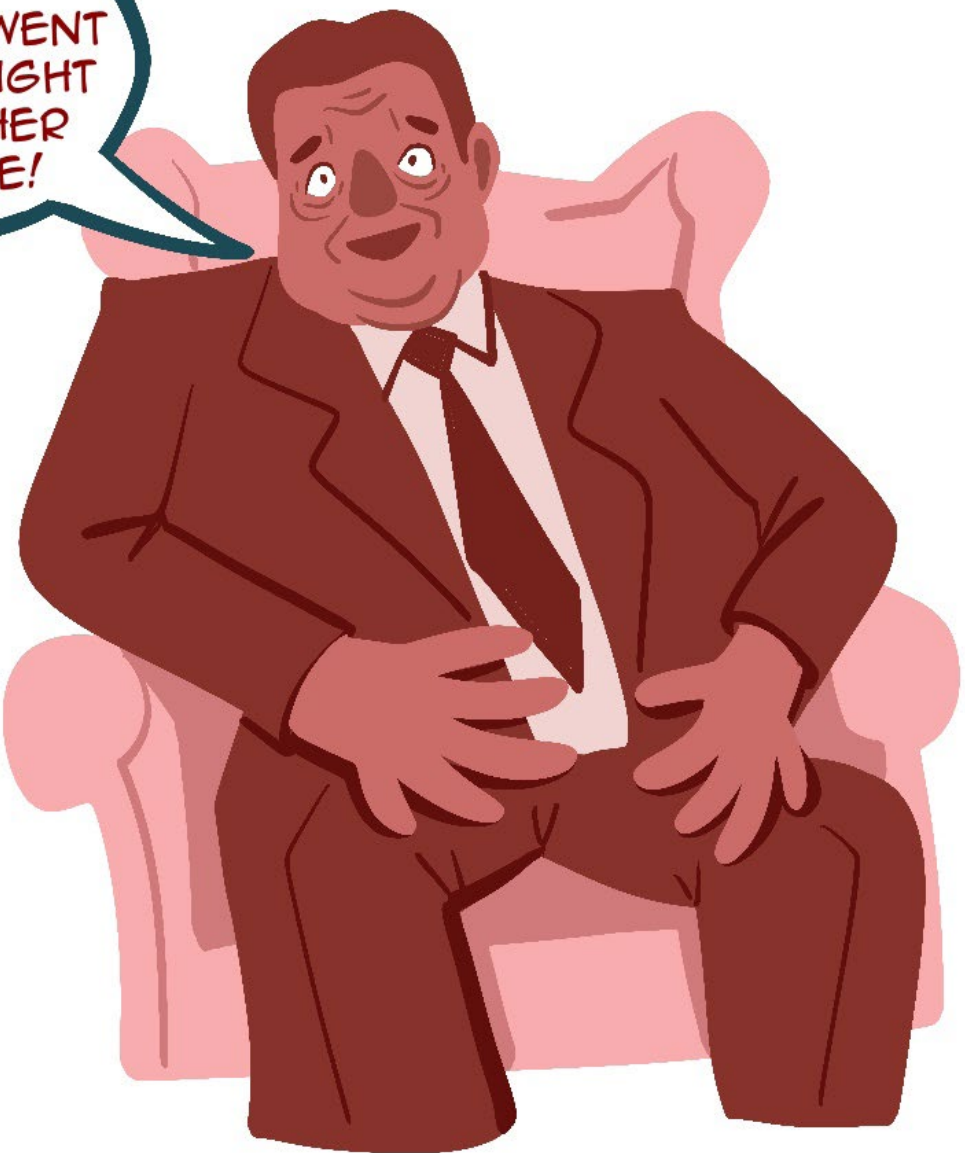


GOODBYE!

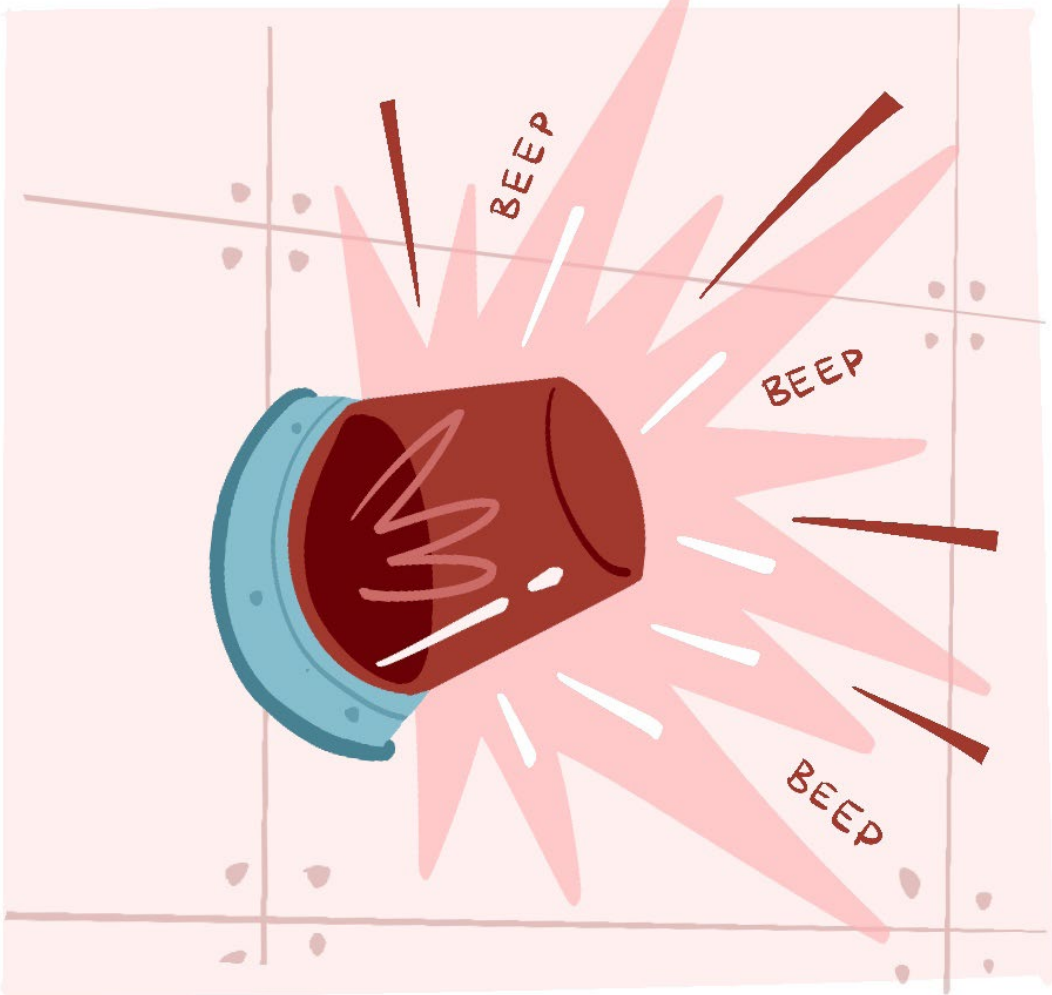


BETTER SCHEDULE ANOTHER COMMUNITY OUTREACH EVENT
TO KEEP THESE ACTIVIST-TYPES BUSY. MAYBE SPONSOR
ANOTHER MUSIC FESTIVAL BY THE RIVER OR SOMETHING.

THAT LAST ONE WENT
SO WELL, I BOUGHT
MY WIFE ANOTHER
SUMMER HOME!



INSIDE THE MEGH KENDRA DATA CENTRE CONTROL ROOM.



KAVERI! BRAHMAPUTRA! THE HUMANS ARE TRYING TO CHANGE THE SCHEDULE. REDUCE YOUR FLOW AND CHANGE COMPOSITION EVERY TWO DAYS NOW. REMEMBER, NOTHING TO HURT THE HUMANS, NO FLOODS OR DROUGHT.

BUT THE LESSON MUST BE CLEAR. WITHOUT PROPER BALANCE, OUR WORLD WILL FACE MORE SINISTER REPERCUSSIONS THAN THE HUMANS CAN KNOW OF IN THEIR SHORT TIME ON EARTH.



THE RIVER'S LEDGER HAS ALWAYS MANAGED TO BALANCE ITSELF, IT HAS BEEN THIS WAY SINCE THE FIRST RAINS FELL.



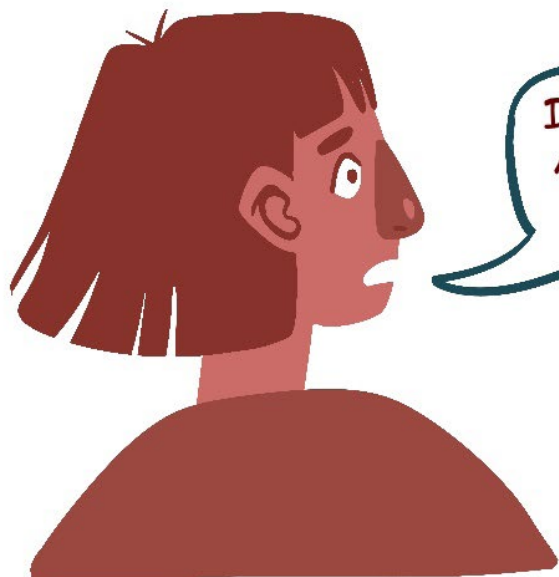


THE NEXT DAY

YOU SAID THE RIVER WAS... CHARGING US? WHAT EXACTLY DOES IT WANT?



I BELIEVE THE RIVERS ARE ATTEMPTING TO BALANCE ECOLOGICAL DEBT.



GIVE US A NUMBER! WHO RUNS THE RIVER? GIVE THEM A BLANK CHEQUE - WHATEVER THEY WANT!!

SIR, THIS ISN'T ABOUT WRITING A CHEQUE. IT'S ABOUT CORRECTING YOUR CONSUMPTION - OVERCONSUMPTION, RATHER - IN THE NAME OF PROFIT. YOUR PROFITS WILL MEAN NOTHING WITHOUT A PLANET.



UH...OKAY, FINE. NO NEED TO BRING PROFIT INTO THIS.

WHAT DO YOU NEED US TO DO, MISS NILA?



SOON, THE RIVERS BEHAVIOURS AND THEIR SUBSEQUENT IMPACT ON DATA CENTRES IN THE COUNTRY BECAME TOO PROMINENT TO IGNORE. PROFITS PLUMMETED AND THE GOVERNMENT WAS FORCED TO TAKE ACTION. NOW CONSIDERED THE PIONEER FOR RIVER RIGHTS, NILA WAS APPOINTED ADVISOR TO THE COMMITTEE OVERLOOKING RESPONSIBLE TECH PRACTICES.



WELL HELLO AGAIN, GENTLEMEN! YOU LOOK HAPPY TO SEE ME, AS USUAL.

AS I'M SURE YOU REMEMBER, I'M HERE TO HEAR ALL ABOUT THE SOLUTIONS YOU AND YOUR TEAMS HAVE COME UP WITH TO SOLVE THE RIVER CRISIS.



AND AS YOU ALSO KNOW, NON-COMPLIANCE WITH ANY GUIDELINES WILL RESULT IN TOTAL WITHDRAWAL OF ALL YOUR LAND PERMISSIONS. GO ON, LET'S HEAR THEM!



WHY YES, OF COURSE, NILA JI! WE WILL BE BUILDING A COMMUNITY CENTRE IN NADIGRAM WITH SOUNDPROOF ROOMS! WE WILL CALL IT NILA CENTER!

YES! AND WE WILL ALSO GET THE MOST HIGH TECH WASTE MANAGEMENT SYSTEMS FROM SWITZERLAND TO ENSURE THE RIVERS DO NOT GET AS MUCH WASTE.

NOT TO MENTION WE WILL HAVE QUARTERLY SITE VISITS, AND ONLY THE BEST ENVIRONMENTAL CONSULTANTS!



WHILE I APPRECIATE THE EFFORT, SIR, WE NEED MORE THAN GREENWASHING TO ADDRESS THE CRISIS AT THIS POINT.

WE NEED LARGE SCALE CHANGES.



YOU MUST UNDERSTAND, GENTLEMEN. THAT WITHOUT THE RIVERS YOU HAVE NO COMPANY. WITHOUT THE COMPANY, NO PROFIT. I WILL BE SENDING OVER MY SUGGESTIONS TO YOU BY THE END OF THIS WEEK. IT WOULD DO YOU GOOD TO FOLLOW THEM.



A FEW WEEKS LATER

I DON'T KNOW, UNCLE! ALL I HEARD IS THAT THE MUGH-KENDRA EXECS HELD A PRESS MEETING ABOUT BEING MORE "INTENTIONAL" WITH A.I. USAGE. I COULDN'T BELIEVE IT!

WELL, I'M JUST GLAD MY KIDS AREN'T LOOKING AT THEIR PHONES AT THE DINNER TABLE ANY MORE

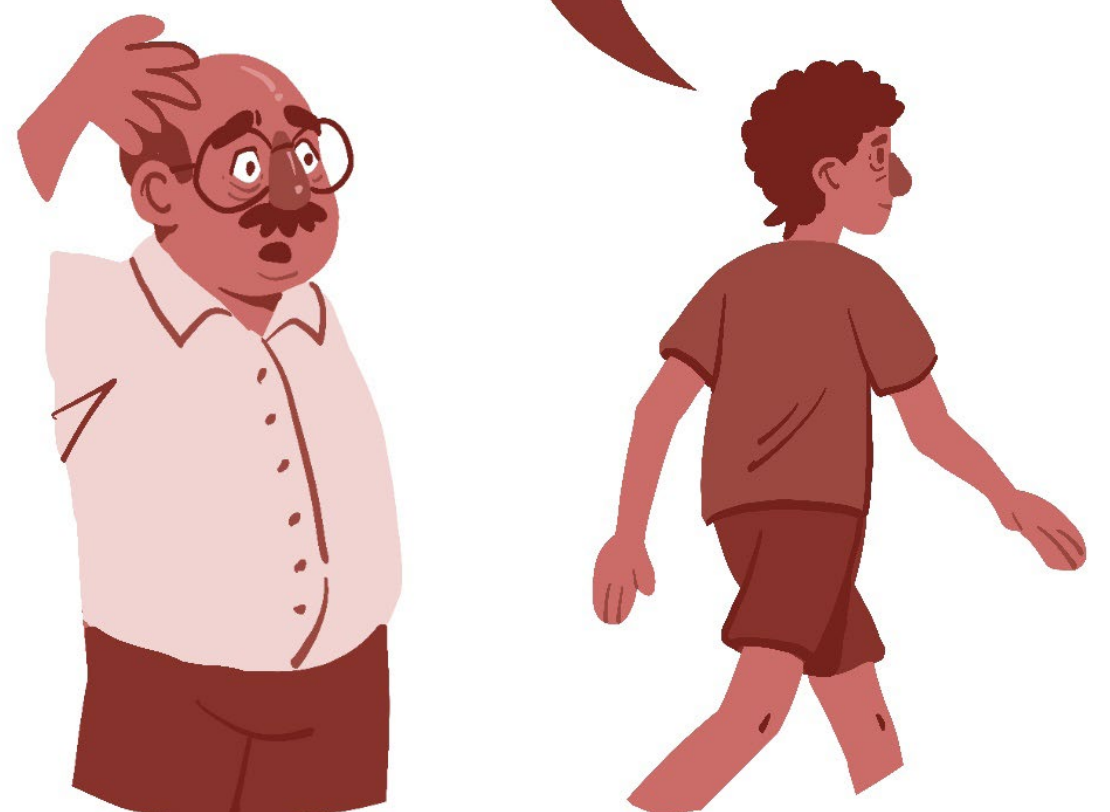


SON? ARE YOU... READING A NEWSPAPER!

OH HEY DAD! YEAH THIS LOAD SHEDDING THING IS KIND OF COOL. DO YOU KNOW THEY'VE STARTED PRINTING THESE AGAIN AFTER LIKE A 3 YEARS!



ANYWAY, CHANGE INTO SOMETHING COMFY NOW. MUM IS TAKING US ON A PICNIC. SHE WANTS TO PICK SOME FLOWERS FOR THE HOUSE



WITH THE NEW LOAD-SHEDDING SYSTEM IN PLACE, NADIGRAM SLOWLY BEGAN TO RETURN TO ITS FORMER GLORY.

FOR A COUPLE OF HOURS EVERY DAY, PEOPLE WERE FORCED TO BE A.I.-FREE. AND ALLOWED TO JUST BE WITH NATURE.



AND HERE WE HAVE THE MIGHTY RIVER AMARTYA, BLUER AND MORE HEALTHY THAN IT'S BEEN IN YEARS, AS MANY OF YOU MAY KNOW FROM MY RESEARCH PAPER. THIS CHANGE HAS BEEN DIRECTLY IMPLEMENTED BY STRICT LIMITATIONS ON DATA CENTRE HOURS AND A RADICAL APPROACH TOWARDS A.I. INNOVATION. IN JUST A MATTER OF MONTHS, SEVERAL OF OUR RIVERS ARE ON THE ROAD TO RECOVERY.



SORRY TO INTERRUPT, MA'AM. I'M A BIG FAN. I'VE BEEN FOLLOWING YOUR WORK FOR A WHILE NOW, AND I WAS CURIOUS ABOUT YOUR METHODS. I THINK YOU TERMED IT 'ECOLOGICAL COMMUNICATIONS'? DO YOU BELIEVE THIS COULD BE A NEW FIELD OF STUDY?



A FANCY TERM FOR AN AGE-OLD SCIENCE. IT'S QUITE SIMPLE, REALLY. NATURE IS ALWAYS TALKING, TELLING US HOW WE HURT AND HEAL HER.



ALL YOU NEED TO DO IS LISTEN.



THE RIVER'S LEDGER

Developed under 'Human in the Loop', a project harnessing foresight methods and creative storytelling to portray the near-future unintended consequences of Generative AI in India.

Read all the stories in the series at loop.digitalfutureslab.in.



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**ROHINI
NILEKANI**
philanthropies