

## The aftermath of Cyclone Thane

**A**round Christmas Day, a low pressure area formed out in the Bay of Bengal. As it moved slowly westwards towards the Indian coast, it intensified into a deep depression and finally, on 28th December, into a very severe cyclonic storm, nicknamed 'Thane'. Satellite images that day suggested it was moving directly towards Pondicherry but most Aurovilians were not unduly worried: we are used to such storms veering north as they approach the coast and it's almost 40 years since we last experienced a direct hit. At worst, we thought, we'd catch the tail of it and get a bit of wind and rain.

But on the night of 29th December, as the wind rose higher and higher, we realized that this time it wasn't going to pass us by. In the early hours of Friday morning, as the centre of the cyclone crossed the coast barely 25 kilometres away, Aurovilians were huddled in their houses under blankets or around candles (there was no mains power), listening to trees flailing wildly and crashing down in the darkness outside.

Morning brought a scene of devastation. Many trees lay uprooted, some lying on buildings, while many of those still standing were leaning erratically or had had their tops ripped off by the force of the storm. Branches, electricity wires and poles lay everywhere, tangled together in a crazy spaghetti.

Aurovilians stepped out gingerly into an unknown land. All the familiar paths had disappeared, all sense of orientation was lost. By late afternoon the sun, as if in apology, emerged in a cloudless sky, and it was suddenly very, very quiet: no sound of birds, people, vehicles, of the general business of the everyday world.

### The response

But there was urgent work to be done. The roads had to be cleared, the ways unblocked; some people were trapped in their houses. Also, as there was no mains power, many people would soon run short of water. So Auroville did what it does so well: it swung into action. An Auroville Cyclone Response Team was created with members drawn from various work groups, and teams formed to clear the roads (the main roads were open within seven hours), to work on restoring power and provide emergency water back-up. A cyclone help desk was set up in the Town Hall to receive requests for help and coordinate responses while the Housing Service set up its own help desk to assess the damage to buildings and provide emergency help. And many of our workers, in spite of the fact that their own houses were damaged and cashew plantations destroyed, struggled miles through the mayhem to assist us in the relief operations.

It took some time to assess the magnitude of the disaster. Miraculously, nobody was hurt, although there were some close calls, but the forests and farms had suffered tremendously – a considerable number of canopy trees had fallen and many farms had lost almost all their crops, fruit trees and farm machinery. In addition, the energy infrastructure of the community had collapsed, almost every windmill was destroyed and over 200 houses, workshops and public buildings had been damaged.

Yet, while the devastation was considerable, not everywhere suffered equally. In one greenbelt community, one windmill was completely destroyed but another, barely 100 metres away, survived unscathed. The Matrimandir itself was untouched, and its outer gardens experienced only minimal damage, although a large branch was ripped off the Banyan and subsequent cleaning has left a considerable gap in its crown.

### The losses

Nevertheless, it soon became obvious that a considerable sum – the present estimate is 5 crore rupees or about one million dollars – would be needed to cover the immediate cost of repairs and



The twisted remains of a windmill bear witness to the force of the cyclone

short term relief (around 60 lakh rupees had already been spent by the end of January) while the longer term replacement of infrastructure and rehabilitation of the forests and farms is liable to take far longer and cost far more: the first estimate is 13 crore rupees (see box). Auroville sent out appeals for help worldwide and there was an immediate response (57 lakhs were received in the first three weeks) as well as messages of sympathy and support from friends, including from the Chairman of the Foundation, Dr. Karan Singh (who wrote to the Prime Minister, requesting 5 crore rupees assistance for Auroville), and from members of the International Advisory Council.

By the end of the first week, access to all communities and collective spaces had been restored and tree clearing in other areas was in full swing. There had been a run on chainsaws in Pondicherry – one shop imported saws in such a rush that all the instruction manuals were in Polish – and chainsaw-fever swept the topos. For the inexperienced, and that were many, a 'chainsaw-for-dummies' workshop was organised.

Restoring electrical connections would take longer, however, as many lines and approximately 150 electricity poles were down. The poles had to be replaced and re-erected and clearings had to be created through the forests before the lines could be functional again. It would take three weeks of heroic efforts on the part of the Electrical Service and its many helpers (Suzlon Energy and Gammon India

lent cranes, JCBs and lorries free of charge, while the Tamil Nadu Electricity Board seconded teams from elsewhere) to restore mains power and, therefore, water security, to the majority of the communities and the surrounding villages.

### What can we learn?

As the immediate relief phase ended, thoughts turned to longer-term planning and what we could learn from this experience. On the most practical level, many of those lessons are obvious: don't plant large trees by houses; plant indigenous trees rather than exotics; put electrical lines underground wherever possible; have adequate alternative back-up power for crucial collective facilities; design buildings in such a way as to withstand cyclone conditions.

On the human level, the cyclone confirmed that people respond to disasters in very different ways. Some people rapidly recalibrated their lives, learning to live without fridges, TVs and permanent internet connectivity, or resting content with clearing and restoring to order a few metres of devastated land a day. Others threw themselves completely into the work, working

late into the night to deliver water to those whose tanks had run dry or chainsawing their way through forests of fallen trees. In their eyes was a light, even a kind of joy, as if they had rediscovered an Auroville and an aspect of themselves and each other which had long been forgotten.

In fact, there was an enormous explosion of collective energy as Aurovilians once again experienced the joys and intuitive skills involved in working together. As one Aurovillian put it, "Even though it was a calamity we are very happy to be here because the spirit of Auroville became alive during this emergency; everybody was helping everybody." Yet another noted, "Thane blasted something through. We were collectively blocked and people are now feeling changes, both individually and collectively." Others took it as a sign that now is the time to put all our collective energy into building the city.

Some Aurovilians, however, seemed more impacted by the psychological shock of losing their usual bearings. In the first few days after the cyclone there was a kind of mild hysteria, fuelled not only by the devastation but also by the intense sun and the presence of so many bewildered guests and visitors, that led to febrile exchanges of cyclone stories, to rumours of a second cyclone on the way and to wildly exaggerated accounts of the extent of the destruction.

### The significance

Inevitably, there was also speculation about the possible occult significance of Auroville being 'targeted' by the cyclone. Within days, an Aurovillian posted on AuroNet a message given by The Mother after the last cyclone struck Auroville in December, 1972. "It is a warning that nature is giving, that those who do not have the true spirit of Auroville will have to change or to go if they do not want to change." Some days later there was another posting quoting Mother on the cyclone which struck Pondicherry in October, 1963. She described it as consisting of formations of "vital ill will", went on to describe "An adverse organization in the most material vital to mislead unenlightened spiritual aspirations" and concluded, "They are quite unhappy at what's going on here!"

What are we to make of these indications? Without a deeper knowledge, it's probably wisest to adopt Wittgenstein's advice: "Whereof one cannot speak, thereof one must be silent." Finally, it may be safest to draw our lessons from nature itself. Within hours, it seemed, the birds and butterflies had returned, new growth was shooting from even fallen trees and the smaller, undamaged, mainly indigenous, trees were straining upwards, luxuriating in new space and unfamiliar sunlight. As one forester put it, "Nature has done its job and it will build back better". Doubtless it will take many, many years for the forests to recover, and some foresters and farmers, in particular, face a bleak financial future. Yet the real lesson, perhaps, lies in imitating the example of those trees which best withstood the onslaught: plunge your roots deep but be flexible, light. And never cease reaching for the sun.

Alan

### Cyclone Thane: Budget for Emergency and Relief

	Rs lakhs
Clearing of Roads and Electrical Lines	63
Electrical Restoration	12
Emergency Water Supply	8
Communities, Schools, Public Spaces	51
Security (services and fencing)	69
Housing (emergency support and repairs)	153
Farms	60
Forest - Windmill Repairs	20
Repairs - Equipments, Street Lights, etc.	13
New Equipments (tractors, wood processing m/c, shredders)	57
<b>Subtotal Emergency and Relief</b>	<b>506</b>
<b>Rehabilitation - over next 5-7 years</b>	
Electrical Infrastructure	445
Ecological Restoration	672
General Infrastructure	200
<b>Subtotal for Rehabilitation</b>	<b>1317</b>
<b>Total</b>	<b>1823</b>

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29 Feb

# Re-electrifying Auroville

In a dim office of the Auroville Electrical Service (AVES) a group of employees in gray uniforms with AVES monogrammed on their shirt pockets is gathered, along with volunteers, around Ponnusamy, the executive, and Prakash, his assistant, awaiting and receiving orders for this the eighth day after cyclone Thane.

Outside, a big blue generator sits on a trailer while a worker shaves its starter wire with a katty (knife). As he inserts it into the outlet, the generator chugs sluggishly then soon rumbles away. A light goes on in the storeroom. Their assignments known, workers set about coiling climbing rope and storing it, along with bolts, brackets and pulleys in vehicles and on motorcycles. A scooter with a 12-pack of large Coke bottles pulls in; there will be food cooked for the workers and delivered.

As the workers pull out, Ponnusamy goes to his office, his cell phone ringing constantly. Tree cutting crews directed by Eric and Muniandi call in for instructions. He takes calls from Aurovilians concerned about the progress.

We go to survey the work. Today the crews are out in the Kottakarai area. An AVES team pulls a pole upright using rope. Down the road, a worker has shimmied up a pole, tied a cross stick to it, and is perched there fiddling with the wires. Re-electrifying Auroville pole-by-pole is going to take awhile.

Ponnusamy tells me that after cyclone Thane had abated he and his son Anand spent three hours hacking their way out of their house in Grace and walking to the Abri office where, happily, damage was minimal. It was then, after the initial shock had worn off, that he realized the magnitude of the problem: for 40 kilometers from Cuddalore up the coast and inland to Villupuram, there was no electricity and thousands of electric poles were lying on the ground, many broken and buried under massive trees, their lines snaking through the newly created underbrush. The Tamil Nadu Electricity Board would take a

very long time to restore their overhead line infrastructure without support. Neither TNEB nor Auroville had heavy equipment to clear trees or plant poles except rope to pull them off the ground. With manpower alone, it would take them at least two months to restore power. Never had they faced such a challenge in all of his 21 years as the executive.

He spent a sleepless night. The next day, Saturday, to his surprise every one of his employees showed up for work. In teams of two, they checked and catalogued all of the poles not completely buried under trees for damage. 62 HT (high tension) poles and 96 LT (low tension) poles would need to be replaced. In addition, the trees along the HT lines would have to be cut or trimmed away for six meters on either side and three meters for the low tension lines to prevent them from falling on the lines again.

Meanwhile a 15 member Auroville Cyclone Response Team (ACRT) had been formed with team members taking responsibilities for various work areas such as water, tree clearing, energy, liaison, help desk, finance etc. This team made a quick assessment of financial and other resources needed.

A request was made to TNEB for them to start sending materials with an offer that Auroville would support them in the restoration works. Poles and line materials started coming in from TNEB and essential tools, gloves, rope pulleys, chainsaws were procured.

Teams of Aurovillian volunteers like Alok, Vici, Muniandi, Eric and Sukrit began clearing the area beneath the lines.

Poles began to trickle in. Huge machines rumbled along the Auroville roads. Toine was able to obtain the loan of a crane from Suzlon Energy, and two JCB's, with lorries, from Gammon India. These vehicles, especially the crane and its admirable driver, Shajahan, would make a huge difference in the work. The guest workers had to be housed and fed, then transported to the work sites. Ponnusamy was now overseeing an organizational effort much larger than he had ever experienced. He was getting 150 calls a day from Aurovilians, workers, TNEB officials, and villagers. The contacts he had made and the confidence he inspired during his long tenure on the job began paying off.

First, the Matrimandir and Bharat Nivas transformers were electrified 8 days after the disaster. Then work began toward Discipline and Aurogreen. He worked to help Kuilapalayam get power from the Kottakuppam feeder along the beach road.

The work strategy agreed with TNEB was: maximum impact with minimum resources. This meant that after the HT line was re-energised, first the low tension lines with the minimum number of poles and the maximum number of connections would be re-installed and connected. In many cases, a new pole would be erected next to the pole that had broken or fallen with a temporary insu-

lated cable connecting the top of the new pole with the top of the old pole. A message went out on Auronet: Switches and meters on old fallen or broken poles may still be in use. Stay away from them. These installations will be revisited to make the connections permanent.

The TNEB had poured so many men into the cyclone area in response to the situation in Cuddalore that at one point they had three teams to spare for Auroville. More transport requirements; more meals to cook (by this time 60), but the work picked up. Then

one day the TNEB pulled two of the teams away, but after frantic telephone calls new teams were bought in.

After 25 days of 10 hour days the AVES workers were exhausted, but 90% of Aurovilians and surrounding villages had power and Ponnusamy began to see the end of the first stage of restoration. There would be many more months ahead to convert the preliminary connections into something more permanent and to replace or repair the Auroville-owned outdoor service connection equipment.

As he looks back at the frenetic last month, he notes that there were communication difficulties within Auroville in the beginning. However, Toine began putting comprehensive updates on Auronet every day after the review and planning sessions that he and Ponnusamy held each evening and in fact throughout the day while in the field or at the Abri office.

As for the future, he notes that plans are already drawn up for putting electrical cables underground in Auroville in a phased manner for which funds are awaited.

Through his leadership, a proactive support group, the hard work of his team and the efforts of TNEB, electricity had been mostly restored to Auroville in less than half the time he thought it would take in those first days after the cyclone.

*Gordon Korstange*

## "A poor energy infrastructure"

Rishi of Sunlit Future, along with Auroville Energy Products and the Auroville Solar Service, provided solar panels and solar back-up systems to Aurovilians who were without power after the cyclone. Here he talks about the experience.

"The moment I saw the amount of damage I estimated the electricity would not be back for at least two weeks so I tried to figure out how to help people who were without current. As most people have an uninterrupted power supply system consisting of a battery and inverter, my idea was to lend them solar panels so that they could charge them. This would give them light for a few hours. I managed to collect about 100 panels which were not being used from the roof of our office, from the Visitor's Centre and from Matrimandir - everybody immediately said, 'Take them' - and within one week we had fitted them on 15 houses. We also installed an inverter and battery at Ilaigarkal School which already had many panels, so people could go there and charge their batteries or laptops. We also purchased small solar lighting systems consisting of a small solar panel, a battery and two LED lights. Thirty-two of these systems were sold and the rest we lent out to people in need.

"Immediately after the cyclone it was like a madhouse. Some people were panicking, they were willing to pay any price for a solar system which would give them current again, but I didn't want to start selling systems just like that because every system has to be sized to the lifestyle and specific requirements of the individual household, and this takes time to assess. Even a simple system with just two panels, a battery and a charge controller is going to cost about Rs.50,000 and when the main supply comes back this may become redundant. So I told these people to borrow some

panels and if they still wanted a solar set up after the electricity is back, I would design them a properly calculated system.

"The main lesson to be learned from this experience is we have a very poor energy infrastructure in Auroville. We have far too many overhead lines and there is no logic to the way in which the power is distributed. We should have our own internal grid over which we have complete control and into which we can feed power and take power from outside. The first step is to get the right people to design the grid for us, then we need to persuade the government to sponsor the project. It won't be cheap, it won't be easy, but we can't go on with a system where one small tree falling on a line can shut off power for 12 hours - to say nothing about the effects of a cyclone.

"In contrast to the destruction of the electricity poles and lines, most of the solar panels and systems in Auroville were undamaged. Of the 10,000 or so panels in Auroville less than 50 have been destroyed along with a few solar street lights. So most people who contacted me said they will invest in solar now.

"It would certainly make sense to use solar energy for collective water systems. Take the Arati overhead tank, for example, which supplies many communities. After the cyclone, they had to run a generator for 20 days to keep pumping the water but if they had had solar pumps, the running costs would have been much lower and the investment would have repaid itself in a year or two."

*Alan*



From top: clearing the sites; loading the poles and bringing them by truck to erect the poles; clearing a path for electricity lines

# "A new factor which we can't ignore"

**J**oseba and Dhalia work for the Housing Service. They dealt with many requests for help in the aftermath of the cyclone.

*What was your experience in the few days immediately after the cyclone?*

**Joseba:** I managed to get to the Town Hall the day after the cyclone, and then a lot of people who had worked with us in housing came offering their services. This helped us a lot because we had plenty of work! Our first task was to set up a cyclone help desk for all those whose houses had been damaged in the storm. A lot of people came with requests for help.

*In what state were they?*

**Dhalia:** A few people were suffering trauma, but generally people were very grateful that we were providing this service and they were very calm: it was a very good experience to see Aurovilians behaving like this.

**Joseba:** Until now, we have received more than 200 requests and more than one crore and a half rupees have been requested. When we receive a request we send people to check the estimate given by the applicant as some people have no idea how to assess the cost of the damage. Till today we have processed many of the requests, and have disbursed more than 18 lakh rupees for the most urgent cases.

*What kind of damage was suffered?*

**Dhalia:** Some buildings made out of keet or other temporary materials have been totally destroyed but the most common problem was damage to roofs. Many people lost tiles and some people with keet or light sheeting roofs had the whole roof blown away.

**Joseba:** It was decided we should divide our help into three categories. Firstly, there are the most urgent cases whose roofs and buildings have been

destroyed or badly damaged. The second category will cover repairing the totality of the damage; the third will include replacing some temporary houses for something more permanent, as well as relocations. Regarding relocations, we have received about 12 requests from people who want to live somewhere else in Auroville. These are mainly people from the beach communities who experienced a tsunami seven years ago and now a cyclone and have decided that they've had enough!

*You are requesting 135 lakh rupees for the next three months. That seems a lot. What do you need it for?*

**Joseba:** Repairs are expensive – we have given two lakh rupees just to replace the glass in Luminosity. Of course, we have no idea if we will receive 135 lakhs, but this will enable us to carry out all the repairs necessary. However, if we carried out a full programme, including relocations, we could be talking about two crore rupees and a programme which may last five years.

*Are you replacing damaged keet roofs with the same material?*

**Joseba:** In many cases we are replacing the old keet roof with a new keet structure. But for the next phase we need to think about replacing temporary roof structures with something more permanent.

*So what are the lessons that can be gleaned from this experience?*

**Joseba:** We have a new factor to consider in Auroville when it comes to construction and that is climate change: the extreme climatic events which are happening all over the world are clearly happening here, too. So the first idea which comes out of this is that we should not any longer build light structures using materials like keet. We will have to revise our construction parameters to take account of extreme conditions and to ensure that our buildings are constructed more solidly. This is a chal-

lenge for our architects as they will have to combine two aspects: the sense of lightness and big vistas which Aurovilians enjoy in their homes and the aspect of a bunker.

Of course, when we talk about planning for extreme weather conditions, we are not only talking about individual houses. We are also talking about city planning, infrastructure, landscaping and afforestation practices. We have to rethink everything.

*Would that include rethinking building large, tall structures like the projected Lines of Force? Some of them are planned to have 8–10 floors.*

**Dhalia:** I think if they are built securely and using quality materials, they would stand well in a cyclone.

**Joseba:** Frankly, I don't know what would have been the effect of this cyclone on the 10th floor of a Line of Force. But clearly we would have to ensure that they would be built of the required strength.

In terms of housing we are already engaged in some experiments which are promising. We constructed an overarching steel roof in Maitreya which didn't move one millimetre in the cyclone. We also started more than one year ago to replace the keet roofs in Aspiration with something more permanent. Two prototypes are now being finished.

**Dhalia:** Clearly, many of our houses were not made to withstand this kind of wind. So we need to come up with prototypes, buildings using the best solar and green building methods which will withstand such conditions – we need at least one pukka, anti-cyclone building as a model.

**Joseba:** The problem, as always, is money. In Auroville we often go for the cheapest solutions, but building to withstand extreme conditions yet retaining an aesthetic of lightness will not be cheap. We will need thicker glass, reinforced louvers etc.

**Dhalia:** The cyclone caused a lot of destruction, yet in some ways it was also good because it gives us the opportunity to learn so much.

*From an interview by Alan*

## "It's a learning opportunity"

**G**lenn looks after a large area of the Auroville forest and Paul coordinates activities in the Botanical Gardens.

*Auroville Today: What was your personal experience of the cyclone and the aftermath?*

**Glenn:** I was awake all that night because of the intense sound, but I only heard one or two trees snap so I thought we had got off lightly. So when I opened my window the next morning at sunrise I went into shock because I couldn't believe the devastation I was seeing. At first, I had this overwhelming feeling of loss but within two hours of getting my chainsaw out and working with other Aurovilians on clearing the roads the whole thing changed. I felt, this means I'm going to be busy for a long time with something that I hadn't planned to do but that's how it is, life goes on. Since then I've been quite positive, though it's tough waking up in the morning realizing you have to hang on to a chainsaw for the next four or five hours. But when you manage to open up another path or clear an area of fallen trees, there's a sense of achievement because the area begins to look beautiful again.

*How many trees have been lost?*

**Glenn:** It's very difficult to assess this. Clearly, the effect of the wind varied from area to area. Many trees went down in a corridor from Dana to Fertile Windmill, and in the small forest to the side of Arka almost everything went down. In certain parts of the forest I manage I've lost 20%, in other areas 60% to 70% of the pioneer canopy, Work trees (*Acacia auriculiformis*), *Khaya senegalensis*, *Cassia siamea*, *Eucalyptus* etc. In actual trees lost this will be a lot lower as there is an understory of

TDEF plants of differing ages just waiting to be freed of fallen trees.

This means we lost a large portion of the income generating part of the Auroville forests: what I would have used to run my scene for the next 10 years is lying on the ground. Moreover, the income we will get from the fallen trees is likely to be much less than some people predict because there is a lot of sapwood, badly cracked logs and the internal stresses the trees were subjected to as the wind veered round may have twisted them inside.

**Paul:** In the Botanical Gardens we have one area, 10 acres, of Tropical Dry Evergreen Forest (TDEF) forest, and there nothing went down. Of course, the trees there are only 12 years old and not tall but if you walk through, it doesn't look as if anything has happened. In the Arboretum, while about 80% of the Work trees went down, only about 30% of the specimen trees were damaged, some by falling Work trees.

However, the Botanical Gardens are not really a forest. Basically, in Auroville you have different types of forest. For example, there are Work tree forests and there are mixed forests, like Work trees with TDEF species underneath. So the damage varies depending upon the type of forest. In the Work tree forests, probably 80% of the trees are down. In a mixed forest where half the trees are Work trees, you find that 40%–50% of the Work trees have gone over. As for the rest, 50% of the *Eucalyptus* have gone down, 50% of the *Cassia siamea*, a lot of big teak trees and some bamboos and big *Khayas*. These are non-indigenous species. The TDEF species have done well.

*What lessons do you draw from the effects of the cyclone?*

**Paul:** We should have been managing the forests more intensively and

reducing the percentage of Work trees in the canopy much sooner because, while Work trees are great trees and a valuable resource to maintain the forests, this would have allowed other species to establish themselves. Also, certain trees didn't get damaged, trees like *Pterocarpus santalinus*, *Terminalia arjuna* and the *Palmyra*, so we should be planting more of these.

For the next year or two we've got a lot of work in the forests, and this might be a chance for more young people to get involved. Many of them would love to become forest stewards and they definitely have the energy and expertise. So perhaps this is a chance for them to get that opportunity.

Another interesting topic is what we are going to do with the wood. It's an amazing opportunity, there's so much wonderful wood out there that we could change the way we build houses; we could get rid of aluminium window frames and make beautiful wood floors.

As for the Botanical Gardens, this is a great educational opportunity because we can show the kids very concretely the results of climate change. For me, there was also a personal learning. When I make presentations to the kids they often ask why the Work trees are much taller and grow faster than the TDEF species. I explain it's because they are not dealing with the multitudes of pests and pathogens that the local species have co-evolved with over the aeons. I always predicted, however, that one day a pest would sweep through the Work trees and wipe them out. In fact, when I came to Auroville and saw the forests were dominated by the Work tree and other exotics but had no understory, I felt a disaster was waiting to happen, for if the pest attack came there would be nothing to replace the dead trees. That's one of the reasons a group of us pushed for under-

planting the forests with the TDEF.

I never imagined, however, that the natural disaster that would cull the Work trees for the first time would be a cyclone rather than a biotic agent. Also, we had often speculated that the reason the TDEF was a short forest was due to the cyclonic storms but now it has been presented to me very graphically.

But we should keep things in perspective. Yes, the impact of the cyclone is enormous, but the forests are still there and in my opinion all the better for the reduction in the numbers of Work trees in the canopy.

**Glenn:** Clearly the TDEF plantations came through fine because this whole vegetation has evolved to cope with conditions like these. We've been planting more and more TDEF in our forests for many years, but we haven't been seeing this happen in gardens and landscaping in the city area. So maybe now is the time to go for TDEF everywhere. It's a different aesthetic – we won't have very tall trees and we will be working more with form and texture than with flowers – but it is far more appropriate for this climate and, as the cyclone has shown, more sustainable.

Again, we're always pushed to make the forest more economically sustainable, so now we have to identify the species which have survived which will give us economic returns, then plant them in certain areas, like those reserved for future construction in the city. I'm going to check out the hybrid Work trees because they give a quick growth and a quick return, and maybe there are one or two indigenous species we could plant, like *Pterocarpus santalinus* which withstood this cyclone very well, which are pioneer species and have value.

All in all, there's lots of things we can learn from the cyclone: we should take it as a learning opportunity.

*Alan*



ctor into Auroville; a crane and bulldozer help hrough the Auroville forests.

# "We've been given a push to open up new possibilities"

**C**hali and Hemant were two of the coordinators of the Cyclone Response Team which formed to organize relief efforts.

*Auroville Today: It seems that many people responded in an extraordinary way to the devastation wrought by the cyclone. Do you have any stories to illustrate this?*

**Hemant:** One Aurovillian was in the final days of her pregnancy but in the aftermath of the cyclone she had no water and Hilde, the midwife, couldn't even get out of her house to be with her. When word went round, somebody left the team clearing the roads and cut a small path for Hilde to get out and the Water Service dropped whatever they were doing and rushed a generator over to the expectant mother's house so she could get water again. Another Aurovillian needs oxygen regularly but without power she could not operate the cylinder, so another team took a solar panel from the Visitors Centre and rushed it over to her.

Another extraordinary moment for me involved the damaged Service tree in the Ashram. I walked in one morning and I saw, high up in the tree, young Aurovillians working quietly away - actually, the entire Tree Care team - under the direction of Narad. A lady asked me who the young men were and when I told her, she said that Mother would have been very happy to see the great care with which they were looking after Her tree. For me it was very symbolic. The youth of Auroville have not always had the best press but here I saw them just cutting through all of that. It was also a wonderful

expression of unity: of Auroville and the Ashram working together.

**Chali:** One personal story that comes to mind is that I had three trees on my house, and they needed to be cut away carefully, but I didn't put myself on the official list because I knew there were so many other urgent things to be done. Then I ran into Philipp (Newlands), a young Aurovillian, who had his leg bandaged after having cut it open with a chainsaw. He was already working hard on emergency relief, but when he heard about my trees he spontaneously offered to come and help. He took care of what was most urgent and later another Auroville cutting team came to do the rest. It's a relief to find that after all the daily petty nonsense we get caught up with, in the crisis people come together and really do what has to be done.

**Hemant:** A few days back an Aurovillian came and brought \$30,000. She said I just inherited this, I hadn't expected to inherit it and I have no need for it, so here it is for cyclone relief.

*What are the lessons we can draw from the cyclone experience?*

**Chali:** One of the things that would have been helpful, and could still be useful in the future, would be to have a contact person in each area of Auroville whom people in that area could get in touch with in case of an emergency, someone who could do an assessment of the need and provide some leadership on the ground. If that person then had five or six other key people in the rest of Auroville whom he or she could contact, the overall response would immediately be more coordinated.

As the solar installations came through well, I've also heard a lot of people saying that they are going to use solar now, at least as a back-up for their conventional grid-based energy system. At Future School we are seriously considering this.

**Hemant:** A number of ideas have come up. One is that we should build structures which can be used as indoor stadiums or meeting places but which can also be used as safe shelters for extreme events like the cyclone. One of the biggest activities in the next one and a half years will be dealing with the huge quantity of wood that has suddenly become available; a lot of people are thinking about innovative ways of using it. It would be good if we can use it in our buildings and furniture and in other cottage industry products. We can also see if we can get energy out of it by using it as biomass in generators etc.

*One concern is that once everything becomes calmer we will go back to business as usual.*

**Hemant:** It's a danger. When Dr. Karan Singh came he said that as a spiritual community we need to reflect about the deeper significance of what has happened, and it's important that we make this collective reflection soon. We need to ask ourselves what kind of future we want. It's an important moment because the greenbelters are rethinking what they've been doing, the architects are going back to their drawing tables, and we are seeing once again how fragile our economic situation is. Somehow, everybody has been humbled by the experience so, hopefully, it will cause us to drop our dogmas - like the city religion or the green religion - and seek more integral solutions.

**Chali:** More and more what comes to my mind is the need for everything and every person to find their right place. For example, keet has its merits as a roofing material, but are we using it in a way that makes sense? The same thing with people: we all have our strengths and weaknesses but often what happens is the 'negative' comes out more strongly because people are not in their right place. As many of our fences and trees have been broken down, Auroville looks much more open now. We can see places that we couldn't see before and I think this is also symbolic. We need to be more open with each other, to concentrate upon the positive aspects of each other. Of course, I very much include myself in that need to change!

**Hemant:** You realize through the way Aurovillians responded to the cyclone that we really are a family because only brothers and sisters respond like this, it is not a system or institution which is responding. There is an invisible thread which is connecting us.

**Chali:** I think there was a kind of grace at work because in spite of the huge number of trees that went down, nobody was injured and the damage to buildings was, proportionately, very minimal. So I feel in a way that somebody up there really felt that we needed a good shake to wake us up, but didn't really want to hurt us!

We've been given a push that can open up a lot of new possibilities, but whether the push will be enough for us to actually materialize them depends on us not going back to business as usual. One very interesting exercise would be to have a general meeting soon where people can share their ideas and the lessons they have learned.

*From an interview with Alan*

## The cyclone in the villages

The effects of the cyclone on the villages have ranged from loss of houses and crops, to fear of further calamities.

**T**he cyclone caused widespread devastation in the villages surrounding Auroville and stunned many villagers with its ferocity. The effects ranged from destroyed houses and crops, loss of power and water, and fear of further calamities, such as an earthquake or tsunami. Fallen trees have particularly caused much havoc, says Anbu from Auroville Village Action Group (AVAG), who estimates that the villages lost 80 per cent of their trees. "Trees fell on houses, water tanks and power lines," she says. "People are suffering a lot from lack of water and electricity. In Morattandi, one tree fell and destroyed five houses. The people have been accommodated in community centres or relatives' homes since then."

Villagers were not prepared for the cyclone's powerful force. Srini Yatra, a filmmaker in Kulapalyam village, describes it as "a fearful experience of nature". In the early hours of the morning, he attempted to go across his garden to his office, to move his computers away from an open window. "The wind was so strong, I couldn't get across the garden, and I had to give up," he says. "I saw a large plastic water tank go flying off my roof. It spun around many times in the air and was carried off to about 200 metres away."

In Edaiyanchavadi village, more than 100 homes were damaged, and the majority of electrical posts fell down. Village resident Shiva was at home with his mother during the night, and concedes they were both scared. "We never heard such a sound," he says. "There were big cracking sounds of trees falling, and a huge wind sound - the sound of tragedy. We went outside at 2 am when it was very bad, and saw many fallen trees. We were still scared, so we went back inside and stayed there till 10 am."

Even more devastating than the damage to houses, many villagers lost precious agricultural crops. "Cashew

crops take five years to mature before they are ready for harvest," says Moris, from AVAG. "For many of the villagers, the crop was in the fourth year, so the loss was devastating. The Government is giving some support but it won't help to address the whole situation."

Moris concedes the Tamil Nadu government compensation for damaged houses is "nothing" - at Rs 2,500 per partially damaged house, and Rs 5,000 for a fully-damaged one. (The Pondicherry government compensation may be more generous.) Not only is compensation insufficient for re-

ed. "Women are suffering most," says Anbu. "Our women's clubs are approaching us for help, in relation to widows and single women who have lost their houses. We're hopeful of getting funds from other organisations to help them. Dalit houses are more affected because of their housing conditions. Their roofs are usually made of keet and are not stable."



building, it is fraught with complications. "One government official came to a village to take stock of the situation," says Anbu, "and he was forced by the people and the leaders to give inflated figures to the government. Although many families were not affected, 90 families put their names down, and they decided to divide the funds between the entire 300 families in the village. This kind of cheaty-business happens. In some villages, genuine cases were not written down by government officers."

As is often the case in disaster zones, the more vulnerable groups, such as women and dalits, are the most affect-

In many villages, power was not restored until 20 days after the cyclone. The government had to bring in additional electricity workers from other districts to address the need, and this took time. Frustrated by the slow government response, a number of local village women went out to protest. "Without power for a pump, people cannot get water," says Moris. "The women blocked the road to make their point. Some villages are getting water delivered by government water tankers, but that's only a short-term solution." This experience has motivated villagers to consider alternative energy sources,



Two destroyed houses in one of the surrounding villages

such as solar lighting and hand pumps - most of which do not work in the villages since generator-powered pumps for overhead water tanks became the norm. Some villagers have also become galvanised in the face of inadequate government action, and have organised teams to clean the streets and restore infrastructure and community buildings.

In the coastal villages, the fishermen experienced widespread loss of boats and nets, and the government plans to compensate them. Moris points out that government officials are wary of the claims of the fishermen communities. "After the tsunami, the government realized that the fishermen over-claimed for the number of boats they had lost. Since then, the fishermen have had to register their boats. However, each time the government officials visit the coastal villages, they get different figures on the number of boats that are there. Because the officials are now suspicious, the fishermen will find it difficult to over-claim the number of boats they lost in the cyclone."

Anbu also cites a "panic situation" after the cyclone, with many rumours flying about another cyclone, tsunami or earthquake. "The earthquake rumour was particularly widespread through the entire north coastal area of Tamil Nadu, including Pondicherry," she says. "On the 1st January, everyone in Pondicherry was woken up at 3am and

told there would be an earthquake. We all came out and stood on the streets. I phoned my mother in another part of Tamil Nadu and asked her to watch the TV and tell me if it was true. When she said that nothing was happening, I told people they should go back to bed. There was a small earthquake in Indonesia, and that is perhaps what had fuelled the rumour."

Another rumour concerned forecasts about the end of the world. A story had appeared on Tamil TV and in the local press, depicting a South American tribal community which predicted the world would end soon. "People from our women's groups told me they couldn't commit to meetings the following week, as they weren't sure if they would be alive then," says Anbu. "Eventually, we sent out a circular to the villages reassuring them that nothing would happen. We asked them not to spread rumours, and to think positively."

The social workers at AVAG are trying to assist with the psychosocial aspects of post-cyclone recovery. "We have trained staff in healing and somatic awareness," says Anbu. "When they go for meetings in the village, they hold meditations with people, and help them with techniques to get grounded. We think it has helped with recovery. The tsunami only affected coastal communities, but the cyclone has had a wider effect."

*Lesley*

# Selecting a new Auroville Council and Working Committee

Selecting members for working groups in Auroville is a notoriously difficult affair. This is particularly so for the Auroville Council and the Working Committee, whose members are selected by a Selection Committee. In 2007 and 2009, the then Selection Committees did a reasonably good job [see *AVToday* # 219, May 2007 and # 246, August 2009], though it also left people discontented. But the selection of 2011 led to bitter dissatisfaction within the community.

The dissatisfaction had already started long before the Selection Committee got formed. The term of office of the 2009 Working Committee and Auroville Council was due to end on June 22nd, 2011 – an inconvenient time as many Aurovilians are on holiday that month. Consequently, there were calls for the Council and Working Committee to stay on for six more months while the selection process was restudied.

The Auroville Council asked the community to vote on this

suggestion and the result was unambiguously clear: a majority of 69% decided in favour of them staying on...

But this outcome was not accepted by those residents who wanted immediate change. They argued vehemently that the community voting had not taken place correctly and called for a replacement of the members of the Residents' Assembly Service (RAS) who had been in charge with the voting process. They even organised a general meeting of their own which appointed an interim RAS. But this group failed to gain recognition.

The Auroville Council then appointed a new RAS. Its first action was to scrutinize the previous voting process, which, it concluded, had been faulty. The new RAS then called for a new vote. The majority decision this time was to proceed immediately to select a new Auroville Council and Working Committee, using the existing selection process, and to come up with a new selection process in the future. This vote left another section of the community dissatisfied.

## The selection process

The new RAS started the selection process [see box]. But many of the former Working Committees and Auroville Councils did not appoint a representative, either because they were not interested, or because they could not agree amongst themselves. Some individuals abstained from participating as they objected to the process. Ultimately, only nine people agreed to participate in the Selection Committee, which was originally designed to constitute 16 members.

Also community participation was not total. "I do not see why I should once again nominate people," said one Aurovillian. "I nominated people two years ago, only to see that none of them got appointed. So why repeat the exercise?"

The Selection Committee received from the RAS the list of more than 300 Aurovilians who had been nominated by the community and started its work.

"Each of us made a short list from these 300 people," said one of the Selection Committee members. "We then compared these nine shortlists, found that roughly 50 Aurovilians appeared on more than one list, and then concentrated on these 50 people. We discussed the potential of each and every individual as a member of the Working Committee or Council and called them to find out if they were interested in serving. Many refused. When it became obvious that we could not find a sufficient number of people, we went through all the other Aurovilians on our lists one by one.

"It was a very exhausting process as each member of the Selection Committee had his or her own preferences and likes and dislikes. What followed were compromises. You had to accept people that you thought were 'wrong,' knowing fully well that on the other side they were doing the same for the peo-

ple you thought were 'right.' If you wouldn't make a compromise, you wouldn't have 'your' person in. We were all being unreasonable in the same way; we all had a person or few people who we were adamantly for or against. We all were bullies and we all made concessions. Everyone. In consequence, the community-accepted eligibility criteria hardly applied."

The Selection Committee then asked for community feedback on the names proposed. While there was hardly any comment on the selections for the Auroville Council, the selections for the Working Committee met with many, often angry responses. The Selection Committee was criticised for not following the eligibility criteria; for not selecting a 'team' but only selecting individuals without considering if they could work together; for not following due process by 'leaking' objections to the persons selected; and, most importantly, for selecting people who, with a few exceptions, have no previous experience in this line of work. The competence of some of the members to do this job was also seriously questioned. There were suggestions that two members of previous groups should serve another term to provide continuity. This was particularly felt necessary as the new Working Committee would have to interact with a new Secretary and, by the end of 2012, with new members of the Governing Board and International Advisory Council.

"We spent a lot of timing going through each bit of feedback. And we did answer comments and enquiries as best we could," says one of the Selection Committee members. "But given the division within the Selection Committee, none of the objections changed anything. The suggestion to include some former WC members was discussed and re-discussed but we could not come to agreement. In the end, we proposed that two members of the former Working Committee would join the selected team for a period of six months." But this proposal was refused by the former members, as the Working Committee, by law, can only consist of 7 persons.

The Selection Committee then simply published the names of the members of the new Working Committee. No meeting took place to explain its decision and it did not publish any report. The selection has left a bitter taste in the mouth of many Aurovilians – including members of the Selection Committee.

## What next?

As has been agreed by the Residents' Assembly, a new method of selecting the Auroville Council and the Working Committee members will now have to be found. The RAS has taken up the task to facilitate designing a new selection process. This work may expand to include a review of Auroville's overall governance and the functioning and appointment of other working groups as well.

Catherine and Carel

## The selection process

For the selection of the Working Committee and Auroville Council in 2007, 2009 and 2011, the community, feeling that direct election of people would lead to politicking which would be no guarantee that the best people would get the job, entrusted the selection to a Selection Committee consisting of 16 people: one member selected by each of the seven previous Working Committees and Auroville Councils and two members selected by the former Selection Committee.

The Selection Committee is mandated to select individuals nominated by the community on the basis of eligibility criteria, agreed upon after a detailed study of the work of the Council and Working Committee.

It is the task of the Residents' Assembly Service to form the Selection Committee by inviting all groups involved to select a person. At the same, the RAS invites each Aurovillian to nominate candidates for the Council and Working Committee, based on the eligibility criteria. It then compiles the names into two lists, one for the Council and one for the Working Committee, without however indicating how many times a person has been nominated in order to prevent politicking. The Selection Committee then makes a selection from the lists, publishes the selected names for feedback to the community, and if no negative feedback is received, declares the persons selected appointed.

# Remembering Rosine

On January 4th, Belgian-born Rosine passed away in Auroville. She had lived in Auroville in the pioneering days of the 1970's, and had arrived back at Auroville only a few months ago, planning to once again take part in Auroville life. But at 82 her body, which was already coping with disorders, was unable to adjust to the changes. Rosine was fully prepared for this eventuality, and she embraced death with the lightness and grace and humour that was so much part of her nature.

Rosine spent much of her life in America. Before her return to Auroville, she was based at the Sri Aurobindo Sadhana Peetham in Lodi, California where she was cherished for the nurturing meals that she prepared. She was also an active member of AVI-USA (the West Coast Branch). On her passing, many people wrote loving tributes to this remarkable woman. On January 7, friends of Rosine, some of whom knew her from the early days, met under the Banyan Tree. They listened to Narad reading out stories, reflections and tributes that people had sent. Later that afternoon, her remains were cremated at Adventure's cremation grounds. Both the memorial service and the cremation had a quiet, light vibration reflecting the truth of how Rosine continues to live beyond the illusion of death.

Those who knew Rosine know that she was a true Aurovillian in the deepest sense of the word. Her introduction to the yoga was interesting.

At one time, her son – who was spiritually inclined from an early age – returned from India with a new-found joy. Rosine sneaked into his room and saw the photograph of a woman he seemed to worship. She looked older than him. Rosine was jealous. He had a new mother! Her son told her casually this was Douce Mere, who lived in Pondicherry, and was now his guru. Rosine resisted looking at this powerful photograph until one day, facing her angrily, she asked "Tu le veux? Prends le." "You want him? Take him." From that day on, the Mother took Rosine too into her arms. The next thing Rosine knew, she was on her way to Auroville, having abandoned the security of her past, the bindings of her family, the familiarity of her country.

Narad recalls the following, the conclusion of which Rosine asked him not to disclose in her lifetime. "The week Rosine spent with me in Mother's Garden in Georgia was an unforgettable one as she spoke of her past life, husbands, son, work etc. frankly and sincerely. She told me of her years cooking for celebrities in Hollywood and how a famous musician would call her at all hours of the night to make food for his guests in the early morning or at any time. She had her room and board and was paid very well, but spent nothing on herself. When she had accumulated one million dollars, she sent it all for the building of the Matrimandir."

Bindu



# Saraswathi Devi

Saraswathi Devi, Project Director of Sakti (opposite Auroville Botanical Garden), Edyanchavadi, and a long-time associate of Auroville, passed away on Sunday 29th January night at the General Hospital in Puducherry after a short period of illness.

Through her unceasing work and caring, Saraswathi Devi touched the hearts of thousands of children, youth and women in the Auroville region and beyond. The spirited social worker and activist was with us for more than 25 years.

Last rites for Saraswathi Devi took place on Wednesday, February 1st, at the Sakti Campus itself.



# P. Sundaram

P. Sundaram of Bharat Nivas left his body on January 28 in Puducherry's East Coast Hospital. Sundaram had been fighting kidney failure since many years, while also suffering from diabetes. He was just 45 years young.

Sundaram originally hailed from Kottakarai and joined Auroville in 1984. He lived with his wife Indrani and their children Sruti and Raguraman in Bharat Nivas. Many will remember him for his presence and activities in Bharat Nivas as well as for the caring way in which he received visitors at the Visitors Centre in the later years. His body was cremated at the Adventure Farewell Grounds on January 29th.

# D. Perumal

On January 30th, long-term Aurovillian D. Perumal peacefully passed away due to heart failure at the house of his daughter Jayagandhi at Kottakarai Farm, at the age of 87.

Perumal, originally from Pudunagar, has lived in Auroville for more than 40 years. For most of the time he worked as staunch watchman at Fertile Windmill. He did a lot of planting there and at other places in Auroville. Around seven years ago his health and age prevented him from continuing. Perumal's body was cremated on January 31st at Adventure's Farewell Grounds



## PASSINGS

# Towards a sustainable and uninterrupted power supply

On January 6th, Michael Bonke, Toine van Megen and Harald Kraft made presentations about Auroville's present and future energy and drinking water scenario. They also suggested a possible solution for the regular power cuts by using the Matrimandir Lake.

Auroville gets its electricity from the Tamil Nadu Electricity Board (TNEB). Although Tamil Nadu has a high installed capacity of wind energy (6,500MW – 44% of India's total) and generates 22% of its electricity from hydro power, still most of the electricity supplied by TNEB is generated from coal, lignite and gas. For Auroville, which aspires to base its energy requirements on renewable energy, this solution is unsustainable.

There is a second problem: there is too little power. Tamil Nadu has an energy generation capacity of 8,500 MW, but it needs 11,500 MW. Though new power plants – including nuclear plants – are being built, the outlook for the future shows few signs of improvement as the energy demands steadily increasing as well.

The TNEB meets the power shortage by importing from other states, purchasing power from private power producers and by load shedding: each day by rotation, in one area after the other, for a few hours the electricity is switched off. In Auroville, scheduled load shedding is two hours daily but often there is additional unscheduled load shedding of another one to two hours.

Foundation but functioning for the exclusive benefit of Auroville. Its first objective is to install a number of wind generators (better known as windmills) and so create a self-sustainable energy park to fully meet Auroville's energy requirements now and in the future. In this way Auroville can become carbon-neutral as far as grid power is concerned.

As the wind velocity in the Auroville area is insufficient to run large wind mills, the wind generators are erected in wind parks elsewhere in Tamil Nadu. The electricity they generate is then channelled into the Tamil Nadu grid. The electricity is either sold to the TNEB or 'wheeled', which means that the amount of energy generated by a windmill in location A can be deducted from the energy bill for electricity taken from the grid at location B (e.g. in Auroville) minus 5% wheeling charges, while energy not drawn immediately can be 'banked', that is drawn within a one-year period. This is also known as "net-metering".

By July 2009, Varuna had its first wind generator up and running. By April this year, less than three years later, Varuna's fourth wind generator will become operational. So far, Varuna has sold the energy produced to the TNEB and has made

consumption, when, as has been predicted, the aquifers turn saline. Several studies on the replenishment of the groundwater-table show that in the Auroville area we are drawing six and a half times more water from the aquifer than is recharged by rainfall. If these studies are correct, then the salination of the aquifers is only a question of time.

"For today, we envisage that desalinated water will only to a very limited extent be used to supply Auroville's drinking water requirements, a maximum of 200 to 300 cubic metres per day. Until then, we intend using the water to help fill the Matrimandir Lake – the other source will be harvested rainwater – and once it is filled, to maintain its water level. We estimate that a lake of the size

envisaged by late Roger Anger would, on an average, evaporate 240 cubic metres of water per day."

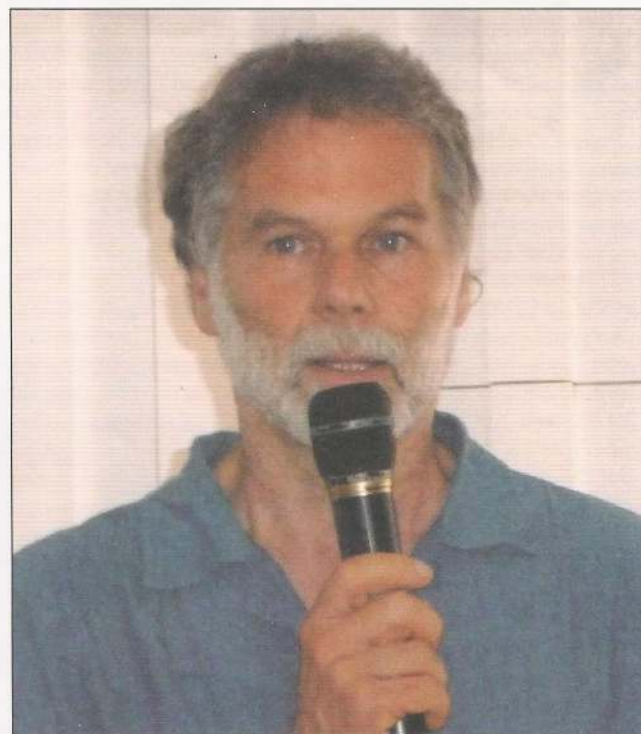
Though Auroville has no need as yet for desalinated drinking water, the villages along the coast have. "We have already agreed with the panchayat of the neighbouring coastal village that we will supply a certain volume of desalinated water to meet their drinking water requirements," says Michael. "Along the coast the danger of the aquifer turning saline is very acute, so they are quite happy with our initiative."

## Battling the power cuts

Finding a solution for the daily power cuts is Varuna's third major project. "A solution occurred to me when going for a swim in one of the lakes in Deggendorf in southern Germany," said Michael. "This particular one is an artificial lake built in the 1960s. It is filled by pumping water upwards from another lake situated at a lower location. This happens at night, when power is cheap. In daytime, when power is expensive, water from the higher lake is sent through a turbine back into the lower lake. The electricity generated is sold and the difference between the electricity bought for pumping at night and generated in daytime is providing a decent profit." The lake in Deggendorf, he says, is one of many such lakes in Germany which help stabilize the nation-wide grid.

"To battle the power cuts we are thinking of following the German example by creating a second lake on top of a 30-metre high hill somewhere in the Auroville Greenbelt," says Michael. "This higher lake, which is planned to contain 150,000 cubic metres of water, would be connected to the Matrimandir Lake and be filled – using the energy provided by the wind generators – from the Matrimandir Lake. Whenever there is a power cut, water will be sent back into the Matrimandir Lake through a turbine. The electricity so generated would be fed into the Auroville grid and be sufficient to provide power to the whole of Auroville during the power cuts."

Calculations have shown that the energy stor-



Michael during his presentation

age of this system would be about 10MWh. In the present Auroville situation, it could produce about 25 hours of continuous power back-up. In an emergency, like now after cyclone Thane, it could provide the present population with 1 hour of energy a day for almost a month. But when the population is 50,000 people, the back-up provided would be only a little over an hour. So as the Auroville population increases, a second and even third system will become necessary. In such a case, the Matrimandir Lake might function as the higher lake, and lower lakes be created in a low-lying area of Auroville, perhaps in one of the canyons.

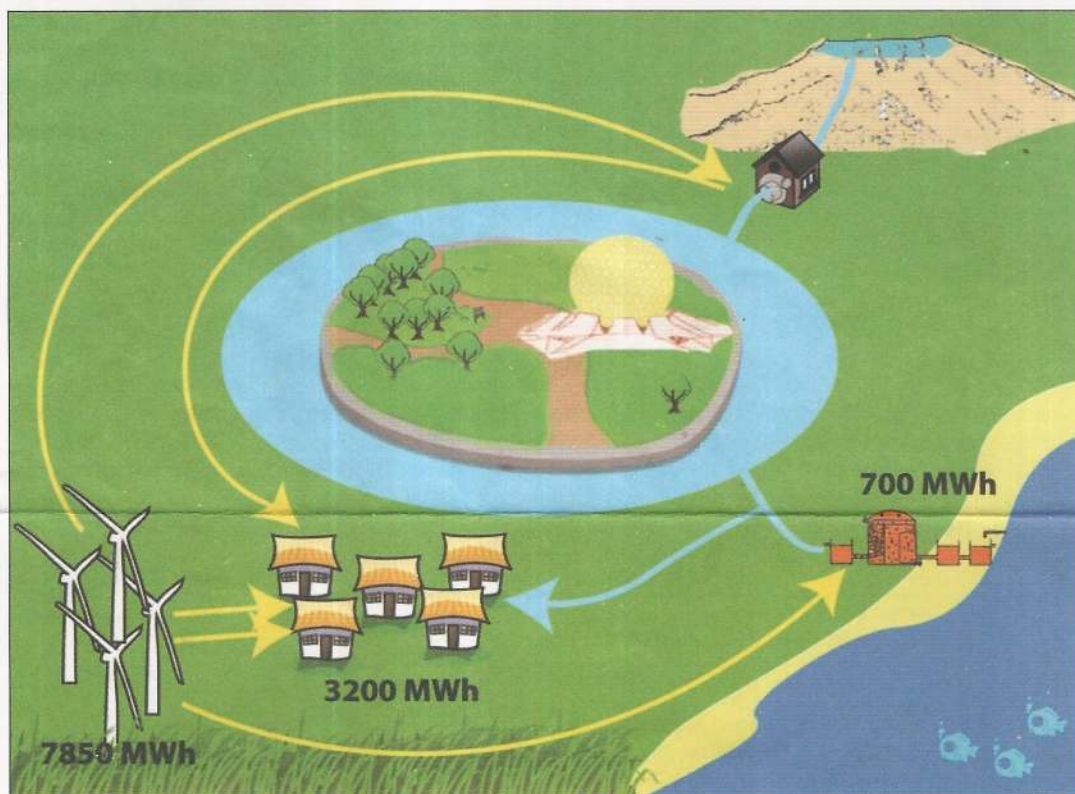
Michael explains that the other possible benefit of the lake system would be that it could act as a very large water reservoir which could be used to produce drinking water in case the water supply breaks down or if the aquifers would turn saline, as it does not take much energy to clean sweet water to the level of drinking water.

## The Auroville electricity network

But how to ensure that during power cuts only Auroville benefits from the power generated by the turbine and that the energy is not tapped by others? "Auroville needs to have its own internal underground distribution network," says Michael. "Quite a lot of work needs to be done and a substantial investment will be required before this becomes a reality," explained Toine, "for Auroville has a very low and scattered urban density. TNEB outdoor transformers will need to be replaced by Auroville indoor transformers; TNEB 22 kV high tension overhead lines need to be replaced by Auroville 11 kV high tension underground cables; and all TNEB low tension overhead lines will need to be replaced by Auroville low tension underground cables."

The first steps towards creating such an internal distribution network are being made by installing an Auroville-owned underground cable system that connects the Town Hall, the Matrimandir, the Solar Kitchen, Bharat Nivas and the Residential Zones sections 1, 2 and 3. These areas consume presently about 1,700 MWh of electrical energy per annum, more than half of Auroville's total electrical energy consumption. In the future, more Auroville users will be connected to this system. Michael considers this first phase of the underground system as the basis for the centralised pumped storage power back-up.

"Clearly, the present system of individual lead-acid battery banks and inefficient inverters or



A schematic view of the Auroville energy and water scenario. Wind generators feed into the grid, which feeds residences, the desalination plant and the pumping station. Desalinated water is fed into the Auroville drinking water supply scheme and the Matrimandir Lake.

To keep continuous power, almost all Auroville buildings have a backup-inverter or UPS (uninterruptible power supply) that run on batteries. The batteries are charged when there is grid supply. Auroville also has a number of diesel generators to run drinking water pumps and other loads that are too big for an inverter. The larger commercial units depend on powerful diesel generators to continue functioning during power cuts.

Judged from the economic and environmental perspective, this situation is equally unsustainable: the lead-acid batteries have to be replaced every 4-5 years and are, moreover, an environmental hazard; similarly, diesel is expensive and polluting.

## Installing wind generators

The idea of having an Auroville-owned wind farm in the south of India was first mooted by Toine, who founded the Auroville Electrical Service in the 1970s. He envisaged the installation of wind turbines in the windy regions of Tamil Nadu to offset the consumption of TNEB supplied grid power. Funding was an issue and the project had to be shelved. Toine made another effort in 2003 and presented a project outline to various Auroville bodies with a request for the funding of at least one wind turbine to start with. The proposal was ahead of its times because funding on that scale (Rs. 60 million for a 1.25 MW wind turbine) was clearly beyond the possibilities of Auroville at that time.

Five years later, by the end of 2008, Michael Bonke, a Friend of Auroville, who had been intimately involved with building the Matrimandir for many years, decided to tackle the energy and water problems. Together with four Aurovilians he founded Varuna Energy and Water Pvt. Ltd. – a private company set up outside the Auroville

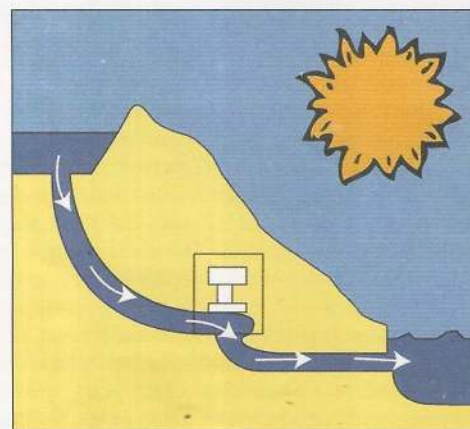
donations to Auroville for the payment of electricity bills. Arrangements are now being made to donate one wind turbine to Auroville so that net-metering can be done with the TNEB service connections of Auroville. With this in place there would be no further need for the selling of energy and donating the sales proceeds.

But why four wind generators? The total energy consumption of Auroville is around 3,200 MWh per year, while the energy produced by the four wind generators will be around 7,850 MWh. "Two wind generators produce enough energy to meet Auroville's present requirements," explained Michael. "Half of the energy produced by the third one will be used for the desalination plant to be built on the beach, while the remaining energy produced will be sold and ploughed back into the wind park so that it can sustain itself and can grow along with Auroville and so continue taking care of Auroville's electricity needs."

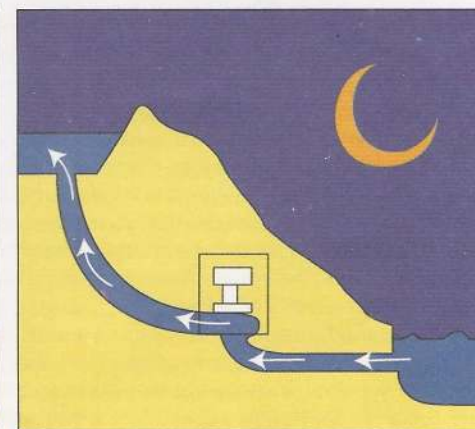
## The desalination plant

The desalination plant is Varuna's second main project. "Varuna wants to create a small desalination plant which will produce, in its first phase, 1,000 cubic metres of drinking water a day," explained Michael. "Varuna have started the work to get the required permissions. We have calculated that, including maintenance, depreciation and labour, the costs of 1 cubic metre (1,000 litres) of drinking water would come to Rs 20."

Today, Auroville's water consumption, including agricultural needs, is about 1,500 cubic metres a day, which is pumped up from the aquifers. But Varuna has no plans to replace pumped underground water with desalinated water, at least not in the foreseeable future. "Desalinated water could be used for Auroville's



In daytime, during power cuts, water flows from the upper lake into the lower lake, generating energy. At night, water from the lower lake is pumped up into the higher lake using energy provided by the wind generators.



diesel generators is not a sustainable long-term backup solution. Yet, I question an Auroville-only power back-up on this scale," says Toine. "We cannot think of Auroville in isolation. Can you imagine the entire Auroville township lit-up but surrounded by villages plunged in darkness? If the pumped storage system proposed by Michael turns out to be viable, I would see it more as a buffer stock of energy that can be used to even out dips in renewable energy availability as part of a distributed generation network [see interview with Toine elsewhere on this page, eds.] instead of an Auroville-only back-up system. Alternatively the pumped storage system could be used for essential loads (water, agriculture, hospitals, street lighting, educational institutions etc.) in the wider region with an intelligent distribution management system that switches off non-essential loads when the pumped storage back-up is used."

Toine's concerns are not fully shared by Michael. "Right now, nearly all households in Auroville have a UPS, while the village houses do not. During power cuts, the Auroville houses are lit while the village houses are not. All that we plan to do now is to make this individual back-up system a centralised back-up system, which runs more efficiently, more powerfully, and, above all, much more environmentally friendly. There is no issue of being unsocial in this."



Excavated earth from the Matrimandir Lake can be moved by conveyor belt to create the hill for the upper lake. This photo shows a conveyor belt in Germany, transporting earth over water.

### The Matrimandir Lake

To create the hill for the second lake, Michael proposes that the earth from the excavation of the Matrimandir Lake be used. "People have expressed concern that transporting such a large amount of excavated earth by truck through Auroville would cause a lot of dust and aggravation," says Michael. "It is also a very costly option. We plan instead to use conveyor belts to transport the earth from the point of excavation to the site of the hill. These conveyor belts can run for kilometres, and if they are situated within the green corridors, there will not be any problem for the Auroville residents."

The hill would be located at a distance of about a kilometre from the Matrimandir. "It will be a nice place for Aurovilians to go swimming and relax," predicts Michael. Asked if the pumping of the water would not cause a large fluctuation in the water level of the Matrimandir Lake, he replied that the fluctuation would be not more than one metre, which is no problem from the aesthetic point of view.

In the question and answer session after the presentations many people expressed their appreciation for the ideas. One sore question remains to be solved, that of the so-called Outer Gardens, some of which have already been planted by Narad, and which the proposed large Matrimandir Lake would submerge. "In the past there have been many and often very bitter discussions about this topic. But I have full confidence that we can find a solution that will satisfy all," said Michael.

Asked when he thinks the hill and the upper lake could start to be built, he said that all the questions are interrelated. "If we have full cooperation from all Auroville working groups and the concerned Indian authorities, we might be able to start excavating the Matrimandir Lake and building the hill and upper lake in about three years. Our energies are now concentrating on manifesting the desalination plant and the pipeline from the beach to the centre of Auroville. Afterwards, we'll start on the hill and the lakes."

Carel

## An vision for Auroville and Tamil Nadu energy

Toine has been involved with energy since he founded the Auroville Electrical Service in the mid-seventies. In 1997 he temporarily left Auroville to become CEO of the Asia operations of Dutch wind turbine manufacturer Lagerwey. In 2004 he joined the senior management team of Suzlon Energy, a leading Indian wind power company with worldwide operations and became the CEO of the company's wind energy business. He returned to Auroville in 2009, working once again in the field of infrastructure, that of energy in particular.

### Auroville Today: what is the Auroville Energy Vision?

Toine: In 2010 I formulated an Auroville Energy Vision which was not only related to the consumption and production of energy, but also to what we see as the relationship between the aims and objectives of Auroville and energy.

I propose that Auroville should strive to obtain energy only from sustainable energy sources and that, to the extent that Auroville uses energy from non-sustainable sources, surplus sustainable energy should be produced to compensate for such consumption.

The Vision also states that in Auroville, energy should be consumed as a means to achieve a higher level of consciousness rather than for the fulfilment of personal desires and comforts. Life style changes are an important element of any sustainable energy strategy. A change of consciousness and the transformation of matter are essential to achieve ultimate integral sustainability.

### How have we done so far?

If we look at the sources of electrical energy that are being used in Auroville, we see that the major source is the Tamil Nadu Electricity Board (TNEB), which produces electricity from a mix of conventional and renewable sources. Auroville has presently 1,340 TNEB service connections with a total capacity of 3.2MW and close to 400 KW of solar photovoltaic installations, which includes installations for pumps, residences, streetlights and the 36KW Matrimandir solar plant. Additionally there are a number of stand-by diesel generators for some communities' water supply and for Auroville's commercial and service units. Although this makes Auroville relatively speaking a good example in terms of renewable energy usage, it is still not good enough for the long term.

Once the wheeling of energy from the Varuna wind generators starts, the TNEB grid power consumption can be off-set. So this part of the Energy Vision is on the way to becoming a reality, provided, of course, that the

installation of renewable energy generators keeps pace with Auroville's growth in energy demand.

### And what about the consumption?

The direct Auroville annual electricity consumption per capita is 1,700 kWh, of which 1,000 kWh is for domestic usage. To the direct per capita consumption of 1,700 kWh per annum we need to add the indirect consumption of electrical energy through energy needed to grow food and create materials, which would take us probably to a 2,500 kWh per capita level. This compares unfavorably with India as a whole, which has an average consumption of 550 kWh per capita and with Tamil Nadu (1,000 kWh), but is still far below that of countries like France (7,000 kWh) and the USA (12,000 kWh).

We should take into account that there is a trend in Auroville to consume more energy. Many newly-built houses, for example, have provisions for air-conditioners. There is also a trend to use more electric transport. It is clear therefore that the electrical energy requirements of Auroville will increase, also on account of the planned population growth to a city for 50,000.

### Is there any indication that Aurovilians are more conscious than the general population in the use of energy?

I think that many people in Auroville are very energy-conscious. They think about the use of energy, and many individuals and units have been installing solar panels or small wind generators. Even though the community pays for much of the electricity consumed in Auroville, and not the individual, we do not see wanton consumption. This makes Auroville an ideal place to test and implement distributed generation.

Distributed generation is an idea which is gaining ground in energy circles. It means that all those who produce renewable energy, individuals who have roof top solar photovoltaic systems installed as well as industries, feed the energy produced into the grid

and take what they need from the grid. People get paid for the energy they feed into the grid, while paying for the energy they take out of it. The consumer becomes also a producer, or a 'prosumer'.

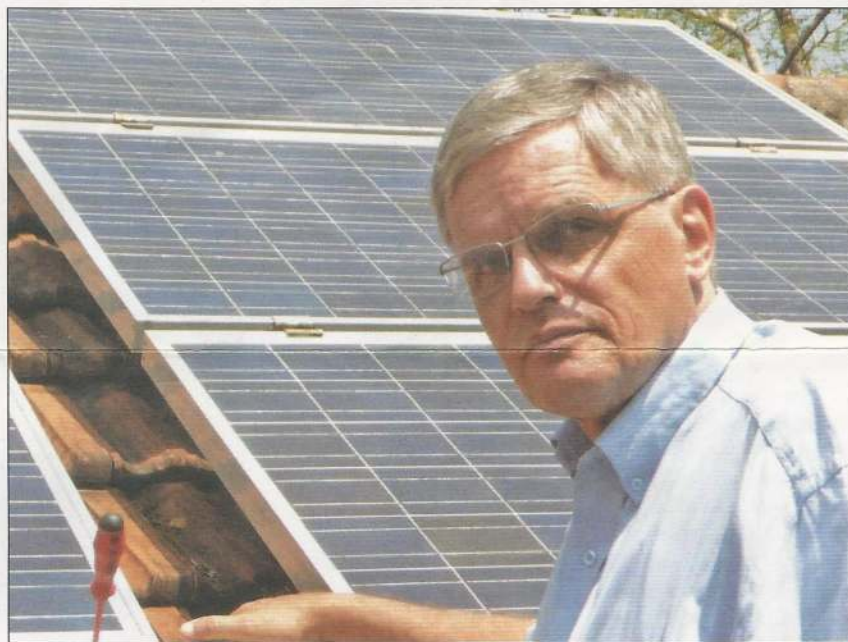
With a reliable underground distribution network in place and a large number of small scale renewable energy generators installed all over Auroville, distributed generation can become a reality here.

In Europe these ideas are now taking shape as the European grid lends itself well to distributed generation. For example, a lack of solar energy in Spain may coincide with an excess of wind energy in Denmark, or vice versa. The DisPower project that ran in Europe from 2001 to 2005 was aimed at answering the question as to how the future grid can be organised, and how technology has to develop, so that the growing number of decentralized renewable energy resources can be further integrated into the European electricity grids in the future, without losing reliability, safety and quality. The DisPower project brought together 37 participants from across Europe, including major energy producers and power plant operators, utility companies, grid managers and energy traders. The consortium also includes 17 academic and research institutions. Results are encouraging and pilot projects are being conducted.

The distributed generation grid will use smart grid technology to reliably forecast the demand and production, and balance the demand and supply from various sources and thus optimize the electricity grid performance.

### Is this something for India?

Absolutely! Specialists nowadays agree that a grid should be as large and diversified as possible to increase the penetration of distributed renewable energy. India still faces power shortages and the total electrical generation capacity is 175,000 MW, which is low in relation to its population and eco-



Toine at his house in the Matrimandir Nursery

nomie growth plans. But the fact that India has not followed the path of, for example, China, which has installed 900,000 MW, mostly coal-fired, plants may now be a blessing in disguise. For now India can make distributed renewable energy generation connected to a national electricity grid a significant element of its power strategy. If all the producers of energy in India, including hydro, solar, wind, biomass and, of course, the conventional sources, would feed into a national grid that is managed with smart grid technology, this grid would become a highway where everybody feeds in and takes out. The contribution of renewable energy sources to national or regional grids can in this way increase without destabilising those grids. In the short and medium term though, we have to deal with the reality of grid outages and therefore hybrid systems that can run both in stand-alone mode with a (smaller) battery bank and in grid-interactive mode will be needed.

### How soon can we see this happening in our area?

The government of Tamil Nadu has plans to have 3,000MW of solar PV installed in the next five-year plan, 2012-2017. A good part of this could be contributed by grid-connected rooftop and other small scale solar systems and this would make distributed generation a reality in Tamil Nadu. This would be a great achievement, for it would be a stepping stone to generating all our energy requirements in the future from

renewable sources. What helps in all this is that the cost of solar PV has seen dramatic reductions in recent times while the cost of fossil-fuel power keeps on increasing. Within the next couple of years we will see a convergence of solar and fossil-fuel energy prices to be followed by a period in which renewable energy will be cheaper than conventional energy. A time will come when fossil-fuel is referred to as a 'non-conventional energy source'!

### But meanwhile there are still all those thermal power plants...

Indeed, and the question is whether the transition to 100% renewable and non-polluting energy sources will go fast enough to avoid global warming. The global carbon emissions are presently 10 billion tons a year, double what the planet can absorb. During the Auroville Green Practices Workshop in September 2011, this issue was addressed by Peter Head, founder of the Ecological Sequestration Trust. This Trust will promote carbon sequestration whereby the waste carbon from thermal power stations is turned into a useful resource to help restore the world's ecosystems. We are in discussion with Peter about a role that Auroville Consulting may play in implementing some of these initiatives in India. So indeed, the transition to 100% renewable and sustainable energy has to be well managed with pro-active initiatives like carbon sequestration. We cannot be complacent.

In conversation with Carel

# Pottery and Paper

Auroville hosted two art exhibitions recently, each of which pushed the boundaries of their genre.

*Jeff Shapiro and Friends* was a collection of strikingly original ceramic art pieces in the Kala Kendra, Bharat Nivas. Shapiro, an eminent potter based in Japan, recently held a workshop in Pondicherry, for which students came from around the world. This exhibition featured the art works of the course participants, who largely use the long firing technique that Shapiro favours. The exhibition was characterized by earthy textures, muted tones and a sensibility of being close to nature. Within these collective traits there was much diversity, but also an unevenness of standard, with some pieces clearly more imaginative and beautifully executed than others. Whilst many ceramic exhibitions offer attractive pieces of utilitarian value, this exhibition generally featured ceramics as a purely artistic form, where aesthetic value and the extension of the artist's self-expression were prioritised over pragmatic outcomes. Some pieces, such as Vineet Kacker's arresting giant teapots and Roshi Jain's delicate lotuses, were clearly intended to be objets d'art. Other pieces, such as oversize vases, plates and bowls, were too beautiful and artistic to ever imagine being used. Priya Sundaravelli's captivating plates – with nature-inflected imprints that hinted of a forest into which the artworks could easily submerge – fitted this description. Overall, the inventive aspects of this exhibition captured the imagination, along with the willingness of a number of the artists to push the boundaries of their genre.

Auroville Papers's excellent showcase *Did you say paper?* at Citadyn Art Centre reflected the high standard that Auroville art can reach when a strong foundational concept is implemented with much thought, refined imagination and hard work. The exhibition was of an ambitious scale and used space well, including giant objects such as vases, bowls, sculptures, wall hangings and lamps. It was stimulating to see an object as mundane and quotidian as paper reworked in such ingenious ways. Interestingly, a number of the art pieces appeared to play upon other quotidian elements of life in India. Sheets of leaf-embedded paper pegged on a rack were reminiscent of sarees drying outdoors or hanging in a wardrobe. A salesman's cycle laden with multi-coloured paper lothas appeared to be a witty play upon



'Darker' by Rakhee Kane



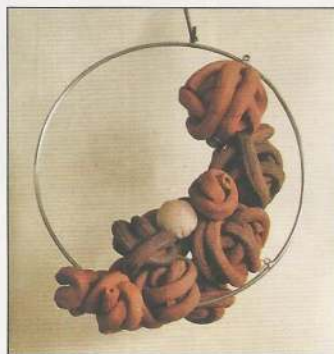
Animal images by Anjani Khanna Yallis



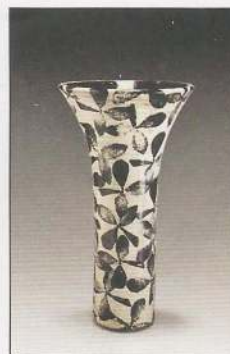
Pottery lace by Madhvi Subramaniam



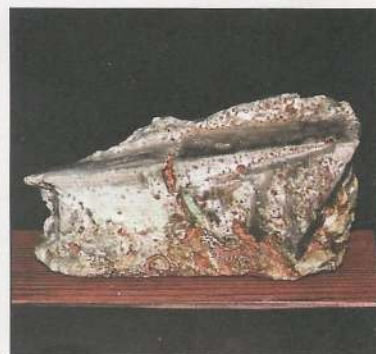
'Icebucket' by Ray Meeker



Decoration by Mudhita Bhandari



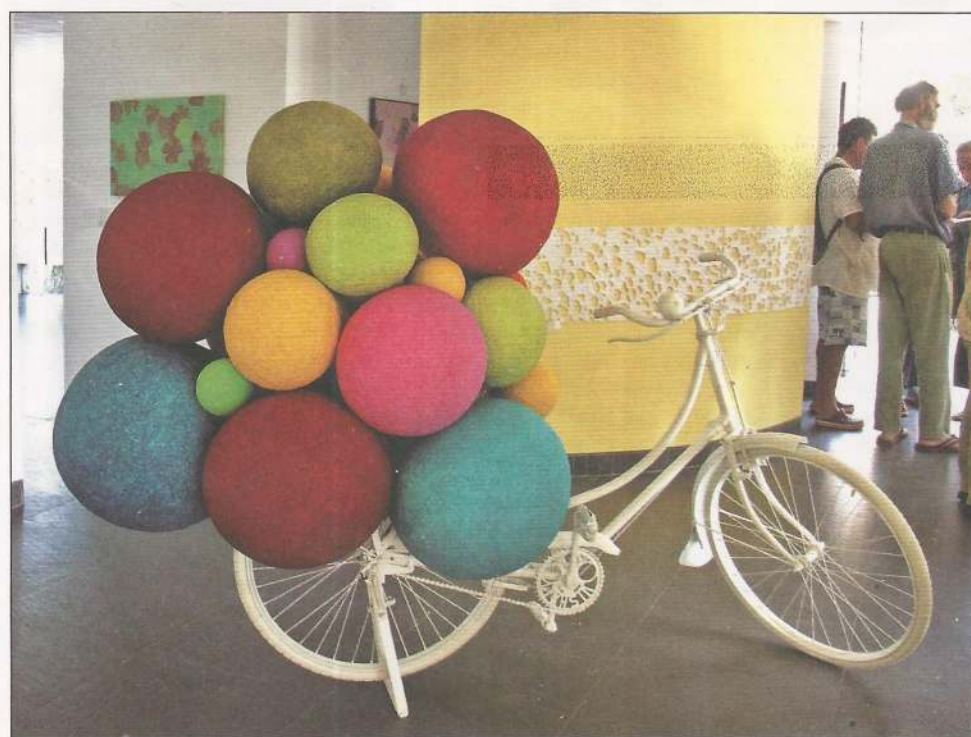
Vase by Deborah Smith



'untitled' by Jeff Shapiro



Vases made of papier maché



A cycle decorated with papier maché balloons



Translucent paper lamps

renowned Indian artist Subodh Gupta's more monochromatic installation pieces. Women's paper maché bangles were worked into a vivid sculptural piece that rose from the floor. An elegant tall lamp featured paper sheaths artistically layered in order to shed a diffuse light. The hand-made and highly textured materials gave the works an added density, which fleshed out the visual experience. One year in the making, this exhibition is a significant achievement and will tour throughout India. The comments in the visitors' book (of hand-made paper, of course), reflect not only the high standard achieved, but the fact that the exhibition inspired and moved many who saw it.

It has been questioned in this publication previously whether art exhibitions in Auroville have a tendency to be repetitive and monochromatic through confining themselves to established genres and emphasising the ethereal over concept. It is reassuring to see that Auroville can host exhibitions that encompass originality, strong concept, high aesthetic standards, and an exploration of lesser-known genres.

Lesley

## Presence for the Mother

Jyoti Khare's exhibition *Presence* opened at Savitri Bhavan's exhibition space in January. A series of collages, the artworks were assembled mostly from portions of sarees that belonged to the Mother. The delicate, pastel fragments were arranged in a manner that showed off the varied textures and intricate embroidery of the fabrics. Some artworks featured a photograph of the Mother embedded in the centre.

Jyoti was presented with the fabrics by an Ashramite, who insisted that she utilise them in her artworks. This unique approach to materials has yielded graceful artworks that project a loving devotion to the Mother. The knowledge that the materials belonged



to the Mother adds a personal layer to the viewer's appreciation.

The result is an exhibition that is fresh and calming in effect, and which holds up the Mother's high standard of beauty. Jyoti states in the exhibition catalogue that: "Every artwork for me was a meditation." As a result, the space and these artworks are very conducive for meditation and contemplation.

Carel

The book *'Presence'* with pictures of the exhibited works made by Auroville Press is available at Savitri Bhavan. Price in India Rs 400. For more information email [savitribhavan@auroville.org.in](mailto:savitribhavan@auroville.org.in)



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