

KERALA CALLING

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SPEARHEADING SOLID WASTE MANAGEMENT



**Kerala Solid Waste Management Project (KSWMP)
is engaged in a relentless battle to make the State's cities
cleaner, healthier and more livable.**

To revel in the innocence of forests
and the wisdom of ancient ways,
to find answers in the
mystery of mountains and
strength in free, soaring lives.

HUMAN *by* NATURE



WASTE ISN'T WASTE UNTIL YOU WASTE IT



It is time we radically changed our approach to waste, be it domestic or industrial, as a key cog in the entire waste management wheel.

Two things are fundamental: one, the individual approach to waste, and two, the awareness that waste management is not a hogwash or a smokescreen.

Cities are bustling sectors of economic activity and there is a huge influx of rural migrants every year. Worldwide, cities are expected to generate 2.2 billion tons of waste annually by 2025, which is the equivalent weight of the Great Pyramid of Giza, in terms of trash, every day.

This stunning amount of waste damages the environment, public health, and the economic prosperity of the nation's citizens and their overall quality of life.

The situation is no different in a densely populated state like Kerala. In spite of Malayalis' sense and degree of personal hygiene, there is a lot to be desired in people's approach to waste management.

Kerala generates about 2.2 million tonnes of solid waste annually in its urban areas. This includes garbage from homes, offices, and shops, as well as industries, institutions, etc.

There should be an urgent call to fix the so-called "throwaway culture." But beyond individuals and households, waste also represents a broader challenge that affects human health and livelihoods, the environment, and prosperity.

Solid waste management is a universal issue that matters to every single person in the world. And with over 90 percent of waste openly dumped or burned in low-income countries, it is the poor and most vulnerable who are disproportionately affected.

The Government of Kerala has taken the matter seriously and has implemented projects to address the issue on a war footing.

Kerala Solid Waste Management Project is spearheading the implementation of the World Bank and Asian Infrastructure Investment Bank (AIIB)- supported project in all the 93 urban local bodies of the state. The project is the continuation of the waste management activities in the state and is made to strengthen the systems of solid waste management activities in its cities. The project is a first-of-its-kind effort by the state government in association with the World Bank and AIIB to make the cities of Kerala clean and find a lasting solution to the solid waste management problems.

Now, waste management is not just about managing waste but with the national emphasis on net-zero and cutting carbon imprint, the need to produce green energy is gaining momentum. In that context, waste-to-energy projects are critical. Kerala is moving in that direction.

It is important to understand that solid waste management is everyone's business.

H. DINESHAN IAS
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INTERVIEW

Renowned danseuse **Mallika Sarabhai** has been appointed as the **Chancellor of Kerala Kalamandalam Deemed to be University**. In an exclusive interview with **Renu Ramanath** for **Kerala Calling** magazine, **Mallika Sarabhai** shares her vision for the future of the prestigious institution and the challenges faced by new-age artists.

she started learning Gujarati. Her teacher used to teach her from the newspapers and she started reading about young wives jumping into the wells and committing suicide. And she started asking around about it and found out this was about the huge pressures of dowry. So, in 1963 she created 'Memory is A Rugged Fragment of Eternity.' In this work, she used Bharathanatyam

I CONSIDER MYSELF A 'MALAYALI KUTTY'

Dr. MALLIKA SARABHAI



Renu Ramanath
Senior Journalist

You come from a family of institution builders and you've been actively involved in the running of Darpana for many years now. So, what will be your plans for Kerala Kalamandalam once you assume the charge of Chancellor?

I've been running, and steering Darpana now for 43 years. And one of my tasks has been how to keep the essence of classicism and yet re-imagine it for changing audiences and for changing tastes, without changing the soul of the style.

Our art is not meant to be museum art; they're living art, which means that once you have the expertise and full understanding of the art, it becomes the language that you must use to talk about what is relevant to you. For instance, Amma, as early as 1963, created the piece called 'Memory is A Rugged Fragment of Eternity,' using Bharathanatyam. After moving to Gujarat,



which is a sringara dance, to talk about hatred and violence.

So I grew up thinking of the arts as a language for change, language for change. And, the language brings attention to those things which people were either not paying attention to, or didn't want to pay attention to. In the five years that I created 'Draupadi' for Peter Brook's Mahabharata, I saw the effect that my interpretation of Draupadi was having upon women across the world. And I came out of it thinking that there was no other language more persuasive to change mindsets,

to open up mindsets than the art. And I think any arts institution needs to keep this in mind in order to make it relevant.

How do I get a 15-year-old in Bombay interested in Kathakali enough to want to see it again? If I say, come to a village and watch a badly lit show that too an all-nighter, that person is going to

things such as what is power, how much power is good, why the greed for acquisition, what trying to know the self means, and once you know the self, how do you make the other self that you understand and empathize with them. In the kind of society that we're in today, all of these are relevant questions and need to be asked, need to be discussed.

It is a spectacle, but it still talks of things that matter to us very much. For, how do you use a spectacular setting to get people to think about some things that are important?



give an attention span of just ten seconds. If you can grab me in that ten seconds' attention, then you've grabbed me, and otherwise not. So, how do you use technology, science, and all the modern things that are available to us to enhance and make arts relevant again? I think that's the challenge I have tried to, always stand up to. And I think in Darpana we have succeeded because, as I said, this new production of ours, this 12th-century Persian book that talks about the ridiculousness of human beings searching for peace outside of them rather than inside. And, it questions

What's your take on using spectacle in a performance? These days, a lot of discussions are happening in Kerala regarding the use of spectacle in theatre, and in performance. Whether using the spectacle is right, whether it will diminish the performance, and so on...

We live in a world where amazing things are seen on a daily basis on your Internet. Things that are being passed on Whatsapp are just amazing. So, then how can we expect anybody to go into a meditative trance? If we were a society, going into a meditative trance we would not have become such a violent society. Obviously, people's aggression levels are very high, people's frustration levels are very high, and their violence levels are very high. Then we have to find a way to grab them, then we have to find something to give them, to bring out the good in them rather than the bad, because most things that we

watch, bring out the bad in us. Such things make us feel lesser, they make us feel diminished, they make us want more violence, and they make us want to scream... But there's good in all of us, how do you reach that? I think the Arts are an amazing way to reach them. That is the challenge for Arts organizations, for choreographers, and for directors. That is really the challenge.

You can't change the fact that everybody is on their phones all the time. So how do you do something that'll draw them in, away from their phones to a five-second, ten- seconds, 15- second ...

who invite me to come and talk to them now, who come and ask me to perform for them, who come and show me their works... It means that I'm in some way speaking to them a language that they want to listen to.

Nowadays, people are coming back into public life,



Kerala Kalamandalam

something that'll make them want to know more and therefore come to the theatre. How do I convert the person who is browsing their phone on the street to come to the theatre? That is the challenge. An artist cannot run away from it. Administrators cannot run away from it, we've to take it on and if they can use technology, so can we. And you can use technology to enhance the arts. It doesn't need to be in competition or in vulgarization.

Is the audience coming back to the theatre, especially in the post-lockdown period?

Very much!

The very fact that over many years now, it is college students

because they missed the live performances...

Yes, but there's also this other thing, that everyone now watches the live streaming.... So, live theatre and live performance have to be attractive enough to get them out of their homes, into their vehicles or buses, or whatever and out. So, you've to give them that kind of experience, which they cannot get on-screen.

So, do you think that working on a traditional art form in the present-day context can really work wonders?

Absolutely, I've just done a new one-woman show called Past Forward which traces the journey of

You know, tradition is not something that stopped at a certain date! So, I'm as responsible for creating tradition as for taking tradition forward. Tradition is not something that you lock up in a museum and throw the key away.

Have you been engaging with the artistic and social scenario of Kerala recently?

In 2006 and 2007, I did a project with the Kerala State Women



Dr. Mallika Sarabhai

Bharatanatyam from the 12th – 13th century to what I have done with tradition today and the changing role of the Nayika as I have interpreted over this period.

So, what is your concept of an institution teaching traditional art forms?

I find it very strange, what I'm doing today will probably in ten years be considered traditional, but it's not traditional today, it's very radical.

Development Corporation, which took me to 40,000 young women across Kerala, talking about women's empowerment.

So, it's going to be a great opportunity for us, to have you as the Head of Kerala's premier art institution, and hopefully, for you too, to be connecting with Kerala again!

Absolutely! I really look forward to it! I consider myself a 'Malayali Kutty'

LET'S TOGETHER MAKE KERALA GARBAGE FREE

M.B. Rajesh

Minister for Local Self Governments,
Rural Development and Excise



Over the past few years, waste management has become a global concern. An immense amount of waste is generated and piled up in households, factories, and construction sites. Along with the improvement in lifestyle, this has posed alarming threats to the environment. If the generated waste is not managed properly, it can cause serious problems to human health and the environment. The Kerala Solid Waste Management Project (KSWMP) is aimed to make urban and rural areas of the state garbage free.

Kerala, a densely populated state, home to more than 3.5 crore people and is spread over an area of 38863 square km. Despite having its high-quality life and scientific temper, the knowledge accumulated by the State is not completely reflected when it comes to the matter of waste management. Malayalis keen on personal cleanliness are lethargic when it comes to the notion of social cleanliness and a hygienic environment. We used to dispose waste from our homes with a prejudiced mind to make sure that our own house is clean and tidy. It is imperative that a drastic change must be brought in waste management and disposal as improper waste handling is destroying natural resources. A paradigm shift should be brought about for waste management and related activities.



The Kerala State Solid Waste Management Project (KSWMP) is aimed to make urban and rural areas of the state garbage free. This project is envisioned through LSG institutions and intends to utilize help from the World Bank. The project aims at the separation, segregation, collection, transportation, and treatment of garbage. The government of Kerala aims to implement this project by ensuring the participation of people by giving them proper awareness on comprehensive waste management. To implement this, general awareness

The project aims at the separation, segregation, collection, transportation, and treatment of garbage. The government of Kerala aims to implement this project by ensuring the participation of people by giving them proper awareness on comprehensive waste management.

is needed and the government will conduct campaigns on waste management solutions. An expo on modern waste processing methods will be conducted for people's representatives. The expo showcasing waste management methods will be held at Kochi from 12th to 14th of January 2022. The fruition of this project can be achieved only with the active participation of LSG institutions, resident associations, merchants' unions, and the public by perceiving it as a collective cause.

The project is being implemented in urban areas by spending 30 crore dollars (2300 crores in Rs). The project will be completed in 87 municipalities and 6 corporations within the span of 6 years. Of this, World Bank and the Asia Infrastructure Investment Bank will provide 10.5 crore dollars each. The rest of the cost is borne by the state government. The project is being executed with the cooperation of agencies such as Suchitwa Mission, Haritha Kerala Mission, Clean Kerala company, and the pollution control board.



The total generation of solid waste in Kerala is around 25 lakh tons annually. The total share of biodegradable and non-biodegradable waste is at 69% and 31% respectively. The biodegradable waste has a moisture content of about 70%. Household waste management should be kicked off from the houses themselves and organic waste should be composed in the precise sources. There are many waste processing methods for fabricating this. A good number of subsidies are provided by the Local Self Institutions to cater these needs. It is also important that the organic and inorganic wastes should be kept separately. Wastes like used sanitary napkins should be kept in separate covers. Hariitha Karma Sena members will collect the inorganic waste to storage units. This should be executed under proper supervision.

Strengthening institute-service methods for urban solid waste management is the salient feature of this project. Technical aid will be given to escalate the efficiency of various agencies and institutions working on waste management. Grants will be awarded to corporations to strengthen decentralized waste management and to process the inorganic wastes in an appropriate way. The government has decided to appoint young professionals for boosting the efficiency of the project in the urban

areas. Health inspectors from Corporations will coordinate the waste-cleanliness activities.

The attitude of people toward garbage and waste workers must be subject to rational thinking. City dwellers are generating heaps of waste in urban areas. The citizens should try to reduce the amount of waste at its source itself. The habit of organized cooking will help to reduce the amount of waste. One must try to cultivate the habit of scaling down waste and the disposed waste should be managed completely. The segregation of waste at its source is inevitable in the waste management process. This will be

Household waste management should be kicked off from the houses themselves and organic waste should be composed in the precise sources.



easy when the organic and inorganic wastes are collected separately. Local methods should be needed to dispose of the remaining waste after processing the same at its source. For this, people have to work side by side with the Hariitha Karma Sena members and should give user fees. Every citizen should be conscious of the approach 'My waste, 'My responsibility' with a focus on instilling a sense of ownership and duty.

Major steps have been taken to eliminate the garbage dumps piled up in various areas of the state. Kureepuzha in Kollam is a perfect model elucidating this. Owing to the Green Tribunal verdict, Kureepuzha became a pioneer in starting Kerala's largest solid waste management process. The process

of segregating waste materials and recovering the soil was executed there. Many materials including microplastics were segregated and sold out. The plastic materials were transported to the cement factories in Maharashtra and Tamil Nadu. By combining segregated waste materials with other materials, it can be used as fuels. Metals, sandal soles, bottle glasses, tyre residues were transported to Delhi for recycling. The filtered soil was given for levelling Baby John Memorial Govt. College ground, Chavara. The closure of existing dump sites can be carried out through such activities.

Elaborate plans have been chalked out to reuse the building waste materials. Much importance is given to preventing the dumping of building waste materials into water resources. The waste materials generated from the construction are collected by charging fees from the building construction owners. Those who dump waste materials against the government's instructions will be punished legally. A detailed guideline elucidating this is prepared.

I hope that this project can make the streets healthier, cleaner, more livable, and garbage-free which in turn can change the face of Kerala also. I request the wholehearted participation of everyone to make this venture a successful one. ■

KERALA SOLID WASTE MANAGEMENT PROJECT AIMS TO SAVE CITIES FROM SOLID WASTE THREAT: Dr. Adeela Abdulla IAS



Dr. Adeela Abdulla IAS, the Director of Kerala Solid Waste Management Project (KSWMP) is spearheading the implementation of the World Bank and Asian Infrastructure Investment Bank (AIIB) supported project in all the 93 urban local bodies of the state. The project is the continuation of the ongoing waste management activities in the state and is made to strengthen the existing systems of solid waste management activities of its cities. The project is a first-of-its-kind effort by the state government to make the cities of Kerala clean and find a lasting solution to the solid waste management problems. In this interview, Dr. Adeela answers in detail about the various aspects of the project.

Why do we need the Kerala Solid Waste Management Project?

Kerala generates about 2.2 million tonnes of solid waste annually in its urban areas. This includes garbage from homes, offices, and shops, as well as industries, institutions, etc. Though attempts have been made to bring in a scientific system for the collection, treatment, and disposal of the waste generated, a complete success in that direction is yet to be reached. Uncollected and untreated waste can become breeding grounds for pests, germs, and diseases, posing a serious hazard to public health and the environment.

So, to address the issue, we needed an urgent intervention. The government have designed the KSWMP in a way to strengthen the existing solid waste



management system with the aim of ensuring that the towns and cities of Kerala remain clean. The World Bank and AIB are supporting our government, and their participation will help us in adopting the best practices in solid waste management.

How does the project help the urban local bodies?

The project supports solid waste management in the 93 Urban Local Bodies (ULBs) in the State. It helps in strengthening the ULBs through policy

The project supports solid waste management in the 93 Urban Local Bodies (ULBs) in the State. It helps in strengthening the ULBs through policy initiatives, technical support, additional human resources, training and capacity building of existing staff, and financial support for the development of solid waste management (SWM) facilities for processing and disposal.

initiatives, technical support, additional human resources, training and capacity building of existing staff, and financial support for the development of solid waste management (SWM) facilities for processing and disposal. The project also ensures the development of regional-level SWM infrastructure facilities for centralised management of solid waste. Also, in addition to the routine budget allocation, ULBs will get more funding in the form of grants, which they can use to strengthen their existing solid waste management systems and services, or create new ones that are environment-friendly. Through this they can ensure that their cities and urban spaces are cleaner and litter-free.

How is the project implemented?

A State Project Management Unit (SPMU) has been set up under the Local Self Government Department (LSGD) to oversee the implementation. While most ground-level interventions in the cities will be implemented under the respective ULB, Project Implementation Units (PIUs) of KSWMP in the respective ULBs will facilitate the ground-level planning implementation and monitoring activities of the project. At the district level, DPMUs



(District Project Management Unit) with more resources in specific areas of expertise shall oversee the activities of the city-level PIUs and coordinate with the SPMU for review and approvals of the project components and release of funds to the ULBs. The SPMU will be in charge of the state-level policy formulation and implementation of the entire scope of the project including planning and implementation of the regional infrastructure projects. The Project Steering Committee headed by the Chief Secretary provides overall oversight and guidance to the project implementation.

What benefits can citizens expect from this project?

People living in the 93 Urban Local Bodies are expected to benefit from this project. The project will help improve the entire SWM chain in the towns and cities of the state, from segregation, collection, transportation, and processing to the scientific treatment or disposal of biodegradable and non-biodegradable wastes. This will lead to better health and environmental outcomes for the citizens of these cities and make the state’s towns and cities cleaner.

ULBs are the primary agency responsible for ensuring solid waste management in their jurisdiction and ensuring a litter- and pollution-free environment for their citizens. The project is designed to support the ULBs

in strengthening their institutional and service delivery systems for SWM. The project also offers technical and project management support to the ULBs through

SPMU, DPMU, PIU and consultancies. 50 percent of the total project fund to the tune of \$150 million will be allocated as financial support to the ULBs for sub-projects implemented by them.

The SPMU will be in charge of the state-level policy formulation and implementation of the entire scope of the project including planning and implementation of the regional infrastructure projects.

Is there a grievance redressal system where citizens can register their complaints about the project?

Yes. Grievance Redressal Mechanism



is an integral part of the project. A web-based system hosted on the official website of KSWMP and a toll-free contact point at SPMU is operational. Further, social media will be actively monitored for addressing the concerns of the public and stakeholders. The complaints registered through toll-free number, website, email, social media pages, and complaint boxes of ULBs and KSWMP will be addressed promptly.

The SPMU will monitor the complaints lodged through these channels for project and service delivery issues and resolve them through the appropriate channels. The project shall also resolve the project-specific issues lodged in the Chief Minister's Public Grievance Redressal Portal, a 24 x7 online platform.

The project will end in six years, and how

will KSWMP make sure that the services and infrastructure put into place are sustained once the project period is over?

Even though the project period is limited to 6 years, the SWM plan to be prepared for each ULB is considering a time period of 25 years, and the sub-projects taken up for implementation under the project are based on this. Also, the project is not only designed to create infrastructure facilities but will develop a system for its sustainable operation and maintenance. The ULBs are expected to carry forward these systems, and the project will include capacity building for the ULBs to do so. It ensures effective monitoring through capacity building and strengthening of institutional framework.

Toll-free no: 18004250238,

E-mail: grmkswmp@gmailcom,

Website: Chief Minister's Public Grievance Redressal

Portal: <https://cmo.kerala.gov.in/>

BRINGING ABOUT A CHANGE IN THE WAY WE TREAT SOLID WASTES

Inadequate processing and disposal create serious environmental health problems. The state government has made some praiseworthy progress in creating awareness about the need to keep the environment garbage free. The Kerala Solid Waste Management Project (KSWMP) ensures the development of regional-level SWM infrastructure facilities for centralised management of solid waste.



U.V. Jose IAS
Deputy Project Director, KSWMP

Waste, especially solid waste, is one of the growing concerns of urban life in our state. The cities of Kerala generate around 22 lakh tons of solid waste annually, where the total waste generation, including that from villages, amounts to 37 lakh tons. The data shows how precarious waste generation is in our cities and the need for urgent intervention. These wastes may end up in unregulated dump yards, roadside, and water bodies if they are not properly

managed. Those heaps of waste untouched or without treatment, pose serious health threats. Even the greenhouse gas from these not-well-handled dump yards adds fuel to climate change. Waste management is important to build sustainable and livable cities. The state government in the last six to seven years has made some exemplary progress in creating awareness about the need to keep the environment waste free and bringing about a step-by-step change in social behaviour. However, effective waste management needs money, modern technologies, and expert interventions.

On the lines of these demands, the state government has given shape to the Kerala Solid Waste Management Project (KSWMP), a six-year project, with the assistance of the World Bank and the Asian Infrastructure Investment Bank (AIIB), in 87 municipalities and six corporations in the state. The preliminary activities of the project are fast progressing in all the ULBs. This novel project will also help in the seamless continuation of the various ongoing waste management programmes implemented by the government. The project also ensures the development of regional-level SWM infrastructure facilities for centralised management of solid waste. Also, in addition to the routine budget allocation, ULBs will get more funding in the form of grants, which they can use to strengthen their existing solid waste management systems and services or create new ones that are environment-friendly. Through this, they can ensure that their cities and urban spaces are cleaner and litter-free.

Kerala Solid Waste Management Project: Necessity

People living in the 93 Urban Local Bodies are expected to benefit from this project. The Project will help improve the entire SWM chain in the towns and cities of the state, from the segregation, collection, transportation, and processing to the scientific treatment or disposal of



biodegradable and non-biodegradable wastes. The project will also help reinforce the entire solid waste management network in the towns and cities of the state. It also

helps improve the scientific treatment or management of biodegradable and non-biodegradable wastes. As part of the project, all municipalities will further strengthen their existing waste management systems and implement their own solid waste

management plans in accordance with their local characteristics.

There will be a three-tiered system for the implementation, assessment, and monitoring of the project. A State Project Management Unit (SPMU) and, under this, District Project

Management Units (DPMU) are functioning in all districts. District-level activities will be coordinated, implemented, and monitored by the respective District Development Commissioner. Apart from this, project implementation units (PIUs) will be functioning in 93 municipalities. Along with this, the services of technical experts and various agencies will be made available at all levels.

The appointment of solid waste management engineers as part of the project at all urban local bodies has already been completed. These engineers will provide support to the city administrations to prepare local-specific waste management master plans, their implementation, and supervision. These engineers would also formulate a five-year master plan for solid waste management. The data collection for this exercise is now underway in all municipalities and corporations in the state.

KSWMP, which is adopted and implemented along the lines of global standards, will bring about a sea change in the way we treat solid waste and will also give a sustainable solution to the menace that has been gnawing us away for all these years.

Also, in addition to the routine budget allocation, ULBs will get more funding in the form of grants, which they can use to strengthen their existing solid waste management systems and services or create new ones that are environment-friendly.

As part of the project, all municipalities will further strengthen their existing waste management systems and implement their own solid waste management plans in accordance with their local characteristics.

COVER STORY

The generation of wastes, in solid, liquid, or gaseous form has been there ever since Man started exercising activities for his existence. But it became evident when the assimilative capacity of the earth started falling. Then Man started looking for ways to effectively manage the waste that he generates. Realizing the ill effects of mismanagement of waste on human health and the environment, states and countries are now keen on devising strategies to deal with different types of waste, especially waste in solid form, and for this, depend a lot on technologies to process or treat wastes.

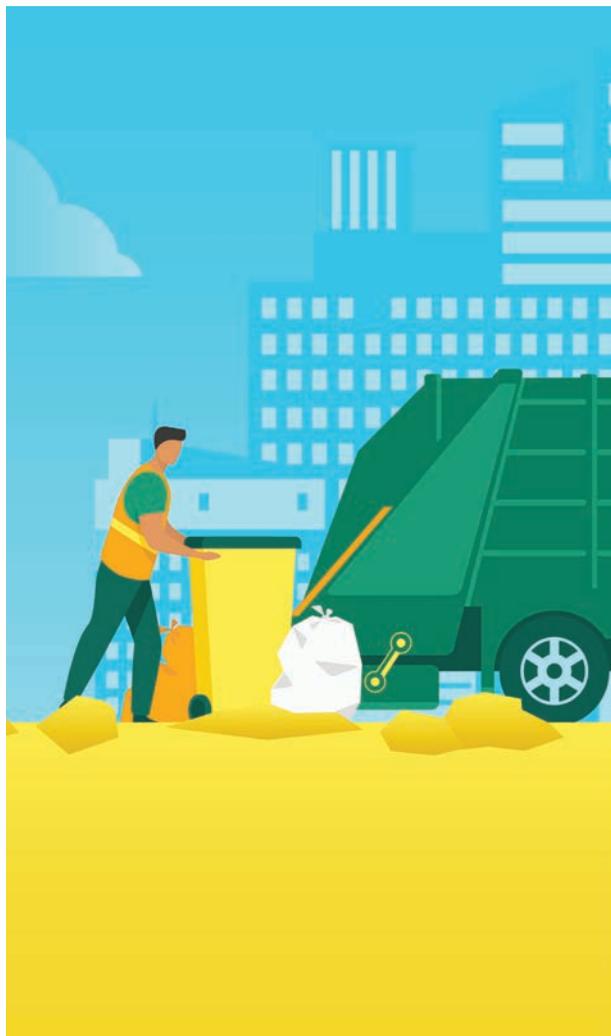
TECHNOLOGICAL INTERVENTIONS IN SOLID WASTE MANAGEMENT



Jayakumar J.S.

Urban Sanitation and Technical Expert
State Programme Management Unit,
KSWMP

Though waste management is a global issue, the strategy should be based on the assessment of local conditions and requirements. There is no universally common solution to the problem. This is because the characteristics of waste could differ. So the technologies adopted need to be simple, operational friendly, and suitable to the region, causing no nuisance or destruction to human health and the environment.



India generates about 60-70 million metric tons of solid waste (Municipal Solid Waste) every day. But only a small percentage of this is being processed and disposed of via scientific way. Different states have tried and tested different technologies and the results have not been encouraging in most cases. The technology selection should be based on the waste characteristics and not based on its easy availability or cost factors alone. The Indian waste type mainly is of low calorific value and hence the Solid Waste Management Rules, 2016 gives importance to technologies like composting and bio-methanation to process biodegradable wastes.

As per the state policy on Solid Waste Management (SWM), published in 2018, the state of Kerala generates about 10,000 tons/day of solid waste. The state has adopted a decentralized approach to managing the quantity generated.



It is being encouraged to treat biodegradable wastes at the source itself; which could be seen as an acceptable approach, especially when the Solid Waste Management Rules 2016 emphasizes the onsite treatment of biodegradable waste (“preference shall be given for the onsite treatment

The technology selection should be based on the waste characteristics and not based on its easy availability or cost factors alone.

of such wastes”, Rule 15(q), Solid Waste Management Rules, 2016). At the same time, the final disposal method available today is the disposal in the Sanitary landfill/ Engineered landfill facility which needs to

be commonplace.

The approach that the state has taken to deal with non-biodegradable waste is also an appreciable

one and many other states in the country are understood to have plans to replicate this. The non-biodegradables collected by the Haritha Karma Sena Units are brought to a Material Collection Facility (MCF) where it is segregated and then diverted to Resource Recovering Facility (RRF) for baling of recyclables and shredding of non-recyclables. The baled materials are then forward-linked for recycling, while the shredded materials are sent for road tarring, which is an accepted approach. The quantity that is not being collected by the Haritha Karma Sena units is being collected by the scrap dealers, either directly or through rag pickers. The rejects go to cement factories as fuel in cement kilns.

The state has realized the fact that burning waste is not an acceptable option and hence has discouraged such practices, except for certain types of biomedical waste, which is required as per the Biomedical waste management Rules, 2016. For the processing of bio-degradable wastes, the state practices bio-methanation and composting, as stipulated in the SWM Rules. This is apt because the waste generated here contains more moisture (more than 60%) as bound moisture and in addition to this, the state receives more than 6 months of rainfall every year, which further adds up to the moisture content in waste. Under such a scenario, the approach should be to adopt technologies based on the biological route rather than the thermal route.

Another challenge that the states and even some of the countries face today is the difficulty in dealing with decade-old dumped waste or legacy waste. These dumps, existing for years, stand as monuments of social and environmental disaster, emitting foul smells and creating leachate to pollute the nearby water sources.

Here also, technological intervention has happened. Initially, it has been through biomining of wastes, recycling the recoverables, and capping the rejects in about 20% of the reclaimed land area, which meant that the reclaimed area was limited to 80%. But now, we have technologies that could reclaim 100% of the dumpsite area. This has been tried and succeeded at the Kureppuzha dumpsite in Kollam Corporation. Kerala needs such technologies as the state faces a scarcity of open land for setting up waste treatment/processing facilities.

The real challenge for the state lies in identifying the land for setting up landfill facilities. With the high density of the population (about 860 persons/sq.km), it is extremely difficult to get land in the normally utilized land area. The Kerala Solid Waste Management Project (KSWMP) focuses on building complete solid waste management systems for Urban Local Bodies, including setting up facilities for rejects. But, for a small state like Kerala, it is highly essential that we try to limit the use of such facilities through actions like prolonging the life of the landfill, when it comes up, by reducing the quantity of rejects that goes to landfill or by adopting the 5 R principles of refuse, reduce, reuse, repurpose and recycle which adorns the logo that represents KSWMP.

The approach that the state has taken to deal with non-biodegradable waste is an appreciable one and many other states in the country are understood to have plans to replicate this.

COVER STORY

HARITHA KARMA SENA FOR A HEALTHY ENVIRONMENT



Jafar Malik IAS

Executive Director, Kudumbashree

The Haritha Karma Sena plays a key role in making the State much cleaner and healthier

Waste Management has got greater significance in the present social system as the rapid growth at which the economies are expanding, along with the rising living standard led to the quantity and complexity of the waste generated. Waste management has turned out to be one of the essential services in the current social system.

The growth of unmanageable waste generation and garbage pile-ups are creating many ecological issues such as global warming and pollution. And in the background of prevailing issues of climate change, waste management has got much relevance in addressing the issue to an extent. The Haritha Karma Sena, a band of Kudumbashree members, has paramount importance in the realization of a garbage-free state. The green force of the Kudumbashree is essentially involved in waste management activities.

A squad of women members is deployed in Haritha Karma Sena with the

responsibility to collect, transport, process, recycle/disposal, and management of waste materials in association with respective Local Self-Government Institutions and Suchithwa Mission. They primarily focus on the collection and segregation of non-biodegradable wastes.

By creating awareness, waste generation estimation, giving instructions and guidance to houses and institutions about the composting devices, making raw materials for source-level composting (inoculum) available at houses/institutions, and collecting non-biodegradables on a calendar basis are done effectively. They also attend source-level waste treatment issues reported by households and institutions in a span of 24 hours. The team is



responsible for mobilizing the support of Haritha Sahaya Sithapanam (Technical Support Agency), If required. They provide services mentioned in the overall waste management scheme, as directed by the Local Self-Government Institutions.

The deployed members collect non-biodegradable waste from houses and establishments to shredding units for recycling. The waste is segregated into different sections based on its features such as H.M White, P.P, H.M, LDPrint, Bajar, Ganny, Bulb, PVC, steel, tubes, bottle, E-waste, LD(Glucose), Bottle caps, Spray bottle, etc. The shredded plastic is being given to the local bodies for road tarring by the Clean Kerala Company. Each Kudumbashree worker will visit around 250 houses to collect non-biodegradable waste. The collection will be based on the user fee and the user fee should be fixed by the local bodies. The manufacture of environment-friendly materials, maintenance of waste disposal mechanism, organic farming, environment-friendly equipment on rent, and compost making and associated works will be taken up by the Haritha Karma Sena members.

The activities, which take the helm of sustainable waste management activities, are implemented under the leadership of Local Self-Government Institutions under the supervision of Suchitwa Mission, Hariitha Keralam Mission, and Kudumbashree. The total membership in the local body area shall be at least two members per ward. They collect the cleaned inorganic waste from each house at regular intervals. A fixed user fee is charged for the same. The non-organic waste collected from households is brought to the Mini Material Collection Facility or Mini MCF and from there the waste is taken to the Material Collection Facility or MCF. The garbage is sorted from here. The recyclables in the sorted waste are handed over to the respective companies by the respective local bodies.

Haritha Karma Sena delivers non-recyclable waste to the Resource Recovery Facility or RRF.

This plastic waste brought to RRF is ground and is used for road tarring. This also enables the recycling of this plastic waste. In an effort to ensure a garbage-free Kerala, Haritha Karma Sena is bringing a drastic change in waste management and disposal.

Apart from this, activities are also being done to provide solutions and instructions to households for organic waste management. Haritha Karma Sena teams are trying to find another source of income in this sector by starting green enterprises that make better products from waste materials and implementing other innovative business models. Green businesses are trying to find another source of income in this sector by starting green enterprises that make better products from waste materials and implementing other innovative business models.

A total of 1018 Haritha Karma Sena is functioning in the state. Of these, 926 are in the rural areas and 92 of them are in the urban areas. There are a total of 4145 registered Haritha Karma Sena Units. Of these, 2704 are in the rural Local Self-Government Institutions and 1441 registered Units are functioning in urban Local Self Government Institutions.

The Haritha Karma Sena has a strength of 28,224 members. Out of them, 23,546 members are functioning under rural self-government institutions and 4678 members are functioning under urban local self-government institutions.

Our environment demands the appropriate initiation of waste management and recycling of all the waste and trash around us. Haritha Karma Sena is making greater efforts with a motive to make the environment healthy and litter free.

A squad of women members is deployed in Haritha Karma Sena with the responsibility to collect, transport, process, recycle/disposal, and management of waste materials in association with respective Local Self-Government Institutions and Suchithwa Mission.

Haritha Karma Sena teams are trying to find another source of income in this sector by starting green enterprises that make better products from waste materials and implementing other innovative business models.



NON-BIODEGRADABLE WASTE MANAGEMENT



G.K. Suresh Kumar

Managing Director, Clean Kerala Company Ltd

Waste becomes a social menace when biodegradable and non-biodegradable waste is mixed together and disposed or burnt unscientifically. The challenge before us is to find a sustainable solution where waste disposal is no longer an issue.

The waste management guidelines of Kerala are different from other states. The public campaign to create awareness about the need for source-level segregation and waste management is carried out by Local Self Governments. Nava Kerala Mission, Suchitwa Mission and Clean Kerala company are the organisations that lead the initiative from the forefront. Only when the public adheres wholeheartedly to the motto 'My Waste, My Responsibility', will the campaign be fruitful. Although several local bodies are effectively managing waste, our goal is to guide each of them to their optimal functionality. Clean Kerala Company Ltd acts as a support mechanism in this endeavour.

Perilous Situation

Plastic products became popular after 1950s. Within a short span of 70 years, plastic became an indispensable article in the world. Lightness, durability, low price, hydrophobicity etc made plastic popular. Since we applied a use and throw attitude with regard to plastic, our planet has reached a vulnerable position. UN Secretary General António Guterres had ominously opined that the world is heading towards a climatic hell. Global warming and carbon emission is increasing irreversibly at alarming rates. The rising menace of solid waste must be evaluated in this context.

The burning of plastic produces highly toxic chemicals like Furan, Dioxin etc, which causes severe health issues. Substances like Styrene and Benzene found in Styrofoam materials like thermocoal can cause serious damage to nerves, kidneys, liver and reproductive system and can cause cancer.

Solution

Even though humanity is in a dire situation, we can overcome this with immediate and effective intervention. The solution is to use plastic prudently. Plastic use can be

reduced through a small lifestyle change. Single-use plastic amounts to around 90% of the plastic used in daily life. If by any chance, you have to use plastic, make sure it is put to repeated use. This can help reduce the hazards to environment to some extent. Do not discard or burn after use. Hand it over to Haritha Karma Sena, so that it can be recycled. The recycled plastic can be made into new products. Those plastic materials which cannot be recycled and used shall be shredded into tiny pieces and used in road construction. Such materials can also be used in cement factories or scientific land filling. For this process to become universal, the society should be made aware of the three important R's of 'Reduce, Reuse and Recycle'.

Segregation and Value Addition

We should be able to manage domestic and institutional biodegradable waste at the source. Local self governments, in association with Suchitwa Mission, facilitate source-level waste management. Appropriate composting mechanisms like Biobins, Composts, Biogas plants etc could be employed or the waste could be used as manure for plants. At the local level, panchayats and municipalities arrange Thumpoormuzhi composting technique for offices and institutions.

Plastic bag, footwear, rubber products, computer, mobile, CFL, tube light, bulb, clothes etc constitute non-biodegradable waste. If these are segregated at source itself, waste management would be easy. After the primary segregation, these waste materials are once again segregated at the Material Collection Facilities (MCF). Later, they are taken to Resource Recovery Facilities (RRF), where final segregation

and baling are done. Waste which is segregated and baled is high in demand. Clean Kerala Company delivers the segregated waste, collects its price and hands it over to Haritha Karma Sena.

Living up to the motto 'My Waste, My Responsibility' will help humanity in the long run. Clean Kerala Company will be there to assist local bodies and other institutions in the effective management of waste materials.

Calendar

Clean Kerala Company has published a government-approved calendar for the collection of waste materials

Sl. No.	Item	Month of Collection
1.	Paper, Plastic, Plastic Covers	Every Month
2.	Footwear, Bag	January, April, July, October
3.	Bottle, Mirror and other Glassware	February, May, August, November
4.	e-waste (tube light, CFL, battery etc)	March, June, December
5.	Medicine strips	January, March, June, September, December
6.	Cloth waste	April, September

Clean Kerala Company aims to establish recycling units in every district. As a part of this, waste collection centres are being set up in every district.

Every month, the plastic and paper waste collected from homes, following initial segregation, is brought to the ward-level mini MCF. The secondary segregation will be done at mini MCF. After this, a proper segregation will be done at the LSG-level MCF.

Clean Kerala Company

The municipalities own 76% and Government of Kerala owns 24% of Clean Kerala Company. Solid Waste Management Rules 2016 and the government's policies helped to widen the scope of functions of the company. A district is divided into 4 sectors at the block level, each constituting adjacent municipalities; a calendar is prepared to determine waste transfer from LSG-level MCF/RRFs. It was after 1-1-2021 that Clean Kerala Company fixed price for the plastic collected and started transferring the amount to Haritha Karma Sena (HKS).

There are 195 Resource Recovery Facilities in urban and rural areas across the state. Clean Kerala Company aims to establish recycling units in every district. As a part of this, waste collection centres are being set up in every district. Doorstep collection of waste will be effective only when the MCFs are functioning efficiently under local bodies. In order to ease the work of Haritha Karma Sena, a conveyor belt in MCF, baling machine for bundling waste materials and weighing machine are required. Local bodies are striving to make these facilities available at all centres.



CKCL at a glance

- Use of shredded plastics for polymerised road construction
3,243.145 MT shredded plastic used till date.
- Length of polymerised road constructed using shredded plastic is 5,215.55 KM
- 8,332 MT of recyclable materials collected from HKS during this period
- Rs.5.16 Crores paid to HKS from 01.01.2021 to 30.10.2022
- 51,322 MT of non-recyclable inert materials taken to scientific landfills and cement kilns for incineration.
- 2,011 MT of E-waste handed over to recycling and processing
- 606 MT of glass waste collected and processed till date
- 42 MT of waste cloth collected and processed till date

COVER STORY

E-WASTE: NEED FOR AN EFFECTIVE LEGISLATIVE MECHANISM TO BRING PRODUCERS' RESPONSIBILITY

Technology has brought revolutionary changes in human lives, which were beyond our imagination earlier. While the primary goal of scientific and technological innovations is to make positive impacts, it results in certain negative side effects as well. It generates leftovers from these technologies, which are hazardous to the environment and human health.



N. Bhadran Nair

Executive Editor, Indian Science Journal

Electricity and electronics are two key components of development in the modern era. Both are the fundamental building blocks of industrial development. It ranges from nano-sized computer chips to very large transformers. In today's world, we cannot think of life without electricity and electronics.

Products and processes involving electricity and electronics generate waste, called electronic waste. Electronic waste or e-waste as is commonly



known is discarded electronic or electric products, such as computers, televisions, VCRs, stereos, copiers, and fax machines or microwaves, home electronic products, mobile handsets, after their useful life.

Each of these products has a certified lifespan according to their manufacturers. While the lifespan of mobile handsets is on average five years, that of desktop computers varies from three to eight years. The lifespan of television sets varies from five to seven years, but the useful life of the latest products could last around 13 years, according to data available.

The useful life of electronic and electric products in India is longer than in western countries, as there is a well-established grey market in second-hand products and e-waste.

The rapid growth of the Information and Communication Technology sector has enhanced the usage of electronic equipment, resulting in faster obsolescence and its up-gradation.

"This in turn accumulates huge e-waste to the solid waste stream. E-waste is growing in India at the rate of 10 percent and its recycling.... recycling



of e-waste is carried out in the non-formal sector using primitive and hazardous methods," according to a report by the Union Department of Information Technology.

E-waste is not hazardous if it is stocked in safe storage or recycled by scientific methods. However, it can be hazardous if recycled in primitive methods. E-waste contains several substances such as heavy metals, plastics, glass, etc., which can potentially be toxic and hazardous to the environment and human health. Besides, lead, and cadmium in printed circuit boards of electronic products, mercury in switches, flat screen monitors, compact fluorescent light or CFL bulbs are hazardous

According to the information given to Lok Sabha on 18 July 2022 by the Union Ministry of Environment, Forest, and Climate Change, 10.15 lakh tonnes of e-waste was generated in India in 2019-20 of which only 22.07 percent was dismantled and recycled.

How to dispose of E-waste?

The management of e-waste in the country is regulated under the E-Waste (Management) Rules,

2016. The rules, further amended, mandate certain specific processes for the disposal and reduction of E-Waste.

- Extended Producer Responsibility: It mandates, producers of electronic and electrical equipment responsibility to manage a system of E-waste collection, storage, transportation, and environmentally sound dismantling and recycling.
- Setting up environmentally safe and sound recycling through authorised dismantlers and recyclers.
- Minimise illegal recycling/recovery operations
- Reduce hazardous substances in electrical and electronic equipment.

The rules stipulate that every producer of electronic and electrical equipment ensures their products do not contain lead, mercury, and other hazardous substances beyond the maximum prescribed concentration.

Despite the rules, we find compliance of it is a little more than one/fifth of the E-waste generated in the country. This is a matter of concern, as illegal cycling or dumping in landfills can have serious environmental and health implications.

Producer Responsibility

If a product contains hazardous material – both environmental or health, the primary responsibility for the disposal of the product after a certified period of life should rest with the manufacturers.

Unfortunately, not many manufacturers have an effective take-back policy. While many claims to follow a policy to take-back expired products, practically it is difficult to return; logistics is a major issue in many others, as they do not have many collection points in India, against their widespread sales networks.

A second option for the disposal of electronic products like laptops and desktops or mobile handsets is to donate to a school or a charitable institution working in the field of education. But before donating it, ensure the equipment is reusable and functional.

The states can bring a stipulation while allowing a sales outlet of electric or electronic products, that they should follow a sound take-back policy without any hassles to the buyer. The solution to recycle e-waste is beyond the means of a consumer or local government agencies, given its toxic nature.

A manufacturer's responsibility should be included in licensing for industries for any products that would generate hazardous material, pre or post-manufacturing. "The solution lies with the brand owners or manufacturers of electronic products, which need to bear responsibility for financing the treatment of the own-branded e-waste, discarded by their customers. This is known as the principle of Individual Producer Responsibility (IPR)," suggested Greenpeace, an international voluntary organisation working in the field of environment.

Such a legal mandate on the manufacturers would prompt them to design products less toxic and more amenable to material recycling.

We cannot overlook the impending e-waste crisis and therefore, effective legislation to embrace producer responsibility for e-waste as in the European Union, Japan, Korea, Taiwan, and some US states is the immediate way out. Electronic and electrical industries should be made responsible for setting up a robust system of e-waste collection and treatment infrastructure. The government should only be a facilitator. ■

COVER STORY

ZERO WASTE KERALA: ESSENTIAL FOR FIGHTING THE SOLID WASTE MENACE AND CLIMATE CHANGE



Shibu K.N.
Regional Organics Campaigner

The COP27 just conclude in Egypt last week reminded the nations about keeping up the promise to bring down emissions to keep the global warming below 1.5 Degree Celsius. The unusual heating up our globe is a serious threat to the mankind as well as the living beings. Our current lifestyles and impulsive consumption encouraged by the market is the driving force behind the emissions. It demands systems for sustainable resource use, resource management and recovery. One of the best entry points to make it happen is zero waste.

Zero Waste

"Zero Waste is a goal that is ethical, economical, efficient and visionary, to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use." (Zero Waste International Alliance)
Zero Waste is thus an approach for sustainable resource use and management rather than waste management. It is not a technology but a strategy for optimal and mindful use of resources.

Is Zero Waste possible?

Yes. Thanal, one of the oldest environmental organisations in Kerala,



introduced the concept of Zero Waste to Kerala way back in 1998. The project 'Zero Waste Kovalam' was the lab for innovative ideas to customise and translate the theories into practice. The major components of the project like Material substitution for phasing out single use products and wasteful resource uses, Green Protocol for waste minimization, Resource recovery centres to replace waste management plants, decentralised solid waste management for effective recovery etc were presented in the project which gathered national and international attention.

'Zero Waste Kovalam' along with other similar independent and successful experiments in Kerala led by communities and local self-governments influenced shaping of solid waste management policy of Kerala. Dr. R. Ajayakumar Varma, the director of Clean Kerala Mission was the main architect of the Malinya Muktha Keralam Action Plan which introduced the idea of a sector wise approach to manage solid waste. The idea of decentralised and overflow management mechanisms for municipalities with an emphasis on waste reduction was the foundation of the Action Plan.

Alappuzha model led by Dr. Thomas Isaac and Thiruvananthapuram Model by the Corporation



of Trivandrum during 2015-20 were two major turning points in the history of solid waste management in Kerala.

The innovative design of an aerobic composting bin by Dr. Francis Xavier of Kerala Veterinary University brought in a paradigm shift in solid waste management of Kerala. He named the device as Thumburmuzhi compost bins and it became an integral part of solid waste management programmes in Kerala due to its simplicity and modularity.

The innovative and impactful campaign led by Dr. T.N. Seema for Haritha Keralam Mission was the accelerating factor for consolidation and movement building for a clean and zero waste Kerala. It was the largest climate action in Asia which addressed water conservation, waste management and safe agriculture through connecting about 8 million households.

The intensive and integrated approach of two missions - Kerala Suchitwa Mission and Haritha Keralam Mission was a great success in terms of building public trust and confidence to address waste issues in Kerala. They laid the foundation by providing practical guidelines for selection of technology, design and implementation of infrastructure, institutional mechanisms and

capacity through building a network of trained experts and resource persons across Kerala. The Government of Kerala gave priority to Clean Kerala through allocating a sizable budget exclusively for solid waste management. And a convergence is also happening with the sectors like agriculture, climate etc. Kerala Development and Innovation Strategic Council (K-DISC) and Kerala Startup Mission are encouraging entrepreneurs with incentives for innovative solutions for solid waste issues of Kerala.

Almost all the local self-governments are currently implementing the project as per the guidelines provided by the missions. More than 60% of LSGs have attained 70% completion to bring in an impressive result in solid waste management. The Great Flood of 2018 and COVID pandemic in 2019-20 derailed the campaign. Now the missions are regaining the track in an aggressive mode with the support of local self-governments.

Kerala has established and proved a solution for waste which includes green protocol for waste minimization, promotion of alternate products and services to eliminate single use plastics, infrastructure for efficient recovery of organics at household, community and LSG level, network of material recovery facilities and resource recovery centres for recovery of non-biodegradable discards, poultry and meat waste recovery, pre-processing / recycling centres for forward linkages, cluster level infrastructure for septage and grey water management etc. All these need to be scaled up to ensure 100% coverage.

What is Next?

In last 7 years the decentralised solid waste management programme created more than 50,000 direct jobs. This is going to be a green business sector with immense potential for growth. Governments have to extend support to nurture this evolving economy to provide just transition of people at the lowest strata to ensure dignity of labour and social security. There should be extra steps to integrate the informal sector especially the waste pickers and waste workers into this evolving system to protect their rights and livelihoods.

Kerala may also require a couple of centralised sanitary landfills to dispose of existing non-recyclable rejects as a medium-term solution and there should be a phasing out plan for non-recyclable products. Hopefully, the Kerala Solid Waste Management Project be able to address this issue. It is time to introduce a cadre of trained personnel as part of LSGs to elevate the existing solid waste management programmes to the next level of climate and environment programme.

A mechanism has to be created to implement Extended Producer Responsibility where the LSGs of Kerala should have complete control to ensure timely finance from producers to manage unmanageable discards like plastics, foams, sanitary napkins etc.

Kerala also needs a strong, persistent campaign to bring in behaviour change of people and to ensure public ownership and participation at all levels to make Kerala waste free.

The models created so far are very strong and replicable. It is time to consolidate and streamline to make Kerala India's first Zero Waste State.

WASTE MANAGEMENT AND CLIMATE CHANGE



Suhana R.H.

Project Assistant
CCTU Suchitwa Mission

'I don't know how many people are aware of climate change and its mitigation, and how an individual can contribute against climate change. Switching to renewable energy is not the only solution to climate change' says Suhana who got selected for the Young Scholar Award by UNICEF India and UNDP India. This scholarship is awarded only to four youngsters from India who work for climate change. With a scholarship of 3000 USD, she participated in the 27th International Conference held in Egypt. Suhana is a thumbnail and inspiration for many as she is trying to address the problems of climate change.

Air, water, and food are the basic necessities of human life. Climate change affects all three and alters the balance of the earth. Broader changes are happening to our planet in which climate change has become a major concern. Unseasonable hot weather in urban areas, unexpected rain flow, extreme rainfall causing flooding, changes in groundwater, and rapid sea level rise are some of the major concerns. Farmers are in distress due to unforeseen climate changes which in turn affects productivity. The impact of climate change has put them in a dilemma where they have no idea about which month is suitable to plant a crop.

In addition to this, climate change is directly affecting livestock and cattle.

They are affected with several diseases because of water scarcity, and extreme heat leading to altered metabolism and increased mortality. The changes in water temperature, rapid sea level change, and unpredictable water currents may affect the fishing community and freshwater ecosystem also.

The burning of fossil fuels, gases released by



factories, cutting down of crops, and urbanization are major reasons for climate change. Methane is released because of improper waste management. This is also the prime reason for climate change.

Whether in small or large amounts, immense

waste is generated in households which is unavoidable. However, the way we deal with the idea of waste management is an important part of climate change. Developing countries have recognized Waste management as one of the most serious environmental problems. According to UNDP forecasts, 50% of the country's population will live in cities by the year 2030, and

the consequences of improper waste management. They are not thinking about where it is going beyond their bins. Do we know what happens to the generated waste in the bins? In most countries, to clear the waste, the landfill method is mainly executed. But this landfill creates a crisis in the climate.

Throwing garbage is harmful to the environment. Firstly, due to a lack of oxygen, organic waste does not turn into compost when the waste is compressed, compacted, and covered with soil. Instead, anaerobic decomposition takes place, releasing methane, a highly toxic greenhouse gas that is a major contributor to global warming. We can solve these problems, but each individual needs to change their attitude towards waste management. Waste management is necessary to avoid landfill and incineration. Decentralized waste management is a suitable solution as recycling and the habit of zero-waste takes time. The basic separation of biodegradable and non-biodegradable waste should start from the households themselves.

Haritha Karma Sena is a proper waste management system implemented by the government to collect waste from door to door of houses. The team members of Haritha Karma Sena separate non-bio waste and forward it to Mini MCF (Mini Material Collection Facility), MCF (Material Collection Facility), and to RRF (Resource Recovery Facility) respectively. From there, plastics are segregated into several categories and recyclable plastics are handed over to recycling companies. Non-recyclable plastics are shredded and transported to cement factories.

The burning of fossil fuels, gases released by factories, cutting down of crops, and urbanization are major reasons for climate change. Methane is released because of improper waste management. This is also the prime reason for climate change.

The government provides various facilities for the composting of biowaste. For household waste, there are kitchen bins, pipe compost, pot compost, etc. We can compost this organic waste with Inoculum. Household biogas plants can be also used for this purpose. At the municipal level, we have aerobic bins, windrow composting, vermicomposting units, municipal biogas plants, etc.

In Kerala, more than 12,000 families use household composting units, and 3810 families use municipal biowaste composting units. Nevertheless, we have not yet reached the goal of zero waste. However, decentralized waste management is an ideal solution. On a positive note, many youth leadership organizations, NGOs, and student civic groups are passionate about volunteering for decentralized waste management. Haritha Karma Sena can also play a vital role in waste management. And it also helps to achieve sustainable development goals. It reduces greenhouse gas emissions and improves the quality of life, allowing us to act for CLIMATE CHANGE. It is the task of every individual to take action against climate change. In this way, we can save ourselves and our EARTH.

the amount of waste generated will be increasing significantly. Although various solutions have been implemented by the government, people's tendency to throw away waste without proper disposal continues even today. These threats from unsustainable waste management are the main source of climate change. People are unaware of



COVER STORY

START-UPS HELPING IN MAKING A CHANGE IN WASTE MANAGEMENT IN KERALA

Kerala is one of the most fertile lands for IT start-ups in Asia. With the availability of young talents and robust ecosystem, the state has become a promising land for waste management start-ups too. Apart from government schemes, a bunch of young entrepreneurs have come up with excellent waste management start-ups in different parts of the state. With the help of technology, they have successfully introduced and implemented sustainable and technology backed solutions to the pressing issues of waste management.

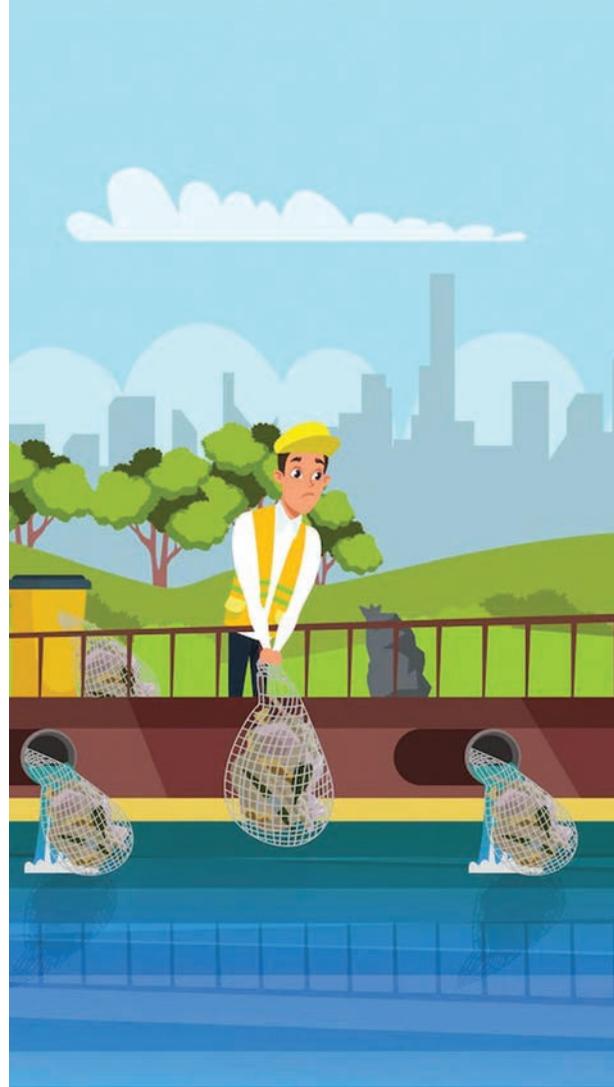


N.M. Salih

Freelance Journalist and Communication Professional

Urban Trash: An 'Uber of waste management'

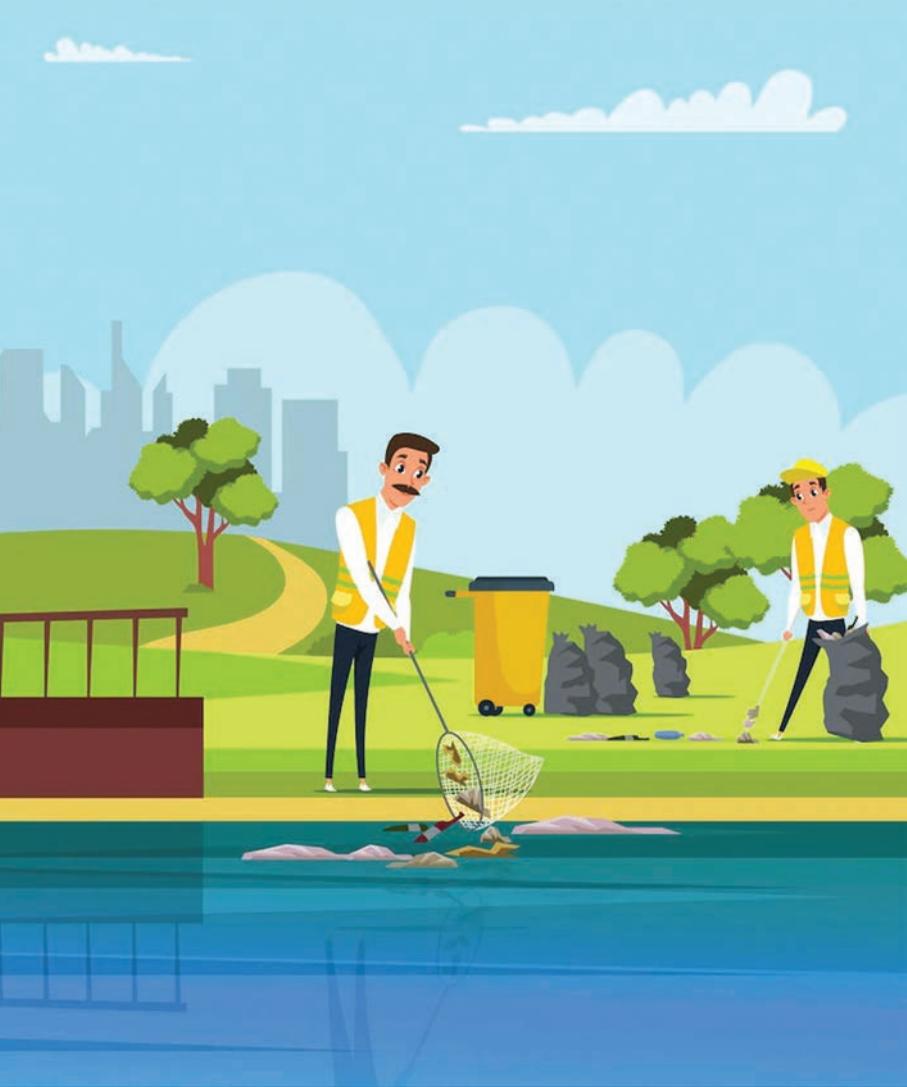
Kochi-based clean tech start-up Urban Trash is on a mission to revolutionise urban waste management by being the 'Uber of waste management.' They have created the most user-friendly waste



management platform that caters to the needs of the urban population and waste treatment vendors alike. They will collect the garbage from the doorsteps anywhere in the city. Customers only need to send a 'Hi' to them. The WhatsApp Business API provides live interaction with an integrated chatbot and helps customers seamlessly connect with the service provider 24x7. Drawing inspiration from the overwhelming response, the company is now planning to spread its wings to other cities.

Urban Trash is in the process of developing a complete waste management platform by integrating collection, route mapping, logistics, supply chain management, payment integration and staff management into one. The company aims to create a pan-Indian network of waste treatment vendors and ensure the availability of raw materials they need to run plants.

The start-up was founded by Thajudeen Aboobacker, a young social entrepreneur, as the result of his quest for the most user-friendly waste collection service and building an ecosystem for vendors and entrepreneurs in the waste collection industry. "The experience volunteering and supervising several waste management projects



traced and end disposal. So far Green Worms has created 312 direct jobs and works across 48 Grama Panchayats in Kerala. They work on a Shared-mission approach with Grama Panchayats and SHG's (HKS/Green Task Force) to implement a systematic waste management while ensuring the operations are sustainable. The team has been working with 1200 SHG member's and enabling community engagement at the centre of operations, enabling Safe working conditions and assured income. Green Worms is operating in Lakshadweep and Andaman Islands to tackle Plastic pollution and poverty. They aim to create 1700 direct jobs and 5000 shared-mission jobs by 2028 to fast forward Circular Economy Transition.

AAKRI goes online

AAKRI app is a single go-to-point for the disposal of all kinds of waste. This initiative was conceptualised to protect our landfills from plastic and recycle maximum for the environment. AAKRI team has been providing all-day scrap pickup service in several cities throughout Kerala, offering services to all residential and commercial customers. The platform aims to help find and map assets that streamline the collection of post-consumer

for the past seven years forced me to find a simple and sustainable solution for the complex and often cumbersome practices in this sector. Waste management can be revolutionised only by prioritising consumer-friendly facilities," He said.

Green Worms fights plastic and poverty

Green Worms is a Social Impact and Circular Start-up in India. Started in 2014 Green Worms

Mission is to create dignified jobs through a circular economy to eradicate both plastic pollution and poverty in India. Their operational focus is on vulnerable islands and coastal villages.

Kochi-based clean tech start-up Urban Trash is on a mission to revolutionise urban waste management by being the 'Uber of waste management.'

Green Worms teams are currently operating in 48 coastal villages in Kerala and provide end to end Waste Management services to local self-governments . Apart from that they create local women collective to implement Waste Management systems in villages and ensure waste has been collected,

waste, schedule efficient and cost-effective waste, schedule efficient and cost-effective pickups, and incorporate the segregated waste into the recycling/vendor network.

"AAKRI is a futuristic environmentally friendly Start-up aimed at addressing the waste menace concerning the life of the people and the environment. We collect all sorts of scrap including e-wastes and pay the customer based on the weight of the material. Then segregates the materials according to the grade and passes the scrap to different recycling industries," says C .Chandrashekar, founder of AAKRI.

Green Worms teams are currently operating in 48 coastal villages in Kerala and provide end to end Waste Management services to local self-governments .

The waste management start-up will purchase anything which can be recycled. Since the launching in 2019, it has expanded its network and shifted strategies according to the needs. AAKRI service is now available at Thiruvannathapuram, Kollam, Kottayam, Idukki, Alappuzha, Ernakulam and Kozhikode.

Residential or corporate users wishing to sell the scrap can simply schedule the pick up through the AAKRI app and request for the pick-up of the waste. Recently, AAKRI has started the collection of biohazard wastes from households and commercial offices in Kalamasseri Municipality for a fee. The company has tied up with Kerala Enviro Infrastructure Ltd (KEIL) to treat the biohazard wastes at KEIL's Brahmapuram plant.

COVER STORY

KUREEPUZHA: A SUCCESS STORY

Evaluated as a model for the entire country, the Kureepuzha biomining project is the first of its kind that has removed legacy waste at any Ramsar site.



Adarsh Onnatt

Freelance writer

Kureepuzha garbage treatment plant in Kollam is the first legacy dumpsite in the State to undergo biomining and to have reclaimed the land. The junkyard with heaps of toxic mixed waste of 70 years was a headache to the Kollam Municipal Corporation for years. The residents here had been warring for many decades with the local self-government authorities to get rid of the waste that has turned their life miserable. Nearly a decade ago, when this writer visited the Kureepuzha garbage treatment plant which situated only a few metres from the Ashtamudi Lake saw heaps of waste lying dormant. The wells of the households near to the site was tainted with leachate from the plant. People struggled for drinking water. There was a permanent protest stage with people protesting against the plant round the clock until 2012. Then, the operation of the treatment plant was discontinued. But, the waste, untreated, lay there.

The project to remove 1.04 lakh cubic meters of legacy waste began on January 24, 2022. Kureepuzha is the first complete biomining project in Kerala. Since it was evaluated as a model project, ministers, public representatives, heads of various departments of the state, technicians, students etc. were regular visitors to the project.



The whole mixed waste piles at the site were completely removed and the land is reclaimed now. This is the first time in India that legacy waste at any Ramsar site is completely removed. Biomining technology separates waste into various components in an environmentally friendly manner. Biomining is unique in that each waste is processed separately. The mining activities have been taken place here strictly adhering to the direction of National Green Tribunal.

The waste management was done under the direct supervision of the Local Self-Government Department and the Engineering and Health Departments of the Kollam Corporation with the approval of the State Pollution Control Board in accordance with the Central Government's rules for solid waste management.

To remove the legacy waste from the plant, Kollam Municipal Corporation assigned National Institute of Technology, Kozhikode, to assess the volume of waste. The study measured the volume of waste to be 1,04,906.88 cubic meters.

Later in August 2021, a private partner, Zigma Global Environ Solutions Pvt Ltd, was selected and given the contract to execute the remediation activities. Although 20 percentage of the capping method was fixed earlier, at the time of execution it was found that the complete removal of waste is needed. Capping near to Ashtamudikayal will only lead to more waste problems. The project was estimated to be completed in 12 months, excluding the rainy season and including a mobilization period of three months. The biomining activities started on January 2022 and was completed by July 2022.

Around 500 to 800 metric tons of legacy waste was treated per day. Waste treatment was carried out using bulky equipment as per CPCB guidelines such as a series of trommels, air density separator and magnetic separator. Wastes like Refuse Derived Fuel (RDF) consists of plastics and other combustible materials. Various types of



soil, stone, metals, glass, tires, wood, bags, shoes, pens, concrete waste, e-waste etc were separated from the heap.

By clearing the dump yard, it is estimated that the emission of carbon dioxide to the tune of 72,647 tons will be avoided. This is equivalent to the carbon dioxide absorbed by 89,005 acres of forest land in an entire year, or equivalent to planting 12,02,234 saplings and growing them for ten years. Also, the RDF extracted from this waste dump is used in the furnaces of cement factories and is used as a substitute for natural fuels such as charcoal and firewood.

Meanwhile, the local self-government department is emulating the successful model of land remediation at Kureepuzha to all the urban local bodies. As part of the Kerala Solid Waste Management Project (KSWMP), 34 such legacy waste dumping sites have been identified all across the state and initial work is started. These lands here will be reclaimed by scientifically removing the waste in these places.

The mixed waste piles abandoned over the years in the legacy dumpsites can be scientifically separated and safely disposed of completely without environmental and health problems, and the non-recyclable ones can be disposed of scientifically by constructing sanitary landfills. As part of the initial activities, various awareness programs will be organized to bring to the people the need and benefits of reclaiming the selected landfills. On the basis of understanding the nature of the wastes in these places through scientific studies, it is decided which methods should be used to change the type of these wastes. These activities will be scientifically coordinated without harming the ecosystem, the respective regions or public health. The government aims to find a permanent solution to the environmental health problems that have arisen in connection with these waste disposal centers.

DIGITAL RESURVEY



DIGITAL RESURVEY: A MAJOR LANDMARK

K. Rajan

Minister for Revenue and Housing

It is my firm belief that Digital Resurvey, launched on Kerala Day (November 1), will become a major landmark in government's endeavour to build a brand new Kerala. This project will definitely be a turning point in the future development trajectory of Kerala. Digital Resurvey will help us prepare complete land records of the state through digital measurement of the land on the basis of possession and ownership. The process is expected to be completed in 4 years.

The history of land survey of Kerala spans over a century. Long before the unified state was formed, surveys were conducted in Travancore, Cochin and Malabar and settlement registers were prepared. Survey settlement was conducted in Travancore from 1886 to 1911, in Cochin from 1905 to 1909 and in Malabar from 1926 to 1934. The survey settlement records prepared in those days using rudimentary tools are still considered as the basic documents regarding land in the state. As the joint family system transformed into nuclear family units, the number of land transfers and transactions burgeoned. But, at the same time, the corresponding changes in land status were not properly documented in survey records. It is in this context that the process of resurvey began in Kerala in 1966. However, even after 56 years the resurvey proceedings have not been completed, owing to the lack of advanced technology and the drawbacks in the conventional procedure. In the last 56 years, resurvey has been completed in only 911 villages out of the 1666 villages. Of this, digital resurvey has been conducted in only 91 villages. The rest of the villages have been surveyed using traditional survey equipments.



If this process is continued, then resurvey in the state will not be completed even in another 50 years. In this situation, the Government of Kerala decided to start digital resurvey using the most advanced technology and complete it on time. This project called 'Ente Bhoomi' (My Land) will be completed in 4 years. Digital survey of land will be conducted in 1550 villages in the state, except the 91 villages where digital survey has already been completed and the

25 villages where the process is underway.

The survey will be conducted using the most advanced equipment like CORS (Continuously Operating Reference Stations), RTK-Rover (Real Time Kinematic Rover), Robotic Total Station etc. In addition, drone-based survey technology will be deployed in open spaces that account to ten percent of the state's land area. Continuously Operating Reference Stations (CORS) are GPS towers established in different parts of the state. Real Time Kinematic (RTK) machines are used to determine the exact location of the land from the signals received from both satellites and CORS stations. Robotic Total Stations are automatic electronic total station machines. Thus, the area of the land can be calculated using the most modern technology and the sketch can be given to the landowner in real time. This enables the landowner to see the draft before the survey department sends the final document to the revenue department. The landowner can raise objections, if any, and clear confusions. This helps to avoid unnecessary complaints after the completion of the survey.

Revenue, Survey and Registration departments are the main pillars that deal with subjects related to land. ReLIS software is used for Revenue administration, Registration department uses PEARL software for land registration and survey maps are prepared using e-maps software. Thus, land-related services are interconnected with any departments. 'Ente Bhoomi' project envisages creating a single-window online system to provide land-related services to the public, once the digital survey project is completed. This will help make all land-related transactions transparent. With this vision, a comprehensive web portal "Ente Bhoomi" has been created. Public can register in the website www.entebhoomi.kerala.gov.in and check whether their land has been included in the ReLIS data in village documents. Provision for grievance redressal with regard to ReLIS data is also available in the portal. The complainant should submit copies of relevant documents like receipts of tax or duty, land deed, court orders etc along with the complaint.

The co-operation and participation of the public is imperative in ensuring error-free documenting of land ownership and land area through digital survey. The Department envisages time-bound completion of survey proceedings through public awareness and public participation. The public can support the government in this endeavour by clearing the boundaries of their land or placing proper signs demarcating boundaries. In the earlier survey procedures, the absence of landowners and the delay in publishing land records led to a plethora of complaints. However, digital resurvey will be conducted in the presence of landowners. And to ensure public participation, Gramasabhas called 'Survey Sabha' will be convened in all the local wards across the state. Survey Sabha has been completed in all the 200 villages selected for digital resurvey in the first phase. Clear guidelines elaborating the significance of digital survey, the role of public in the survey, and its benefits were distributed in the Survey Sabhas. The overwhelming public participation in Survey Sabhas is testimony to the acceptance of the digital survey project by the people.

The correct measurement of one's land and undisputable right to property is a citizen's right. The possession of land is the basis of ownership. If extra land is discovered along with any private land or uncontested land in possession, then there is no provision in our state to give ownership to it along with the currently owned land. The government is contemplating a Settlement Act that grants ownership to such possessions as well. At present, it is the onus of the landowner to prove his ownership. The government is considering adding provisions to the law stating that once the digital survey is over, land records be regarded as the conclusive proof of land ownership. Majority of the litigations in our state are related to land-related disputes. When the Settlement Act comes into force, it can hopefully put an end to land-related litigations to some extent.

The comprehensive land record of Kerala derived through digital survey will include the entire topographic details of the land and will become an authoritative document for the future development of the state. It will also be extremely helpful in disaster management activities. This initiative demonstrates the government's earnest wish to make the common man an integral part of the development of the state.

HEALTH

DECODING MEN'S MENTAL HEALTH



Dr Sagar T. Thevalappuram

Consultant in psychiatry
District hospital, Kollam
Nodal officer, DMHP

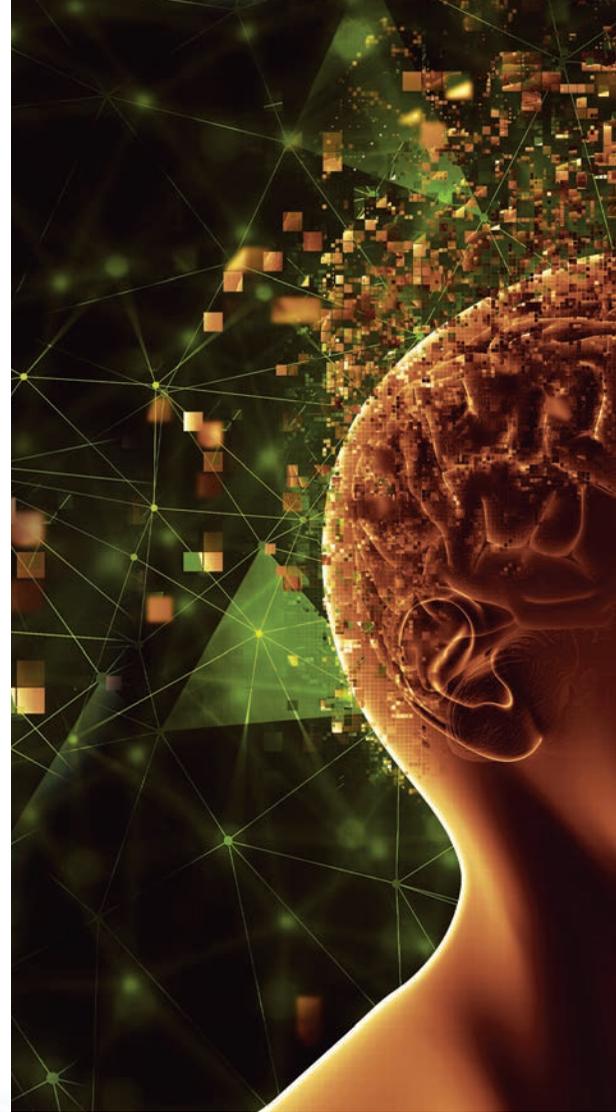
Surveys from around the world show that men are reluctant to open up their issues related to mental wellness. According to studies men are more likely to die by suicide than females. Dr.Sagar T .Thevalappuram is elucidating about mental awareness and other health issues among men and potential ways to overcome these mental health challenges.

Now the world population crossed 8 billion (800crores). The latest estimated Kerala population is 3.469 crores or 34.69 millions. This figure includes 16650132 males. The sex ratio is 1.084, which means 1084 females per 1000 males. Schizophrenia, the most serious psychotic mental illness affects one percent of the population and half of them are males. This is an illness of unknown aetiology with an onset between 15 and 35 years characterised by delusion, hallucination and disorganised behaviour. Often this has a chronic course. After the initial positive symptom stage it may progress into a negative symptom stage. Effective drug treatments are available now. A section of the patients having poor insight, lack of drug compliance and inadequate psychosocial support and end up with disability who need proper rehabilitation.

Depression is one of the biggest issues among men. According to US data from CDC, 5.5 percent of young adult males suffer from depression. Depression among men is diagnosed less often than in women and the symptoms are less typical of major depressive disorder. Men having depression may exhibit higher levels of anger, aggression, and irritability or express their distress in different ways. One important danger of depression is suicide. As per the National Institute of Mental Health data, men are 3.7 times more likely to die by suicide. 49 percent of men feel more depressed than they are willing to admit and 45 percent believe that their mental health issues can be solved on their own. Most of the symptoms of depressed mood, lack of adequate sleep, lack of

interest, feelings of helplessness, worthlessness, hopelessness, negative automatic thoughts, anhedonia or inability to experience happiness, fatigue, reduced psychomotor activity, inability to concentrate, reduced appetite, expressing suicidal ideas may be seen in varying degrees for a period of two weeks or more. Very effective medicines are available. Psychological treatments like cognitive behaviour therapy also will help. For a few cases, Electro Convulsive Therapy (ECT) will help. Now Ketamine therapy and some stimulation treatments are also available.

Another important issue is anxiety disorder which includes panic disorder, Obsessive Compulsive Disorder(OCD), generalised anxiety disorder, social anxiety disorder, and phobia. Besides these issues, much importance should be given to substance use disorder. According to recent data from the west, young men are more likely than women to abuse alcohol and drugs like cannabis/ marijuana, hallucinogens, and prescription painkillers / opiate drugs/ narcotics. Men are more likely to binge drink than women and have high rates of alcohol-related hospitalisations





common mental disorders, bipolar disorder is underdiagnosed. Often the symptoms may even be ignored. Overconfidence and reckless behaviour are the signs of the manic phase of bipolar disorder while irritability and social withdrawal are symptoms of the depressive phase. Some of the boys have an intellectual impairment and related issues, conduct disorder, attention deficit hyperactivity disorder (ADHD), autistic spectrum disorder, and learning disorders. Tobacco use, nicotine dependence, and related issues may be of serious concern for many males.

Around 60 percent of men experience at least one trauma in their lifetime that may be related to accidents, physical assault, sexual abuse, love failure, or witnessing death or injury.

Communicable and non-communicable diseases like diabetes, hypertension, and dyslipidemia affect the male population also. Physical illnesses like infections, infestations, heart disease, respiratory diseases like COPD, congenital diseases, metabolic disorders, cerebrovascular diseases, benign tumors, cancer, musculoskeletal issues, dental problems; ear, nose and throat issues, ophthalmic problems, skin problems, kidney diseases, gastrointestinal, sexual and genito urinary problems are seen among the males. Various medical and surgical problems affect males. Prostate cancer is a very significant issue mostly among elderly males. Prostate enlargement is usually benign. But prostate carcinoma is an extremely aggressive condition often manifested as painful urination with hematuria, poor bladder control, erectile dysfunction, persistent low back ache, and reduced semen. PSA (prostate specific antigen) blood test is used to screen for prostate cancer.

Government has a widespread public health delivery system to address the issues of the needy. Along with that private-sector health institutions also plays a vital role.

and death.

Post-traumatic stress disorder (PTSD) is another significant mental health issue among men. Around 60 percent of men experience at least one trauma in their lifetime that may be related to accidents, physical assault, sexual abuse, love failure, or witnessing death or injury. More than two-thirds of adolescents have experienced a traumatic event that can have a long-term

effect on mental health in the form of PTSD adversely affecting daily life and functioning.

Depression among men is diagnosed less often than in women and the symptoms are less typical of major depressive disorder.

Another significant issue is bipolar mood disorder / bipolar disorder formerly known as

manic depressive psychosis characterised by ups and downs in mood and activity levels. Bipolar disorder symptoms in males typically manifest between the ages of 15 and 24 and affect about 2.6 percent of the US population. As with other



DRUG-FREE KERALA

'No to Drugs' campaign initiated by the government was embraced by all sections of people. People realised the intensity of drug abuse prevailing in the society especially among adolescent groups.

INTENSIFYING THE WAR AGAINST DRUGS



D. Rajeev IOFS
Chief Executive Officer
Vimukthi Mission

The highlight of the first phase of the campaign is that the messages regarding ill-effects of drug abuse percolated down to the society. Vimukthi Mission, in association with SCERT, prepared a training module for taking awareness classes among students and parents. Debates and discussions about the ill-effects of drug abuse took place with the participation of various stakeholders. Students' unions, NSS, NCC, SPC, Bharat Scouts and Guides conducted various programmes in schools. Mobilization of students against drugs occurred during this campaign period.

It may be noted that the drug abuse problem can be eliminated with a twofold strategy i.e., strict enforcement and an intensive awareness campaign. As part of enforcement activities, from October 2nd to November 1st, Excise Department detected 805 NDPS cases and arrested 798 persons. From these cases 111.013 Kg Ganja, 4.157 Kg Hashish oil, 514.237 gm MDMA, 55.482 gm Methamphetamine, 5.45 gm LSD, 79.95 gm Heroin etc were seized. 2,382 history sheets of accused involved in NDPS cases

(Data bank) were prepared and accused are being monitored by Excise officials and legal actions are being taken against them as per prevailing rules.

As part of the intensive anti-drug campaign, four-level committees have been constituted for monitoring and co-ordinating the awareness campaign. On 22nd October, people's representatives lighted a lamp against drug abuse in various places across Kerala. Awareness programmes in schools, colleges, Kudumbashree, Panchayat level etc were carried out. Rallies and Sports activities were carried out in Tribal and Coastal areas to create awareness among them about the harmful effects of drug abuse. Anti-drug campaigns were conducted to create awareness about the ill-effects of drug abuse in the areas where

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in OP and 229 people in IP during the campaign period. Counselling centres gave counselling to 942 people over phone and in person. With the help of other stakeholders like Kudumbashree and ASHA workers, the details of addicted people will be collected and necessary steps will be taken to extend treatment facility to the identified people.

The overall vision of the second phase of the campaign is that the momentum maintained during the first phase of the campaign has to be continued in society. An action plan has been prepared and disseminated to all stakeholders about the various activities during this period. Special programs like drug-free places in Panchayats, social audit at school premises, debate competition, activities in schools, goal challenge against drug abuse, career development programmes in colleges, drug-free family, drug-free street, various awareness activities in turfs and Arts & Sports clubs, social media campaign, conduction of legal awareness classes for courier service centres / industrial estates / godowns / supply centres, awareness seminars in cinema/serial sector, etc have been included in the second phase. Vimukthi Mission is spreading the message among the people by publishing the relevant contact numbers in social media, print media etc. through which people can

migrant labourers are settled. The first phase of 'No to Drugs' campaign was concluded by creating human chain in schools, colleges and public places with a strong message against

Students' union, NSS, NCC, SPC, Bharat Scouts and Guides conducted various programmes in schools. Mobilization of students against drugs occurred during this campaign period.

drug abuse and symbolic destruction of drugs was also carried out by students all over Kerala.

De-addiction centres run by the Excise department in association with Health

department extended treatment for 2658 people

register complaints and take counselling.

Consistent engagement is needed to steer clear the adolescents of the vortex of drug abuse. Activities in the areas of Sports and Culture will definitely help the people to abstain from unwanted activities. A well-informed citizenry about the problem of drug abuse is a precondition to make a society free from drugs. This campaign will definitely create a society wherein people will be aware about the perils of drug abuse and the need to abstain from this. Each individual has to take a pledge that they will not take drug in their lifetime and they will not allow others to use drug as well.

With the help of other stakeholders like Kudumbashree and ASHA workers, the details of addicted people will be collected and necessary steps will be taken to extend treatment facility to the identified people.

DIGITAL KERALA

Declared as the first fully digitally literate grama panchayat in the state, Pullampara, a grama panchayat in the Thiruvananthapuram district, has become another feather in the cap of the State. 'Digi Pullampara - Total Digital Literacy Campaign' is a beau ideal of a project that was conceived by an individual, communicated to a group of people, was embraced by a whole community and became a model for the state itself.



THE EXCITING JOURNEY OF A PANCHAYATH TO TOTAL DIGITAL LITERACY



Sajina Sathar

Digi Pullampara Core Team Member and District Women's Welfare Officer & Technical Officer, State Extreme Poverty Identification Cell, Kerala

Inequalities owing to digital illiteracy, digital divide, economic impoverishment, low social status and health backwardness often lead to less participation of the marginalized in the development process of the government. Hence, very often, the fruits of such projects cannot be enjoyed by them. The benefits of information technology can be effectively extended to people only if all the citizens are digitally literate and empowered.

The 'Digi-Pullampara' project aimed to bridge this divide and make technology accessible to the most marginalised groups of the society. Besides, the project aimed to be the initial step towards making Kerala, the first State to achieve 'total digital literacy'. The experiment carried out in Pullampara panchayat has proved to be successful and can be emulated elsewhere in the state.

The project took off after a presentation by Sajina Sathar, District Women Welfare Officer, Thiruvananthapuram, before the Pullampara Panchayat authorities. After the presentation, it was unanimously decided to go ahead with the project. A core team comprising of P.V. Rajesh, President, Pullampara Grama Panchayat, Shamnad Pullampara, a resident of Pullampara and an employee of the Technical Education Department, Sanob. S, Deputy Development Commissioner of Rural Development Department, Dinesh Pappan, District Engineer of MGNREGS and Sajina Sathar was formed to streamline and co-ordinate all the activities of the project. The project received the cooperation of other departments, voluntary organizations, volunteers, engineering colleges and other educational institutions.

In the first phase, a mobile app was developed with the help of a start-up company to identify the digitally illiterate people. 'Digi - Pullampara' Digital Survey 2021, the first phase of Pullampara Complete Digital Literacy Project,



was inaugurated by D.K. Murali, Vamanapuram MLA on 15th August 2021. A house-to-house survey was conducted in all the 15 wards of the panchayat using trained volunteers and the number of digitally illiterate citizens was ascertained based on their age and education.

National Digital Literacy Mission programmes provide digital literacy training to people between 14 and 60 years. But in this project, the Panchayat decided to train people between 14 and 65 years. The survey found that a total of 3917 people in 15 wards of the panchayat

needed digital literacy training. Of these, 617 were bedridden and could not be trained. The training program for the remaining 3300 people, 'e-Vidyarambham' was inaugurated by Navjot Khosa I.A.S., the then District Collector.

The topmost benefit of this scheme was the empowerment of citizens of Pullampara Gram Panchayat, especially women

The training modules were designed and approved by APJ Abdul Kalam Technical University. The NSS volunteers of four adjacent engineering colleges along with the local volunteers imparted training to the digitally illiterate.

Training was provided at home visits, during free time at the Mahatma Gandhi National Employment Guarantee Scheme sites and in other

places where groups of learners converged. During the training phase, non-availability of mobile range in six wards of the panchayat created roadblocks. To overcome this, District Collector convened a meeting of all service providers in the presence of the M.L.A. Following the meeting, a new mobile tower was set up but a delay in the process badly hit the training and the project. John Brittas, Rajya Sabha MP arranged to commission a new mobile tower at the highest point in Pullampara ward. Thus, an infrastructural glitch faced by the residents of Pullampara was solved under the 'Digi-Pullampara' project and the training process was completed very quickly.

The evaluation process of the trainees was assigned to the NSS Units of the four Engineering Colleges, by the APJ Abdul Kalam Technical University. The volunteers visited the houses of the trainees and completed the evaluation. A total of 3300 people were trained at various stages and evaluated. 3174 trainees passed the evaluation process, but 126 trainees failed. Hence, 96.18% of those trained passed.

The topmost benefit of this scheme was the empowerment of citizens of Pullampara Grama Panchayat, especially women. The scheme would also facilitate the citizens to avail Government services easily and at the fastest speed. This would accelerate socio-economic development of the Grama Panchayat.

'Digi - Pullampara' - Phase II Activities

The panchayat plans to start the following activities in Phase 2 to widen the horizons of the project:

1. 'Satyameva Jayate' - Training on cyber security and cyber awareness in collaboration with Police Department
2. Provide advanced training for conducting financial transactions using UPI using smart phones
3. Special training for women and girls in applications and projects related to women safety
4. Make the panchayat a paperless panchayat by providing government services completely online to all families
5. Digital Grama Sabha to help the citizens who are employed outside the panchayat to participate in the grama sabhas and participate actively in the democratic process.
6. Training to use ATMs, Panchayat to provide insurance to all citizens
7. A digital hub at panchayat level for skill development of the youth and children

Digi-Pullampara became a successful model thanks to the unreserved co-operation of the public, government, employees, political leadership and other organisations. If this model is replicated across the state, the target of 'Total Digital Literacy' can be accomplished in the near future.

MUSIC

PUTHUCODE KRISHNAMURTHY

THE SPIRITUAL RADIANCE OF MUSIC

Puthucode Krishnamurthy was a Carnatic musician who was abundantly blessed by the music. He, in turn, worshipped music ardently in whatever roles he played in life – as composer, singer, teacher, and music scholar.



Ramesh Gopalakrishnan

Music Critic



Puthukkode Krishnamurthy is a name that is irreplaceable in the musical tradition of Palakkad. When Chennai city was virtually anointed the headquarters of Carnatic music, there was no south Indian region other than Palakkad that could boast of a musical tradition that gave birth to many geniuses. Such was the history of musical renown and musical antiquity of the land. That Puthucode Krishnamurthy the musician contributed his energy towards keeping alive the cultural vibrance of Palakkad at various levels is what not only makes him extraordinarily relevant but also sets him apart.

Puthucode Krishnamurthy was born in 1923 to Krishna Shastrigal and Parvathy Ammal at Puthucode village in Alathur taluk in Palakkad district. It was his mother who initiated him into the world of music. Later he trained under Shesham Bhagavata and Krishna Bhagavata and pursued higher studies in music under the tutelage of Palakkad Rama Bhagavata. As soon as he turned 17, he went to Delhi where he began composing music for the Akashvani (AIR). During this period, he got the opportunity to learn, gain a scholarship and attain finesse in Hindustani music, a factor that played a huge role in imparting an imaginative richness to his performances. Puthucode Krishnamurthy exuded a rare musical radiance that harmoniously combined his effortless presentation of sangatis [embellishments], a skill bequeathed by his mentor Rama Bhagavata, with the artistic brilliance of Hindustani music and the devotional fervour of Carnatic music. Listening to his rendition of "Rama! Nee Samaname Varu," a Tyagaraja composition in Kharaharapriya raga is all that is required to give us a glimpse of his prowess. He raises the lyric to a different dimension altogether with the seamless blend of deep devotion, imaginative flourishes, fluid manodharma [improvisations], and emotive range.

After the elaborate and creative treatment of the raga, when he proceeds into the very first line "Rama! Nee Samaname Varu" of the pallavi [the first part] of the keerthana, the sahridayas will have left the worldly terrain, mounted a celestial chariot, and soared high into the spiritual realms of pure devotion. In a space of three-and-a-quarter minutes, he

will present this line in three dozen different ways! Only then does he move into the next line "Raghu vamshodharaka". But even then, his devotional appeal to Lord Rama will continue, undiluted. The line "Rama! Nee Samaname Varu" gets repeated over and over again, as though it were a refrain. And what we get to hear in this phase is a filigree-like tonal embroidery of sangatis. By the time he completes the anupallavi, the charanam, the niraval, and the svara prasthara, with the sheer power of his pure music and unparalleled devotion, he will have installed in the hearts of his sahridayas, the idol of Lord Rama as the font of spiritual radiance. Thus Puthucode Krishnamurthy takes us beyond the physical and worldly boundaries of the idol and shares a rare insight into the deeper meaning and range of Rama devotion.

Puthucode Krishnamurthy was appointed as a teacher at the Swati Thirunal School of Music in 1958. This was the time when he had become a familiar name among music lovers in Chennai. But he had always desired to be known as a musician from Kerala. Like Vaidyanatha Bhagavata who wished to be known by the name "Chembai," the village of his birth, and K. V. Narayana Swami who fixed "Palakkad" the name of his native town to his, Krishnamurthy liked to prefix his name with "Puthucode," and took immense pride in it. In 1976, he was promoted to the post of Principal of the Chembai Memorial College of Music. Two years later, after his retirement, he joined as a teacher at Kalakshetra in Chennai. This was where his friendship with M. D. Ramanathan the great musician became stronger. Since both of them had acquired scholarship and skill that were so organic and refined as to lend depth and diversity to each other's perspectives in the course of their conversations on classical music, they optimized this span of time to the fullest. And the greatest beneficiary of this interface was the musical world of Kerala.

Puthucode Krishnamurthy's was an artistic personality that made unparalleled contributions as much to Malayalam as to the musical tradition of the state. His musical compositions, written in Malayalam, in praise of Devi and designed as ghana raga pancharatna keerthanas are eloquent testimonies to his extraordinary acumen. They are "Janani nin thiruvadi" (Nata raga – adi tala), "Kanivodu karunapangam cheyvai" (Gowla raga – roopaka tala), "Sreevidya swaropini" (Arabhi raga – mishra chapa tala), "Thaamasam thelluminiyaurthenil kaniyuvan" (Varali raga – khanda chapa tala) and "Sarvamangalavum tharum sarvanayike" (Sree raga – mishra jhampa tala). What is amazing is that all these five compositions are in different ragas and different talas.

It was when he was staying at Karamana in Thiruvananthapuram that he died unexpectedly. He passed on in the evening hours of 23 August 1985. He was only 62. In terms of his musical life, Puthucode Krishnamurthy had not even crossed his youth yet. There was at least a quarter century's energy left in him to lead the land towards the spiritual light of Carnatic music. But fate had decreed otherwise. Therefore, it is our responsibility to preserve the legacy of this great musical genius with care so that the coming generations may benefit from his stupendous contributions.

CINEMA

Poetics of a Ship Sunk



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"Love was when I loved you" : Kate Winslet & Leonardo DiCaprio in Titanic.

Twenty-five years later, every conversation about The Titanic could be condensed into: it had cost more than any movie ever made, it made more than any movie ever made, the melodrama of Rose and Jack's love story, the debate over whether Rose could have prevented Jack's fate, and the awe-inducing climactic spectacle of the sinking ship. Like the ship, time stripped the film of its wholeness.

 In a cold night in 1912, the might of man's creation collided with a mass of floating ice. That night the Titanic sank claiming 1,523 lives of the 2,200 people on board.

The once-deemed unsinkable ocean liner has been instrumental in producing over a century of reflection and emotions and in being a never-ending source of creative and critical fascinations and complexities — as a symbol of technological hubris, as a classic disaster tale, as an indictment of the class divisions of the time, as man's attempt to conquer nature. It inspired moral, social and political metaphors that are often invoked to remind us of the limitations of modernity and ambition.

So was James Cameron's Titanic released in 1997. First, the three-hour run time interludes through multiple stories, numerous characters, and thousands of nameless extras. Then there are the stories and themes that range from the allegories of hubris to the debauchery of the industry and the triumph of the human spirit.

Like the crowds that first saw the Titanic docked in 1912 the audience too was undoubtedly excepted by the sheer size of the object/ship, and the dichotomies that came to pass off as normal within its settings. In 1997, Titanic was all but inescapable. It collected 11 Oscars and

earned more than a billion dollars at the global box office.

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Cameron's Titanic is essentially two films joined at the hip: a young-adult teenage fantasy running into a massive disaster picture. The distinction comes almost at the halfway point. Like the dichotomies of the original ship, the film alternates between the doomed-love-story-of-a-poor-boy-meets-rich-girl story to an over-the-top caricaturist villain in Billy Zane and marries it with the historically accurate, heartbreaking depiction of a set of musicians playing to the panicking passengers with the full knowledge of all their imminent doom.

The simple depiction of the poor people who appreciate painting and dancing as the good guys vs the "evil" rich people divided critics and audiences alike. While Robert Altman, the legendary film director, went so far as to say that Titanic "is the most dreadful piece of work I've seen in my entire life", Roger Ebert, the legendary film critic, wrote

The Titanic captivated audiences outside of Europe and the Americas where the ship was never part of any popular lore

that the film's appeal "comes not because it is a love story or a special effects triumph, but because it touches the deepest human feelings about living, dying, and being cherished."

Subsequently, the Titanic captivated audiences outside of Europe and the Americas where the ship was never part of any popular lore. For these audiences, Cameron's movie became the story and a way to reinforce existing perspectives — the British nonchalance in the face of adversity appealed to the Japanese sense of "gamen while the French were fascinated by the hidden political messages in the film, even as the Chinese thronged to theatres when Jiang Zemin, the communist party chief, praised the film during his address to the National People's Congress. But it was clear that the film meant something to everyone.

While the music and instrumental soundscape of "My Heart Will Go On" crafted by James Horner for Celine Dion shapes the film's emotional highs and becomes an Oscar-and-Grammy-winning-record-breaking-smash-hit, Dion's voice drilled into people an emotional connection to the disaster.



James Cameron



Celine Dion



James Horner

Perhaps Titanic's appeal lies not in the fictionalised Rose and Jack but in Cameron's ability to drive empathy, distress, and helplessness through the stories of some of the real people on board — Thomas Andrews, the shipbuilder quietly awaiting his fate in the smoking room next to the clock, Captain Smith, stoic at the wheel, Wallace Hartley, leading the musicians with "Nearer, My God to Thee", Ida and Isidor Straus, forever looped in an embrace as they drown.

Perhaps the shock and awe are in the meticulous recreations — of the ship, the failure to provide enough lifeboats, the despair, of the captain's blatant disregard of

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iceberg warnings, of the reckless decision to go full speed ahead to New York, of the class struggles, of pitting the old against the new, of the magnanimous destruction of the ship into two and its subsequent descent into the darkness below.

There's no denying that the Titanic was a cultural phenomenon. The four funnels of the ship made unexpected appearances everywhere from school bags to tea stalls to high-end bars to the back of autorickshaws and the sides of vegetable vendors.

There's perhaps a no better example of a film whose curious seductions add a layer of wistfulness and poignancy from the start and expertly engage and manipulate one's fear, lust, sorrow and happiness.

Perhaps the shift in people's approach to Titanic over the years is aptly summarised by the scene where an aged Rose when presented with her old silver hand mirror dredged from the 85-year-old wreckage simply observes that while the object itself has not changed, her reflection has.

COVER STORY

Kerala has taken a great leap in achieving the goal of a zero-waste state by taking the less travelled path of digitalisation in waste management at the granular level. For this, the HarithaKeralam Mission, along with the Suchitwa Mission, has launched a smart garbage monitoring system christened the Haritha Mithram Smart Garbage Monitoring System App.

HARITHA MITHRAM APP: KERALA LEADS NATION IN FINDING DIGITAL SOLUTIONS TO WASTE MANAGEMENT



K.T. Balabhaskaran
Executive Director, Suchitwa Mission

The Haritha Mithram App will help to streamline the activities of Haritha Karma Sena and its waste management activities, straddling various functional aspects covering generation, transportation, and the enormous process that follows. Under the Nava Keralam action plan, almost all the LSGDs have been integrated with a seamless chain that connects door-to-door waste collection by the Haritha Karma Sena, maintenance of mini material collection centres, Material Collection Facilities (MCF), Resource Recovery Facilities (RRF), domestic and institutional level bio-waste, disposal of material, and the installation and operation of organic waste management systems at household and institutional levels. The activities under this network system are monitored from ward level to state level through this unified online platform called the Haritha Mithram App.

The project is being implemented under the leadership of local self-government bodies with the participation of Kudumbashree units under the supervision of the Suchitwa Mission and Haritha Keralam Mission. KELTRON has developed the app and provides continuous technical support.

The app provides information regarding waste sources such as homes, institutions, and public places. The activities of Haritha Karma Sena in each LSGD can be monitored, and details regarding the quantity and type of waste collected through doorstep collection, the quantity and type of waste that comes at the MCFs and RRFs, and the amount of waste collected by Clean Kerala Company or other private agencies are made available on a real-time

basis. A web portal as part of the app will help integrate and monitor waste management services. The real-time information from the LSG ward level to the state level will also be available in the app.

A special module incorporated in the app enables the public to directly participate in the process. Public participation will help in forming civic awareness regarding cleanliness. People can report about



local pollution problems through the app to their respective LSG bodies. This will enable mechanisms to report problems, including careless and hazardous dumping, and report the dangerous practise of burning of waste to the local bodies concerned.

The launch of the app at the local body level will be conducted in two phases. In the first phase, the project is being implemented in 376 local self-government bodies. In four corporations, 59 municipalities, and 313-gram panchayats, the project is at the stage of completion.

The state-level launch of the project implementation activities was done by M.V. Govindan Master, former Minister for Local Self Governments. The district-level and local self-government level rollout of the project is taking place in different parts of the state with public support.

Digitalization in waste management is the need of the hour, as it will help keep a tab on the status of biodegradable and non-biodegradable waste generated in the state. This is the right step in the right direction on the part of the government to come up with such an innovative initiative. In fact, Kerala is the first state to hit the roads in full force to find a digital solution to the stinking problem of solid waste management.

WORLD AIDS DAY

UNITE GLOBALLY TO ELIMINATE INEQUITIES #WORLD AIDS DAY

HIV continues to be a major global public health issue that has taken the lives of millions of people around the world. Human Immunodeficiency Virus (HIV) targets the immune system of human beings and weakens their immunity against infections. When the virus destroys the function of immune cells, the infected individuals gradually lose their immunity.



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The world has trembled before the epidemic of AIDS in the 1980s. Since then, several action plans are being implemented globally to prevent and combat HIV. It is hopeful that we have been able to counteract this epidemic to a certain extent, as a health emergency. AIDS deprives the right to life of the people irrespective of developed or developing nations. It is a matter of relief that the nations and the civil society have come together in combating this disaster. The role of Civil Society in fighting the HIV is appreciable.

HIV status in India

According to figures for 2021, HIV infections are dropping

STOP KEEP H #WORLD



in India, but the number of individuals living with the virus is still estimated at 24.01 lakh, including 51,000 children. Eight states, including Andhra Pradesh, Karnataka, Tamil Nadu, and Telangana, have the majority of the afflicted population. Around 45% of the total estimated is women, and 2% are children under the age of 12 years. Assam, Chandigarh, Delhi, Jharkhand, Punjab, Tripura, and Uttarakhand are some of India's states and UTs with comparatively low HIV prevalence. Kerala is safer than

AIDS HEALTHY AIDSDAY



the nearby states of Tamil Nadu, Andhra Pradesh, and Karnataka in south India. India just began implementing an HIV preventive method that is strongly linked to lower rates of infection in high- and low-risk groups. According to estimates, the number of new HIV infection cases in India has drastically decreased. Since 2010, the number of new HIV infections each year in India has decreased by 46%, according to HIV Estimation 2021.

Human Rights of HIV infected people

Sometimes HIV affected people struggle with issues like unemployment, inadequate educational opportunities, access to healthcare, and stigma and discrimination. Adoption and marriage-related issues are also a problem. Every individual has the right to health including access to health services and the right to equal treatment and dignity. Discriminatory laws and practices concerning with health status, gender identity and sexual orientation become barriers many times, in accessing

The active involvement of organizations like NACO and state-level AIDS Control Societies in raising awareness within civil society, which in turn actively engages in the rehabilitation of HIV-positive individuals, is a matter of relief.

human rights. By enabling effective response, it is essential to protect, promote, respect and fulfil the human rights of HIV infected people and to ensure that they have access to the health services they need. Human rights are to be protected essentially for safeguarding human dignity. Sex

workers have to face stigma and discrimination; including verbal, physical and sexual abuses; and they are subjected to mandatory HIV testing. This can be considered as human rights violations by the state authorities. But it is a fact that the HIV infection rate among sex workers is approximately eight times more than others living with HIV globally.

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The International Covenant on Economic, Social and Cultural Rights ensures health rights including access to goods, services and conditions necessary for the realization of the highest attainable standard of health (Article 12). Children's rights are protected by certain international human rights instruments specifically

under the Convention on the Rights of the Child. Necessary awareness programmes should be carried on in every society, so that stigma and discrimination against the children affected with HIV can be reduced and they may be allowed to study with other children in normal schools. The stigma and discrimination of people with the Human Immunodeficiency Virus (HIV) are effective barriers to HIV prevention. The active involvement of organizations like NACO and state-level AIDS Control Societies in raising awareness within civil society, which in turn actively engages in the rehabilitation of HIV-positive individuals, is a matter of relief. The function of field-based NGOs is equally commendable.

To walk the ancient streets that run
across cultures, beliefs and ideas,
to open wide the mind and watch
the colours seep into each other and
let the courtyard of the world
make us human, all over again.

HUMAN *by* NATURE

