The concept of water conservation is perhaps as old as human civilization itself. One need to just peep into the history to see how people in the ancient times put in place systems for water storage and water conservation. But that was a time when consumption for water was very less. Today with population explosion, rapid industrialization, high demand for food, there is a need for water conservation like never before in the history of mankind.

So the big question. Are we prepared to meet the demand for water, which is growing by the day? Well one may say that steps like ground water recharging and rainwater harvesting are becoming popular. But the pace and extent of such water conservation measures needs to be increased to meet the challenges lying ahead.

First and foremost is that there is a dire need to bring attitudinal change among people and their habits. Water is precious. ...water is life.

# WATER

## Availability Demand Viability

**K.V. Mohanan**

In spite of the fact that more than three fourth of the earths surface is covered by water and hundreds of lakes, and thousands of rivers exists on the land. 1n other words acute scarcity exists amidst apparent plenty. As per the latest statistics the annual renewable fresh water in the world is 47000 cubic Kms. Corresponding figure for India is 1869cubic Kms, which is about 4% of world's supply.

It is estimated that 97.2% of water on our planet occurs in sea and nearly 2% occurs in ice bodies. The remaining 0.8 % occurs as ground water and surface water. Out of these 0.8 %, one third is in the form surface water and two third in the form of ground water. Precisely 99.2 % of water available on the earth is un suitable for direct use because it is either saline or occurs as solid ice in inaccessible places. So only the remaining 0.8% of water is available for direct exploitation. This limited source becomes more precious when the demand is growing at an alarming rate.

## Water Resources of Kerala (Myth and Realities)

Compared to national average Kerala receives 2.78 times of rainfall and compared to Rajasthan and Tamil Nadu we receive five and three times of their rainfall. It is true that this small piece of land is blessed with 44 rivers. The people of this Gods own country meets their drinking water requirement through the available 44 1akh open wells. This is the only land in the world having the maximum well density i.e. 10-450 wells one sq. km. It is estimated that in Kerala for every seven persons there is a well.

The above listed statistics may mystify and bias the onlooker. When these mystifying statistics are analysed critically the realty will be unveiled from the myth.

Yes, we have 44 rivers, but what type? River is defined in Kerala as a drainage channel which is more than 15 kms in length. But as per national norms rivers with drainage area about 20000 and 2000 sq. km. are called major and medium rivers respectively. With this national norm, Kerala does not have a single major river and has only four medium rivers. The total catchment of all these rivers is only 28739 sq. kms. and have a discharge of 72873 MCM. A single southern river has a discharge of 105000 MCM. Precisely it indicates that the combined total discharge of our 44 rivers is less than the discharge of one single southern river i.e. Gothavary.

Per capita resources availability is a better indication of richness of an area than resources availability in unit land. It is due to this reason we talk about per capita

P. Kunhabdulla

income, per capita energy etc. There can not be an exception for determining the water resource richness index in a different way.

Total fresh water availability of any country or a basin remains more or less constant but the population in those geographical boundaries increases thereby the per capita fresh water availability decreases with time. During the last 100 years India's per capita water availability decreased fourfold, whereas for Kerala it bas been decreased fivefold.

## Demand for water

Water is mainly needed for irrigation industries and domestic purposes. As more and more land is quickly brought under irrigation and more industries are established at a very fast rate and also rapid growth is noticed in population it is needless to say that the demand for more and more water is going high in every sphere. However, reliable statistics giving actual consumption of water in these three fields are not available. But it is roughly believed that 75% of water is used for irrigation, 20% in industries and 5% for domestic purpose including drinking requirements.

The below given table with regard to water consumption highlights the magnitude of the issue.

| Sl. No. | Water requirement | Product |
|---|---|---|
| 1 | 1000 tons | 1 ton grain |
| 2 | 2000 tons | 1 ton rice |
| 3 | 70000 gallons | 1 ton steel |
| 4 | 64000 gallons | 1 ton paper |
| 5 | 75 gallons | 1 pound cloth |

The above glimpses of water requirements illustrate that enormous quantities of water is needed by us. It also makes clear that all our demand for water are to be met from the negligible 0.8% of global fresh water resources.

## Why conservation?

Ground water is supposed to be an annually replenishing resource. In the balanced situation the annual draft created due to the drawl of ground water will be replenished to the original status during the next rainy season. Depending upon the porosity and permeability of the prevailing geological formations, the infiltrating water will be stored either in the unconfined aquifer or in the deep seated confined or semi confined aquifer.

## Studies by Ground Water Department

Ground water department bas conducted a comprehensive study about the ground water level fluctuations in Kerala and its quality monitoring under national hydrology project. An observation piezometer network was established all over Kerala and water level fluctuations were monitored, using sophisticated DWLRs. The DWLR data of the piezometers when subjected to trend analysis study revealed the alarming results. The result cautioned that the ground water levels of Kerala wells have declined within a range of 30 cm to three mts within a period of five years. The extrapolation of these water level plots seriously indicate that, a huge number of wells in Kerala may become permanently dry shortly if the prevailing hydro geological situation is allowed to continue as such. These studies also revealed that serious quality hazards are stepping in, though the gravity is less. Huge extraction of ground water made certain blocks as dart area. Where the discharge from the aquifer being high and the natural recharge being insufficient, water conservation and artificial recharge became vital and critical

Kerala is the only land in the world having the maximum well density i.e. 10-450 wells one sq. km. It is estimated that in Kerala for every seven persons there is a well.

## Glimpses On Ground Water Re-Charge Techniques

It is a funny thing that none of the water conservation techniques, which we are talking about nowadays, are new. They are all conventional techniques successfully prevailed in India before centuries. It is simple logic that, successful water conservation could not be possible without proper soil conservation.

Our conventional type of contour cultivation, construction of contour bonds and terrace walls, contour trenches and pits, bench terracing etc. are some of the successful water' conservation methods prevailed in India. Gully plugging using loose rock dams, brushwood check dams, bamboo reinforced earthen dams; geotextiles are some of the effective water conservation methods which are in use even in these Hi- Tec days.

## Sub Surface Dykes

Construction of subsurface dykes in preferable locations is a highly successful ground water conservation technique. These dykes are constructed along the downstream side of narrow valleys up to the basement. Such subsurface dykes prevent sub surface ground water flow from the upstream side there by raising the ground water table and preventing the depleting trend in ground water level.

## Checkdams

Check dams facilitates as a high effective ground water recharge techniques. Check dams provide two fold advantages. The impounded surface water can be utilized directly for many purposes. At the very same time it recharges the ground water reservoirs in the adjoining areas. But check dam should be constructed very

During the last 100 years India's per capita water availability decreased fourfold, whereas for Kerala it bas been decreased fivefold.

judiciously. The present trend of constructing different check dams by various agencies in the same river need rethinking. Check dams should be planned in a river with a comprehensive outlook maintaining the minimum base flow of the river. Otherwise these check dams will cause the death of the river itself. The unscientifically constructed innumerable number of check dams in Bharathappuzba cautions us this danger.

## Percolation Ponds (Thalakulam)

Percolation ponds and dugout farm ponds were our old conventional water conservation structures. These ground water structures provide sufficient time to percolate water molecules to the deep seated aquifers. As part of urbanization we started filling up these valuable ground water recharge structures and constructed multi storied buildings over it, which decreased the ground water recharge drastically.

## Recharge Bore and Tube Wells

Ground water investigation techniques were quite advanced now. Using sophisticated instruments availability of ground water could be predicted now with zero error. But even the ground water hydro geologists ignore the importance of ground water conservation and recharge.

The widely discussed present day ground water recharge methods are concerned about recharging the unconfined water table aquifers. Where as recharging the deep seated crystalline and sedimentary aquifers are not given proper importance. We are drawing huge quantities of ground water from these deep seated confined/semi confined aquifers. So artificial recharge of these aquifers is an inevitable aspect of any ground water based project. Artificial recharge bore wells and tube wells can be constructed in desirable locations for recharging the deep seated aquifers using rain water. The present allegations and complaints against bore wells and tube wells could be minimized to a great extent with the help of these recharge techniques..

## Rain Water Harvesting

Rainwater harvesting essentially means collecting rain water on the roof tops and storing it for later use. The collected rainwater can be used directly and the excess allowed to flow to the ground to contribute the ground water storage. Rainwater harvesting has the two fold component of consumption and recharge. This technique when implemented scientifically arrests the ground water depletion and raises the declining water table. Rain water harvesting and artificial recharge became very important issues now. It is essential to stop the decline in ground water level, arrest seawater ingress and conserve surface water run off during rainy season. Rainwater harvesting is made mandatory in many cities of India including Kerala.

## Pollution and Misuse

Kerala is supposed to be a State with 100% literacy. But our water using habits shows that we are water illiterates. The rate of pollution of ground water and surface water in Kerala is quite alarming. Among the above ground water pollution is more dangerous because even after removing the source of pollution, it takes years to purify the aquifer. Studies reveal that water in the Chaliyar is acidic with a sulphate concentration of 2400 mg/litre against the permissible limit of 400-mg/litres. Bharatha puzha is already polluted with high mineral oil, iron, organo chlorides and pesticides. The adjoining wells get polluted when the river water recharges these wells.

The reservoirs at Malampuzha, Peechi, Pazhassi and Kuttiadi are in the serious threat of high fluoride concentration. Hopefully our Pookkod Lake remains pure for the time being. The gravity of pollution in wells against

Kerala coasts is severe. Travancore Cochin Chemicals and FACT deposits 2 tons and 1.1 tons of mercury every-year as industrial waste. The wells around Kochuveli, Chavara and Neendakara are already contaminated with Hg, Pb, Zn, Cr etc. The holy river Pumba is polluted with a DDT concentration of 400mg/ltr. Thanneermukkom bund suffers with 6000 mg/litre of lindane, Vembanad Lake and Manimala River with an excess endosulphan concentration of 122 mg/litre and 114 mg/litre respectively. As these water bodies recharge the adjoining wells ground water also became polluted dangerously. The pollutions discussed above are mostly man made. It is pathetic to note that as part of our urbanization and industrialization we are mercilessly polluting this precious natural resource.

Present day statistics reveals that an average Keralite is misusing 80 litres of water everyday. Against the WHO standard of 120 LPD/person, our minimum use is 200 LPD. If we multiply these 80 litres with our population the volume of water which is being wasted could be estimated.

## What to do?

It is an established fact that the demand for ground water is increasing day by day and the recharge is decreasing with time. So, now there is wide gap between demand and supply, which we call as shortage or deficit of ground water. The degree of pollution, deforestation etc. amplifies the bad effect of these deficits. We cannot manage this deficit only by adopting textbook conservation techniques. What is highly needed is a basic change in our water using habits so as to avoid wastage of water. Protection of water resources, stringent measures against pollution, deforestation, filling of fields, ponds and a total retrieval of our conventional method of land use is the need of the day. Simultaneously rainwater harvesting, ground water recharge and of course controlling the population etc. should be resorted to. Desalination, recycling and re use can also be resorted to a great extent provided these methods are made cost effective.

A wise man once opined that "if there happens to be a third world war the sole cause of it will be neither political nor economical but will be of 'water." So let us plan for the judicious use of this precious natural resource so that our next generation will not be the victims of a crucial war for 'water.'

■ The author is Senior Hydro Geologist, Ground water Dept.

E.V. Ramakrishanan

# Water riddles

**Sunitha Narain**

In search of studies regarding water needs of 'Kerala a wet-drought state. Searching in villages and academic papers, an anomalous statistic caught my eye. According to 1999 estimations of the National Sample Survey Organisation and the 2001 Census, only 11-14 per cent of rural Kerala had access to potable water supply. But the same data showed some 77-85 per cent of people had drinking water supply.

This discrepancy, I then understood, stems from government parlance. "Coverage of drinking water supply" takes into account government (or publicly) created assets — pipes, tube wells or hand pumps. But people in Kerala depend upon private dug wells, which technically falls outside the scope.

This missing link was confirmed when I asked people. They invariably showed me a dug well inside the homestead. The problem, they explained, was their well dried up in the 2-3 peak summer months. I then learnt there were an incredible estimated 4.5 million dug wells in the state — 300 per sq km. These wells tapped the shallow aquifers, a perfect solution since natural recharge is largely poor in this mostly lateritic region. The yield was sufficient to meet household needs in normal times. Clearly these dug wells — 5-50 metres deep — were the perfect decentralised source for Keralites. So I wondered: Shouldn't these be integral to drinking water supply programmes?

No. Kerala follows the national norm: rural drinking water supply built around piped water or hand pumps. As early as the 1970s, the Central government introduced the accelerated rural water supply programme to give states grants for water supply. In 1986, the programme was revamped as the Technology Mission on Drinking Water and then, in 1991, renamed as the Rajiv Gandhi National Drinking Water Mission. In 1999, the National Democratic Alliance government proclaimed it would provide safe drinking water to all in five years and upgraded the mission. A new department of drinking water supply came up.

By 2002-03, Rs 40,000 crore was spent and over 91.6 per cent of villages fully covered — that is, they had a source of water 1.6 km from the settlement. But even government officially accepts that this estimation is not worth the paper it is written on. Villages are "covered", but water is not available. Even as government reaches 100,000 settlements each year through pipes and hand pumps, it finds another 100,000 — source dried-up, water quality worsened or pipe broken — back in the list.

In early 2000, the government addressed these "sustainability" problems through 'reform'. It allocated 20 per cent of the rural water supply funds to quality improvement and keeping the source sustainable, and

By actively harvesting Kerala's massive rainwater endowment to build up aquifers, peak summer shortage could be tempered as well.

15 per cent for operation and maintenance (O&M). But was such reform adequate? The Centre for Development Studies, some years ago, estimated that the entire annual expenditure on the programme — some Rs. 2,000 crore — was needed to just meet the replacement costs of equipment and for O&M.

In late 2002 then prime minister Atal Behari Vajapayee launched with great fanfare the Swajaldhara scheme: now, the "community would own, operate and maintain" the water system. Communities were to contribute 10 per cent to the total capital costs; once completed, panchayats would take over O&M. They would charge for water delivery and recover their costs. The state, downloading its duty, believed the "sustainability and quality" problem plaguing the programme was solved.

In Kerala, the only difference is that the community brings in 15 per cent, the panchayat 10 per cent and the government the remaining 75 per cent of the total project cost. Some Rs 400 crore is allocated for 5 years till 2006; the "beneficiary group" of self-selected households is expected to contribute to and oversee programme implementation. From what I saw, it was clear this approach would improve the quality of service delivery. But sustainability? Here, each household pays roughly Rs. 2000 for capital costs and Rs. 30-50 per month as electricity costs. The source of the water — pumped to a tank and then to homes — is invariably a well some distance away. The problem is that in densely populated Kerala, these wells for private (call it community, if you will, but the arrangement is quite privatised) water supply are a potential source of conflict, with other well-owners in adjoining lands worried about water level decline. Also, if not adequately recharged, the source could dry up, becoming a wasted asset. The cost makes it impossible to replicate across the state.

In this context, let's return to the dug well. It is a decentralised source. It is cost-effective: over 70-80 per cent households have access to it. Still, government does not begin to plan for it. I would argue that the drinking water programme in Kerala should have been centered around this wealth of 4.5 million dug wells, resolving then the problems of quality and quantity. Kerala also has the largest number of unsanitary toilets, located near water sources. Therefore, the greater need is to invest in better sanitation. By actively harvesting Kerala's massive rainwater endowment to build up aquifers, peak summer shortage could be tempered as well.

But water planners in Kerala, as in the rest of the country, always fail to see what is under their nose. How many such systems have been destroyed wilfully by bureaucracies that failed to see what people were doing to secure their water-future? Will Kerala's dug wells hold out?

The author is a Environmentalist and Editor of *Down to Earth* magazine.

With more awareness among the people and active initiatives of the local governments, the sources can be conserved and managed to meet the fresh water requirements of the households of Kerala.

## Protecting Natures Gift

# Traditional Practices

**E J James**

The major fresh water source, traditionally in use for domestic and irrigation purposes on the Malabar Coast, was the open well. The streams, springs, *surangams* and ponds were also used along with the wells in certain areas. At present, more than 70 percent of the population in the State depend on open wells for meeting their domestic water requirements. Around 40,000 ha. of land in the State is irrigated by wells, and another 50,000ha. by ponds and tanks. Location-specific soil and water conservation measures appropriate for different physiographic zones of Kerala were developed, down the decades. An integrated approach considering land-water-biomass, appropriate for this humid tropical region, slowly evolved. Wherever fresh water sources, either surface or ground, were not available, people even resorted to rainwater collection. The people of the region practised certain innovative measures to purify their drinking water using locally available materials. The traditional irrigation techniques of Kerala have been efficient and eco-friendly. They even used a crude form of modern drip irrigation in the past. Some of the traditional water management practices of Kerala still have relevance not only in Kerala but also in the entire humid tropical regions of the world. An attempt has been made to highlight the salient features

E.V. Ramakrishanan

of the traditional water management practices of the south-west coast of India.

## Traditional Sources of Fresh Water

### Dugwells

The State of Kerala, situated on the south-west coast of India, falls within the humid tropics. The average annual rainfall of the region is 3000 mm. The area receives 80 per cent of the rainfall during the south-west monsoon period from June to August and the north-east monsoon period from September to November. The average rainfall during the rest of the months from December to June is less than 20 per cent of the annual average. There are also rain-shadow areas in the State like the eastern part of Attappady in Palakkad district and Vattavada in Idukki district, which areas record less than 500mm of average annual rainfall.

Because of the seasonality of rainfall, most of the surface water sources either dry up or yield only limited quantity of water in summer months. Rainwater is mainly confined to monsoon months. The spatial and temporal pattern of rainfall and the ephemeral nature of most of the surface water sources compelled the inhabitants of this humid tropic region to probe the groundwater sources for meeting their requirements of fresh water. Thus evolved a 'well culture' in Kerala, which continues even to this day not only in the rural areas but also in the cities.

According to the sample surveys conducted by CWRDM, there are around 4.5 million open wells in Kerala, of which 3 million are perennial and used round the year. These wells have been constructed down the decades in the lowland, midland and even highland belts of Kerala. A recent survey, being conducted in the same areas, shows an average increase of 25 per cent in the number of wells. Kerala may be one of the geographical locations with the highest density of open wells. At the present average rate of Rs 10000 for constructing a well, the people of Kerala have invested Rs 4500 crores in constructing wells to meet their demands, especially domestic requirements. This illustrates the initiatives taken by the local people to meet their fresh water requirements without external support.

The density of open wells is the highest in the lowland, where recent and subrecent geological formations are found. These dug wells have a maximum depth of about 10-15 m and diameter of about 1-2 m (CWRDM 1995). Due to over-exploitation of groundwater in the coastal belt, there has been a tendency for salt water intrusion from the sea.

All along the midland, laterite forms as a residual deposit due to weathering of either crystalline or sedimentary rocks. The thickness of laterite generally varies from 5 to 8 m. Groundwater is generally encountered under water table conditions in the lateritic aquifers of about 10-20 m thickness. Dugwells of relatively large diameter of about 4-6 m are common in this region. The laterites are often underlain by weathered rock and these are separated by a lithomargic clay zone which is prone to caving. In the highland, groundwater occurs under water table condition and it can be extracted through dug wells. Though the past generation of people of Kerala did not have much

knowledge in hydrogeology, their practical skill and experience helped them in selecting the best possible source for meeting the fresh water requirements.

Most of the homesteads in Kerala had a dug well. Generally, these wells were dug before the houses were constructed so that the water requirements for construction could be met from these wells. The traditional code of practice of the builders of Kerala has certain stipulations with regard to the location of wells in relation to the house. The 'water diviners' had a great demand in the region. Some of the wells were constructed close to the kitchen so that water can be drawn from the well without coming out of the house.

The art of construction of wells had attained perfection in Kerala. Often, laterite walls are aesthetically constructed along the circumference of the wells. These structures were generally founded on a wooden member made out of gooseberry tree. This wooden member prevented differential settlement of the walls and their collapse due to this phenomenon. The walls prevented the caving of wells specially in the lithomargic zone at the bottom. The laying of the wooden member known as *nellipadi* was an important ceremony and it was believed that the gooseberry trunk could purify water.

The people of Kerala still constructed wells prior to the construction of a house and are highly dependent on their wells for meeting the domestic water requirements. Even in a city like Calicut, 56 per cent of the population still depend on their wells for their daily need. With the increase in population, the density of wells increased but the sanitation facilities did not make much progress. This has resulted in the contamination of dug wells by faecal coliforms. It is reported that majority of wells in the State are facing biological contamination. High levels of chloride, iron and total dissolved solids are also found in some wells in the State.

The State may have to depend on its wells for domestic purposes in future also. This will considerably reduce the burden on the government to provide drinking water to the people of the State. Considering the advantages associated with the traditional dug wells of Kerala, there is a need to study the problems faced by them and to initiate actions to rejuvenate, sanitise and maintain these traditional water sources. The Government of Kerala has made some enactments to control and protect this valuable source of fresh water. With more awareness among the people and active initiatives of the local governments, these sources can be conserved and managed to meet the fresh water requirements of the households of Kerala. Even today, well water is preferred to other sources of water by the people of Kerala..

The system of ponds, tanks and channels helped in recharge of ground water, storing of water and replenishing the soil moisutre. Some of these channels helped in irrigating coconut seedlings and vegetables.

## Ponds and Tanks

While majority of people of Kerala traditionally depended on well water for drinking and cooking purposes, the innumerable tanks and ponds-both in the homestead and public places – were used for bathing, washing the clothes and meeting the requirements of domestic animals. In fact, the domestic water requirement of the people of Kerala, even two to three decades ago, was combinedly catered to by two sources: dug wells and ponds. Many of the homesteads had their own ponds and tanks. If a family did not have them, they depended on their neighbour's ponds or tanks. Those who did not have this water source nearby depended on the public ponds or tanks or those attached to places of worship. Thus, traditional 'well-pond' system worked out well in this humid tropical region with seasonal rainfall. In places where these sources were not at all available, the inhabitants depended on the flowing streams for meeting their demands.

The ponds and tanks of Kerala not only catered to the domestic water requirements of the people and the needs at the places of worship but also served as sources for irrigation. Some of them also acted as percolation tanks helping in the recharge of groundwater table. The *elas* or small watersheds of Kerala had a pond or *kulam* at the upstream or higher elevation known as *thalakulam,* which not only facilitated gravity flow to the lower elevations and valleys but also helped in recharging the groundwater and maintaining the soil moisture. These *thalakulam*s are seen even today in certain parts of Palakkad district. In the erstwhile Cochin State, attempts were made to interconnect several tanks so that a cascading system was developed. This helped in storing

water, regulating the levels and achieving optimum use of water for irrigation purposes. The remains of these 'tank systems' are still found in this area. In larger plots of land, especially in the lower part of the midland and lowland, there were several ponds in the compound, which were interconnected. The network of canals and ponds helped in draining away the flood waters as well as in recharging the groundwater table. In that sense, traditional 'well-tank' system can be considered as an integrated system. Such a system was sustainable, and even today there are several lessons to be learnt by water management experts from these traditional practices.

Durga Shanker

The ponds of Kerala, according to some of the studies being conducted, are unique ecosystems with high degree of biodiversity. The fluctuating hydroperiod, unique water balance components and the hydric soil at the bed have been responsible for the unique *flora* and *fauna* in these water bodies.

It is estimated that 50,000 ha. of land in the State is irrigated by these ponds and tanks. A survey carried out by CWRDM has identified 1000 ponds and tanks in Kerala, each of them capable of irrigating a minimum of 2 ha. of land, without accounting for recuperation (CWRDM 1989). The estimates show that such ponds and tanks identified in Kasaragod district can hypothetically cater to the entire domestic water requirements of the district. However, more location-specific studies are required with regard to these water bodies. The role played by ponds and tanks is being slowly recognised by the people of Kerala. At least three large tanks were rejuvenated recently in the Calicut city.

## Surangams

Surangams are basically tunnels dug through laterite hill slopes, from the periphery of which water seeps out. The traditional farmers of Kasaragod district and Dakshina Karnataka have been involved in constructing this type of structures for centuries. In Kasaragod taluk alone, 338 *surangams* have been identified, most of which yield good quality of water. About 60 per cent of the *surangams* are perennial and have an average discharge of 20 lpm during the dry season (CWRDM 1991). Some of the *surangams* had openings to the ponds and tanks, which helped in storage of water. The *surangams* are used mainly for the purposes of drinking, irrigating cash crops, and even stabilizing the second crop of rice.

It is opined by some historians that structures similar to *surangams*, known as *qanats,* have been once popular among the Mesopotamians and most probably these structures are evidences of the Mesopotamian connections of the people of Kerala. Some of these structures were made by the hard work of three or four generations in a family. Even today, *surangams* have relevance in areas with laterite hills in Kerala.

## Springs

The density of population in the highlands, especially in the Western Ghats, was very low till the large scale colonization started five decades ago. The tribals of the ghats depended on springs and mountain streams for their freshwater requirements. The water from the springs was stored in pits or *kundu* and carried in pitchers to their hamlets. Tribals of Kerala often preferred the running water and not the stagnant water of the wells. Bamboo poles split into two was used to channelise water from the spring to the pitchers. The quality of spring water is generally good. A survey by CWRDM (1991) has identified 250 springs in Kerala. An average spring can cater to the requirements of 20 families.

## Checkdams

Several checkdams were constructed by the erstwhile kings of Travancore. The Pandyans had constructed several *anicuts* and weirs across the streams even ten centuries ago, the *anicut* across Paralayar with 6 m height being quoted as an example. They had also constructed a system of cascading check dams at Pandyan Kal. The checkdam across Pazhayar constructed by King Marthanda Varma of the erstwhile Travancore State is still extant along with the associated irrigation systems. The remains of a few traditional checkdams made out of brushwood and stones were found in certain pockets on the eastern side of Kasaragod. Constructing checkdams across the streams and diverting water to the adjacent plots for irrigation were age-old practices prevailing in Kerala. They were generally put up by the farmers themselves, utilising locally available materials.

## Rainwater Collection for Drinking

Rainwater harvesting was practised by the people of Kerala in olden days, mainly in the coastal areas. A cloth was tied to four coconut trees and a stone was put in it. Rainwater falling in the cloth was filtered and collected in vessels for meeting the domestic water requirements. The Central and State Governments and NGOs are now

making efforts to popularise rainwater harvesting in Kerala.

## Soil and Water Conservation Practices

The major water conservation measures must include: (i) management methods that reduce runoff, (ii) reduce evaporation, (iii) reduce deep percolation, and (iv) prevent loss from storage. People of Kerala had their own methods, evolved in this region, to take care of all these.

## Contour Benches and Furrows

A combination of contour benches, cross benches and furrows was practised in the homesteads of Kerala, where perennial crops were cultivated (James 1998). The furrows were made in the compounds using spade or by ploughing. This is generally done just after the onset of south-west monsoon or before the north-east monsoon. In some areas, this is known as *thulakothu.* The entire cultivated area was divided into several blocks separated by raised contour and cross benches or v*arambus.* The major v*arambus* often followed the contour line. The furrows created across the slope trapped rainwater and permitted it to infiltrate and recharge the groundwater table. This helped considerably in maintaining the water levels in the wells and ponds in the homestead.

## Moisture Retaining Soil Mounds

The traditional farmers, especially in the sandy belt of lowland, used to take out soil using spades from their farmland in the monsoon season and make conical mounds out of the moist soil These conical mounds generally will have a diameter of 50 cm and height of 75 cm. These conical mounds will be broken and the soil spread out after the rainy season. The soil of the mound with considerable moisture content, when spread out, will help in retaining the soil moisture of the farmland for much longer time.

## Grids of Channels

In the midland-lowland belts of Kerala, grids of channels were made in the compounds to drain away stormwater during the monsoon months. These channels often ended up in ponds and tanks. This system of ponds, tanks and channels helped in recharge of ground water, storing of water and replenishing the soil moisutre. Some of these channels helped in irrigating coconut seedlings and vegetables.

Many of the depressions which once served as drainage channels have been converted to roads. Most of the land used for drainage was in the possession of the government. The reclamation of drainage networks for roads, especially in urban areas, have contributed to frequent flash floods when heavy rainfall occurs. An attempt should be made to make use of the natural drainages for the purpose for which they are meant.

## Coconut Products for Water Conservation

The people of Kerala have been using coconut husk for soil moisture retention. The husks are often arranged around the plant and this mulching process retained the soil moisture. This traditional practice has been further developed, tested and perfected for different crops based on research. The coconut leaf was also extensively used for mulching. The coconut trunk, split into two, is used for conveying water, specially across depressions and channels. The coconut trunk is also used as piles in the coastal areas, since its durability is found to improve under saline conditions.

## Use of Crop Residues

The surface crop residues (specially *thoval*) were extensively used by the farmers as manure, both in coconut gardens and rice fields. The residues placed in the basin, taken around the coconut tree, not only served as a manure and medium for air circulation but also helped in retaining soil moisture and increasing the rate of infiltration. Crop residues also can be applied to fields that would otherwise be bare and unprotected. It is found that application of straw of rice on sloping ground can reduce erosion and runoff.

Clove is capable of removing total coliforms. Nannari, another plant used to purify water in Kerala, has a capability to remove calcium.

## Sacred Groves

In the traditional building code, there is a mention of *kavu* or sacred grove, which has to form a part of the homestead. The location of this with respect to the house and the area to be covered are discussed in the traditional code of builders. Even today, several of these sacred groves are extant. These groves helped in reducing runoff and in maintaining soil moisture. Investigations are being carried out by scientists to understand the role of these sacred groves in water conservation. Most of these mini-forests are niches of biodiversity.

## Kayyalas or Contour Terraces of Kerala

Recognising the need for soil and water conservation in an undulating topography, the farmers of Kerala resorted to contour bunding in their own traditional

manner, much before the Puertoriccan contour terrace walls were introduced. Such protection was essential in the highranges, foothills of the ghats and the sloping hills of the midland *elas* or watersheds. These structures not only conserved soil and water but also made available thick soil overburden necessary for cultivation purpose. Wherever rock outcrops were there on the slopes, the *Kayyalas* or contour bunds slowly built up a soil cap fit for cultivation. The skill for constructing such structures slowly evolved in Kerala. Depending on availability of local materials, two types of structures are common in Kerala, namely, the mud terraces and stone terraces. The local people had their own methods to identify the contour line and locate the structures. They also knew the ideal soil moisture level for commencing the construction of mud *kayyalas*. In very steep slopes, contour terraces are not generally recommended. However, in several parts of Kerala, these structures are found even on steep slopes. Most of these structures are stable also.

In some areas at least, these traditional contour terraces are combined with vegetative measures. The local farmers have identified the species to be planted to give additional protection to these terraces. In some areas, they grow certain plants on them which have commercial value. These terraces are popular even today among the soil and water conservation experts in many parts of the world.

There has been a recent trend among the people of Kerala in the humid tropics to blindly follow the soil and water conservation measures popular in the semi-arid and arid zones. Several NGOs, funding agencies and even Government departments are propagating such practices which are not fit for Kerala. It is necessary to give stress to the traditional soil and water conservation measures suitable for the humid tropics; these measures have been time-tested and proved to be effective.

## Water Purification: Traditional Methods

People of Kerala had developed their own methods to purify water used for drinking. They used seeds, roots and barks of plants abundantly available in the region. Water used for drinking was often boiled with the parts of the plants to which they attributed ability to purify water. The studies in CWRDM has shown that gooseberry is capable of removing fluoride from water (Harikumar 1998). It is worthwhile to note that walls on the periphery of wells were constructed on a foundation made out of gooseberry wood. Leaves of *Ocimun sp*. have a capacity to remove total coliforms and *E. coli*. Clove is also capable of removing total coliforms. Nannari, another plant used to purify water in Kerala, has a capability to remove calcium. There is a trend in Kerala to go back to these plant materials to purify drinking water.

## Traditional Irrigation Practices

In the past, gardenlands situated in the midland and parts of lowland were irrigated using water from the dugwells. The main crops thus irrigated include coconut, arecanut, vegetables etc. In the absence of mechanical devices, water was lifted

either manually or by making use of animals. One of the most popular lifting methods (*kalathekku*) made use of bullocks, which pulled out the large vessel containing water (*thekkukotta)* by walking on a well designed track. The artisans of the area had shown great skill in designing the vessel with its flexible leather part (*thumbi*), wooden pulleys, and in lying out the track through which the bullocks moved. By this water lifting technique, more or less continuous flow was ensured in the channels, and the losses were minimum.

Another technique for lifting water from wells used lever-arm and counter-weight and the system was manually operated. This was known as *kottathekku* in the erstwhile Cochin State. The effort required to lift water was minimised. The design of the trapezoidal vessel, lever-arm and the counter-weight was perfected by experience.

Not only the water lifting devices but also the mini-channel network required for irrigating a homestead from the well was well laid out and designed considering the physiographic features, soil characteristics, type of crops, and limitations of manual operations. The main channel, distributaries and basins around the plants were properly made to prevent loss of water and to achieve maximum efficiency in irrigation. Such a system maintained the general soil moisture content of the the compound. To lift water from a lower field to a higher one, *chakras* or wheels, popular also in other parts of the country, were made use of. Another method used in the lowland belt to lift water was by a basket-like vessel operated by two persons . For draining water from low-lying rice fields of Kuttanad and Kol-land, *petty* and *para* were used. Though centrifugal pumps were used, the design of the entire system was indigenously developed. It is worthwhile to note that all these devices were popular till recently.

E.V. Ramakrishanan

These eco-friendly techniques are now slowly disappearing from Kerala.

The water management practices prevalent in Kuttanad and Kol-land have been highly innovative (UNEP/WI 1997). The design of polders with dykes and the techniques used to drain away water from the rice fields situated below mean sea level, were all perfected by the local farmers. Even the techniques used for making bunds, especially ring bunds, by plastering mud over a bamboo skeleton were perfected by experience.

The micro-irrigation techniques, which are widely adopted by the farmers now, have been popular in Kerala. In fact, drip irrigation was practised by the local farmers. Pitchers made out of mud was fixed on a pole near the coconut seedlings and the water was made to drip through a wick fitted at the bottom of the pitcher. This not only saved the quantum of water required otherwise for basin irrigation but also provided continuous watering. This system was also simple to operate. The pitcher could be filled up by water taken out from a nearby well or pond.

## Integrated Water Management Practices in Kerala

The traditional codes dealing with building construction have specifically mentioned the location of a house with respect to the topography. There are also specifications with regard to the wells, *kavu* (sacred grove), locations of different species of plants to be cultivated, etc. It is clear from the traditional codes of practice that the people of the area were conscious of integrated management of land, water and bioresources of their homesteads for sustainability.

In a typical homestead or compound, there were a few wells to cater to the domestic and irrigation requirements. There were also compounds with one or more ponds, which have been used for bathing, washing of clothes and for the requirements of cattle.

Most of the people depended on combined 'well-tank' system. Many of these percolation tanks and ponds helped in recharging ground water table. In addition to this, the bench-terraces, furrows made on the land and basins made around the plants in monsoon season also helped in recharging. The well was generally the only source to cater to the domestic and irrigation requirements in summer moths in a homestead. Some of the homesteads also had *kavu* or sacred grove which helped in retaining soil moisture and recharging groundwater table. Moreover, the sacred grove ecosystem and the pond ecosystem served as niches of biodiversity. The surface residue of crops was used as manure. All these practices paved way for an integrated management of soil, water and plant within a homestead or compound. Several such homesteads/compounds constituted a well managed *ela* or watershed. The rice fields in the valley of the watershed most of the time had water levels above the ground or the water table was just below the ground level. All these practices go to prove that the people of Kerala were conscious of proper utilisation of their resources for sustainable development.

The people were also conscious of several soil and water conservation measures. These are evidenced from the *kayyalas* or contour terraces, check dams, mulching practices using crop residues, etc. They also resorted to soil mounds to retain moisture, grids of channels to drain away stormwater and recharge groundwater, cascading systems of ponds for irrigation, etc. Location specific measures were adopted to achieve the desired results. In fact, the soil and water conservation measures followed by them helped in reducing soil erosion, maintaining soil moisture and summer flows and recharging ground water. Since the rice fields were properly maintained by them in the past, it not only helped in recharging the groundwater table, but also in containing the flood waters in monsoon season. The large area under forests in the past also helped in maintaining the summer flows and recharging the groundwater flows, as evidenced from the studies at CWRDM.

Due to several anthropogenic factors - increase in population, changing pattern in water use, deforestation, changes in landuse and cropping pattern, reclamation of rice fields and wetlands, tendency to get rid of wells and ponds, aversion to adopt the traditional soil and water conservation measures and lack of integrated approach – the components of water balance equation, valid for the watersheds and river basins of Kerala in the past, were considerably distorted. This had an impact on the aquatic ecosystems and in turn on the entire watershed/river basin ecosystem. The remedial measures generally suggested and implemented are those followed in arid and semi-arid zones, which are not often fit for the humid tropics. Therefore, it is necessary to go back to the time-tested traditional water management practices of Kerala for sustainable development of water resources of this region.

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# challenges ahead

**V.Subhashchandra Bose &**
**Bindu P. Ramankutty**

## Conserve water for posterity

The beautiful and bewitching state of Kerala is blessed with amazing greenery and water wealth, the land of rain. The state receives an average 3,000mm annual rainfall whereas the country as a whole receives an average annual rainfall of 1,150mm and is placed second only to Brazil which receives the highest rainfall in the world. The world as a whole receives 800mm of annual rainfall. When it comes to the State of Kerala, we receive more than twice the average annual rainfall of the country. Kerala with many small and large rivers (44), thousands of ponds (1,35,620) numerous streams (3,200), many lakes (658) and a number of rivulets(187) is water-rich. Apart from these, the State has more than 50 lakhs wells. The state is also rich in natural water conservation facilities as it is endowed with rich forests, wetlands etc.

However, can we sit back today and say or assume that we have achieved water sufficiency? The State which is supposed to be water rich is faced by so many water related problems. The State today has fallen back in ground water availability to the State of Rajasthan which receives the least rainfall in the country. We are faced with multiple problems of floods, droughts, water scarcity and related crop losses. It is also a fact that the State has no major rivers but only four medium rivers. And even after receiving an annual average rainfall of 3,000mm, we are losing much of the rainfall to the sea owing to the sloping topography of the State. We have to think of blocking this water and sending it back to the ground. Water serves as the backbone of our economy. Areas of water use are drinking and domestic use, agriculture, industry, health, electricity, environmental protection etc.

| Prospects | Challenges |
|---|---|
| · High Rainfall | · Physical setting |
| · Literacy | · Paddy reclamation |
| · 44 rivers | · Slope soil |
| · PRI'S | · Construction pattern |
| · Ponds | · Ground water |
| · NGO's | · Behaviours depletion |
| · Open Wells | · Rainfall pattern |
| · R&D | · Capacity of rivers |
| · Lakes | · Deforestation |
| · Organisations | · Environmental |
| · Forests | degradation |
| · Traditional practices | · Land use pattern |
| · Wet lands | |
| · Technological options | |
| · Sacred groves | |
| · Low cost technology | |
| · Paddy fields | |

However, water scarcity, contamination, ground water level depletion and other problems are rampant in the state, we have to find solutions to these problems. An attempt is made here to address these problems.

**The water related problems faced by the state are due to the following reasons**

- lack of serious and concerted efforts in water conservation.
- increasing water contamination and
- improper use of water.

**Lack of serious and concerted efforts in water conservation.**

About 92% of rainwater Kerala receives flows to the sea within 44hrs due to the peculiar geographic setting of the state, the surface run off flow of a drop of water being 3m per second. Whereas the under ground run off flow of water is very slow and takes as many as three days. Very little effort is put into water conservation in Kerala owing to various reasons. And the same are dealt with here.

## Increasing water contamination

The surface water sources in Kerala are contaminated due to various reasons. Highly poison insecticides are used for agriculture, even banned ones. As many as 32 banned pesticides are used in the State. Chemical fertilizers are also increasingly used in abundance. These pesticides and fertilizers ultimately find their way from the fields to the waters. Apart from these, faulty construction of sewage systems including latrines, negligence and ignorance in disposal of biological and human wastes have aggravated the situation. Little do we realize, that it is ultimately the waters we use, that receives the poison and the dump. And no wonder that today even our well waters are polluted and infected by E-coli bacteria. When drinking water is ideally supposed to be free of E-coli bacteria, our waters are infected by thousands of these bacteria. Even as water availability is a problem, the availability of clean and pure water is a serious problem as clean water has become a highly limited resource today. A sad situation- 'Water, water everywhere but not a drop to drink!'

## Improper use of water

Improper use of water is rampant and there is very little effort to save water. Judicious use of water is the need of the time. On an average 20 litres clean water/ day is sufficient to meet a person's daily needs and for all other purposes a total 80 litres water is sufficient for use on ~ daily basis. But, we use as much as 180 to 500 litres water on a daily basis. Drinking water is used not only for drinking but also cleaning cars to gardening and other purposes suggesting how mindlessly water is being used. When the government spends ten rupees to purify water and offers the same at subsidized rate of three rupees, very little care is taken to use this valuable resource wisely. Even as people are spending between 200 to 500 rupees a week to get water in some areas, wastage is widespread in others.

**Following factors make water conservation difficult in Kerala**

### Natural setting of the state

The state's topography which influences high run

off rate renders insitu water infiltration difficult. The rugged and undulating terrain and variation in slopes reduces possibility of natural water conservation. An average 110-120 number of annual rainy days and high force of raindrops are unique to the state. The sloping topography and the forceful raindrops accelerate speedy runoff of most of the rainwater to the sea. The Arabian is separated from the western ghats by hardly hundred meters and the short narrow rivers of Kerala are a limitation. The nature and structure of the soil also limit insitu infiltration of water. Therefore the sloping and undulating topography of the state, number of rainy days, force of rain and rainfall duration, rainfall fluctuation, low flow of rivers, rock structure, nature of soil all render water conservation difficult in Kerala.

### Human interventions

If untampered nature is self sufficient in tackling or balancing its shortcomings in certain areas. However, human beings have severely tampered or played with nature and its resources. Destruction of forest wealth in the name of development has done away with many of our water sources. While one hectare forest area is capable of holding 30,000 cubic km water, one hectare paddy field can hold 5,00,000 litres water.

The ever changing and faulty land use and cropping patterns have drastically affected water availability. Tampering with the inherent unique wealth of the state like destruction of sacred groves and ponds, wetland reclamation, demolition of hills and hillocks have resulted in severe damage to water sources. Increasing construction activities has stood in the way of insitu infiltration of water. Splitting into nuclear families, changing lifestyles and evolving trends has paved way for construction boom which instead have choked our land and water sources. Instead of recharging water into the ground we have increased its wastage. Indiscriminate and haphazard construction of roads has tampered the natural drainage systems. The developing world sees water and rains more as a disturbance than convenience.

## Year 2004-A lesson

The drought faced by Kerala in 2004 has taught us a lesson. Fluctuating rainfall in that year had resulted in widespread drought. The year witnessed grave drinking water scarcity and many suicides by farmers. All calculations went haywire with rains playing truant giving rise to many enquiries and studies were conducted. Drought, tanker lorries, floods, rehabilitation camps have become more familiar whereas water conservation has not figured in our agenda till date.

## In search of Solutions

Wholesome scientific and regional water management practices have to be adopted to address the water problem. Short term and long term programmes. with respect to water conservation and management are a must. Our monsoons are periods when water conservation can be effectively taken up. The rains have to be effectively harvested. Rainwater harvesting is very much in focus. Insitu water infiltration and conservation is also needed. Concerted and serious efforts are required to increase groundwater table.

The problems of water scarcity cannot be addressed until protection and maintenance of all regional water sources and retention and upkeep of freshwater sources are done and effective control of pollution and contamination of water sources is practiced.

**Following measures are to be practiced for effective water conservation**

### Rejuvenation and Maintainance of wells

For a total 65 lakh households in Kerala, a total number of 50 lakh wells exist. Rightly therefore, Kerala has the highest well density (250 to 400 wells/km) in the world. Most wells are seasonal and face problems of drying up in summer. A good number of wells can be rejuvenated especially in the midland and lowland regions with the help of rainwater. Rainwater falling on rooftops can also be harvested and recharged into the wells to increase water availability and reduce water salinity. Digging of rainpits, cultivation of Vetiver and other practices can be taken up to increase groundwater recharge and insitu water infiltration around the wells.

## Protection of ponds and streams

All ponds and streams in the state need to be rejuvenated on a war footing with immediate effect under the leadership of Panchayati Raj Institutions (PRI) with active participation of local people. Increasing the depth and protection of side walls of ponds and undertaking conservation measures, including decontamination of water is a must. Local Water Protection Samithis have to be formed to protect these water sources. Water conservation measures are to be taken up catchment area wise for each water source with peoples' participation under the guidance of PRIs.

## Rainwater harvesting

Rainwater falling on rooftops can be harvested successfully and used for drinking and other domestic purposes and also for agriculture in the state. An approximate 3 lakh litres of water can be harvested from a roof area of 1,000 sq. ft. and an approximate 1,20,00,000 litres of rainwater falls on an acre land/ annum. Use of low cost rainwater harvesting structures and adoption of other traditional practices and artificial pond construction are popular methods of rainwater harvesting in Kerala.

## Groundwater recharge

There are many ways to reduce surface flow of water and raise groundwater table using various agronomic and engineering measures. These measures have to be implemented at the local level for best results.

## Afforestation

Planting of trees on a large scale can raise ground water level. Planting Vetiver having medicinal properties also increases the value of water. Planting of trees on river beds, along canals, roads, along seashore etc. should be promoted.

## Protection of natural water conservation facilities

Forests, paddyfields, wetlands, sacred groves, mangroves, ponds, rivers, streams etc. are natural water conservation facilities. These have to be protected for better water conservation. Sand mining activities should be restricted and alternate building materials popularised for construction activity.

## Waste management

Eco-friendly waste disposal mechanism should be encouraged and measures should be adopted to prevent all forms of waste from entering water sources. Newer methods and better habits should be evolved for effective waste disposal. An attitudinal change in this regard is essential and water bodies should not be taken for granted and become dumping areas. Controlled use of insecticides and chemical fertilizers should be encouraged. Contamination can be checked to a great extent by promoting organic farming instead. Introduction of proper sanitation facilities wherever lacking is a must.

## Watershed management

Water conservation measures can be made more scientific through watershed based development. Water conservation and agricultural practices should be taken up small and large watershed wise. River basin approach at district level and micro water shed approach at panchayat level is ideal for planning purposes for protection of water sources in the state. It is the need of the hour to reorient various administrative boundaries in the state based on river basins and watersheds for effective water management and environmental protection.

## Role of PRIs

Protection and conservation of water sources at local level can be taken up through peoples' participation by implementation of projects at the local level. The existing planning guidelines of local bodies makes mandatory watershed management programmes. Rainwater harvesting is an integral part of productive sector. PRIs can play a major role in designing and implementation of location specific decentralised plans.

Services of a large number of experienced NGOs, technical experts, R & D organisations in Kerala can be utilised for water conservation.

## Water literacy

Water literacy programmes are necessary for sensitising the people of Kerala to create awareness on the importance of water conservation. Awareness programmes should go hand in hand with water conservation activities. Controlled and judicious of freshwater is most essential. While freshwater use should be restricted to drinking and cooking purposes, alternated ways should be explored to meet other needs.

## Renewed collective peoples' approach

Concerted efforts by the government, PRIs, NGOs and local people provide immense scope for water conservation. In all the efforts active peoples participation is absolutely necessary. Water conservation cannot be achieved only through individual participation. Collective and location specific approach is wanted.

All available water sources can be conserved using the above knowledge and water sufficiency can be attained. Water prosperity can be achieved in the land of rain. What is needed is the will and change in mindset of the people. Become a part of water conservation. Help save water for posterity.

Conserve water where it possible. ■

Drinking water is used not only for drinking but also cleaning cars to gardening and other purposes suggesting how mindlessly water is being used.

# Showers of blessing

**Susan Jacob**

With the first human settlements of about 6000 years ago, began a two fold struggle with water. On the one hand, people had to protect themselves against flood and on the other hand they had to ensure safe water supply for domestic use and irrigation. As a consequence, Hydro technical installations were the one among the earliest technological achievements of human kind. Rain water harvesting techniques were more popular among these achievements.

The present day subject of talk among the common people, especially in areas where ground water quality is not suitable for domestic purpose is Rain Water and its Harvesting which we followed in the past, during our forefathers. With the development of technology the natural spot sources like well, pond, Nallas and water flows, all were ignored or obsoletes and the only source of domestic water before the general public has become piped water. While the Government sources for financing such a large number of public water supply schemes are not adequate and the demand of conservation and harvesting of natural sources have received wide publicity.

High flood during monsoon season and acute drinking water shortage in summer season was the scenario in the costal belt of Kerala, especially in Vypin Island, the densest populated

*The approximate volume of water available for harvesting with respect to roof top area and annual rain fall of that area has been shown in Table.*

| Rainfall(mm) Roof top area(sqm) | 200 | 300 | 400 | 500 | 600 | 800 | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 3.2 | 4.8 | 6.4 | 8 | 9.6 | 12.8 | 16 | 19.2 | 22.4 | 25.6 | 28.8 | 32 |
| 30 | 4.8 | 7.2 | 9.6 | 12.0 | 14.4 | 19.2 | 24 | 28.8 | 33.6 | 38.4 | 43.2 | 48 |
| 40 | 6.4 | 9.6 | 12.8 | 16 | 19.2 | 25.6 | 32 | 38.4 | 44.8 | 51.2 | 57.6 | 64 |
| 50 | 8 | 12 | 16 | 20 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 |
| 60 | 9.6 | 14.4 | 19.2 | 24 | 28.8 | 38.4 | 48 | 57.6 | 67.2 | 76.8 | 86.4 | 96 |
| 70 | 11.2 | 16.8 | 22.4 | 28 | 33.6 | 44.8 | 56 | 67.2 | 78.4 | 89.6 | 100.8 | 112 |
| 80 | 12.8 | 19.2 | 25.6 | 32 | 38.4 | 51.2 | 64 | 76.8 | 89.6 | 102.4 | 115.2 | 128 |
| 90 | 14.4 | 21.6 | 28.8 | 36 | 43.2 | 57.6 | 72 | 86.4 | 100.8 | 115.2 | 129.6 | 114 |
| 100 | 16 | 24 | 32 | 40 | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 |
| 150 | 24 | 36 | 48 | 60 | 72 | 96 | 120 | 144 | 168 | 192 | 216 | 240 |
| 200 | 32 | 48 | 64 | 80 | 96 | 128 | 160 | 192 | 224 | 256 | 288 | 320 |
| 250 | 40 | 60 | 80 | 100 | 120 | 160 | 200 | 240 | 280 | 320 | 360 | 400 |
| 300 | 48 | 72 | 96 | 120 | 144 | 192 | 240 | 288 | 336 | 384 | 432 | 480 |
| 400 | 64 | 96 | 128 | 160 | 192 | 256 | 320 | 384 | 448 | 512 | 576 | 640 |
| 500 | 80 | 120 | 160 | 200 | 240 | 320 | 400 | 480 | 560 | 640 | 720 | 800 |
| 1000 | 160 | 240 | 320 | 400 | 480 | 640 | 800 | 960 | 1120 | 1280 | 1440 | 1600 |
| 2000 | 320 | 480 | 640 | 800 | 960 | 1280 | 1600 | 1920 | 2240 | 2560 | 2880 | 3200 |
| 3000 | 480 | 720 | 960 | 1200 | 1440 | 1920 | 2400 | 2880 | 3360 | 3840 | 4320 | 4800 |

*( Extract from CGWB Guide)*

villages in South Asia till 2002. Government spends crores of rupees for sea wall construction to protect the land and the belongings of mankind on one side and on the other side for lorry and barge water supply to quirts the thirst of Vypiniites. But, the problem of drinking water shortage has changed with the successful implementation of Rain Water Harvesting program with full cooperation of public and the financial assistance from Government. So I can direly say that the system is one of the best method to control the flood and drought which most of the countries are facing.

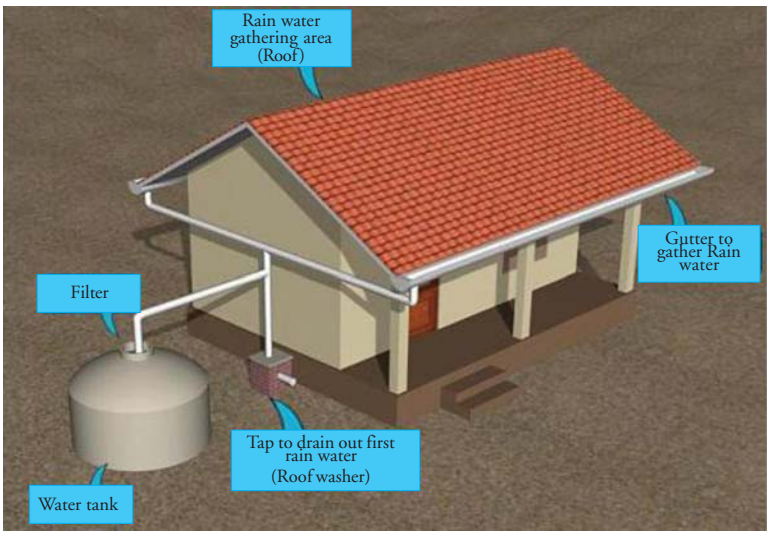
"VARSHA"

When government itself had come forward to assist such an endeavor, Kerala Water Authority in early 2002 had commenced its promotion and the first Community based Rain Water Harvesting Scheme namely" VARSHA" had successfully launched in Vypin Island of Ernakulam District. In the same year this was scaled up to other districts like Alleppy , Kottayam and Thiruvananthapuram with the financial support of Government of India under Rajiv Gandhi Mission Programme. Later on every year KWA has been implementing large number of VARSHA Rain Water Harvesting Units with consumers participation in the State of Kerala.

Domestic Rain Water Harvesting or roof top water rain water harvesting is the technique through which rain water is captured from roof catchments and stored in tanks / reservoirs/ ground water aquifers. It consists of conservation of roof top rain water in urban areas and utilizing it to augment ground water storage by artificial recharge. It requires connection of the out let pipe from roof top to divert collected water to existing well / tube well/bore well or specially designed well.

## Design of Storage/ Settlement Tanks

Storage of rain water may be in different ways based on different factors like Geotechnical, availability of land,



*An abstract of the completed units in various districts as on March 2006 is given below.*

| District | No. of units completed | | Population benefited | No. of units in progress | |
|---|---|---|---|---|---|
| | 5 family units | 2 family units | | 5 family units | 2 family units |
| Thiruvanathapuram | 130 | - | 3250 | 363 | 1025 |
| Alappuzha | 350 | - | 8750 | 130 | 295 |
| Kottayam | 18 | - | 450 | - | 168 |
| Ernakulam | 280 | 650 | 13500 | - | 364 |

*A broad idea about the particular diameter of pipe which will be required to cater to certain roof surface area for given average rate of rain fall in millimeter per hour is shown in table.*

| Diameter of pipe (mm) | Average rate of Rain Fall(mm per hour) | | | | | |
|---|---|---|---|---|---|---|
| | 50 | 75 | 100 | 125 | 150 | 200 |
| | Roof Area (Sqm) | | | | | |
| 50 | 13.4 | 8.9 | 6.6 | 5.3 | 4.4 | 3.3 |
| 65 | 2.41 | 16.0 | 12.0 | 9.6 | 8.0 | 6.0 |
| 75 | 40.8 | 27.0 | 20.4 | 16.3 | 13.6 | 10.2 |
| 100 | 85.4 | 57.0 | 42.70 | 34.20 | 28.5 | 21.3 |
| 125 | | | 80.50 | 64.30 | 53.5 | 40.0 |
| 150 | | | | | 83.6 | 62.7 |

affordability, social, and economical which governs the local environment. In costal belt saline intrusion is quite common and the sodium chloride content in raw water crosses the acceptable limit for domestic use. So Kerala Water Authority (KWA) followed only the method of storage in ground level tanks. The Program VARSHA tells the success story of such a massive conservation of rain water in Vypin Island, the western part of Kerala. Around 500 lakh liters of fresh water is collected during every rainy day through this system.

## Role of NGOs and community participation

The project was implemented as a community water supply system benefiting two or more families and with a

*The design of storage tank has to be based on the water requirements, rain fall and catchments availability. Approximate quantity can be worked out using the following method.*

| | |
|---|---|
| Area of roof top in sqm | - a |
| Average annual rainfall in mm | - b |
| Run-off Co-efficient for different roofing ( 0.85 for conventional types) | - c |
| Co-efficient for evaporation, spillage etc (normally taken as 0.80) | - d |
| Quantity that can be harvested | = abcd liters |

provision to store 5000 liters of water for every family which is sufficient for the summer months. The financial support was at 90:10 between Government of India and the Individual household. The works were carried out through Non-Governmental Organizations (NGOs) with out any time or cost over run. As on today around 5000 families were covered with this system in Kerala excluding the private systems which may be another 5000 families and commercial buildings.

## Need for Technical Support & Awareness Campaign.

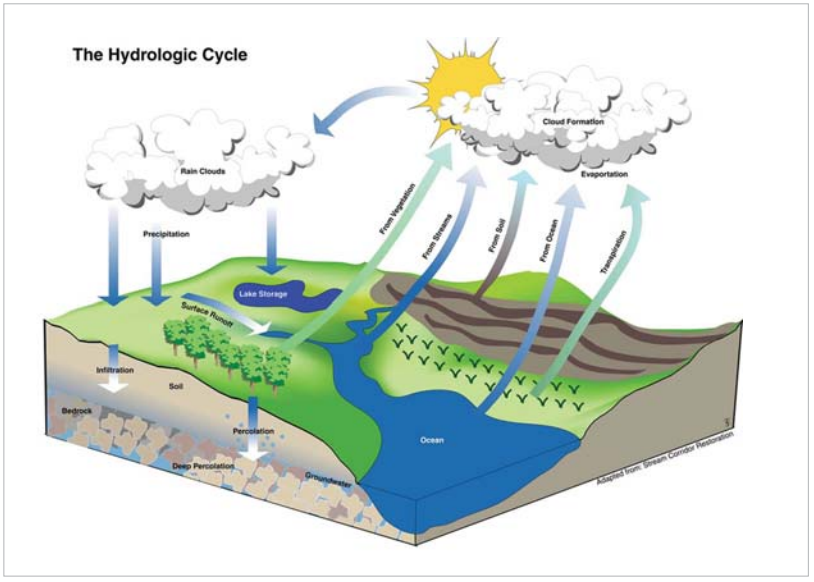
Even though the system is of high cost and low technology, proper planning, design and implementation requires the assistance of experts to select the appropriate technology conducive to the locality. For an effective functioning of the system, awareness to the consumers and general public is an essential item which needs more emphasis in such programs. Knowledge of the local metrological data, Geotechnical conditions of the soil, atmospheric pollution, social habits and financial status are to be taken into account for selection of the method of harvesting and storage of fresh water.

## Quality of Harvest water

As far as Kerala is concerned, the atmospheric pollution is a major problem only in very small area and hence the rain water gives good results.

## Social Benefits

With the implementation of the project, the households come together for their basic need and they feels the ownerships and responsibility of maintaining the system effectively. They practice the good habits of




water sharing, conservation of water, wastage control and effective utilization of water.

Ground Water depletion and Flood Control

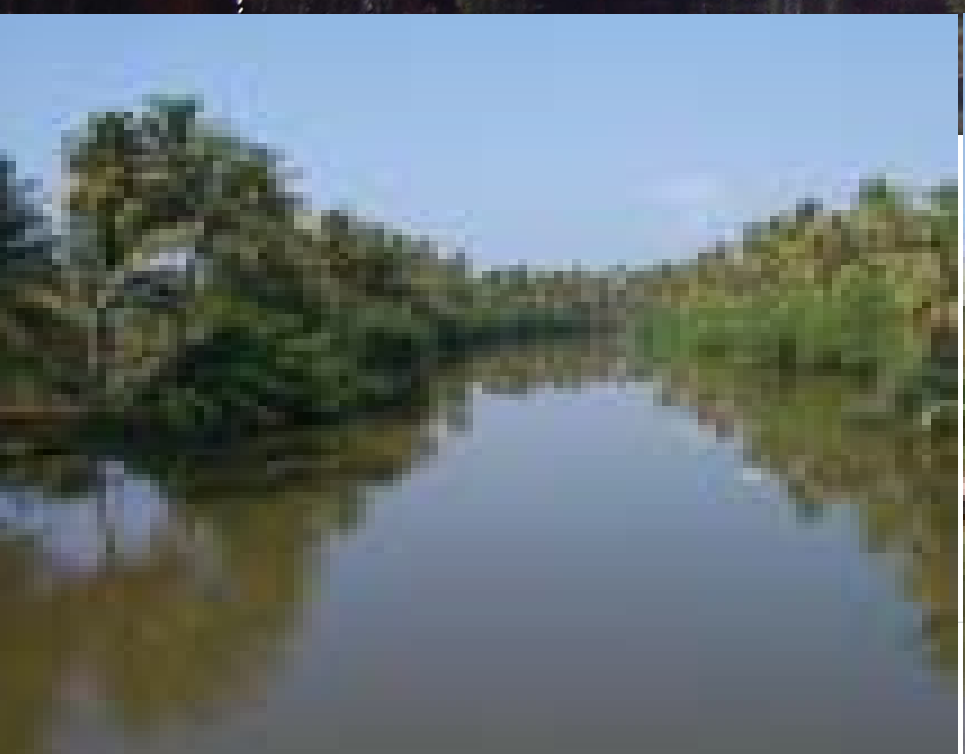
The fast technological development in drilling and pumping methods have paved the way for a massive implementation of ground water harvesting mainly for irrigation and for industry and drinking purposes. There was a great increase in the extent of area irrigated from 6.5 million hectors in 1950 to 40 million today. It is unfortunate that with rapid over drawls of such a huge quantity ground water, no adequate measures are taken to recharge the aquifers. This imbalance between depletion of ground water and their slow recharging has resulted in rapid drying up of aquifers and the consequent lowering of ground water table. Recharging is one of the best way to control the effect of ground water depletion and floods but it is recommendable only for low intensity rainfall conditions. In Kerala the cost of land is so high that constructing big ponds or digging wells at every premise is not advisable. But recharging ground water aquifers is economical and acceptable to the public. Various agencies and agricultural department itself are promoting this and every year the results are most encouraging.

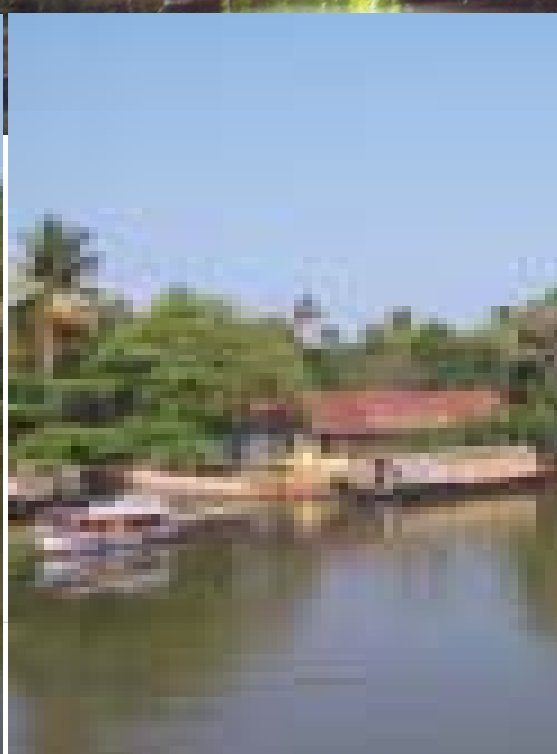
## Strategy

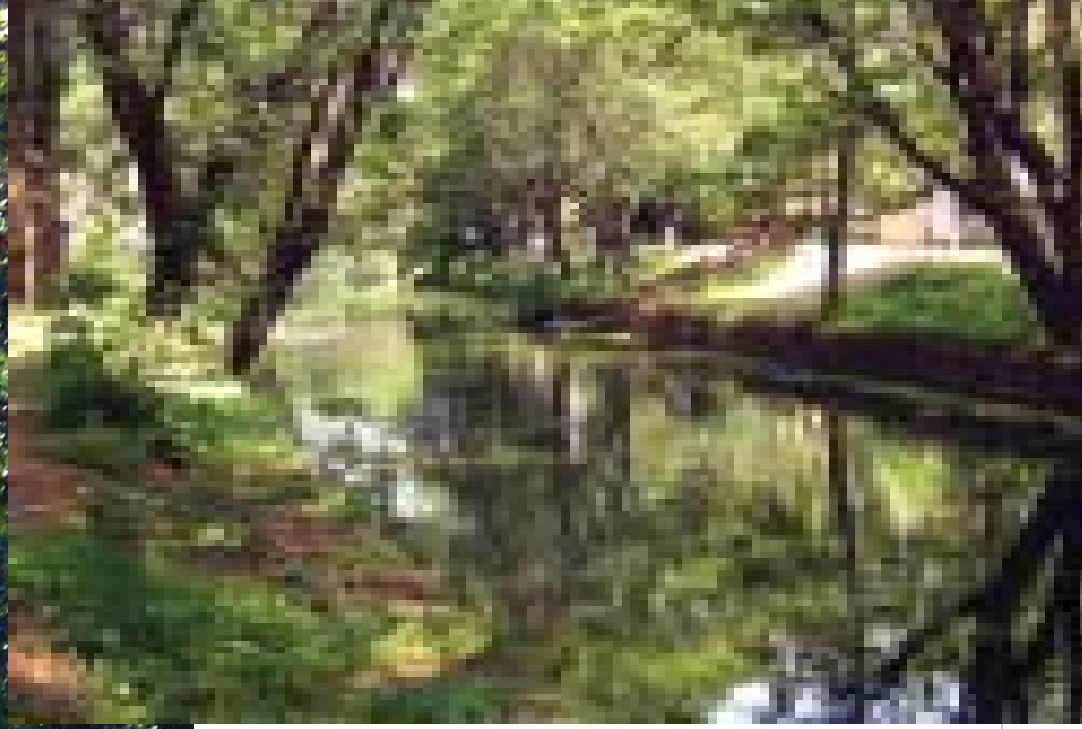
Strategy is of great importance for the successful implementation of any program with beneficiary contribution. Selection of beneficiaries, involvement of local self government is to be clearly spelt out. Government policy in framing building rules with provision for rain water harvesting has to be made mandatory. Women's participation and their role in operation and maintenance in the system are to be made aware through awareness campaigns and media.

■ Engineer, Central Region, Kerala Water Authority, Kochi.

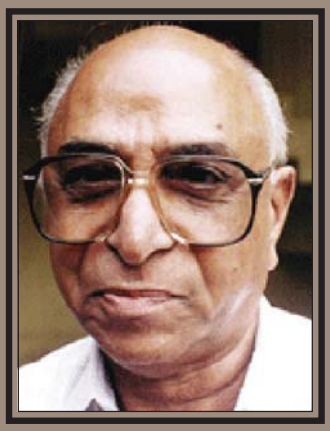
# Water water...







Photos: **Premila V. Nair**



**T.K. Ramakrishnan**
**(1922-2006)**

# One more star in the firmament

The magnanimous and splendid relation with the people of Kerala made T.K. Ramakrishnan an odd man among the politicians. He always stood in between the people who experienced miseries and infliction from the mainstream society. Born in a layman family, he reached higher positions in the Kerala politics and power. T.K. became notable in the life of Kerala as a home minister and cultural minister.

T.K. was born as the second of the four children of Vadakke Vymeethiyil Thirunilathu Kunjaman and Itty at Eroor in 1922. T.K. started his travel through the leftist path even years before the leftist progress raised in Kerala. Today it is very difficult to imagine the socio-political milieu of the state at that time. The politician in T.K. realised that the commitment to people is more important than anything else. Because of that itself, he tried for a new world order leaving all the miseries he had to endure. He was the member of the party central committee and the leader of the State Marxist Party. We can see the contributions of T.K. in a number of trade union organisations.

As the minister of Culture, T.K. made a variety of contributions. He kept warm relation with writers and those associated with cultural activities. Reading and writing was a part of T.K.'s day today life. The novel "Kallile Theepporikal" told us about the socio-political environment which he believed to be correct. He wrote a number of dramas vice "Thyagabhavanam", "Aaradhana", "Agathimandiram", "Sahodaran" etc. The first one among them was 'Gramathakarcha."

T.K.'s role in establishing Agricultural Workers' Union in Kerala was commendable. As the Minister of Fisheries also his contributions were memorable. Bus service for fisherwomen is notable among them. Trawling ban during the monsoon season was another important measure he took.

T.K. was elected nine times to the assembly and he became the minister thrice. He chaired the positions of the opposition leader and LDF convenor. He was active as the Central Committee Member of the CPI (M) till last year.

In these respects, T.K. lived as a notable politician for more than half a century in Kerala politics. Surely, his demise has made a void in the socio-political life of Kerala. When the pure presence of old generation petalled down one by one, we can expect their contributions would definitely inspire new generation. ■



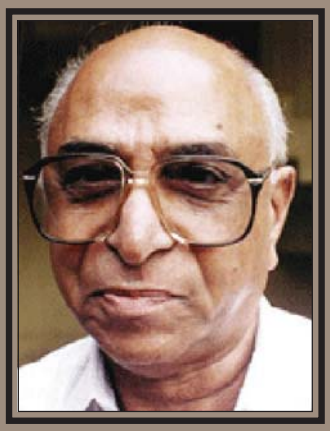
**Prof.P.K.Abdul Azis**

The International Education Meet held during February 4-7, 2006 at Kochi was a path breaking initiative to advantage the cause of Higher Education in Kerala keeping in mind the global needs for the next few decades.

Kerala is on the threshold of a remarkably promising growth track. Being the most literate state in India, Kerala is poised to play a bigger role in the area of higher education. The fact that thousands of graduates and professionals from Kerala are working successfully in foreign countries with distinction and professional esteem, testifies the inner strength of the educational system that the state has nurtured for the past few decades. The 21st century is going to be a knowledge era propelled by phenomenal advancement in the area of information and communication technology.

With this International Education Meet, the Govt. of Kerala has initiated process of dialogue between foreign Universities and their counterparts in Kerala for a meaningful and sustainable partnership that will lead to mutual benefits, further strengthening the already strong traditional ties between India and the respective countries.

The education meet provided a venue for an academic interaction on the theme "Excellence in Higher Education for Social Justice and Economic Development". The deliberations on six core themes like autonomy in higher education; financing of higher education; motivation



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Educational meet

# Towards a New Educational policy

schemes and career management for teachers; safeguarding quality in higher education; knowledge creation, innovation and research; and access and social justice in higher education threw up ideas, specific measures and actionable initiatives that will provide the basis of a long term road map for the state. The meet also hosted an exhibition on the opportunities and avenues in higher education sector.

Delegates from India and abroad participated in the four-day event. Around ten universities signed MoUs with various universities in Kerala. CUSAT signed MoUs with Manitoba University (Canada), UCSI (Malaysia), De Montfort University (UK), Tilberg University (The Netherlands), International University of Business Agriculture and Technology (Bangladesh), Mzumbe University (Tanzania), Eastern University (Sri Lanka), Peradeniya University (Sri Lanka), North East Wales Institute of Higher Education (UK), Director of Science and Technology (Embassy of Federal Republic of Iran), and Perdeau University (US). The university signed MoUs with Spice Organization, California, and France Asia Educational Consultants also.

The International Education Meet is a pioneering initiative by an Indian State to reposition its higher education sector in the fast changing global scenario. Taking into account the presentations and discussions at the Meet, the Vice-Chancellors of Kerala Universities have identified core issues that, in their opinion, should guide this process as it moves forward as well as priority measures that may be considered by the Government of India, the Government of Kerala and the Universities.

## Repositioning Higher Education

We believe that there is unprecedented opportunity for a state like Kerala, with its high levels of social development and many achievements in higher education, to take advantage of the emerging global knowledge economy and increase knowledge-driven economic growth in Kerala. This is a most effective way to rid ourselves of our age-old curse of poverty and unemployment and improve the standard of living of all our people.

For the knowledge sector to become a core driver of Kerala's economic development, every person in Kerala must be provided the opportunity to participate in and benefit from the knowledge economy. For this, Kerala must set two core goals: (i) universalize higher education; and (ii) raise the quality of Kerala higher education to the highest levels of global excellence.

Kerala must take a bold step and become the first

Davis

State in India to set for itself the ambitious 21st century goal of universalization of higher education. Having substantially achieved the goals of universalizing literacy and elementary education, and given that basic higher education will be a minimum prerequisite for a decent wage in the 21st century, this is essential for the future stability and prosperity of the State. This goal should be pursued in parallel with the ongoing effort to universalize secondary education by 2016. Today, some 90% of youth of college going age in Kerala do not have the opportunity to receive post-higher-secondary education. This is unacceptable. Universalizing higher education will require a massive expansion of the higher education system of Kerala. We realize that his will be a very difficult challenge. However, it is a challenge that can and must be met. Kerala has a proven track record of achievement in setting and meeting great challenges in education.

Kerala must also resolve to raise our higher education standards to the highest global levels. Again, this is a difficult challenge, but one we have to meet. Meeting this goal will require collaboration and partnership with higher education institutions at the national and international levels and fostering institutions in Kerala that are of global and national excellence. Curricula, programs, faculty, and students will all need to be a part of this transition to higher standards.

We believe that the steady and marked decline of the role of the public sector in higher education should be reversed. Public investment in higher education should be significantly enhanced – while education should account for at least 6% of GDP, higher education should receive a higher share of investments in education.

We recognize that an expansion of the system of higher education of the massive scale required not only substantial new public sector investment but also substantial new private sector investment. This should come mainly from the "not-for-profit" sector (i.e., organizations such as charitable societies, NGOs and community organizations). Private players in higher education will need to serve public interest. We acknowledge the excellent services now being provided by several charitable and community organizations in the education field. However, higher education cannot be a commercial matter and the commercialization of higher education needs to be firmly resisted. The policy environment will need to be adjusted as required to facilitate these goals.

It is crucial to ensure that gender justice remains central to the higher education system of Kerala, in access, academics as well as in academic administration.

Kerala must ensure that no student who gains admission into higher education – in a public or private institution – is denied the opportunity to study only because he/she cannot afford it. This is essential to ensure that higher education benefits the poorest of the poor.

The Vice Chancellors have also decided to establish a "Consortium of Universities in Kerala" to enhance mutual coordination and cooperation. This body would have decision making authority on matters common to all Universities in Kerala such as transferability of course credit, cross-enrolment in individual courses across Universities, exchange of students and faculty, harmonization of assessment criteria and methodologies, and such other matters.

In addition, the following main policy measures are recommended with reference to each of the themes discussed at the Meet.

## Advancing Social Justice through Excellence in Higher Education

- Any admission of students from outside India should be without prejudice to Kerala students, i.e., such admissions should not result in any reduction of seats available for Kerala students even if they remain temporarily vacant.
- Ensure that Supreme Court decisions prohibiting profiteering (for any seat, including management seats) and capitation fees, as well as requiring that admission and staff appointments be on the basis of merit, are fully enforced.
- Take prompt steps to enact necessary State law to implement 104th Constitutional Amendment in Kerala.

- Establish a Chief Minister's Fund to provide scholarships for higher education to students who cannot afford higher education and take steps to make loans, grants and other financial assistance more easily available to them. Admissions should be strictly merit-based and should be de-linked from financial capacity of students to pay.

## Safeguarding Quality of Higher Education

- Establish an independent regulatory authority to undertake accreditation and oversee the quality of the higher education sector, particularly private institutions, and provide an avenue for redress to students and parents as needed. Members of the regulatory body should be eminent academicians noted for their independence.
- Establish an Institute for Higher Education focusing on teacher training, research into higher education, pedagogy, soft skills, faculty and course evaluation and training of non-teaching staff.
- Use ICT to enhance quality, transparency and availability of information; enhance knowledge management and knowledge sharing. This will include making available on-line information on admission and teacher selection processes and examination results.
- Establish a new International University based in Kerala, with an international curriculum, international faculty and an international student body.

## Action to be taken by Universities in Kerala

- In order to safeguard fairness and objectivity, when the Syndicate decides on matters of affiliation, as is the practice with Boards of large institutions, Members of the Syndicate should not participate as members or observers in any inspection team.
- Ensure that curricula are regularly updated to be made state of the art, flexible, responsive to employment needs; and provide greater space for electives. Develop courses tailored to needs of society. Teaching and research should be mutually supportive.
- Reform examination systems to provide for continuous and multiple-sourced evaluation, reducing excessive reliance on centralized exam systems. This will also assist in curricular reforms.
- Strengthen basic science education and liberal arts education, and provide appropriate incentives and rewards such as scholarships.
- Strengthen value education.

## Autonomy in Higher Education

We express the strongest support for enhancing academic, administrative and financial autonomy of Universities, their departments and affiliated colleges, with appropriate accountability.

**Recommendation to the Government of India**

- Amend the UGC Act to give State Governments the power to confer deemed University status in accordance with procedures and norms that State Governments shall establish.

**Recommendation to the Kerala State Government**

- Amend relevant laws to ensure that only persons of academic excellence (possessing a doctorate and having held an academic position of Reader or higher) shall be a member of the Syndicate of any University in Kerala. Introduce a requirement that the Vice Chancellor shall be consulted and his or her views obtained prior to the appointment of any such member.
- Remove requirement for Government NOC for seats and courses, leave this function entirely to Universities if there will be no demand for additional aid from Government

**Action to be taken by Universities in Kerala**

- Autonomy to be granted expeditiously to selected colleges in accordance with UGC Guidelines.

## Financing of Higher Education

- Ensure that fees are kept at affordable levels with no increase for students who cannot afford to pay higher fees. Subject to the above, enable Universities to charge higher, differential fees to those who can afford to pay, including foreign students.
- Establish a Kerala Education Bank to mobilize, disburse and manage financial assistance to students and raise resources for Universities and colleges.
- Allow Universities to admit foreign students to generate additional resources that will help Universities improve standards and facilities for needy Kerala students.

**Action to be taken by Universities in Kerala**

- Each University to establish a corpus fund to finance scholarships for needy students and meet other developmental needs. Corpus will be constituted by donations, and gifts from alumni and well-wishers.
- Universities to devise new schemes for raising new sources of revenues consistent with their statutes and objects.
- Universities to develop and implement programs to enhance efficiency and reduce costs so that the savings may be used for university development and for supporting scholarships for needy students. Such schemes will include enhanced use of ICT for e-governance and out-sourcing non-core activities if essential for better delivery of services.

V. Knowledge Creation, Innovation and Research

**Action to be taken by Universities in Kerala**

- Provide maximum autonomy to research teams, ensure appropriate rewards and incentives for research, strengthen links between research and development needs.
- Establish IPR cells in each University to ensure adequate protection of the intellectual property rights of the University, its faculty, researchers and students.

■ The author is Vice-Chancellor CUSAT.

*Odathil Palli- Thalassery*

# The Keyis of North Malabar

**Sasikumar C. Thalassery**

Keyis are nobles among the Moplas of Malabar known for their immense wealth and landed properties which they acquired through brisk trade they carried out in Kerala even before the advent of English East India Company. Kunhipacki Keyi – the fourth lineal descendent who became the head of this affluent family in 1809 was the first to be addressed with this honorific title. His predecessors Aluppy and Moossa were addressed by Gujarathis who had trade relations with Tellichery as *Kakka* which is also Gujarati word meaning *Karanavar*, applied to both among elderly or respected person among both Hindus and Muslims. The title *Kakka* became associated with their successors up to Kunhi Packi and from Kunhipacki onwards they were known by the appellation, *Keyi*. The term Keyi is of Persian origin meaning owner or '*nathan*'. In those days crew of the ships called their masters as 'Keyis'. Since the Keyis were also owing ships they also came to be adorated with this title. The Keyis were very generous, honest and truthful. Owing to the immense wealth of the family a kind of aristocracy is attached to them. Even now they enjoy a high and elevated position among the Muslims.

The history of Keyis can be traced back to 17th century about 1680 AD when Aluppikakka who is regarded as the founder of the family, the first among the Keralites who found a prominent place in foreign trade, a dealer in copra and spices in Chovva, a rural village about four km south east of Kannur. Aluppy Kakka a shrewd businessman so that the merchants whom he had sold the spices were exporting them to foreign countries from Tellicherry and earning huge profits decided to migrate to Tellichery with a view to have commerce with distant places.

Aluppy Kakka purchased a small strip of land in Tellichery from the Kottayam Raja near the foreshore, built a thatched warehouse and started the business. Within a short time his business developed and he brought his two sisters and children. This group form the basis of Keyi family – a family to be remembered hereafter a name to figure brilliantly in the awards of the history of Malabar. Since the family come from Chovva they were called 'Chovvakkaran' and their name begins with the initial 'C'. The small warehouse was replaced with a big one came to be called "Kakka's Pandikasala and he began exporting spices to foreign countries.

Tellichery was ruled by Dutch and Aluppikaka got extensive help from them in his business but the worse he had to face was from the Vaniambalath a powerful Muslim family. They were jealously watching the growth as wealth of Aluppikaka. Aluppi was very diplomatic and he tried to win over their favour through a marital alliance – but his decision to marry a lady of their family was disapproved by their Karanavar. So he took a bride from Achorath family. The refusal to grant consent for Aluppikakka's marriage with the lady of their house was taken as an insult by Aluppikaka and he gave an injection to his family members not to have marital relation with

Devadas

them in future. All the Keyi's branch except one family honoured their Karanavar's decision. The hatred went to such an extent that they ever prevented Aluppikakka from going for prayer in the mosque under their jurisdiction and also forbade the kadhi from doing any religious services to him. Aluppikakka never yield before them. He built a separate mosque known as 'Thazhathupalli', and arranged a separate Kadhi for his family. Hereafter Keyis were having separate Kadhis to perform religious functions. When Aluppikakka's family expanded he built a beautiful house known as 'Orkatteri' known for its exquisite splendour and architectural beauty. When he died he was buried in his own mosque. Though Aluppikakka laid the foundation of Keyi family it was his nephew Moosakakka, responsible for strengthening and fortifying and increasing the wealth of his predecessor.

When Mysorian interlude began it evaded alarm among the Hindu families because they had to face forcible conversion. Moosakakka a friend of British came to the rescue of Rajas and Brahmins. Chirakkal Raja who took refuge in Tellichery Sri Ramaswamy temple along with several brahmin families and Hindu families were taken in Pathemars and small ships to Travancore. Travancore Maharaja gave them asylum. The act of Moosakaka held him in high esteem. After the Tipu's invasion the trade decreased and the business which Moosakaka started independently with the help of his uncle failed and he left Tellichery to Venad to seek the help of Maharaja. The king greeted him very honestly and gave him financial help. With the king's help he again started business. His business flourished and he returned with gifts and asked the Maharaja to take back the money he had given him. The king declined happily and gave him all facilities to trade in his kingdom. He also gave him teakwood for the construction of a mosque in Tellichery where he understood his intention. In Aleppy for the smooth transporting of his merchandise Moosakaka constructed a canal, which is known as "Moosakaka canal" and the places where he lived came to be known as "Moosakaka Valap."

With the fall of Tipu, Malabar came under the suzerainty of British but the Keyis dominance in trade increased considerably. With British help, Moosakaka established trade relations with London, Paris and Amsterdam.

With immense wealth he returned to Tellichery constructed a big warehouse on Bombay model. The front portion of this warehouse was ornamented with glasses. It eventually came to be called Kannadi Pandikasala, which exists even today.

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Like his illustrious uncle he also constructed a beautiful mosque in Tellichery in the 'Karimbin-odam' (Sugar cane plantation) formerly belonged to the Dutch, occupied by the British and later purchased by Moosakaka. Odam means *thottam* or garden in Dutch language. Since it was constructed in *odam* the mosque came to be called '*odathilpalli*. The mosque had copper plate roofing and golden doom in the minor and share the scenic features as the ones noted in the Brahmonical tradition. There was opposition in laying the dome a privilege enjoyed by the temples so Zamorin gave speed permission to lay the

domes in the Minar. It highlights the communal harmony that prevailed in those days and the policy of enlightened toleration followed by the Kerala rulers. All the Muslims can offer prayers but in the *Kabaristan* only the dead bodies of Keyis, their wives and children are buried. Moosakaka does not live to see the domes to be erected so the ceremony was done in 1861 by Kunhamed Keyi of Keloth branch of Keyis. A strange practice of mass entertainment was done by emptying sugar bags in a well to give sweetened water to the large number of coreligionists assembled to witness the function.

Moosakaka became mediator in the war between British and Arakkal family, the only Muslim ruling dynasty in Kerala. The Raja accepted the rule of British and the company asked to pay Rs.10 lakh as war indemnity. The Raja failed to pay the money and Moosakaka paid the money for Raja and later recovered from the revenues which were hypothecated to him. In appreciation the Raja gave consent for marriage of a beebi of his family with Ussenkutty, a nephew of Moosakaka. The title Elaya was conferred on the consort as per custom guest like the Elaya Koyil Thampuran confers on the consort in Travancore. This nobleman died in 1806 and buried in his own mosque Odathilpalli and a mausoleum is erected on his grave.

Devadas

*Kannadi Pandikasala - Thalassery*

Moosakakka was followed by Valia Makki Kakka and then by Kunhipakki. Keyi has already been referred to Aluppy Kakka and Moosakakka lived in pomp and splendour but none of the descendants had the grandeur of their predecessors. Cheriya Makki was the last of the Keyis to head the whole family. After his period Keyi family was divided subdivided and now altogether there are ten branches of Keyis. Cheriya Makki Keyi was least interested in his forefathers business so it began to decline. With the emergence of freedom and the close up of Tellichery port, Keyis as a trading community disappeared from the area but even today, though they have no glory as in the past the majority of buildings and lent properties in Tellichery belonged to Keyis. Some of the buildings and houses they erected in the past are in good preservation as venerable landmarks of a glorious past.

Even from the beginning of 19th century Keyi began to play a dominant role in all fields and produced leading figures in every walk of life. The justice party and the Kerala Muslim Majlis had its origin in Tellichery. The founder president of Majlis the predecessor of Muslim League C.P. Mamookeyi hails from Puthiyapura branch of Keyis. The first among them to receive the title Khan Bahadur from British was C.P. Mammad Keyi of Keloth Branch. C.P. Mamookeyi of Pawkath branch was the first Muslim to head the Tellichery Muncipality as chairman. Mayankutty Elayavu of Valiapura branch was a great philosopher and poet and well versed in philosophy. Tafsir, the first Malayalam translation of Quran was done by him. He constructed a 'Keyi Rubal' at holy Mecca for the welfare of Hajis from Kerala. It served as a shelter for pilgrims for a very long time until its demolition by the Saudi Government. A.P. Umerkutty of Keloth branch wrote a book on Keyis in Malayalam filled "Malayalathile Keyimar" which throws a flood of light on the historical background of Keyis. The Arabian dish Alsa and Mughal dish Biriyani was popularised by Keyis in Kerala. The ritual arts like '*Arabanamuttu*' and '*Daffmuttu*' was also patronized by them. C.K.P. Cheriya Mammoo Keyi whose name is memorable as a kingmaker in Kerala politics. C.P. Pocker Sahib and C.P. Kunhamed of Pazhaya parambath were famous cricket players during British period. C.V. Mayankutty Keyi of Valiapurayil was a famous wrestler. P.V. Kunhi Moosa of Puthiya Valap was famous horticulturist and tennis player.

C.P. Aluppi Keyi, a member of the organising committee formed in Tellichery for the 200th death centenary of Moosakakka the patriarch of Keyi family is an acknowledged social worker and consumer activist, earned a good reputation among Keyis for his activism. Ad. C.O.T Ummer, Dr. C.O.T. Mustafa, Dr. C.O. Umerkutty, C.O.T. Aluppi Keyi, C.K.P. Mammad Keyi, C.K.P. Abdurahiman Keyi, C.K.P. Raiz are members of both the said celebrated committee and Keyi families, a family which has a proud historical background of Malabar in the last centuries. ■


## Kerala's health sector

# Crying for Cure

**Dr. B. Ekbal**

Kerala has made remarkable achievements in health almost comparable to that of even developed countries. The widely accepted health indicators like crude death rate, infant mortality rate, and life expectancy evidence this. Most analysts have seen Kerala's achievements in health as something of an enigma. Kerala's achievement in health in spite of its economic backwardness has prompted many analysts to talk about a unique "Kerala Model of Health," worth emulating by other developing parts of the world

## Kerala Model of Health

Kerala can be said to have made the transition from a society with high population growth rate, high crude death rate, and high infant mortality rate to one with moderate population growth rate, low crude death rate, and relatively low infant mortality rate. That this has come about without major economic restructuring of the society sets it apart as a model of what is possible, within severe constraints to development, in the health sphere.

There are many socio-economic conditions unique to Kerala, which have been postulated to make this health model possible. Kerala has a highly literate population compared to other Indian states. This especially the high female literacy, has to be given due credit when we look for explanatory factors.

It is also to be noted that Kerala has nurtured a political climate wherein the rights of the poor and the under privileged have been upheld and fought for. This was the result of a fairly long period of struggle for social reforms exphasising dignity of people who were considered

socially 'inferior' which later found expression in secular-democratic movements culminating in nationalist and socialist movements. Hence, there is a remarkable reduction in the rate of exploitation of the underprivileged in Kerala compared to other Indian states.

The agrarian reforms that were implemented in the late 1950s ended the feudal relationship in agriculture and giving land to the tillers. This improved the social living conditions of the landless poor in the rural areas. This might have contributed to the alleviation of poverty among the agricultural labourers leading to the improvement of their health status. The public distribution system of food through fair-priced ration shops distributed throughout Kerala assures minimum food materials at relatively cheap cost to the people. This has assured certain amount of nutritional status to the poor, warding of poverty related diseases.

Apart from the socio-economic factors outlined above the universally available public health system in Kerala has also contributed to the high health status of the people. Kerala has a three-tier system of health care, the Primary Health Centres and the Community Health Centres (CHC), Taluk and District Hospitals and the Medical Colleges evenly distributed both in the urban and the rural areas. Apart from Modern Medicine, Ayurveda, Homeopathy, and other alternative systems are also very popular in Kerala.

However, the widely acclaimed Kerala Model of Health has started showing a number of disturbing trends recently.

Leenus

## Kerala Health Crisis

Although the mortality is low, the morbidity (those suffering from diseases) is high in Kerala compared to other Indian states. Hence the Kerala situation was described as 'Low Mortality High Morbidity Syndrome" (Panicker and Soman 1985). It is interesting to note that both infectious diseases like dengue fever, diarhoea, leptospirosis etc and the so called life style diseases are both prevalent in Kerala. More over the incidence of many life style diseases are more than the national average. (Table one and two). Moreover, many epidemics that were supposed to have been eliminated from Kerala like Malaria are definitely staging a come back. In addition, diseases like Japanese Encephalitis that was sporadic in Kerala has appeared in many parts of the state as epidemic apart from the appearance of the modern scourge like AIDS. Fortunately the incidence of AIDS is still low in Kerala. However considering the presence of stigma and discrimination towards those who suffer from HIV/AIDS there is every possibility of AIDS emerging as a major public health problem in Kerala.

Another disturbing trend is that the Public Health System is getting alienated from the people and only 50% of the people even from the lower income group seek medical help from the Government hospitals . This is because of the fall in the quality of services at the Government hospitals.

This environment of the perceived inefficiency of the Government medical facilities is one of the factors that provided the impetus for the growth of the private medical care set up in the state. The social milieu of the state is changing and features of a consumer society are visible in all occupations. This has led to the commercialisation and the commodification of health care. Health is no more seen as a right but as a commodity to be purchased by money.

A comparison of the infrastructure and health manpower development in the private and public sectors confirms the supremacy of the private sector in the state. The number of beds in the government institutions grew from around 36000 to 38000 in the 10-year period from 1986 to 1996, whereas in the same period, beds in private institutions grew from 49000 to 675000. This amounts to nearly 40% growth in the private sector beds in a period of 10 years as against nearly 5.5% in the Government sector. In the case of doctors about 5000 doctors work in the government sector whereas double the number work in the private sector. More significantly, private sector has far outpaced the government facilities in the provision of sophisticated modalities of diagnosis and therapy. Simultaneously, public sector itself is being subjected to internal privatization. Because

of the irregular supply of medicines and other materials patients seeking medical care from the government hospitals are forced to buy them from outside. Also the laboratory facilities are quite inadequate in the government hospitals and patients have to depend upon the private labs for getting investigations done in time.

The privatisation of medical care is leading to over medicalisation and escalation of the health care cost (Table Three). The establishment of large number of self financing medical colleges are worsening the situation further. Because of private sector boom and also the tendency towards specialization doctors are refusing to join the government hospitals and hence there is a severe dearth of doctors in the rural and even some urban centres and medical colleges. The net result is the marginalisation of the poor and it is roughly estimated that at least 30% of the people in the state are denied health care or find it extremely difficult to meet the growing health expenditure.

**In short the important aspects of the present health scenario in Kerala are:**

- The simultaneous presence of the diseases of poverty and the diseases of affluence or life style diseases.
- The decay of the public health system.
- The uncontrolled growth of the private sector.
- Escalation of health care cost.
- Marginalisation of poor.

## Towards a People's Health Policy for Kerala

Toning up of the health care system in the state and making it capable of taking on the burden of provision of equitable, efficient and good quality health care needs concerted actions from the political parties, social movements and the professional organisations. Taking into consideration the specific problems of the Kerala health scenario a People's Health Policy for Kerala should be formulated. Reinstating the primacy of the government health services, with its emphasis on primary health care should form the basis of the health policy for Kerala. There should be social control and auditing of the private sector. The health expenditure should be controlled.

These objectives can be realised only through an administrative and financial decentralisation of the health services department, while ensuring community involvement in formulating and implementing health care programs and reforms. The Panchayat Raj now provides the possibility for the people to demand the resources to operate a health service in which the people themselves will play the dominant role and of which they will be the chief beneficiaries. All infrastructure, health manpower development, training, distribution, and production of drugs and equipment must conform to achieve this, and not in reverse as is at present. Only thus can a cost effective, human and accountable health service be provided that is funded and operated by the local bodies with the technical assistance of the health professionals. This system involves the entire community and especially the women in identifying their health problems. The people can be mobilised to improve not only the curative care but even more so in health education as well as in the prevention and control of the diseases that originate in their environment.

With the handing over of the institutions from the PHCs to the District Hospitals, to the local bodies as part of the decentralization process there is a tremendous scope for solving many of the health crisis through which Kerala is passing now. The Panchayath Raj system rooted in community involvement is poised to change the health scenario in our state and is likely to conceive a new Decentralised and Participatory Model of Health Care in our state. In case this becomes a reality then Kerala will bestow another unique model of health care worth emulating not only by the other Indian states but also by other developing parts of the world.

Table One

| Incidence of Life Style (Chronic) Diseases | | |
|---|---|---|
| | | *(per lakh population)* |
| Name of Disease | India | Kerala |
| Hypertension | 589 | 1433 |
| Diabetes | 221 | 980 |
| Heart Disease | 385 | 914 |
| Mental Diease | 132 | 283 |

*Economic Review 2004 State Planning Board, 2005*

Table Two

| Attack of Communicable Diseases | | | | |
|---|---|---|---|---|
| Diseases | Attack | | Death | |
| | 2002 | 2003 | 2002 | 2003 |
| Dengue Fever | 263 | 3861 | 1 | 67 |
| Leptospirosis | 2928 | 2162 | 199 | 98 |
| Diarrhoea | 539863 | 506034 | 26 | 16 |

*Economic Review 2004 State Planning Board, 2005*

Table Three

| Per Capita Health Expenditure | |
|---|---|
| Year | Rs |
| 1987 | 89 |
| 1996 | 549 |
| 2004 | 1722 |

*KSSP 1987,1996,2004: Health Survey and Kerala Padanam*

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# Behind colours

**Johny M.L.**

**In the death centenary year of Raja Ravi Varma, Johny ML goes through the work and life of the great artist and the impact of his work on the Malayalee society.**

For an average Malayali Raja Ravi Varma is an 'icon maker'. Ravi Varma gave him 'Gods and Goddesses' for daily worship. There was a time when each household in Kerala took pride in having a Ravi Varma oleograph. Ravi Varma's contributions to the modern Indian art were generally neglected thanks to the generic apathy that the Malayali society holds towards visual art. Perhaps, Ravi Varma made a came back through text-books that fed the children with ideas about the artist as a child prodigy, who excelled in naturalist drawing.

True that Ravi Varma was a child prodigy. However, the myths built around his artistic genius have a folkloric tinge. Every child prodigy painted on the walls. They almost ruined the walls to make really 'awe-inspiring' drawings. Or they completed the unfinished paintings of their elders or mentors with a 'masterly' hand. And most often these child prodigies learned their skills by looking at the elders working. Their godly talent is whetted by their 'Ekalavya' like devotion towards art. All those biographies written on the life of Ravi Varma have detailed narrations on these aspects. Hence, Ravi Varma became another Da Vinci or Picasso in these biographies.

Where, then, shall we find the real Ravi Varma? Shall we find him in his paintings? In his oleographs? Or in the correspondence done between Ravi Varma and his brother? The biographies tell us that Ravi Varma was a very sensitive person and he loved the people around him. The well known biographical novel 'Raja Ravi Varma' written in Marathi by Ranjit Desai not only reveals Ravi Varma as an artist but also as a human being. But it is a novel. Discerning facts from fiction is quite difficult, as we do not have many reliable sources to dispute the fiction. In this novel Ranjit Desai presents a Ravi Varma who is not an icon maker or a painter alone but a passionate human being.

Somehow, the Malayali society has shown a strong reluctance

There are not many evidences to prove the Malayali's acceptance of Ravi Varma as a passionate genius as conceived by Ranjit Desai.

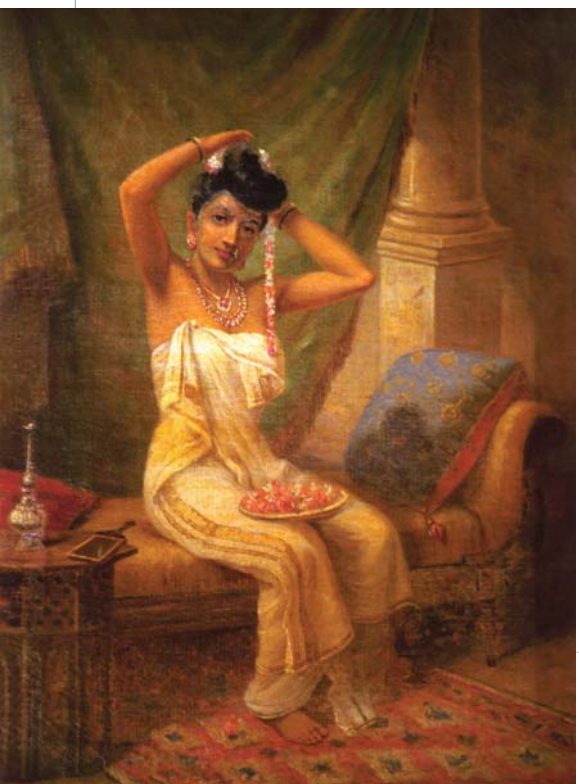
to accept Ravi Varma as a human being; to be clear, a very passionate human being. There is a saying that artists are very hot blooded creatures. They are the beings of passion and emotion. They are driven by a divine passion. The concept of presenting the artist as a demi-god is purely a western concept. In Indian artistic tradition we hardly see any individual artist. Only during the end of Mughal Period we come to know names of individual artist like Basawan or Nainsukh. The enormous art works that we see around in our country are often known by the patron who funded the making of them. Ranjit Desai seems to have taken the western concept of 'artist-genius' to build the character of Ravi Varma.

There are not many evidences to prove the Malayali's acceptance of Ravi Varma as a passionate genius as conceived by Ranjit Desai. While accepting Ravi Varma as a genius, the Malayali cannot imagine a Ravi Varma who indulges in carnal pleasures. There could be religious reasons for it. But accepting Ravi Varma as a 'modern artist' ridden with a fare amount of existential problems is beyond their conception. Perhaps, the title 'Raja' hinders them from looking at Ravi Varma as an ordinary person with 'natural' feelings.

Locating Ravi Varma in the modern artistic as well as art historical context becomes rather difficult for the Malayali due to his forceful identification of the artist with his creations. Ravi Varma was an artist who painted ordinary scenes as well as mythological themes. The genre of portraiture was not unknown to him. Similarly his confrontations with the quotidian realities gave him a lot of insights about the characters that he painted. Malayalis do not want to face this fact in the life of Ravi Varma. As an art historically closed and insular society, Kerala feared Ravi Varma falling from the pantheon of Hindu gods and goddesses. They have identified him one amongst the many godheads.

Interestingly, Ravi Varma's early paintings show that he was more interested in secular themes (here secular

Ravi Varma was not a painter who lived in the 'ideal' world of imaginations. He involved himself in the practical world. He was an enthusiastic entrepreneur. But at the same time he was a failed businessman.



means 'social and non-religious'. It does not connote the theoretical position of being 'anti-religious). He painted the portraits of courtiers and palace women. There is nothing wrong in assuming that to train his hands he might have painted/drawn a lot of secular scenes in Kilimanoor, Thiruvanathapuram and Mavelikkara. These secular paintings and drawings might have helped him to understand his own future works in Baroda and Bombay.

As history says, Ravi Varma was familiar with the style of Alagiri Naidu, who was an exponent in the South Indian tradition of painting and that of the visiting Dutchman Theodor Jensen, who had a first hand experience of the European tradition of oil painting. If one looks at the western art history, painting or sculpting mythological characters have ceased by 19th century. The neo-classical homo-centric academicism ruled the aesthetics of most of the traveling artists from the West. They were out there to make a living by showing their skill in creating figures in their Aristotle-an perfection or very similitude. Ravi Varma's adaptation to the medium of oil was not an isolated incident. He might have, in all the probabilities, graduated himself to the watered down academic naturalism as seen in the Dutch artist.

The receding space, the point of departure and the perspective are the major imports that Ravi Varma did to the linear and non-perspective art of India in general and Kerala in particular. In my opinion, Ravi Varma was unloading his historical baggage of traditional and indigenous painting style of Kerala by introducing the western perspective in his pictorial fields. As believed generally, Ravi Varma was not just re-creating theatricality of the Bombay mythological in his canvases. The western perspective and the theatricality came handy for him to express his innermost feelings as an artist.

Perhaps, even for Ravi Varma himself, the title 'Raja' and the hospitality extended to him by many 'Rajas' were debilitating factors. He had to resort to allegorical representations in order to reveal what was going on in his mind. Looking at the works of Ravi Varma in this light, one can see the problems of a man caught in an industrializing society. He painted scenes from mythologies and poetic plays. It helped him to talk about his own ambitions and insecurities. He could let loose the violence in him through the depiction of 'Jatayu Vadham'. He could narrate his own exile through the life of 'Harischandra'. He could talk about his love through 'Sakuntala Patralekhanam' and 'Sakuntala'. He expressed his passion for an ideal woman in the innumerable women's portraits. 'Here Comes Papa' could be a very poignant moment in a happy 'grihasta's' life, which Ravi Varma was not blessed with.

Ravi Varma was not a painter who lived in the 'ideal' world of imaginations. He involved himself in the practical world. He was an enthusiastic entrepreneur. But at the same time he was a failed businessman. He complained several times to the people of means and power that his works and oleographs were being faked and sold. It would be a fallacy if one believes that Ravi Varma painted 'away' from his life. Whatever he painted would have an intricate relationship with the psychology of a creative man who exiled himself from the protected atmosphere of his native land to the industrial hubs of the country. Using the methods of mechanical reproduction to multiply his works was his declaration of being a modern artist, which Walter Benjamin discovered much later in his long essay titled 'The Work of Art in the Age of Mechanical Reproduction.' The Malayali fails to recognize Ravi Varma as a modern artist with his own problems. They want Ravi Varma to be either a genius with no social connections or to be a non-detailed textbook. Unless and until the Malayali accepts the psychology and sociology of Ravi Varma, he will remain a child prodigy in textbooks.

■ The author is the editor of www.mattersofart.com

# Sreesanth sharpens his skills

Sreesanth ,Shanthakumaran Sreesanth also known as Gopu used to dream of being a pilot to fly in heights.And now God answered his prayers to bloom out in flying colours. When his dream changed from pilot to be a player like Sachin Thendulkar, his days of hardwork began. His hard work paid him well when he became the part of Indian Cricket Team. Sreesanth took four wickets in his debut test.

Sreesanth, 22, Right-arm fast-medium bowler and Right-hand batsman began to play cricket when he was 13 and his first idol was his brother Dipu Santhan who went on to play cricket at the university level. His first One Day International was during India's match against SriLanka held at Nagpur on Oct 25, 2005. Sreesanth got his first break when he was selected to attend the MRF Pace Foundation. Since then he has not looked back and has been a regular in the Kerala's Ranji squad. Sreesanth currently plays for Indian Airlines and is based in Delhi .

Life changed dramatically for Sreesanth from the time he got the wicket of Sachin Tendulkar during the last Challenger Series. It was unforgettable for him, especially because he have been a mad fan of Sachin . He used to paint MRF on his bat . He wanted to bat like Sachin. Now having watched Sachin from close quarters he want to emulate his patience and perseverance, says Sreesanth, who has gained by observing and learning from his seniors.


> Experts knew he had the potential but it needed the backing of Lillee for Indian cricket to discover the force that he has developed into.

Pacer Sreesanth was rewarded for the good performance in the Challenger Trophy with a place in the 15-member Indian team for the first two one-day internationals against Sri Lanka. His day begins at 5, even during off-season. Meditation for mental toughness and exercises to develop physical strength and endurance are part of his daily routine. Sree santh always reminds his mind what Greg Chappell told him, "a fast bowler with patience is dangerous."

Sreesanth's rise has been meteoric for those who are not aware of the youngster's hard work in the last three years. Experts knew he had the potential but it needed the backing of Lillee for Indian cricket to discover the force that he has developed into. A hamstring injury nearly ruined his career two years ago but he fought back, and with an effective out-swinger as his potent weapon gained respect on the domestic circuit.

Former Indianfast bowler T.A. Sekhar has played a big role in shaping Sreesanth's career. Sekhar is Well Known for his technical excellence in grooming fast bowlers. He firmly believes and thanks God for his success. As he always dreamt of playing for the country and he was lucky to have worn the Indian cap. He is proud to represent the country which remains the most priceless moment of his life. He reveals with his usual humble smile. And the cricket lovers in Kerala witnessed Sreesanth at Kochi playing in Indian colours against England. The first Keralite to have this honour. ■

# Euro fest

**V.C.Jose**

"Unlike the films elsewhere, European films have something pertinent to tantalize the viewers." This is what the acclaimed director Adoor Gopalakrishnan commented while inaugurating the 11th European Film Festival in Thiruvanan thapuram on the evening of April 4. He continued, "their approach to the medium is bold, artistic and exceptional." One is not surprised in his comment when happens to watch the movies screened in the festival.

Topsy-turvy

As of late Thiruvananthapuram and Kerala at large has become one of the important destination points of film festivals in India. Thanks goes to the credits of film lovers who still keep a serious eye on such films. Except one or two films, all the films exhibited as part of the week long festivals were severely risen to the expectation of the people. The upward rise of viewers participation alone is sufficient to substantiate the stand period.

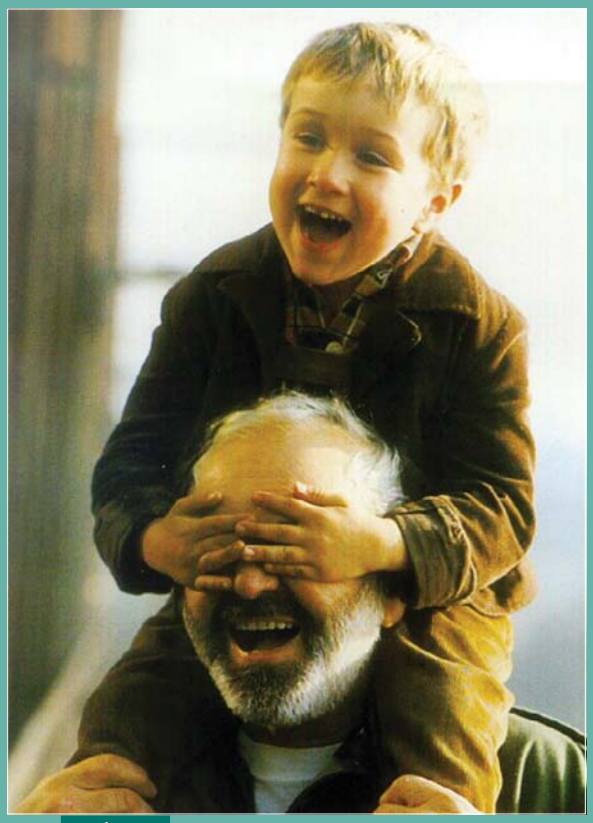
One of the dominant features of this year's festival was that either the films were newly released or directed by debutants, still something serious to expound. Also, it seemed as if the European Films were distanced itself from their antique cliché like communism, world wars and Jewish genocide. However, ethnic cleavages and the like have indeed a place in these films which are currently taking their life to commotion. To put it briefly, Festival films composed a bouquet of 17 films each one from a different member country that give vivid reflections of the cultural stream of Europe and stories that describe the European life in a certain socio-economic and cultural environment.

It is an undisputed fact that big players in this genre of films are Europe. This is not forgetting the works of Ray or

Cheese and Jam

The murmuring coast

Cistern



Kolya

Kurosowoa. When the curtain come down to the festival, among others, a viewer is studded to left with the images from pictures like *Kolya*, *Topyu-Tury* and *The Cistern*. It may not in any way be an exaggeration to step out with the conclusion that Kolya directed by Jan Sverak made the viewer spellbound for a moment amidst thundershower of claps. The film is all about the relationship between an aging bachelor musician and a small Russian boy. The story is set in the late 80's. The period just before the fall of communism in Czech. A friend comesup with a solution to the debttrapped musician. Jan Louka to marry a Russian woman for which he would get in return a handsome amount. Circumstances force him to agree with the proposal. Subsequently, his 'wife' immediately emigrates to Germany, leaving behind her five year old son Kolya. At the beginning, Jan considers the situation a nightmare but his feelings change when slowly a warm relationship develop between the man and the boy.

The murmuring coast

Any film festival, if it has to dwell in the mind of the viewer, has to acquaint some unique experience with our life. The Greek film, "The Cistern" in that respect has all the ingredients like a film which is only a hand away to our culture and language. The film has a lot of a resemblance with our film 'Venalkkanavukal' scripted by M.T. A group of eleven-year-old boys spend the last carefree summer of their childhood. They are not bothered about the world of grown-ups, with its loves, passions, prejudices and curses. School has closed for their summer holidays and the children spend their time playing games, running, errands and riding their bikes. It seems, life is a game in to which they channel all their physical energy and imagination.

Along with this, they enjoy their diving abilities in a cistern. Their summer vacation become as bizarre to them when one of the buddies drowns in the cistern. Love, jealousy and friendship all come to the limelight of their childhood life.

When it comes to the inaugural film the *Topsy-Turvy*, it portrays the intrinsic rivalry among artists. In this British Film, a writer and a music composer collaborates each other during the beginning of their profession. They part ways as one finds it very difficult to go ahead with the other. But fate brings them together against and expound something remarkable. This 160 minute long film was quite exciting and appreciative. The film *The Murmuring Coast*, from Portugal, as the name indicates, depicted the long lasting relationship between a man and a woman in spite of the turmoil of war that engulfs their life. In *Cheese and Jam*, director Branko Djuric explored dryness of life and its maladies. A Bosnian man who is unemployed and above all lazy is being deserted by his wife and promises to come back only if he is willing to change. In an effort to please his wife, he gets entangled in smuggling and it gets out of control of him.

The 'Hector' directed by Gracia Querejeta made an ardent dissection to surface the lost mothers affection with his son and one's relation to accommodate his long lost father.

The *Hector* directed by Gracia Querejeta made an ardent dissection to surface the lost mothers affection with his son and one's relation to accommodate his long lost father. Similarly, in *Squint your Eyes*, Andrej Jakimosulri unfolded the transient, toxic life of the city as against the country side life through a girl who abandons her parents and take refugee in her teacher's abode who tired of the civilized vagaries put up a life in the country side.

It must be said that the seventeen film shown as part of the Cultural Exchange Programme between the EU and India is a commendable exercise. Certainly, a film reflects the cultural ethos of a changing society. Along with this it helps to understand their changing perspectives of life. In that respect, the festival incrusted a mark of respect to the organizers for their committed selection of film and their painstaking journey to make it a success. ■

# Back to nature


Yellow wattled lapwingre

WHO SAYS the younger generation not bothered about nature, inhabitants, life? Here a group of youngsters in the midst of their heavy syllabus, find time for spending time with nature. A group of students in Thiruvananthapuram Engineering College find a new method of nature love. They used to take photographs of numerous birds that come to the campus. The members of the nature club of the college says that it was not an easy task. The students made the habit of morning walk, so that they could find the birds. They found out 55 varieties of birds. They include birds of our own country and foreigners. Nature love of this group was known to the outer world with the exhibition of the photographs in the college. The Engineering College also bagged Indira Priyadarsini Award for the book they published on 1816 – trees which belong to 85 categories. Campus nursery is another activity of the students in which they grow 1800 plants of 136 categories.

Students are now involved in the publication of a book which says about the detailed study of variety of birds.

## With the next bell...

IT IS FOR the first time a competition for the children's drama on state level held. The combined attempt of Kerala Sangeeta Nataka Academy, Bala Sahitya Institute and Moovattupusha Fair paved the students to display their talents before a wide audience. Till then the opportunities were limited to schools and youth festivals. Though the first venture, the interest of the participants and involved amateur clubs were appreciative.

First prize is bagged by 'Poovankozhi Mottayittu' by Aruma Children's Drama Club in Thiruvananthapuram. 'Chottupathram' by Neruvabhram UP School, Kannur won second. Prizes were also distributed for best director, best playwright and best actor/actress.

# Goodbye Power cut

Our environ is too hot these days. The summer is strengthening day-by-day defeating records of previous years. But little bit of relief exists. The water level of the reservoirs those produce electricity are in a satisfactory condition. While comparing with last year, our power consumption has definitely increased. But this year we should not have to grope in the summer.

The major reservoirs such as Idukki, Sabarigiri, Pallivasal, Idamalayar and Sholayar occupies a fair level of water and expected to produce 1311 billion units of electricity. The water to produce 358 billion units of electricity is now surplus than the last summer. An average of 41 billion units of electricity is needed for the whole state per day. Last year the consumption was 40 units per day.

Our in-house water reservoirs produce only 25 billion units of electricity daily. The rest is to find out from the Central pool and thermal power plants. The main reservoir Idukki now contains the highest level of water worth to produce 664 billion units of power.

Yet more than a month we have to wait for monsoon. So this should surely be a happy news to Kerala.

Deepak

**Life & Line** — **P.V. Krishnan**

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