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KERALA FLOODS

Rebuilding Lives: Towards Safe Drinking Water and Community Resilience

REDR INDIA

RedR India – Registered Engineers for Disaster Relief- is a non-profit organization that relieves suffering in disasters by selecting, training and providing competent and efficient personnel to humanitarian aid agencies worldwide. RedR India is part of the RedR Federation, which maintains the roster of trained professionals and specialists for humanitarian work who are available to assist, governments and extend support in a crisis situation and build resilience. The RedRs have a global reputation for development and presentation of high-quality training and technical support services for the humanitarian aid and disaster risk reduction sectors. RedR has offices in Australia, India, Indonesia, Malaysia and the United Kingdom. RedR India consistently promotes disaster risk reduction and emergency response capacities and systems through, capacity building projects, training courses, studies and researches, advocacy and technical support to various government and non-government organizations in India, Central, South and South East Asia, Asia Pacific region and parts of Africa.

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Letter to Our Readers and Patrons

The floods that ravaged the state of Kerala in 2018 were the worst in the State in more than nine decades. All 14 districts experienced the havoc of flooding and 10 districts were ravaged by landslides on fertile, arable land. Over 430 lives were lost and more than 5 million - nearly a sixth of the state's population was affected by the floods. The Government of Kerala moved with an uncommon sense of urgency, mobilizing every arm of the government and enabling its partners in the humanitarian and development world, the voluntary and faith-based agencies and the corporate sector to play their role in delivering relief and saving lives.

A number of small groups came forward in every district and relief and aid got channelized through these organizations, invariably under the lead of the District Collector. The fisher-folk in particular stood out for their efforts to save thousands of lives on the high seas.

RedR India, alongside a handful of notable national and international humanitarian agencies, was on the ground with community relief supplies and personnel early on. As news of large-scale displacement and destruction at a scale not witnessed in the state's recent history poured in, NSE Foundation stepped in with food, clothing and water supplies in relief camps and landslide-affected hard-to-reach areas.

With conjoined and well-coordinated relief efforts, as Kerala moved into the recovery phase, the state Post Disaster Needs Assessment (PDNA), identified Water Resources, Irrigation and Risk Reduction among the leading sectors for priority attention.

RedR India and the NSE Foundation have focused on three principal areas of support in the recovery phase: i) Capacity Building of the Community and Frontline Workers on Water Quality Testing and Treatment ; ii) Landslide Risk Management at Gram Panchayat Level ; and, iii) Strengthening Risk Informed Development Planning (RIDP) at Gram Panchayat level.

In partnership with Kudumbshree, the poverty eradication and women's empowerment programme implemented by the State Government, and the Health Department at district level, RedR India and the NSE Foundation have helped build multi-layered capacities for disaster risk management, including water quality testing and treatment, landslide risk management and for risk-informed development planning in the flood-affected districts of Kerala.

RedR India plans to help sustain the initiative by facilitating Risk Informed Development Planning for selected priority sectors. This will be undertaken in one affected district as a pilot model to be completed over a period of one year.

In the following pages we bring you glimpses from post-floods Kerala, as well as insights from an eclectic range of water activists, experts, practitioners and communities.

It is our hope that through our work, we have been able to generate the empowerment we intended; and also enhanced the disaster management capacities of the communities affected by the floods.

Rema Mohan
CEO, NSE Foundation

NSE Foundation

Tanaji Sen
CEO, RedR India

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Impact of Flood on Infrastructure

Contaminated Well in Niranam Panchayat, Pattanamthitta

Post-Flood Scenario and Issues

Following the floods in Kerala, the communities in 5 districts were facing a drinking water crisis due to contamination of wells and damage to pumping stations in the flood-hit areas. Two of these districts, Wayanad and Idduki, are hill districts and the remaining three, Pathanamthitta, Allapuzza and, Thrissur are in the plains with the Arabian Sea to the west.

Most wards in these areas are both coastal and low lying and were almost entirely submerged during the floods. This resulted in slushy water entering the homes and clogging sanitation pits and wells, which were the primary source of water for the households. Many of the households in the plains had piped water systems which were largely erratic pre floods and are now wholly disrupted.

Groundwater accounts for meeting the domestic needs of more than 80% of rural and 50% of urban population in Kerala besides fulfilling the needs of around 50% of irrigated agriculture. High population density, industrialisation, urbanisation, mismanagement of water resources and vagaries of climate change have taken their toll on the water resources in the state. Evidence shows that this availability of freshwater sources has been declining over the years amidst growing demand for water due to high population density and changing water use habits. Most people in the state are reliant on community wells for their fresh water needs.

Due to polluted wells (nearly 100%) and damaged pumps, water was being distributed to relief camps primarily through tanker lorries which is the least cost-effective but most expeditious option in a crisis situation. Public health authorities swung into action, undertaking water purification efforts on a war footing.

Apart from the difficulty of drying the wells, dead reptiles, insects, e-waste and garbage floating in the water also hindered the cleaning process. Further, the pump sets and motors in most of these wells were ruined due to flooding, making it a costly affair to get the wells fixed.

To prevent water borne diseases state government initiated super-chlorination to clean water bodies especially wells. Post floods, a large amount of debris, filth, animal carcasses, and other types of materials flowed directly into wells, making their cleaning and sanitisation a priority. This situation was further compounded in hard-to-reach and remote forest settlements and tribal communities.

Most of the landslides occurred in areas where recent construction had happened. Scientists also found evidence of large subsurface channels flowing under the soil, a new factor they hope to incorporate in future hazard models. In a district like Idukki that lies within the Western Ghats, a mountain ranges that stretches along the west coast of India, the heavy rain from the monsoon had saturated hillsides of the Ghats during the summer months, triggering more than 1,000 landslides. In Idukki alone, the slides buried 161 structures and damaged roughly another 2,000.

The unprecedented number of landslides along the hilly terrain of Kerala particularly in the districts of Idukki, Wayanad, Kozhikhode, Malappuram, and Pathanamthita resulted in significant causalities and widespread loss and damages to properties and infrastructure. One of the lessons learnt from these landslides was to understand the various characteristics and causes associated with them and help explore local mitigation actions to be undertaken by local government officials.

RedR India chose to contribute to the large response efforts in the field of WaSH, which emerged as a critical area of intervention as water and sanitation infrastructure and systems were badly affected. The aim was to provide access to safe drinking water for the flood affected communities including some of the under-served forest areas, and build capacities of the frontline functionaries on water quality, testing and treatment. Overall, the goal was to enhance the humanitarian and disaster risk reduction capacities of the community. At the Gram Panchayat level, this was brought about through the pilot project of integrating Risk – informed development planning (RIDP) and engaging Panchayat members from vulnerable districts of the state in a comprehensive capacity building exercise for dealing with landslide risks.

Activity 1: Securing Community Wells with Water Filtration Systems

- Identification of Forest Areas and under-served locations demonstrating water quality testing and training
- Consultations with forest dwellers, SC/ST groups and Gram Panchayats
- Installation of community water filtration and treatment systems and distribution of household filters
- Training on Operations and Maintenance and Basic Hygiene
- Formation of User Groups and Handover
- Periodic Monitoring

Forest Department of Government of Kerala and District Legal Services Authority

Capacity Building of Frontline Workers and Communities on Water Quality Testing and Treatment

Delivery of 4 day ToT Training through classroom and field level practice training in 7 districts.
Delivery of 1 day Training module through orientation and demonstration in 5 districts

- Training Modules Development and Translation in Malayalam
- Participants Mobilization
- Delivery of Training
- Distribution of Water Testing Kits to Participants
- Training Evaluation
- Feedback, Adaptation and Enhancement for future training
- Handover of list of Master trainers and other participants to the Government

Kudumbashree and Health Department, Government of Kerala

Activity 3: Provision of Technical Support on WASH to District Administration in 5 districts

In collaboration with UNICEF and Government of Kerala, strengthen line department capacities on WASH Response and Recovery Actions and support post-disaster needs assessment in Alappuzha, Idukki, Wayanad, Ernakulum and Pathanamthitta districts with deployment of eight WASH Specialists.

Unicef India and Government of Kerala

Activity 4: Technical Support for Strengthening Water Safety and Water Sources Development

Deployed of WASH specialists to undertake study on low-cost technological and innovative solutions to ensure access to safe drinking water to flood affected communities. The work involved meeting with various stakeholders and resulted in the development of a detailed proposal and project plan for making wells as safe drinking water resources. The detailed proposal and project has been shared with district administration and local organizations in Kerala for piloting and mainstreaming

Kerala Water Authority, District Planning Department, and Haritha Mission

Activity 5: Landslide Risks Management Training for Panchayati Raj Members

Delivery of 1-day classroom and field training in 8 districts. The objective of this training was to orient PRI members and community members on the various aspects of landslide including the basic concepts, causes, effects and types of landslide accompanied with its mitigation measures and management.

- Training Modules Development and Translation in Malayalam
- Participants Mobilization
- Delivery of Training
- Training Evaluation
- Feedback, Adaptation and Enhancement for future training
- Handover of list of trained personnel to District Administration

Geohazards India, District Disaster Management Authorities, UNDP, Don Bosco College of Social Work, District Legal Services Authority and Panchayati Raj Institutions

Activity 6: Strengthening Risk Informed Development Planning (RIDP) at Gram Panchayat

The work entailed development of guidelines and checklists on risk informed development planning for 13th Working Group on Biodiversity, Disaster Management and Climate Change and undertake pilot at 2 Gram Panchayats.

- Review of Literature on disaster risk management and LSG planning processes in Kerala
- Liaison with key stakeholders at district and selected Panchayat
- Developed Guidelines: developed risk analysis check-lists for select panchayat-level Working Groups for risk-informed planning
- Developed Training manual for undertaking community processes for RIDP
- Pilot Training for Panchayat members on the training manual
- Undertook Risk Assessment and Hazard Analysis at Gram Panchayat level by applying guidelines and checklists
- Developed Panchayat Plans through consultation meetings with 13th working group of Panchayats
- Vetted and hand over of Risk informed Panchayat Plans to District Administration and KILA in Thrissur

Kerala Institute of Local Administration, Eriyad Gram Panchayat and Thekkumkara Panchayat

FOSTERING LOCALIZATION

Building Local Cadre of Trainers on Water Quality Testing and Training

K Ranjini, District Coordinator, Kudumbashree with Hazira, ASHAWorker

Cherukode Panchayat, Malappurram

Prabhakaran M and K Ranjini from Cherukode Panchayat are amongst the group of 20 Junior Health Inspectors and Kudumbshree Micro-enterprise Consultants (MEC) who attended the first batch of RedR India training on water quality testing for Mallappuram district.

Prabahakaran says Hepatitis A is endemic in the Panchayat. Lack of sufficient attention to maintaining water quality standards is one of the drivers of water-borne disease in the village. The panchayat is thickly populated with small and marginal farm-hands and labourers who own, a marginal piece of land that accommodates small living quarter, a toilet with a leech pit and a personal open well for fresh water supply, all in close proximity of each other. There has been documentation which suggests the regular contamination of the open well due to refuse from the leach pit. Despite open defecation being a thing of the past, there is a high volume of e-coli in the water in the open wells, pointing to the inter-mixing of water due to leakages in the leach pits.

Ranjini is the district Coordinator of Kudumbshree and post the workshop, she is now a veritable champion of water quality testing. Her work in Kudumbshree allows her to travel across the districts and interact with other social workers all of which provides her with a frontline view of the major water quality crisis in the state.

"At home, we have for years used the ultra-violet (UV) water filters to keep our drinking water clean. The filtered water is regularly boiled before consumption. My 13-year-old son Drupath Krishna knows he must always drink boiled water. Last year he went with his school for a four-day study tour to an adjacent district and sure enough, he called in sick for four days with stomach trouble. We need to be very cautious when thinking of drinking water", Ranjini says.

Hazira, 45, an ASHA worker and a mother of two, says at the household level she notices a strange reluctance to water testing. *"So many people I know still refuse to drink boiled water. It's the taste that they hate"*, Hazira says.

Ranjini feels the discernible dip in water quality is linked to the widespread situation of water scarcity. Fresh water levels in open wells are running low in peak summers and going down every day.

Prabhakaran states, *"Most villagers here have an overhead tank of 750 liters to 1000 liters capacity. We pump water once a day from the family well. With each passing day of summer, it takes longer and longer for the overhead tank to be filled".*

Along with high turbidity , the overhead tanks need regular cleaning. Most villagers spend extra money on having the tanks cleaned at least two to three times a year. The piped water supply, always scarce and intermittent, at one

hour a day, is collected in a common community well that caters to 45 to 50 families in one neighbourhood. A large majority of people do not have access to piped water supply. But predominantly, the piped water is not used for drinking circumstances.

According to Prabhakaran water contamination is just one of the many risks; the vulnerability also rises due to insufficient attention to personal hygiene. The practice of handwashing is not considered a priority; thereby increasing the chances for rapid spread of communicable diseases.

The situation of water-borne disease in Kerala is still under control, this is attributed to the high generalized awareness about the risk of water-borne disease. Through ASHA workers and Kudumbshree workers, the disseminating information about risks has been given a bigger outreach. There was a mass chlorination campaign in 2018 in all the 19 wards of Mampad panchayat. During the 8 month long chlorination campaign, all households and public wells were chlorinated twice a month.

Prabhakaran also attended the training for water quality and testing in Malappurram from 25th to 28th March, 2019. *"The training was a great refresher and my knowledge of water testing and treatment methods was enhanced. I learnt a great deal about new filtration and the chlorination procedures."*

The annual Clean Porur Campaign started off in 2018 by spreading awareness about solid waste management. Under the slogan, *"Healthy Ward, Healthy Panchayat"*, the month-long pre-monsoon campaign reaches out to over 7000 households that comprise the Porur Panchayat. Rajini, days after being trained organized a training on water quality testing for ASHA workers and Kudumbshree CDS members as well.

However, a direct impact of the RedR India training was the integration of water quality testing into the Panchayat-wide campaign. The 37 members who were trained on water quality training from RedR India engineers will also look towards offering trainings for lower-level of ASHA workers, as well Kudumbshree workers at the level of Community Development Society (CDS).

The trainings, which will start in the middle of May 2019, will percolate down to the Area Development Society workers of Kudumbshree and finally the Neighbourhood Group (NHG)-level workers. The NHG, comprising one volunteer per family in the Panchayat will be responsible for ensuring that water quality standards are adhered to at the household level. Funding for the trainings will come from dipping into several pots of funding, such as the National Health Mission that has allocated 10000 rupees per ward, the Ward Sanitation Fund and the Panchayat-level People's Participatory Fund.

Prabhakaran rightly sums up the safe water initiative with these word, *"We all look forward to percolating this training down to the Neighbourhood Groups (NHG) that is the last-mile outreach layer of Kudumbshree that interacts at the household level, these learnings will go a long way in equipping families with the tools they need to keep their water safe from contamination".*

A Junior Health Inspector Champions the Cause of Clean Water in 'Cancer' Village

> *"We are in the process of collecting and analyzing data. Once we have the data, we will work with experts to improve the quality of water as well as propose additional health measures to keep people safe*

Lalu Joseph Interacting with ASHA Workers in Edvilangu Panchayat of Thrissur

Lalu Joseph, 48, is the junior health inspector (JHI) recently posted to Edvilangu panchayat from Ernakulam. He fits into the definition of a champion frontline functionary who constantly goes beyond the call of duty to foster a culture of wellness. The ASHA workers under his charge swear by his commitment to learning and training himself to be of maximum benefit to the citizens.

Posted in Edvilangu since October 2018, he took leave of absence from his duty-station to attend the water quality testing and treatment training that was being offered by RedR India in the neighbouring district of Ernakulam.

"I had heard great feedback from fellow JHIs about this three-day training. Since the training was being conducted in another district, I was not entitled to attend the training. I was so keen on attending; I petitioned the Additional District Medical Officer of Ernakulam. She was kind enough to allow me to participate. I am glad that I went the extra mile for this training".

Joseph says he was immediately able to tell the difference between a typical government training and the one organized by RedR. "While our trainings tend to be heavy on theory and lectures, the RedR India training was all about learning by doing. We got practical lessons in testing water quality including its ph value and TDS, with a high degree of precision.

Shahida Sindhu, an ASHA worker who works with Joseph feels that the training is markedly different from the old-style training. Throughout the three days, the emphasis is on learning by doing. *"Earlier, we used to test the quality of water merely by observing its color and transparency. This training has helped us to understand that their disease is a world of impurities in water beyond those that make the water turbid".*

Almost all the families that we interact with have been most grateful for being given the vital knowledge about simple ways to keep water clean and clear but also about the price we pay

when we do not pay attention to water testing.

Joseph is most worried about an unusually high burden of chronic ailments like kidney disease and cancer. He says there are more than ten patients who are undergoing dialysis and almost one fifth of the households have someone suffering from cancer. He says the ASHA workers are helping the panchayat build a database of water sources, water use and water quality which might provide some clues into the xhigh occurrence of high rates of life-threatening disease. *"I am pretty convinced water is a major reason for these diseases in the village"*.

Suresh, the local ward representative in the panchayat says that each one of the 15 ponds in the village that once used to have flowing water were systematically killed as locals started dumping concrete and solid waste. *"Not only have the ponds turned into open dumps, even the wells in their proximity are now fully contaminated"*. Suresh feels that excessive water contamination is a cause of concern and explains the presence of serious, life-threatening diseases in the village.

Santosh, 52, and a toddy labourer and throat cancer survivor says he first noticed something was wrong with him when once day getting out of bed, he realized he had lost his voice. He was lucky to receive timely medical intervention at the Thrissur Medical College where he was treated with radiation. Now on a recovery course he says others may not be so lucky. He thinks it baffling that such a small village should have such a high burden of the dreaded disease.

According to Joseph, the health department at the panchayat level is designing an income-generation scheme around water testing at the household level. *"As soon as we receive water testing kits for our ASHA workers, these frontline volunteers are going to go door-to-door helping people to test their water quality and help them with proper and effective chlorination, all this in return for a small fee. We have discussed the proposal with multiple families who are all willing to pay a small user fee to have their water tested on a regular basis".*

The model of community water testing now at work in the village has already covered more than 300 households in three wards of the panchayat. On a defined day, as many as 60 households are called to report at a common meeting point with samples of water from their individual water source. The JHI then demonstrates water quality testing on each sample and trains the participants in various aspects of water quality improvement.

As user of this community water testing model, Shahida observed that each community water testing session, found water in the village to be high on turbidity, low in ph value (below 6) and on the higher side in TDS (total dissolved solids) that refers to any minerals, salts, metals, cations and anions dissolved in water. TDS comprises inorganic salts such as calcium, magnesium, potassium, sodium, bicarbonates and chlorides. Until such time as each ASHA worker is equipped with a water-testing kit, the community water testing model can help in keeping the families safe. The cost of these Water testing kits range anywhere between 3500 rupees to 4000 rupees.

Having helped the households in focusing on improving the quality of water they consume, next up on his mind is to work with the community to imbibe a culture of water conservation and to act purposefully to recharge the ground-water table. *"Our advice to households is to save every drop of water they can during the monsoons rains. We are upping our game this season on rain water harvesting to recharge our ground water sources".*

"We are in the process of collecting and analyzing data. Once we have the data, we will work with experts to improve the quality of water as well as propose additional health measures to keep people safe", says Joseph.

Taniya Demonstrating Water Testing Kits to the Participants

Taniya N.T.

Just around the time that the August 2018 Kerala floods, I was completing my Master's degree in Social Work from Don Boscoe College, Sultan Bathery, Wayanad. Soon after, I started life as a Project Coordinator for a project Punarjani (New Life) for flood survivors. The project involved for livelihood support, electrification support for flood victims, habitat-building support and psycho-social support.

I started working for RedR India from January 2019. As a fresher, it was a great opportunity to work on a project of this scale. In the trainings that I conduct, most trainees are older than me and more experienced as well. As someone who would like to be a professional trainer, this has been a stepping stone to be able to handle and lead various training sessions, after being given the exposure so early in my professional career.

Being a trained social worker, I also learn a lot from the participants. I even get access to traditional information that goes beyond my own knowledge. There is a lot of give and take in these sessions. The evaluation feedback form that participants fill in also helps me in self-improvement as a trainer.

Since January 2019, RedR India has conducted 14 trainings for junior health inspectors, Kudumbshree members and ASHA workers. As a trainer, I have been involved in five of those trainings. These trainings have been held in Wayanad, Palakkad and Malappuram.

As part of a well-designed strategy, RedR India is helping train the Kudumbshree workers in water quality testing. These workers are highly motivated, enjoying a high degree of trust with the communities. They are the most ideal vehicle to spread the knowledge about water quality testing to the households.

I feel a three-day training can go far in training the participants in all practical aspects water quality testing and chlorination. An additional module on water-borne diseases, how these are caused and what can be done to control them can make the trainings even more useful.

Perhaps what is needed is a strong follow-up training approach that can help further consolidate the participants' learning. For greater retention and immersion of our training methods and knowledge, we have created WhatsApp groups for each group of training participants. We are planning to make one group per district that can interact, clear doubts trouble-shoot with each other on chlorination methods and water quality testing. In a way it becomes a means of monitoring the practical application of our trainings at the ground level.

RedR India provides a comprehensive and userfriendly water testing kit to each participant. The kit comprises a Turbidity Scale, a TDS meter, a residual chlorine chloroscope and a pH tester.

The floods of August 2018 have caused wide-spread contamination in most districts. People became vulnerable to water-borne disease and infections because of multiple risks. There is also the common issue of leakage of sewage from the leech pits into open wells. Lack of wellplanned sewerage and drainage systems in most districts is making the case worse.

Participants in my session are mostly interested in practical sessions around chlorination, preparing the mother solution, testing turbidity of water, TDS, pH and residual chlorine. In those sessions, they remain animated and involved as they receive solid do-it-yourself skills. The hands-on methodology of RedR India trainings has clearly enabled the community to learn and manage their water sources better.

STAKEHOLDERS SPEAK

Panchayat President ensures Swift Relief and Response Actions

Latha Prasad
President, Niranam Panchayat, district Pathanamthitta

Q: What were the big challenges you faced following the unprecedented floods?

At that time, the main challenge was to evacuate around 2,000 people living as part of 700 families spread over the entire 13.7 kilometer panchayat area that was completely sub-merged. Temporary community accommodation was arranged in the upper stories of people's homes as well as in makeshift camps. In the middle of August 2018, we faced three spells of torrential rains. The spell of rains between August 15 to 23 was by far the worst and caused maximum damage. In those early hours and days after the floods, I used to receive more than a 1000 calls every day, from people looking desperately for help.

Niranam panchayat is located in the low-land area which is highly flood-prone. Each one of the nearly 4,800 households in this panchayat was affected in one or another way.

I took a step-by-step approach but made sure early on that I had access to a core team to lead our response in various sectors. I received a lot of support from individuals and the civil society at large. A major evacuation camp was set up in the upper floors of the Higher Secondary School where some 800 families were made to settle in. The remainder of the families were evacuated to Parimalla church and several more to the neighbouring district of Alapuzzha. The Collector's office made available boats for people to be moved back and forth.

Latha Prasad at a Community Well in Niranam Panchayat in Pathanamthitta District

Insufficient sanitation facilities was by far our biggest challenge. Our girl children were particularly inconvenienced. The school building with its 12 toilets provided a minimum infrastructure but it was clearly not nearly enough. But we tried to keep the toilets clean day in and day out.

The flooding had happened in no time, catching us unawares. On the morning of 14 August, we were called to participate in a preparatory meeting with the Collector. By the time I returned from the meeting, the panchayat was already knee deep in water.

Over 2000 volunteers from all over Kerala came forward to help. Several of them were my own fellow panchayat representatives from even faraway places. Once we had the people evacuated, I remember our next challenge was to secure food grains as people had lost all their personal supplies. We took law into our own hands and broke open the godown of the government fair price shop which had a ready supply that we could distribute. The government reinforcement of food supplies took three days to arrive.

The camps continued to function for about three to four weeks.

Q: How extensive was the damage to water sources and purification systems in the Panchayat?

The public water pumping motors were destroyed in the floods, and household electronic items were damaged beyond repair. Almost all houses rely on personal wells on their drinking water needs. Paddy-fields are spread over two-thirds of our panchayat lands, causing high turbidity to our water supply. The colour of water is like tea-water here.

Ironically, submergence and unprecedented flooding in this area was followed by a period of intense heat, unusually dry winter weather and acute scarcity of water.

Q: How do you assess the technical and capacity support provided by RedR India for the restoration of community wells in some of the under-served wards and locations in your Panchayat?

There are 26 panchayat wells, most of them in areas inhabited by the scheduled castes. Some of these wells are now connected with the AP 700 water filters supplied by RedR India. How can I forget those dismal days when RedR India engineers worked day and night to have the water filters up and running? Families even from somewhat distant areas come to the community wells that are fitted with the water filters. The water here is visibly clear and free of turbidity making it safer than in their own wells. The filtration system comes outfitted with a pre-chlorination dose so that the filtered water is also properly chlorinated.

For six to eight months in a year when the water level in the wells is high enough, the water filters are a boon. To supplement clean-water efforts across the panchayat, I have prioritized the supply of ceramic water filters to some 400 families belonging to the BPL and SC categories. Individual families can purchase these filters from the panchayat at a cost of just 200 rupees while the panchayat subsidizes 1000 rupees from its own funds. There is still a lot of families to cover as we over 1800 BPL and close to 500 SC families in this panchayat.

Mobeersha KM, RedR India Staff Demonstrating Hand Washing Technique to School Children in Allapuzha District

RedR India can assist the State in Building Capacities

Jayakrishan
Secretary, District Legal Services Authority and Sub-Judge, Pathanamthitta

In 2017, the Pathanamthitta District Legal Services Authority (DLSA) was adjudged the best in the entire country. DLSA is a statutory body. Its primary role includes, i) providing free legal services; ii) expanding legal literacy; and iii) conducting Lok Adalat.

The first role enjoins upon the DLSA to extend social services under special circumstances. For instance, post-August 2019 floods, the citizens have the right to social services such as compensation against property and agricultural losses. In such a situation, the DLSA acts as a mediator between citizens and the government that has the responsibility for provision of basic services.

The DLSA has worked closely with RedR India in making sure that low-maintenance and affordable water purification systems were installed on multiple community water wells in some of the most inaccessible village areas of the district. The DLSA volunteers facilitated on-site water quality testing and training for health inspectors, ASHA workers and other volunteers in places where the water filters were installed. DLSA Pathanamthitta decided to help the floods-affected victims mobilized the para-legal volunteers with generous help from other Sri Sat Sai Seva Organization, for immediate relief operations. Help also came from Habitat Humanity for India who distributed 25,000 household kits among the affected populations.

Some 32 families of tribal communities in Arranappara scheduled tribes (ST) settlement were among those to receive the household kits. The Adivasi settlements in our district are largely bereft of electricity. We are working to bring light to the doorstep of these tribespeople who inhabit the shores of river Achancoril.

Seventeen of the 21 units of the famed metal mirror works were destroyed in the floods. The DSLA handed over a compensation of one lakh rupees per affected unit, enough to make 20 mirrors.

The Kerala High Court has designated three Lok Adalats located in Thiruvananthpuram, Calicut and Ernakulum to hear appeals by the flood-affected citizens against district and state government authorities in connection with complaints about flood relief and response. The Pathanamthitta DLSA is providing free-of-cost legal services support to citizens who would like to file such appeals.

Another pillar of support has been the network of Anganwari workers. Some 8,000 to 10,000 AWs across all 53 Gram Panchayats in the district pitched in with rehabilitation support.

All said and done, post-floods, the biggest problem faced by the authorities has been the lack of effective coordination between and among voluntary organizations at the district and state levels. If only the district and state-level administration had coordinated well, the entire rehabilitation challenge the state faced would have been addressed within four to six months. Instead, the Government of Kerala chose to collect and control the funds flow for relief activities and take direct responsibility for relief and rehabilitation.

The problem extends to the water sector. Here again, the government should be an enabler and a coordination point. As a statutory body, we have to interfere wherever there is a need.

Thanks to the efforts of the DLSA and the district-level women and child development department of Pathanamthitta, a comprehensive programme of child-friendly legal services to children has been rolled out at the panchayat and municipality levels. Cheeneerkara, Kalanjur, Kunnamthanm, Konni, Pandalam, Naranamoozhy, Naranganam, Erathu, Ezhumattur, Omalloor and Thannithodu among other panchayats and municipalities have already received such trainings.

Organizations like RedR India can play an even bigger role in helping the district and state authorities to make up for the severe capacity gaps that we face in equipping our panchayats with real-time, state-of-the-art support in keeping our scarce fresh water sources clean and our children safe from disease.

Water Quality and Testing Training an Essential Skill for Frontline health Workers

Dr. Sreedevi S,
Additional District Medical Officer, Ernakulam

> *"The 'Unite for Health Ernakulam' mission has provided a much-needed platform to advance an understanding among our people of an integrated health approach.*

Q: How was the district able to avoid an epidemic, post-floods of 2018?

We have received excellent support from our higher authorities in the health department. The Minister for Health led from the front in delivering the post-flood health response. Because of the high-level support, we are able to carry out effective interventions at the ground level.

A flood of this magnitude had not been witnessed in recent memory. The district collector was coordinating all aspects of rescue and rehabilitation, providing excellent funding and oversight support.

Lakhs of people were dependent on the relief camps. The relief camps seen in previous floods, had no more than a few hundred people living in them. In concert with our government and non-governmental partners, we planned for adequate provision of safe drinking water to the camps. This was one of our first priorities.

A certified health control room swung into action which enabled us to airlift medical personnel and supplies to all the camps. Doctors visited camps in country boats to reach inaccessible areas.

In most of the affected panchayats, additional health centres were set up. To stave off the possibility of an epidemic, we formulated a programmed by the name of Shraddha, that enabled us to provide real time support in the relief camps to even patients suffering from chronic ailments such as chronic kidney disease, cancer and post-traumatic stress disorder (PTSD). Our volunteers proactively visited households in the camps to administer prophylaxis. Barring a handful of cases of leptospirosis, we had the health situation under control.

Our health volunteers together with Kudumbshree workers reached out to each and every affected household. With excellent support from the National Health Mission (NHM), we bought

an abundant supply of doxycycline, masks, bleaching powder. The NHM support enabled us to pay a small remuneration to the volunteers.

Q: What has been the caseload of water-borne diseases in the district?

In Ernakulam district, we do not see high incidences of water-borne diseases; there has been an odd case of hepatitis A. Since well water accounts for a major proportion of water needs of the citizens, most health issues are associated with this source of water. Extensive chlorination is being carried out and a major district-wise IEC campaign for hand-washing is being carried out.

Q: What has been the strategy for health outreach to the most underserved areas such as tribal settlements?

In Ernakulam, we have pockets of health populations near Koramangala. Some 14 or 15 residential colonies in all. The Kudumbshree and the primary health centre in this area are doing an excellent job of healthcare delivery.

A major challenge for the health department is to ensure our vast numbers of migrant workers are included in our routine health outreach.

A total of 40 participants from the Health Department have participated in water quality testing. The partnership with RedR India has been very fruitful in this respect; we need to expand the outreach of information further so that most of the health workers are equipped with this training in the district.

We need to empower our field staff like junior health workers and ASHA workers with upgraded technology like modern water testing kits.

The 'Unite for Health Ernakulam' mission has provided a much-needed platform to advance an understanding among our people of an integrated health approach. Under the four main pillars of this campaign, we have the Atithi Deva Bhava (A guest is like God) that targets the migrant labourers; campaign for solid waste management; good habits for a healthy future; and, immunization.

In apartment complexes, the health department is carrying out regular inspections of tanker lorries that are supplying water to many such complexes. We have continued to intensify our advocacy campaign for making it a habit for the citizens to drink only boiled water and to indulge in proper hand-washing to avoid falling sick from contagious diseases.

Handing Over Ceremony of Community Water Filtration System in Pattanamthita District

Addressing Potable Water Shortage in Tribal Areas

Anjan Kumar
Chief Conservator Forests, Wildlife Circle, Pallakkad

My association with Red R started when a senior officer told me that RedR India is interested to work in forest areas on improving drinking water quality. There are several tribal hamlets that are vulnerable to water-borne diseases and would benefit from water filtration systems. Many tribal people are living in remote forest areas that remained cut off from electricity, physical and communication infrastructure for a number of days following the mega floods of August 2018. Their only source of water was open wells which were completely contaminated by muddy intrusions. These Adivasis community wells were in a need of a mega clean-up campaign.

The water filtration systems were installed in five locations. I have seen for myself these systems in place in two places: in Kuriankutty tribal hamlet in Paranbikullam Tiger reserve in Palakkad district, about 100 kilometres from the district headquarters. The second water filter is installed in Vachimaram tribal hamlet in Thrissur in the Vazachal forest division.

In certain places the tribals have lost their habitation altogether. Initially, they were provided makeshift shelter in community hall.

Communication was badly affected across all tribal areas. Even the coup roads were totally damaged. The forest department started stocking upon on essential ration supplies in camp sheds. The forest officials stayed in close contact with the tribal populations which made it possible for us to supply of rations until such time when road connectivity would be restored. n some tribal areas, we see the sudden appearance of the African cat fish. After the floods, they have infiltrated the river systems and the dams. It is a carnivorous fish that multiples very rapidly. The fear is that this fish will predate on the native fish and the real impact will be seen on the consumption habits of the local population over a period of time.

It will also impact livelihoods as the native fishermen will be averse to fishing anything other than the native stock that they know and recognize. This African Cat Fish is also likely to impact the pride of the state, the Miss Kerala fish, a native species found only in the Chalakudi river basin.

Impact on Water

For most of the tribes, availability of potable drinking water was severely affected. Their main source of water are the small forest streams. The heavy mudslides deposited huge quantities of mud and silt in the streams. In many cases, the landslips have caused most of the steams to change their course, taking them further away from the Adivasi habitats. Wherever the streams are within reach, the water has been muddied beyond recognition.

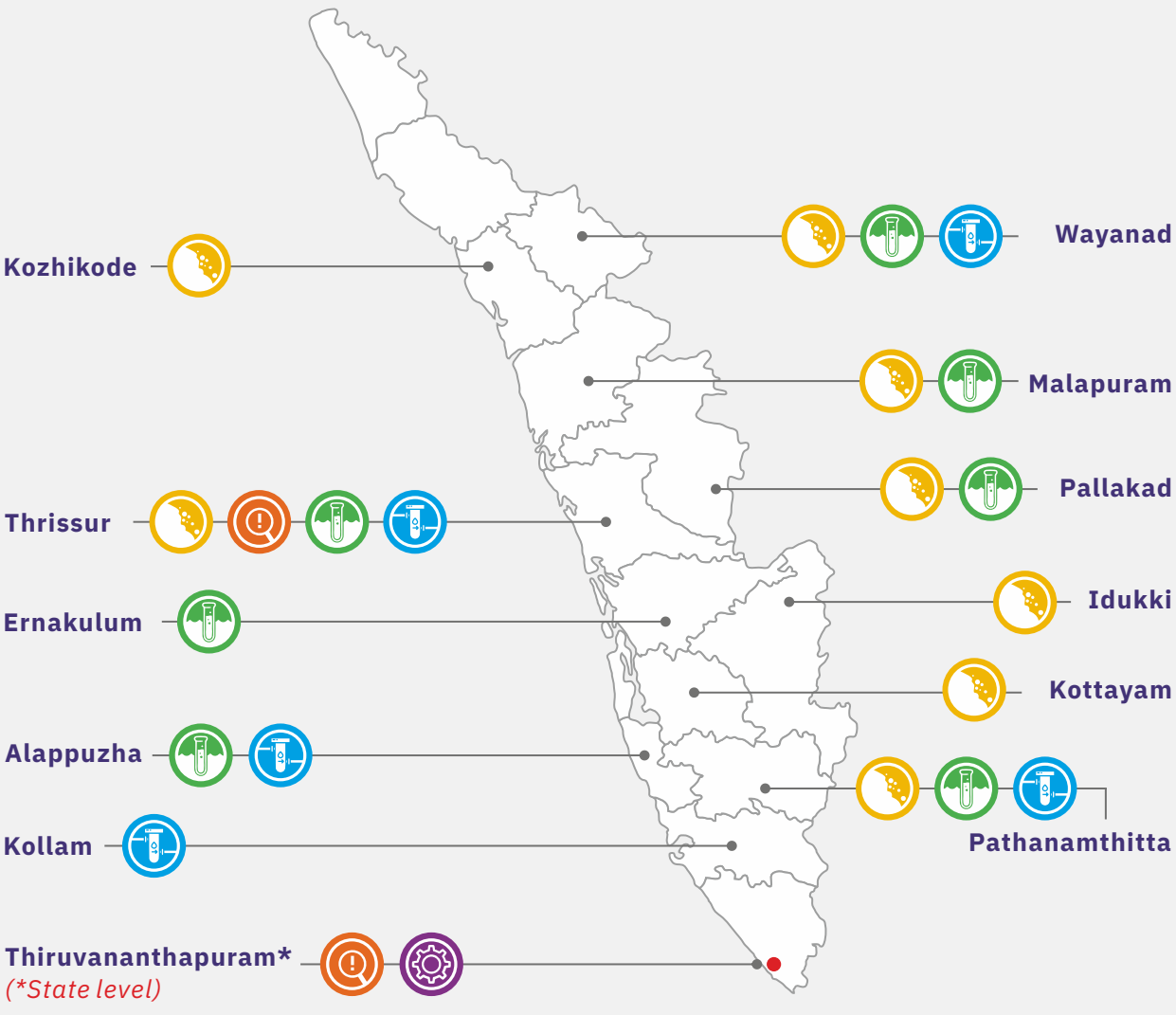
Tribal communities such as the Kadar and Malasar rely on small fishing and selling of non-timber forest produce such as wild honey for their livelihoods. Quite a few are employed by the forest department as daily labourers.

Scheduled Tribes such as the Kadunayakar are fully dependent on forests and do not practice any form of agriculture.

The RedR water filtration technology is much needed in the tribal areas. It can be installed easily, is portable and low-maintenance. Many more of these machines should be installed in areas inhabited by the forest dwellers.

Beneficiary of Household Water Filters, Mukkampuzha colony, Vazhackal Forest Division, Thrissur

Geographical Coverage



Landslide Training

RIDP

Water Quality Testing and Treatment Training

Scoping Study

Filter Installations

300

Trained over **300 Government frontline workers** on Water Quality Testing and Treatment

20 700

Installed **20 community water filtration units** and 10 household filtration units in hard-to- reach areas in 5 districts benefitting approximately **700 families**

500

Trained more than **500 community members** on basic hygiene and sanitation care

250

Provided **250 water quality testing kits** to district administration in Wayanad, Thrissur, Pattanamthitta, Alapuzzha and Ernakulum Districts

WaSH

Carried out Assessment of Damage to **WaSH systems** in affected schools

15

Developed **Module on Landslide Risk Mitigation** for Panchayats and capacity building of Panchayat officials and leaders from **15 Panchayats**

Toilet

Demonstrated **Twin Pit Septic waste management systems** in selected areas of Idukki District.

Sanitation

Presented paper on **State-wide consultation** on technologies for sanitation units in water-logged areas held in Alappuzha.

360

Training of more than **360 PRI members and community members** on landslide risk management in **7 landslide prone/affected districts**.

277

Equipped and trained **277 health department** frontline workers and Kudumbashree members on water quality testing and treatment in **7 worst affected districts**

Wells

Developed Scoping Report on '**Conversion of Household Open Wells into Safe Water Sources**'

7300

Reach out to more than 1845 community members directly and more than **7300 community members** indirectly through **70 short training capsule** on basics of water quality testing and treatment

Water

Provided inputs on **water safety and disaster risk reduction** to Rebuild Kerala Development Plan of Government of Kerala

RIDP

In partnership with Kerala Institute of Local Administration, developed guidelines and checklists for piloting **risk-informed programming** at **Gram Panchayat Level.**

STORIES OF OUR BENEFICIARIES

Demonstration of Twin Pits for Households

Toni K Joy, Idduki district

Alppara village,
Kanjikuzhi Panchayat, Idukki district

Post-2018 floods, a handful of homes in the tiny, picturesque mountain village of Alppara were identified by the district administration and the village Panchayat to receive new sanitation facilities based on an extensive survey conducted by RedR India.

Annie Joy, 30, a part-time beautician and a mother of two is a beneficiary from the village. She says a neighbour filed a lawsuit against them alleging that sewage from her leach pit was contaminating fresh water in their personal well. *"The Kanjikuzhi Panchayat stepped in and prioritized our house for having a new toilet constructed by RedR India, which was in conformity with established standards"*, says Annie.

In the hilly terrain, the leach pit is supposed to be constructed some 15 to 20 metres from the nearest fresh water source, an open well in this case. Now, as the toilet and the leach pit have been built according to proper standards, the complaints from the neighbor have disappeared as well.

"Thanks to a systematic survey, the toilet and the leach-pit has been properly engineered such that there is no chance of contamination any more. The daily fights with the neighbours are a thing of the past", Annie mentions.

The toilet and the septic tanks have also been constructed with due regard to Vaastu, the traditional Hindu system of architecture.

"Before beginning construction work on the toilet, we are required to seek due permission of the Panchayat. The Panchayat not only examines the feasibility of the toilet site to ensure that due attention is paid to sufficient separation of the leach pits so that the water source is not sullied; they also make use of the opportunity to deepen awareness of the need to safeguard drinking water sources", Annie chimes in.

Pointing to her twin daughters and her parents in-law Annie says, *"Safeguarding our water is the key to safeguarding our health from water-borne disease"*. Bini Somy, her father-in-law standing nearby nods in agreement. He says the floods washed away his entire cardamom plantation. The family, he says, also lost their cattle and yet he was adjudged as the best farmer in the entire panchayat. *"In farming as well as at home, paying attention to small things pays rich dividends"*, Somy avers, with the wisdom of someone who walks the talk and does the right thing.

In the adjacent Pazhayarikodim village of Kanjikuzhy Panchayat, Toni K Joy, 28, says that at the construction site where his house is getting built as part of the PM's habitat scheme for shelter-less people living below poverty line (BPL), RedR India engineers have helped him identify the well site and the leech pit site. Joy has received the entire toilet-building material and is waiting for the next tranche of construction money to be sanctioned by the Panchayat. Toni is currently without work though in the past he has held bit jobs in the tourism industry. His mother is a beneficiary of the Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGS) and between her and his younger brother, they bring home around 10,000 rupees a month these days. The 4 lakh rupees sanctioned for the tiny tenement that Toni has started to build will not be nearly enough to complete the construction. He reckons he might need and additional 3 to 4 lakh rupees to get the job done and is bracing to raise a loan from a local bank.

Annie Joy with her twin children and parents-in-law outside her home in Alppara Village in Iddukki District

Manju Inspecting the AP 700 Water Filtration System Fixed to the Community Well

Manju, Thrissur district

Kadar Colony, Kolthirumedu Forest Range, Thrissur District

In the Adivasi Kadar colony of the Kolathirumedu forest range in Thrissur district, Manju R, 35, is in charge of the community water filter user group. It looks after the maintenance of the community water filtration plant connected to the common well, making sure this village of 42 families remains safe from water-borne diseases. A single mother who lost her husband to an undiagnosed disease when he was just 30, Manju has seen illnesses at close quarters. She wants to protect the villagers with all she can, "In summer we experience extended water shortages. Good or bad, this community well is all we have; there is no other source of water, other than a tiny canal nearby that remains mostly dry".

"Water scarcity has been with us for 20 years now", says Silomani, 56, another Adivasi homemaker who is a mother of two. The tiny forest hamlet was to receive water diverted from the Peringalku dam from a canal. "We were told we would have access to clean water from the canal within 500 metres of our homesteads. But I have seen the canal running almost dry all my life. The community well is where we fetch water for all our needs".

In the peak summer months, as villagers reach for the well for their water needs, it doesn't take long for the well to hit rock-bottom. A near-absence of winter rains over the years as well as the intense summer heat means that the water table in the village keeps shrinking all the time. Add to that the excessive pressure on the well to meet all kinds of water needs of the villagers. It is no surprise then that for close to six months, Vachumaran village experiences a massive water scarcity. *"In these months, we see the turbidity levels shoot up".*

Suresh Soman, the RedR India engineer who has helped install and train villagers in the use of the AP 700 water filtration systems across tens of locations in Kerala, says, *"We need at least a metre of water in the well for the water filter to work. The primary filters of the manually-operated system get choked with mud as water levels deplete beyond a level. Clearly, we need a minimum level of water for the system to function with a degree of effectiveness".*

Manju says because of the low water levels she has not been able to use the water filtration system for at least four months now. *"But for the months that the well fills up and the filtration system swings into action, the villagers experience a world of difference".*

As fresh water scarcity engulfs Kerala, declining water quality has been a huge problem in villages like Vachumaram. While most people are concerned about the visible turbidity, there is decidedly less awareness about the presence of serious contaminants like e-coli. RedR India engineers and volunteers, with support from the National Stock Exchange Foundation (NSEF), have been working tirelessly to engage with health workers – junior health inspectors, ASHA workers and Anganwadi workers – as well as established social mobilization platforms such as Kudumbshree, to instill a pervasive sense of urgency among average citizens about the need for maintaining water quality.

Manju says it took some getting used to as the auto-dozing of chlorine would change the taste of the water. For the Adivasi families who rely on nature's bounty in more ways than one, there are few solutions forthcoming for their growing struggles with water quantity. The community water filter provides a hope to keep them safe from harm caused due to contaminated water.

Kotapadam Panchayat, Mannarkad Mandalam of Palakkad

Kotapadam village in the heart of the Silent Valley, with its 600 homesteads, faced a battering from the mudslides in the wake of the unprecedented torrential rains in August 2018. Three people lost their lives and farms were flattened on a massive scale.

The villagers are clueless why they lost so much without any apparent provocation. After all, there is no wanton felling of trees and flattening of the forest by the dreaded JCB machines for real-estate development.

Abdul Aziz, 63, who owns a two-and-a-half-acre poultry farm found his entire poultry washed away in the horrendous landslides. Hundreds of bamboo trees fell like nine pins on his farm as raging winds lashed the area. A Gulf returnee who worked for over ten years in Saudi Arabia as a security guard, headed back home to spend the advancing years of his life with his family.

Having spent most of his savings on the marriage of his four daughters, three years ago he raised a loan of 10 lakh rupees from the local Arayan Cooperative Bank to start his poultry business. He mortgaged his house to the bank and agreed to repay the loan at 12 per cent interest per annum.

Just when the business was beginning to be settling down, the lashing waters on August 16, 2018 washed it all away. He lost everything overnight. His 13,000 sq. feet of farm land is now rubble. Each one of his 450 rubber plants that would have been ready to yield income from 2020 all destroyed. Overnight, Aziz was on the verge of destitution.

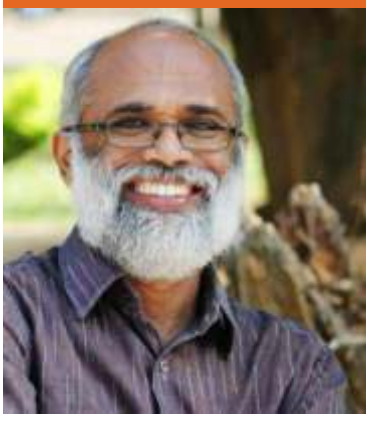
V S Vasu, Panchayat member recalls that the last time the village witnessed torrential rainfall was more than four decades back. *"Back then, it was in another area of course. This time the rains were just something else. The resulting landslides occurred at multiple places, almost simultane-ously. From Wayanad to Palakkad and Nilambur to Malappuram it was the same story of heavy mudslides causing untold destruction of homes, farms and in places even loss of lives and livestock"*, he says.

Vasu was a participant at the training workshop on comprehensive Landslide Risk Management, organized by RedR India in his area. He agreed with the comprehensive nature of inputs provided on topics including landslide scenario in India, causal factors for landslides and landslide risk management, he was left with questions about the real cause of landslides in his region, since his village in the Silent Valley is verdant with vegetation and there is just no construction-related activity at work in this region.

Abdul Aziz at his ravaged farm in Kotapaddam village, Palakkad

WAY FORWARD TO BUILDING RESILIENCE IN KERALA

N Jagajeevan
Activist, Thiruvananthpuram



The overall policy changes with regards to the environment are usually inimical to the poor. Whether it be the mining policy, the shifting mandate of the National Green Tribunal or the forests policy, the entire policy framework has been modified to suit the neo-liberal project.

Kerala gets good rains for close to eight months in a year. The state has 42 rivers, sufficient backwaters, ponds. Yet, more than 60 per cent population of the state depends on open wells for its drinking water needs.

We have the mountainous terrain in the western Ghats, there is the midlands, the low lands and almost 600 kilometres of coastline. All in all, an environmentally-friendly geography.

The present situation is that the vast areas around the western Ghats are vulnerable. The midlands are fully landslide-prone. The coastal areas are highly susceptible to saline intrusions and cyclones.

So how did things come to such a pass?

A major culprit is the unscientific land use. A large section of the paddy fields has been reclaimed for housing and construction work. The real-estate and construction boom is leading to a rapid disappearance of the mountainside. There is unlimited quarrying in the Western Ghats.

Indiscriminate sand-mining, banned only recently, has wreaked havoc on the river beds, affecting long-term river health. These unscientific interventions are destroying the environmental security of the state. The crisis of environmental vulnerability is deepening every day, and this is most characterized by the declining capability of the poorest and the most marginalized sections to deal with environmental hazards.

Take the mounting crisis of water scarcity in the state. Kochi, Munroe Thruthu and Kuttanad are among the most vulnerable. Our fresh water lakes are drying up at an alarming rate and quickly turning into wasteland.

The Government of Kerala should take a serious view of carving out an environment-friendly development policy. Because the crisis facing our environment is reflected most in extreme poverty. Those depending on forests for livelihoods, the agriculturists, the fisher-folk as well as those in the informal sector are all affected by the water crisis.

Despite a rather successful social mobilization programme in Kudumbshree, people are not much aware about climate change even as they are the primary victims of this phenomenon it. No timely rains mean insufficient water for life and livelihoods, accompanied by an unusually hot summer. This cocktail of factors is leading to living off farms and other natural resources can survive amidst the recurrent cycles of floods and droughts.

The real estate boom is one of the main culprits, together with the growing culture of mass consumerism. Another issue is that while industrialization is needed to create jobs, we need to think through the model of industrialisation most suitable for our needs. Currently, our dependence on water and thermal-based energy production is almost complete. Renewables should be at the core of a forward-looking energy and pro-poor industrial policy.

Local-level economic development can be greatly bolstered by reducing the carbon footprint. A strong local and decentralized governance model at work is a very hopeful sign for the state. Most panchayats are doing an excellent job of natural resources management as well as addressing local poverty by promoting local production. Environment-friendly local planning is what the panchayats need to focus more on.

Water resources development is the key. We need to work on improving the capacity of soil to absorb water. We need to conserve our back waters, our rivers, fresh water sources, ponds and open wells as well as conserve our mountain ecology and quarry land.

Until recently, rivers, streams and ponds were used for bathing and other non-drinking water activities while as well water was used only for drinking. Worse, few use common water resources such as community wells and other sources as they are either highly polluted or running dry in most cases. We need to regenerate these common water bodies. There has to be a big emphasis on recycling of used and waste water for agriculture purposes.

Participants of Water Quality Testing and Treatment Training in Ernakulum

Community Volunteer Helping the Team for Water Filter Installation in Pattanamthitta

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