

# Auroville Outreach

A newsletter from Auroville international township

July 2000

## Giant solar collector comes on stream

May this year saw a historic moment for Auroville, when the giant 15 metre diameter solar collector on the roof of the Solar Kitchen finally came on stream, after long delays caused by a series of technical problems, and a first meal was cooked using the steam generated by the sun.

When Auroville decided some 5 years ago to build a community kitchen capable of providing up to 2,000 meals a day (1,000 lunches + 1,000 dinners), steam seemed the obvious heat transfer medium, and the need to use solar energy to produce it paramount. A single large diameter solar collector was decided on, though the question remained whether to go for a fixed solar bowl

or a moveable parabolic reflector. The former was chosen, mainly because a large parabolic reflector would have had to be so light (to require little energy to orient it constantly towards the sun) that it would have been very vulnerable to cyclones.

Once this decision had been made, a multi-disciplinary team consisting of Gilles Guigan (France), Sylvie Rousseau (France) and John Harper (Canada) assisted by Andres Veski (Estonia) and Piero Cicionesi (Italy) came together to take up the various technical challenges.

The first problem was the civil engineering: how to construct the masonry structure for a perfectly spherical bowl tilted 12 degrees towards the south to compensate for the latitude of the site. The problem was solved by Auroville's Centre for

Auroville is an international township in Tamil Nadu, South India, founded in 1968.

Inspired by the vision of Sri Aurobindo and The Mother, about 1,500 people from India and some 30 other nations are building a township dedicated to an experiment in human unity, with the eventual hope of contributing to international understanding and the evolution of human consciousness. Nearly 5,000 of the 40,000-plus local people living in the dozen-or-more villages that comprise the Auroville bio-region are also involved in the project, providing their skills and labour.

The township, projected for 50,000 people, will radiate out from the central Matrimandir and its surrounding gardens in 4 zones, the International, Cultural, Residential and Industrial. A large forested area, the Green Belt, will eventually surround the entire township area.

Present activities in Auroville include wasteland reclamation and reforestation, organic farming, village development, education, health care, renewable energy, appropriate building technology, arts and culture, handicrafts and small-scale industries, architecture and town planning.

As described by its founder, Auroville aspires to be "a universal town where men and women of all countries are able to live in peace and progressive harmony, above all creeds, all politics and all nationalities."

For more general information visit the website: [www.auroville.org](http://www.auroville.org)



*15 metre diameter solar collector on roof of Solar Kitchen*

Scientific Research (CSR) using 96 prefabricated ferrocement radial elements, which were put in place and then plastered using a rigid arm made to pivot around the central point of the sphere.

The 2nd problem was the optics: how to accurately line the surface of the masonry structure with mirrors. For reasons of economy it was decided not to order special spherical facets, but to go instead for flat 3mm thick modi mirrors cut to 15 x 15 cms size. These were first protected from deterioration of the mirror coating by laminating them on the back with a 2mm sheet of plain glass using Araldite, and then fixed in place using silicone adhesive. The whole work took nearly 5 months, as it could only be done between 5 and 10 pm each evening to avoid the workers being 'solar cooked' inside the collector bowl during daytime. Each of the 11,000 facets was fixed to an accuracy of within 5 to 10 arc minutes using a laser beam reflected back to its source.

The 3rd problem was how to provide the required amount of steam at the appropriate time of day for cooking - morning and afternoon - all through the year, regardless of weather. The solution was to hybridise the system with a diesel fired boiler, and to incorporate a heat storage tank so that at least an hour of stored heat would always be available even at peak cooking times.

The 4th problem was the thermodynamics: how to transfer the heat safely from the receiver to the heat storage tank. It was decided to use a long-lasting heat transfer fluid able to handle temperatures of up to 345 degrees C. Meanwhile, laying leak-proof pipelines capable of carrying the fluid at over 300 degrees C was no simple matter, as pipes expand by up to 3.6 mm per metre for every 300 degrees in temperature. A similar problem was

faced with the heat storage tank, as heat transfer fluids expand by 7% in volume for every 100 degrees C. i.e. 21% for 300 degrees C.

The 5th problem was the steelwork and mechanics for the supporting structure of the moving solar receiver at the heart of the collector. This receiver, weighing some 200 kg, had to be supported and held with great accuracy in the focus of the collector. An anchoring device also had to be incorporated to secure it.

The 6th problem was the computerised tracking system by which the receiver arm at the core of the collector bowl would always point at the sun between 8 am and 4 pm, and then return to a vertical rest position; also that in the case of excess heat in the receiver, or high winds, it would move rapidly out of focus or to the anchoring position. All these problems were overcome using an Auroville-written software programme in conjunction with experience already gained with the heliostat tracking system for the Matrimandir. Some hardware had to be designed and assembled too.

Last but not least, because of regular electricity power failures in this part of the world and the absolute need to keep the pump running at all times; to avoid having to constantly reset the computer; and to be able in emergency to rapidly move the receiver arm out of focus, an uninterrupted power supply system was incorporated.

It says a lot for Aurovilian tenacity and the breadth of know-how available in the community that the whole structure was built and assembled in Auroville, and all the above problems were solved by Aurovilians. For a community still numbering only around 1,500 in total, including children, that's quite an achievement.

The final positive note is that, with more and more institutions in

India showing interest in solar power, Auroville is now in a good position to help. In this context some enquiries have already been received, and more are expected as awareness of the success of the collector spreads.

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## Saving a school

There is a small village near Auroville called Edayanchavadi. A considerable proportion of the people living in this village are illiterate, and the land around it is so arid that farming depends entirely on rainfall.

The Mother of the Sri Aurobindo Ashram heard about the plight of the people of Edayanchavadi from an Italian disciple named Nata in the early 1970s, and gave her encouragement to him when he expressed a wish to do something to help them. She put her spiritual force behind his work, and gave the name "Udavi" - meaning 'help' in Tamil - to the project.

Nata started by setting up a small dispensary, then drilled a well to provide good water supply, followed by a store for essential commodities. Seeing also the need for employment opportunities, he next started 'Auroshikha Agarbathies', an incense factory which could provide the villagers with work.

After some time Nata was making good profits, so he started a small creche-cum-school for several children. It was an informal affair in which children were given a bath, milk and bread plus a little bit of reading & writing etc. Later, noting that the children had to start earning as soon as they finished their studies, Government recognition was obtained for the school to help them get jobs, and the school was officially named Udavi Gentillesse



*Class in progress at Udavi School*

Matriculation School.

All went well for some 12-14 years, until a labour dispute arose affecting the agarbathy factory. This escalated, until finally it became necessary to close the factory because of violence in the area, followed by the school as a result of teachers also being threatened.

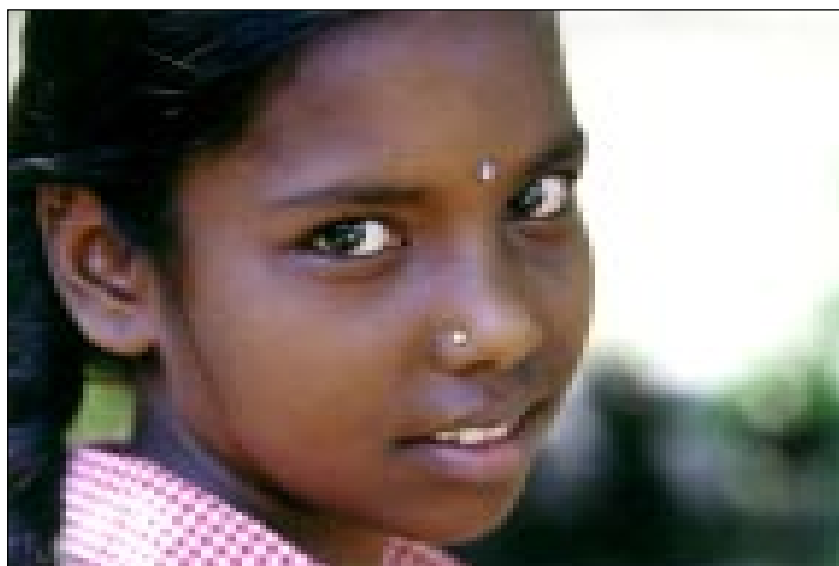
As so often happens in such situations, the people to suffer most in the circumstances were the innocent ones, in this case the 250 children and their 25 teachers. As a result of negotiations, it was agreed that the problems affecting the factory should be separated from the needs of the school, and the trustees then approached Auroville's Sri Aurobindo International Institute for Educational Research (SAIIR) with the suggestion that they take over management of the school for an initial period of 3 years. This was agreed, and the school reopened in June 1999, with an Aurovilian Co-Director. Other Aurovilians have also joined and are actively involved, taking classes in maths, physics, chemistry, English, Tamil, music and carpentry, and also coaching in volleyball. Finance for the school continues to be mainly from a Pondicherry-based trust, though Auroville's Palmyra project (see

April Newsletter) is also contributing.

The aim of Udavi School is to follow as closely as possible the guidelines laid down by The Mother and Sri Aurobindo on the subject of education, while taking the children up from 1st to 10th standard in preparation for their Government-held Matriculation exam. As an indicator of the success of the school to date, it's interesting to note that four groups of students have now sat for the exams, and on each occasion there has been a 100% pass rate, with very good overall results, many in the first division.

Since Auroville took over Udavi a number of innovative changes have been made. New sports equipment and playground facilities have been donated by an Aurovilian. Weekly meetings involving all staff have been started. A decentralisation process has been implemented, with the teachers now encouraged to participate fully in the decision-making process affecting the school. Assessment procedures for the children are being looked at, to better reflect the criteria for successful education as given by Mother and Sri Aurobindo. And, perhaps most important of all, the local people - in particular the village elders and a number of other responsible people - have been involved, and are now actively consulted in matters affecting the school.

As to future plans, Sanjeev, the Aurovilian Co-Director, says: "We want to steadily introduce more progressive ways of teaching, and we want to improve the school's infrastructure by adding a proper sports complex, a gym, a football pitch, basketball and badminton facilities, a computer lab, an extension to the library, and more facilities for vocational training. At the same time we want to involve more people from the Ashram and



Auroville, because of their awareness of Sri Aurobindo and the Mother's guidelines for education, and we want to collaborate more with other schools in Auroville and fully integrate Udavi into the wider Auroville educational scene."

The children who have attended Udavi to date have amply shown that, given a chance, they are capable of rising above the poor material circumstances of their background and local environment and turning in first class results in examinations and other fields of endeavour. In other words they are well worth supporting, and it is with real enthusiasm that Auroville has taken up the challenge of overseeing development of the school and ensuring an ever better education for them.

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## Kalamitra and Kala Khoj

One of the indicators that Auroville is now on the world cultural map is its inclusion in the itinerary of major performing artists from within India and abroad.

Kalamitra (Friends of the Arts) was formed by a group of Aurovilians to stimulate cultural life in Auroville by promoting a wide range of events - plus workshops - in the fields of theatre, dance, music, poetry, the visual arts, exhibitions and cinema, while at the same time providing support to upcoming artists and performers in Auroville itself.

Over the years many top-ranking artists, Indian and foreign, have offered to come to Auroville to perform, asking only that basic



*Scene from 'Daughters of the Ocean' by Arangam Trust Group*

expenses such as travel and accommodation be met. A not-long-ago example was an Austrian dance group who came all the way to India for performances in just 3 places - Delhi, Chennai (Madras) and Auroville.

Obviously Auroville feels honoured to be singled out by such artists as a special place to perform. Their visits confirm not only Auroville's status as a unique "international" township, offering a truly international audience to perform before, but also its special status in the world, as a place belonging to humanity as a whole; a place where whatever happens can become an offering and contribution to a higher ideal.

Kala Khoj (In Search of Art) is an offshoot of Kalamitra. Its aim is to facilitate the development of an international network of exchange programmes involving artists from India, Auroville and the rest of the world wishing to deepen their

research in the arts, with outside artists sometimes taking up residence in Auroville for periods of time ranging from several weeks to several months. In support of this aim Kala Khoj has become an affiliate member of the international 'Res Artis' network - now represented in over one hundred and twenty countries - and is currently designated the responsible centre to coordinate and develop the Res Artis programmes in South East Asia.

Although in its infancy, Kala Khoj has started receiving requests from foreign artists wanting to work in the residency programme, and is now included in the 600-page "Guide to host facilities for artists on short-term stay in the world", covering over two hundred organisations in nearly thirty countries.

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