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IN THIS ISSUE

A Decade of RE-search 1

Some of CSR's and Auroville's achievements in the field of Renewable Energy, and an interview with Chamanlal.

The Housing Crunch 4

A look at the housing situation and development constraints, and the architects' views.

"So I asked Paris for another extension" 6

Marval tells her story

Invocation of Peace 6

From the Vedas

Miscellaneous 7

Short News

It Was That Kind of Month 8

Humour: monsoon watching

In October this year, the Indian Renewable Energy Development Agency (IREDA) awarded the Centre for Scientific Research (CSR) a plaque recognizing its contribution to the promotion of renewable energy in India during the last decade. Bindu lists some of CSR's and Auroville's achievements in this field in the light of the present situation in India.

The situation in India

Throughout the year, an intense tropical sun shines and strong winds blow in most places in India. In principle, India is an ideal place for tapping renewable energy sources like sun and wind. In reality however, renewable energy became a national concern only in 1982 when the Government established the Department (which subsequently in 1992 became the Ministry) of Non-Conventional Energy Sources (MNES). Even now, budgetary allocations for promotion of renewable energy are extremely low compared to the conventional energy sources of coal, oil and hydro-electric power which operate with huge subsidies from the Government. In the eighth Five Year Plan of the Government (1992-1997), allocation for the renewable sector formed a meagre 0.8% of the total funds allocated to the energy sector.

While some industries are beginning to build wind farms for generating electricity, in general the industrial sector has not put in much capital or research and development into renewable energy-based technology.

Therefore RE remains a relatively costly option. Moreover, as Chamanlal Gupta, an expert in solar energy, points out, "In

India, we cut corners in engineering and in installation, and we have no culture of maintaining things. This affects renewable energy systems more than others because, as they are continually exposed to the weather, they require the highest standards of workmanship and upkeep. These problems—lack of care, honesty and environmental consciousness—are basic human problems that confront the nation."

This bleak situation is somewhat mitigated by an increasing awareness of the social and environmental destruction that is caused by the production, transportation and use of coal, oil, nuclear and hydro-electric energy. Progressive NGOs and individuals are seeking to implement renewable energy projects which do not give out toxic emissions during operation and, as opposed to large-scale power projects, do not cause displacement of the people.

"And then," adds Chamanlal Gupta, "some people turn to renewable energy out of sheer necessity. There are remote areas in the country which cannot be feasibly connected to the state electricity grid. Furthermore, the present national

demand for energy greatly exceeds the current energy production by conventional sources. This shortfall of energy can be as high as 16% of the total requirement during peak periods." This situation is only likely to get worse. It is predicted that India, despite its low per-capita rate of energy consumption will face a massive shortage of energy in the year 2015 due to the sheer size of its population. As yet no large scale initiatives in renewable energy have been undertaken to prepare for this deficit.

The situation in Auroville

Since the beginning, Auroville has been involved in the research and implementation of renewable energy and is now recognised in this country as a "testing" centre for a wide variety of renewable energy technologies.

Tency is one individual whose commitment and determination has led to CSR being a pioneering institution in India in the field of renewable energy. "It all started modestly enough," recalls Tency, "back in the eighties, I wanted to have a biogas unit as we had some cows... I approached Ulli (Hauser) who

had built such a unit in Djaima. Ulli, at that time, wanted to experiment with ferrocement techniques, and this led to our building the first ferrocement biogas plant in Auroville... It was not easy. For we had nothing, no machinery, no special tools, not even a building! But we persisted, and soon perfected our technique by making several such biogas plants. To cut a long story short, the Ministry of Non-Conventional Energy (MNES) of the Government of India recognized our efforts and gave us substantial grants to start a workshop—which came to be known as CSR—for the production of small-scale ferrocement biogas plants.

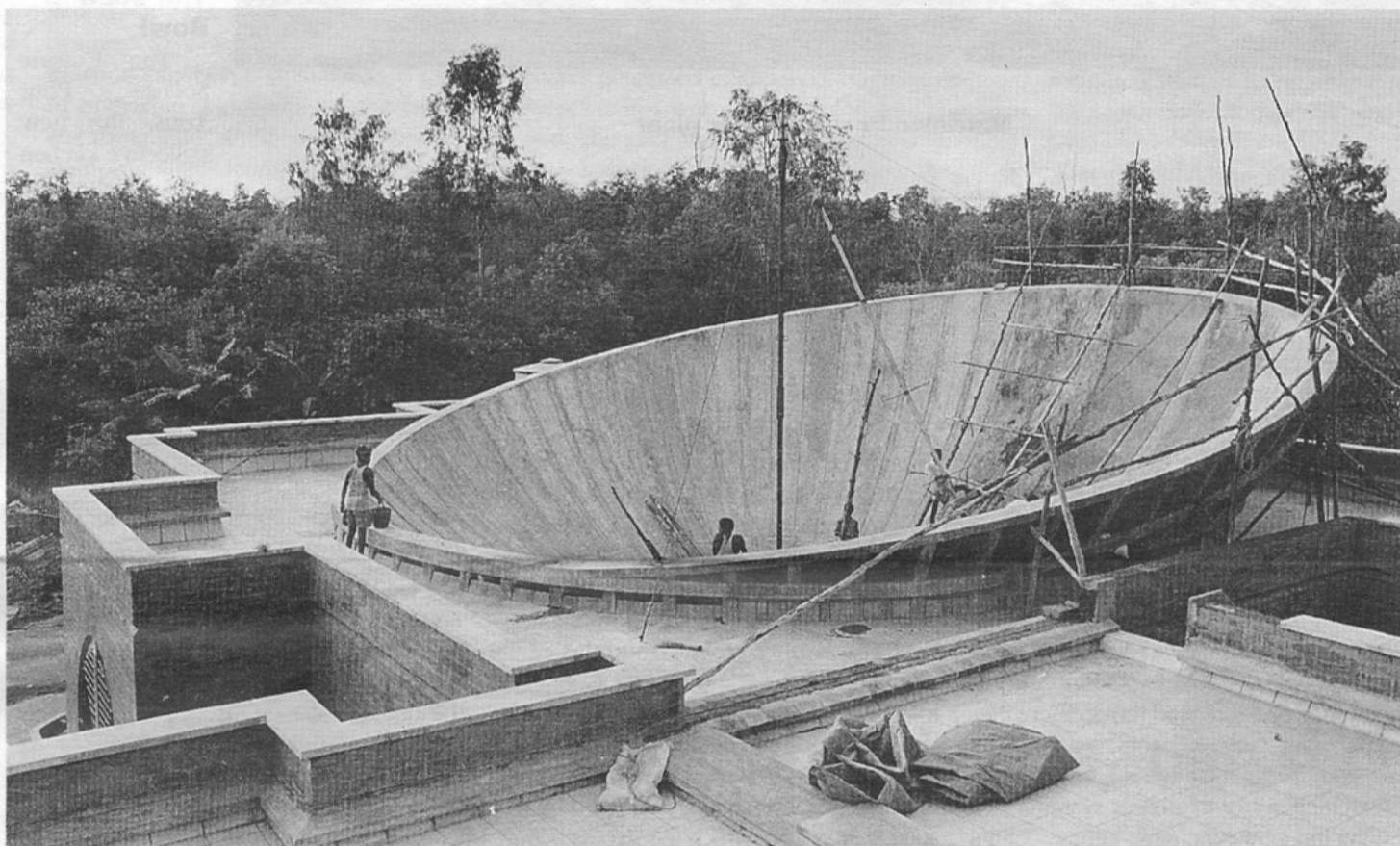
"Our achievement or contribution in this field was ferrocement. Biogas plants already existed in India, but these being made out of brick and steel had a short life due to corrosion. We were the first to manufacture ferrocement gasholders that were gastight.

"I guess we at CSR have never looked back since then. It was one experimental project after the other. After the ferrocement biogas plant, Ulli developed a tech-

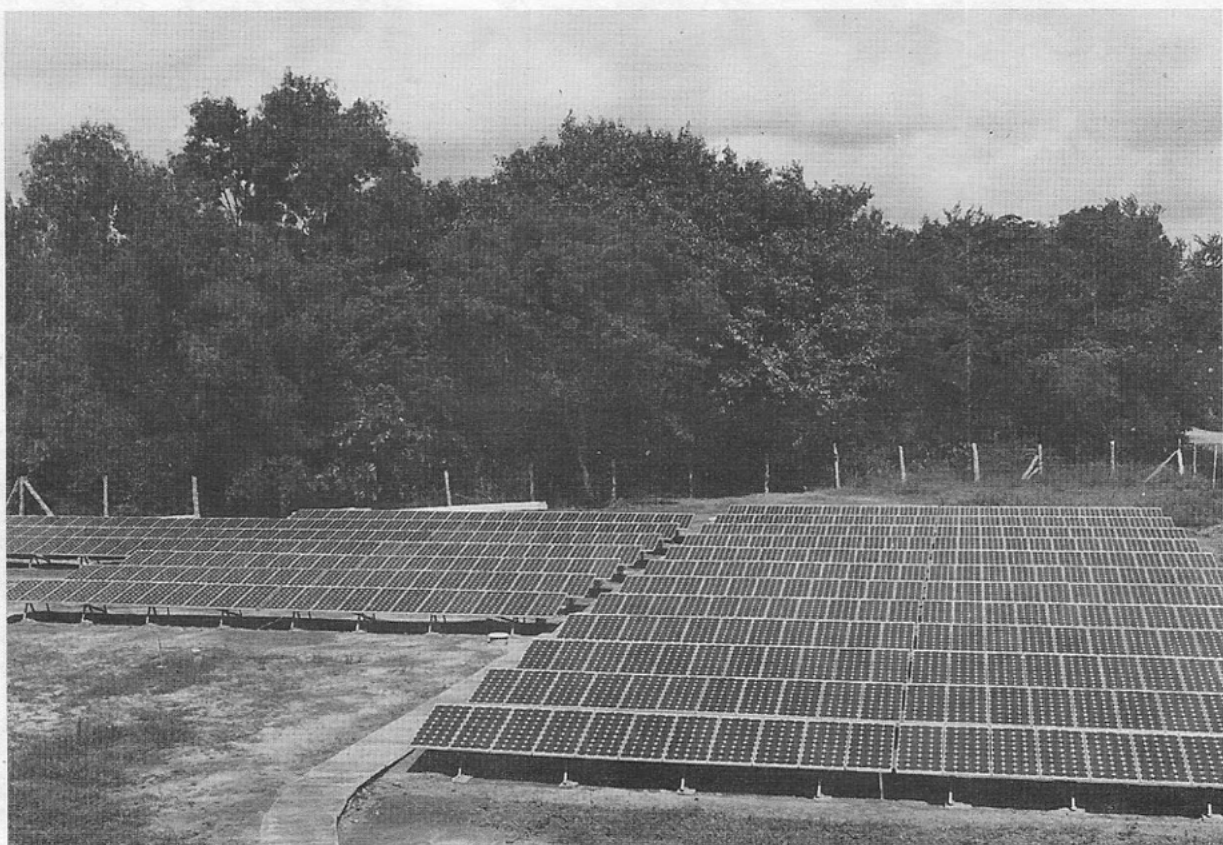
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A decade of RE-search

Auroville's contribution to the promotion of Renewable Energy: an overview



Solar bowl under construction at the "Cuisine Solaire Pour Tous"



Matrimandir solar power plant

(continued from page 1)

nique for manufacturing ferrocement doors... and this eventually led to our setting up Auroville Building Centre (AV-BC) that promotes prefabricated ferrocement elements, including ferrocement biogas plants and mud-brick technology."

AV-BC is the sole supplier of biogas plants in the Andaman and Nicobar islands. Besides ferrocement biogas plants, CSR, which is recognised by the Indian Government as a Scientific Research Institution, develops and promotes high-performance multiblade wind pumps, solar cookers, solar curing devices for prefabricated ferrocement elements, solar concentrators, solar lamps and solar pumps. It is also involved in researching water treatment systems.

"To me however, says Tency, "CSR's biggest achievement is that it represents a group of people who work together and evolve together in an absolutely non-hierarchical atmosphere with no real fixed rules. That we have managed, despite everything, to grow together is a perpetual wonder. It is that which creates the joy, the smile within and keeps one going even when the times are rough."

Solar Energy in Auroville

The first solar panels came to Auroville in the early seventies. And today, Auroville has more than 100 houses fully powered by photovoltaic panels and 35 houses that use solar power in conjunction with the state-grid connection. Some communities, and the Visitors Centre complex which acts as a demonstration site for alternative technology, run solely on solar and wind energy. The photovoltaic energy capacity in Auroville is more than 15% of the total photovoltaic capacity in India.

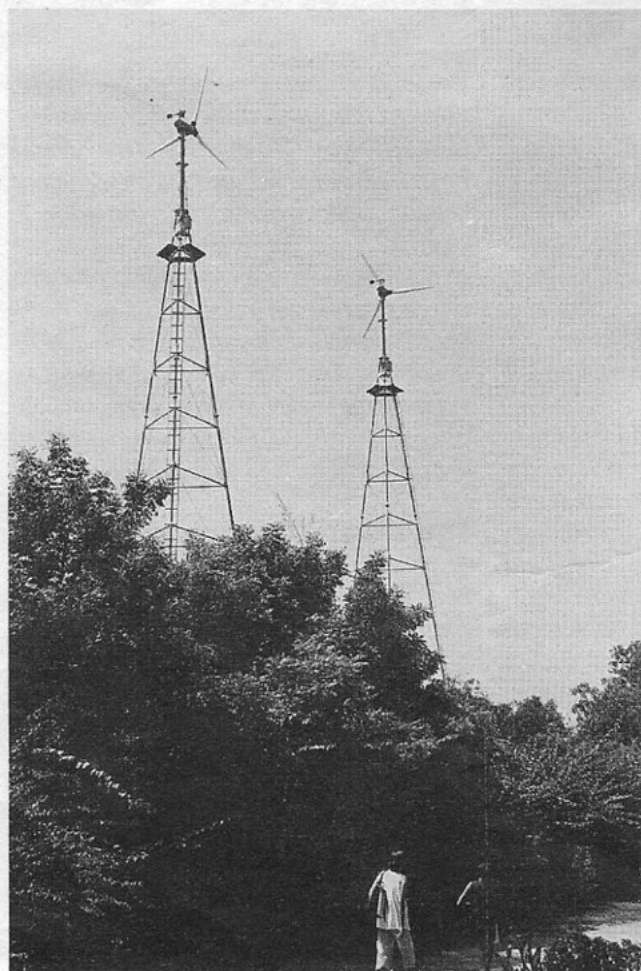
Solar energy in Auroville is used mainly for home lighting systems, pumping water for drinking purposes and irrigation, heating water for domestic purposes, and food processing. Other solar applications developed are solar curing chambers for ferrocement prefabricated

elements and solar concentrators

The Solar Power Plant for Matrimandir

Based on the Mother's remarks that solar energy would be the energy of the future, the Matrimandir Group decided to initiate a special project that envisaged the use of photovoltaic cells to provide lighting for the inside of Matrimandir, as well as for the area around the twelve petals and in the gardens.

The subsequent solar power plant that was set up by CSR for this purpose consists of 484 photovoltaic modules of 75 Wp each giving a total capacity of 36.3 kWp. A battery bank stores enough energy to cope for two days without sun. The plant operates in the bi-directional mode: the batteries are first fully charged by the solar panels after which the excess power



Wind generators being tested at the Visitors Centre

"The sun is the physical sign of the Supramental, the goal towards which we are moving in our Yoga."

The Mother

can be fed into the state electricity grid. This system, the largest stand-alone photovoltaic power plant in India, serves as a test-bed in the country for decentralized power generation.

The Solar Bowl

The Cuisine Solaire Pour Tous, the new collective kitchen of Auroville,

takes its name from the huge solar bowl that will be used to harness solar energy for cooking. The ferrocement base of this stationary bowl is already built and faces south. It is 15 meters in diameter and 7 meters above ground level. The sun's rays, trapped by a huge hemispherical mirror, will focus on a cylindrical boiler which will follow the sun's position by means of a computerized tracking device. On a clear day, sufficient steam at a temperature of 150° C will be generated in this boiler to cook two meals a day for 1000 people.

John Harper, who is part of the team building the bowl, has been interested in the use of solar energy for many years. During the mid-seventies he spent two years working with Chamanlal Gupta in the solar energy department at the Sri Aurobindo Ashram. In the early eighties,

John built a prototype solar concentrator of 3.5 diameter at the Centre Guest House that was functional for about two years before it fell into disuse. "In those days," says John, "prototype solar concentrators of 10m diameter and 20m diameter were being developed at Marseilles (France) and at the University of Texas in the States to prove the concept of using a "bowl" as a concentrator to tap solar energy. I guess, because of the oil embargo in the '70s, there was an interest in developing other forms of energy. But unfortunately, after the supply of oil was guaranteed again, interest

and subsequent research into solar bowls died down in the West.

"The only other large solar cooker in use in India is located at Mt. Abu in Rajasthan. This cooker has a capacity of cooking for 1200 people and consists of 24 separate parabolic reflectors, each with a reflective area of 7.5 m. We decided upon a solar bowl with a single concave mirror rather than separate parabolic reflectors, because stability of the whole system is an essential factor for us given the strong winds that prevail during the monsoon. Though our design differs from theirs, we have had a fruitful exchange of ideas and information with the team at Mt. Abu. Incidentally, our main solar scientist, Sylvie Rousseau has a close contact with Bernard Authier who developed the bowl in France, and the design of our boiler and concentrator are based on the French model.

"One of the problems I had when I built my first model at the Centre Guest House was devising a system to track the sun. Now, because of our experience in putting together the Matrimandir heliostat to supply a steady beam of light into the Chamber, we have the knowledge to handle this technical aspect.

"To me, building this bowl is one step towards the future. With this bowl we will be producing steam for cooking, but eventually the heat that you trap could be used for a variety of purposes such as pumping water, producing mechanical power, industrial process heating etc. One can envision the whole of our Industrial Zone running on solar energy...

"It is a question of orientation. Walk across an open field on a bright sunny day—you can feel yourself being roasted and scorched by the burning sun, or you can feel a great joy in the perception that you are being bathed in a powerful flood of rich golden energy!"

Wind Energy in Auroville

There are more than 30 windmills of various designs spread over the Auroville plateau for pumping water. Generating electric power through wind is somewhat stymied by the fact that Auroville does not always get the high velocity winds that prevail further south. Two wind generators, which under optimum wind conditions are capable of generating 4kW of power, are part of a hybrid solar and wind energy system that is being tested at the Visitors Centre. "But", says Robi, a local wind energy expert, "it is more likely that the actual output we get in Auroville will be as low as 0.2kW."

Windmills for pumping water have been designed and built in Auroville by Jean Pougault and other Aurovilians since the pioneering days. The early Cretan windmill, made of wood and cloth-sails, one of the first designs of Auroville, could

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During an interview one of the Mother's secretaries recalled, "Regarding coal and oil, the Mother said that both are fossil fuels and so, by their very nature, belong to a dead past. We should look for our energy requirements from things of the present leading into the future. Nuclear energy is obtained by breaking up the nuclei of atoms, and so, in its very principle, is a destructive energy, the force selected by the antagonistic Powers that try for the destruction of the world, the pralaya.

She said that one of the signs of the New Age will be when humanity learns to draw energy from above, from the inexhaustible source of the sun instead of from below by denuding the earth."

(Shyam Kumari, *More Vignettes on Sri Aurobindo and Mother*)

(continued from page 2)

still be seen until recently. Wind energy in Auroville got a big thrust in 1972 when five discarded windmills for pumping water were donated by the National Aeronautical Laboratory. These were overhauled and modified so successfully that two are still operational. In 1979, the first prototype high-output windmill was designed in Auroville and later led to new models being designed and constructed. Robi got interested in wind pumps when he wanted to install one at Gaia in the eighties... and this eventually led to his managing the wind-pump division of Aureka workshop.

Aureka and the AV55 Windmill

Aureka, in collaboration with CSR, designed the Auroville Multiblade Windmill AV55 in 1984. A market study done for the Government of The Netherlands in 1993 concluded that the AV55 wind pump is one of the most cost-effective

means of pumping water and is three times more efficient than other windmills in India. The AV55 wind pump has been subsequently included as an Excellent Example of Renewable Energy Applications in the European Community Joule project called "Power for the World—A common concept". "The design," says Robi, "evolved from the practical experience of Aurovilians gained in operating windmills for the last two decades. The AV55 can be used for pumping water from borewells as deep as 100m as well as for low-lift high-volume output from open wells."

"Aureka is not exactly a commercial unit" concludes Robi, "and this, coupled with the lack of skilled manpower and infrastructure, prevents us from expanding and extending our services to other parts of the country. Also, for a long time, unlike other wind pump companies, we did not receive any support for our efforts from the Government." The MNES finally included the AV55 wind pump in their

subsidy programme in 1995 covering approximately 30% of the cost of each installation. Since then, in the last two years, 33 AV55 wind pumps have been installed in other parts of India. Also, Aureka has recently built up a research collaboration in the field of wind energy with Eindhoven University of Technology in The Netherlands.

Future directions

Toine van Megen, who is part of the Renewable Energy Group in CSR, formulated an energy policy for Auroville where all its requirements would be met from renewable sources. Says Toine, "Basically it would work as follows. Smaller local loads (individual houses and small buildings) would be met mainly from decentralised solar energy with grid backup if required; medium-sized loads (community buildings, domestic pumps, etc.) would be met from centralised solar plants, biomass systems and hybrid systems which are grid connected so that power generated in excess of our requirements is not wasted and is fed into the grid. The grid would act as a backup system. Larger loads (industries, pumping stations, etc.) would be connected to the grid, but the power consumed by these loads would be generated by our wind turbines, to be installed in one of the windy areas in the south of Tamil Nadu." CSR is working towards these goals by planning diverse projects—which are at various stages of conceptualization—for making further use of wind and solar energy. If favourable winds continue to blow... then it is possible to envisage in the near future that much of Auroville

and the surrounding villages would be powered by clean renewable energy. But such a renewable energy program would require the support and commitment of the whole community and not just a few dedicated individuals.

Some projects in the pipeline

- ❖ A wind farm project in southern Tamil Nadu that would meet all the grid-electricity requirements of Auroville and sell the excess back to the State.
- ❖ Designing a smaller model of the AV55 windmill that would be more cost-effective than other small windmills currently available in the market for promotion throughout India.
- ❖ Conducting a workshop for windmill manufacturers in India to demonstrate and disseminate technology for manufacturing windmills.
- ❖ Promotion, installation and maintenance of gasifiers or bio-mass generators in Auroville and in the surrounding villages to provide energy for small-scale industries and the like.
- ❖ Electric vehicles—cycles, mopeds and buses—in the City of Dawn.
- ❖ The setting up of an Energy Service Agency for the promotion of renewable energy in all the four southern states of India.
- ❖ A research/demonstration project to operate a solar photovoltaic system with concentrators of a total capacity of 48kW.
- ❖ A research and demonstration project, funded by the E.C., to operate co-generators with sterling engines.

CHAMANLAL GUPTA ON SOLAR ENERGY:

"A spiritual community cannot be unsustainable, can it?!"

Chamanlal Gupta, who joined the Sri Aurobindo Ashram in 1967, is recognised nationally and internationally as an expert on solar energy. He is a frequent visitor to Auroville, having helped Aurovilians over many years in the development and installation of renewable energy systems. At present he is advising on the design of the solar bowl for the new collective kitchen.

At a recent function in Delhi, when the Centre for Scientific Research received an award from IREDA for being the best NGO in all sectors of renewable energy in India, Chamanlal also received an award for his outstanding contribution to promoting Renewable Energy in India.

"I became involved with Solar Energy by accident. I was in a research institution and when my boss put me in charge of the new Solar Energy lab I was too junior to be able to say no! Actually, in 1964 everybody ridiculed me when they heard I was doing research in solar energy: it had absolutely no national priority. I was about to stop my work in this field when, after presenting to the Mother a solar hot water system for use in the Ashram, she wrote me a message: "Blessings for effectiveness". This gave me the strength to con-



Chamanlal Gupta

tinue.

"This is only one of the indications that the Mother was in favour of renewable energy. Other indications are that in 1957 she already had a solar cooker, and a windmill and biogas system were oper-

ating in the Ashram, and in 1971, when I told her I wanted to do renewable energy (RE) research in Auroville, she was very happy and promised me money. The culmination of that period of research was Eco-house in Certitude, which was the first integrally-designed ecological house in the whole of Asia.

RE in Auroville

"In Auroville, there are all the elements of a sustainable community—RE systems, waste water recycling, appropriate building materials etc.—but Auroville is still not centred around sustainability. Auroville has come as far as it has on the shoulders of a few enthusiasts: the majority of Aurovilians are sentimentally attached to the idea of sustainability, but they are not prepared to organise their lives around it. In fact, the predominant image of Auroville for me at present is of motorcycles roaring out of Bharat Nivas!

"Yet Auroville, in comparison with the rest of India, has so much going for it when it comes to RE and sustainable living. Here people are well-informed, able to maintain things well, and money is not the huge problem that it is elsewhere. The problem is that old habits die hard, it takes time for renewable technologies to become established, and most people don't have the commitment to stick with

something if there are initial problems.

"However, I was VERY pleased that the Matrimandir solar power plant was inaugurated recently. Matrimandir has passed through many stages. There was the completion of the excavation, the finishing of the basic structure, the completion of the chamber, and the installation of the crystal—each one marked a definite material and occult stage. In my view, the inauguration of the solar power plant is in the same category because now, for the first time, Matrimandir receives its power from the sun. (Previously, the power for the lighting of Matrimandir came from the State grid. eds.) And since the Matrimandir represents, for me, the Truth of Matter emerging from the bowels of the earth to meet the descending Supramental Truth, the crystal now becomes, at night as well as during the day, the meeting-point of that descent and ascent.

"Finally, I'm as sure now as I was on the first day I came here that Auroville is the right place for developing renewable energy and other sustainable technologies. After all, a spiritual community cannot be unsustainable, can it?"

From an interview by Alan

The Housing Crunch

"The Auroville Housing Service is extremely concerned about the increasing number of Aurovilians without any financial means. We know that it will be very difficult for them to get decent accommodation before many years, because their situation is entirely dependent on the financial means of the community. The Auroville Housing Service can only solve the most urgent and the most serious cases, and this with the utmost difficulty. There are many cases pending..."

This is an excerpt from a recent letter written by the Housing Group. The urgency of the situation led AUROVILLE TODAY to look into the housing situation in particular, and development constraints in general.

THE BEGINNINGS

Once upon a time, land for housing was available aplenty in Auroville. For there were few people and they were encouraged to settle on and develop as much land as they could. Or for those who gave their time and energy to the building of Matrimandir, there were makeshift and yet delightful collective housing projects in keet at Aspiration and the Matrimandir camp. The times were tough, the land barren. In some places, there was no water or electricity. The living spaces, usually in temporary buildings, were often cramped. But there was a sense of community and no housing shortage.

In the seventies and eighties, things changed: permanent houses with individual garden space gradually became the norm. Auromodèle especially deserves mention here for it was intended as an experiment in housing and collective living that would be a model for the future city. The first houses in

Auromodèle were designed by Roger Anger, the architect of Auroville appointed by the Mother. However, the climatic and environmental factors of the tropics hadn't been taken into account in the design. Also as a collective living experiment Auromodèle did not succeed. The houses were too spread-out, the population density too low. Unfortunately, this pattern of development continued to be repeated in many other areas of Auroville.

In the nineties, however, many realized that if this trend of building detached houses were to continue, the city would not be able to house the projected 50,000 inhabitants. Construction of detached houses and especially keet houses in the city area was banned. It was decided that the Residential Zone would house 35,000 inhabitants and be divided into five sectors. Various architects were invited to build collective housing projects with a certain density of population for two of these five sectors.

In the meantime, the forests surrounding the city area, termed the Green Belt, had grown up. Some greenbelters, freed from the task of nurturing young forests, turned to other activities, and slowly, one by one, changed their falling keet houses for more permanent dwellings.

THE PRESENT

To the newcomers who arrive with no knowledge of this historical process, the message that Aurovilians are giving today is confusing and frustrating. Despite seeing many Aurovilians live in spacious houses with plenty of land around, they are being told that this type of accommodation can no longer be constructed in the city area. Furthermore, they are not allowed to settle down on just any piece of land. Their options are limited. Some of them take an apartment in the collective housing projects that have come up—Grace, Prayatna, and the ones that are still in the process of being built—Vikas, Prarthna, Surrender, Invocation, Arati. Others, who refuse to live in a collective housing project, have the option of finding a place to build in an existing community—a nearly impossible task—or starting a new community on the fringe of the city, or building in outlying areas such as Djaima, Auromodèle or New Creation.

DEVELOPMENT CONSTRAINTS

Here we list some of the factors that presently frustrate town-planning and development in Auroville.

Non-availability of land and water

How does one plan for a city when all the land needed is not yet bought? This is undoubtedly our biggest challenge. Without the land, it is impossible to lay

roads, pipelines for water or transmission lines for electricity along future roads. The road network into the first two sectors of the Residential Zone, for instance, is blocked as a major plot of land is not available for purchase. One consequence of the non-availability of land has been that the infrastructure and houses have been built spread out on available pieces lying far apart. The result is a lengthy network of dirt roads all over the Auroville area, that is expensive to maintain.

"Buying land," says the Land and Estate Management Group which has only limited funds at its disposal, "is not just a question of putting your cash down. We have to be very careful about what we buy and where... every move we make has an effect on the land prices."

Scarcity of water in the region is another serious constraint to development in the Residential Zone. Existing wells are fully used. Water harvesting systems need to be developed further.

Lack of Planning

Two bodies in Auroville, the Development Group and the Planning Group, are supposed to collaborate to plan for the city's present and future needs. But the roles that these two groups currently play is woefully inadequate and somewhat confusing.

The current composition and term of office of members of the Development Group is not clear. It also has no clear mandate from the community as members are self-appointed or nominated by friends. Representatives seek to protect their interests instead of fostering development or even issuing guidelines for development. By and large the only role that the Development Group plays is to review individual projects and accordingly grant or withhold building permission.

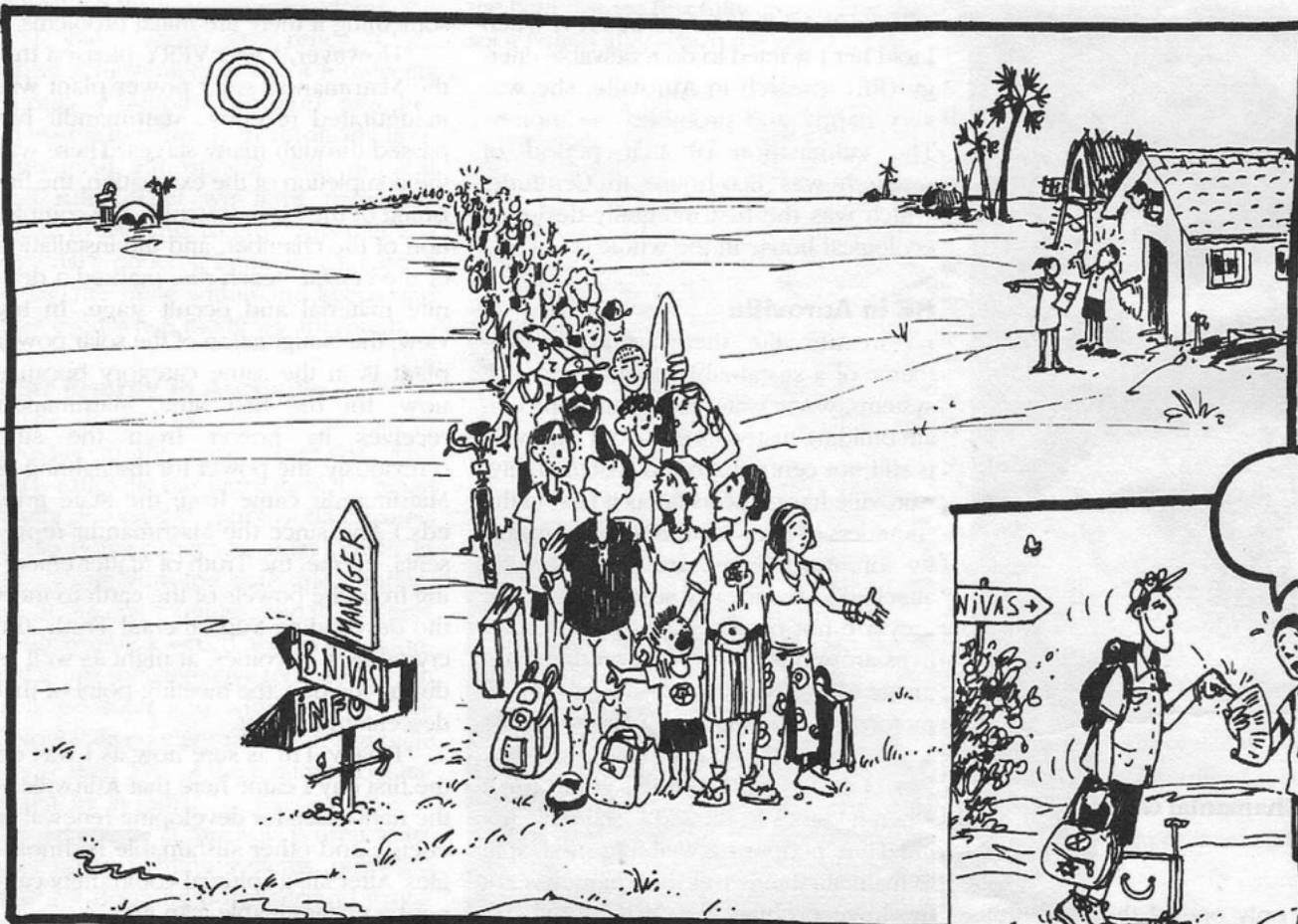
The Planning Group consists of members who are part of Auroville's Future, the town-planning service that was started by Roger Anger. Their plans have also been criticised by many in the community for not sufficiently taking environmental factors and ground realities into account.

One architect complains, "A proper Development Group would profile the needs, the housing density, the types of housing, the financing systems, and the logical sequence for building infrastructure. They would prepare the design brief for the architects based on Auroville's present needs and the needs for the next five years. At present, the architects are forced to be developers without access to the information, finances or cooperation from the existing Development and Planning Groups."

Auroville desperately needs a team of professional town-planners, architects and environmentalists who can work full-time to formulate a good developmental plan for the city and implement it in a sustained manner.

Pressure on the Green Belt

The Green Belt is envisaged as



"Are invited to Auroville all those who thirst for progress and aspire to a higher and truer life"

CARTOONS ON
THESE PAGES BY
EMANUELE



The Housing Crunch (contd.)

a green zone of farms and forests around the city that will act as the lungs of the city and as a buffer between the city and the outside. The Green Belt is still far from being a continuous zone—the majority of its lands have still to be bought and a major section of it, including Certitude, Samasti and Sharanga, is purely residential. Michael Mason, a forester and a member of the Green Belt group, notes that “nowadays because of the restrictions imposed in the city area, people who want to build a house with a garden tend to look to the Green Belt... but the quiet, rural atmosphere of the Green Belt will be lost if this is allowed. Small as they are, our young forests harbour jackals, civet cats, monitor lizards and a wide variety of birds. They are becoming rich and beautiful areas and we want to protect them.” For this reason, the Green Belt caretakers a few years ago published guidelines restricting individual electricity connections, the use of agricultural chemicals and polluting machinery, and settling in the Green Belt for purely residential reasons. But it must be noted here that a population density for the Green Belt has not been determined and, perhaps like most other individuals, communities and groups in Auroville, the Green Belt caretakers are also known to be biased in their views about who is allowed to build there.



Financial constraints

A recent survey and report presented by the Housing Service declares that many people are in need of proper housing in Auroville and that there are no sources of capital to build permanent or “pucca” houses for all of them. The Housing Service tries to help houseless people to find accommodation. All housing transactions in Auroville are the responsibility of the Housing Service. Also, the Housing Service tries to collect 10% of the total building cost from each house that is put up in Auroville and uses this capital to fund new houses or repair existing ones. But the requests that come to the Housing Service for help far exceed the funds they have.

Their report seems to hint that the Entry Group policy of continuing to allow people to enter the community with insufficient funds is to be blamed for this

shortage in housing. Shraddavan of the Entry Group however disagrees. “Almost all the the new housing that is being built is financed by newcomers. And Auroville’s problems will only be solved by growth, not by stagnation. What the Housing Service hints at but does not say openly is that many Indian newcomers do not have the resources to afford the kind of accommodation that is presently almost all that is on offer.”

There are many Aurovilians, including Indian newcomers and young Aurovilians in the age group of 20 to 35, who cannot afford the apartments that are being put up today. There is no possibility to obtain a mortgage or to rent a place. A mortgage is not possible as an Aurovillian cannot own a house or a piece of land in Auroville—all immovable assets belong to the Auroville Foundation who holds them in trust for “humanity as a whole.” Renting a house is equally not possible, for those who depend on receiving a maintenance allowance from the community as such a maintenance barely covers the basic costs of living.

For many people this creates an impossible situation. Where in the world are people expected to pay for a house up-front—which they won’t own? And how can we ever expect young people who have never had the chance to earn money to put down a large sum for a house? Serious thought has to be given as to how to finance accommodation for

them. The financing of housing complexes, which should include small apartments for temporary occupation by young people, has to be given the utmost importance.

Lack of an enforcing authority

Auroville relies on the goodwill of its residents for its functioning. None of the existing groups have the power to enforce decisions or any guidelines that are put forth by the community. Decisions of the Development Group and the guidelines of the Greenbelt Group have been, on occasion, flouted with no consequences whatsoever to the offenders. This encourages others to ignore guidelines as well, which in turn causes frustration in the community and hinders planned development in Auroville.

THE WAY FORWARD

It is clear that we cannot continue development in this so-called “organic”, haphazard way where individual whim rather than a concern for the community as a whole facilitates or hinders projects. A lot has been accomplished in Auroville because of individual will and determination. But, for the next step, we need to come together to share a single collective vision of the future development of the city. This will be Auroville’s greatest challenge.

Bindu

A couple of years back when various collective housing projects were proposed, it was a gift from heaven for many. Aurovilians, and newcomers in need of housing bought into one or the other of the projects. From cheap utilitarian “Leg-aums” in Vikas and studios in Surrender, to the palatial apartments in Invocation, there seemed to be a house designed to suit every kind of budget. There was a lot of goodwill and trust. Many Aurovilians were happy that they could have a decent place to live without spending their time and energy in the cumbersome building process. Today, however, the prices of all of these apartments has almost doubled. And a number of clients, who put in all the money they had and still do not have a finished apartment, are totally disheartened. Some had no choice but to withdraw from the project and, with no alternative on the horizon, now face more years of homelessness.

AUROVILLE TODAY spoke to architects about what makes the building process so uncertain and difficult.

Traffic and trees. Aesthetics and accountability. Funding and friendship—these are some of the topics that came up in our talk with the architects—Helmut, Andre H., Raman, Rolf and Suhasini. All of them are frustrated at the moment. Projects are stymied by dissent, poor supervision and lack of money. Criticism is easy and emotions run deep. Identifying areas of concern which all four hold in common is easy.

A lot of agony, not much ecstasy

The architects' views on building in Auroville

The obstacles, which are all linked with each other are capital, trust, and accountability.

Capital

Cheap housing is not cheap anymore. People are expected to pay Rs. 4-6 lakhs for individual quarters and Rs. 9 lakhs or more for family quarters. We’re talking here mostly about apartments with kitchens, baths, a terrace or two.

When additional money is requested, clients wonder “Who’s responsible? Who cares?”

What’s making it so expensive? A lot of the cost is in infrastructure—water, electricity connections, roads, landscaping. Labour accounts for almost 50% of the costs—18% higher than Pondy because we pay better for less and we provide more holidays, sick leave, bonuses and other benefits. As one architect put it, it is partly our guilty conscience lest we foreigners be thought of as exploiting local labour.

Coupled with this is a lack of a solid funding base. In the rest of the world, this means support from industry—an industrial base in any city insures a cash flow into development—but in Auroville we lack this base. As one architect puts it, “Today Auroville is not a capital-rich place where we can invest for the future.

We should be building for about 150 people per year, and each of these people should be investing about thirty thousand rupees [\$ 850] for infrastructure. But we don’t have that kind of money. Even on a loan basis, given the absence of private ownership in Auroville, who can give the financial guarantee for the loan to the lending agency?”

Trust

There is a lack of trust between the architect, the contractor and the client. Architects often find clients fussy who, even with a small amount of fixed capital, want a custom-designed house. Contractors have been known to complain about architectural drawings that are not properly done or not done in time, something which also adds to the costs. The clients find that estimates are poorly drawn up and sometimes totally unrealistic. Then, when additional money is requested, clients wonder “Who’s responsible? Who cares?”. Which brings us to accountability.

Accountability

Often the work has to be re-done. Who pays? The client, of course. There’s no “legal” way in Auroville to force a recalcitrant contractor to pay up for his mistakes. Without insurance, or even a fixed price contract and an agreed code of building standards, it is “build at your own risk”. As a client, then, it would be important to talk this over before you start. What happens if there are mistakes, gross miscalculation, huge delays—who

pays? The architects say they can put aside some money for contingencies, but then they have to charge more at the outset. Without a percentage as a breathing space, according to one architect, they feel “strangled”; trying to keep prices down at the insistence of those who have little money to spend, there’s nothing left over for emergencies. And, inevitably, there are emergencies.

Lack of proper site supervision often leads to theft and this also drives up the price. Ways of stealing from a construction site range from the mundane (put some cement in your lunch pail) to the spectacular (boldly arrange for a lorry to come and just cart stuff away unchallenged).

The problem mostly stems, agree all the architects, from the fact that many contractors here don’t know their work. “The contractors we have,” explains an architect, “are all local ones that have learned their work on the job. The management aspect of this job requires organizational skills that they have never been taught because there was no one to teach them. What happens is that architects end up doing more than their job should entail. They end up doing supervising, some financial management, and the logistics of moving the workers around. An architect uses all the time that should be spent planning and coming up with more interesting architectural solutions on jobs that should actually be done by contractors and developers.”

Jill and Bill

MARVAL'S ROAD TO AUROVILLE

"So I asked Paris for another extension"

Why did I come? What am I doing here? How do I feel about Auroville??? I often ask myself these same questions. They remind me, too, of the tourist who, standing next to the Eucalyptus grove and looking around curiously, asked me, "Excuse me, can you tell me where Auroville is?"

My path to Auroville started long ago, without my knowing it: I'd been doing T'ai Chi for years and had been going to retreats at Thich Nhat Hanh's Plum Village in southern France; I was already doing sitting and walking meditations; I had done research on the connection between eastern philosophies and western psychotherapies for my degree. I was "looking for something" and looked in some very obscure corners as well (Saharan camel safaris with the Tuaregs, parachuting off Alpine cliffs, seeking out remote corners of France and Austria on enduros, climbing mountains, running marathons, travelling...)

I had never heard of Sri Aurobindo, the Mother or Auroville, but the path leading me here was not accidental. At a certain moment in my life, a series of events and connections with certain people led directly here. Many obstacles fell away with very little or no effort on my part. Doors leading to other interests closed. My three children are grown and on their own: David does the computer-end of pollution control, Phil does something cutting-edge with computers at MIT, and Annie works in advertising and mothering.

Three years ago, I sent a job application with a friend of a friend who was visiting Auroville, asking her to show it to "someone in education" and Transition responded with an invitation to teach for an academic year, in trade for room and board—a far cry from the impressive salary I was earning at a private school in Paris... But I accepted, very few questions asked, and, without regret, I stored my fancy sports car, big motorcycle, ten-speed bicycle and various possessions in friends' cellars and garages. All alone for the first time in twenty years, with one suitcase, a backpack, and my laptop, I set off for India—and whatever lay there. In retrospect it seems strange that I didn't have a million questions for information about India and Auroville and, yet, I felt I was embarking upon an adventure that was right for me.

When I got here, I felt "at home" right away and threw myself into finding out as much as I could. I read everything I could get my hands on about Sri Aurobindo and Auroville and found the "something" for which I had been looking. I immediately joined the Savitri Study Circle and continue to find this epic poem one of great delight and inspiration for me. I also read about the Hindu mystics, Indian culture and travelled all over Southern India and Rajasthan and Goa; I grew to love India, a land of contradictions and surprises and diversity, an

eclectic patchwork of assimilated bits and pieces, a rich pandemonium of languages, music, spirituality, generosity, culture, art, traditions—and rubbish, gender discrimination, corruption, castes and strange driving patterns...

In Auroville I was disappointed to find that all the "evils of the west" were also abundant: I found an incredible amount of gossip, greed, power plays, big egos, bureaucracy, politics, elitism, selfishness, conflict and "pidgin" English—and was sad to find, as one guide book stated, that "the Utopia had failed..."

It didn't take me long, however, to feel something else, too, the strong force that exists here—and that's when my feelings about Auroville began to change. Underlying all the imperfections is a sincere conviction of the possibility of a collective life, unity, harmony and the evolution of Humanity—and a devotion to the ideal. Many other things brought me joy as well: a group of really open, supportive friends, greeting people all the time, closeness to nature, the feeling of earth under my feet, the magical play of sunlight, amazing synchronicity in daily occurrences, the sound of the bamboo and frogs and the pelting of monsoon rains, the atmosphere at the bonfires, the Green Belt, the easy pace, the freedom from convention, music, the flowers all over, huge "houseplants" growing wild, big colourful butterflies and unbelievable birds, insects and snakes, mongoose families sneaking across the road, butter and milk fresh from the cow, coconuts and papayas fresh from the tree, vegetarian foods, massages, the sun, the beach and the ever-changing Bay of Bengal, sitting in the chamber, playing scrabble, alternative medicine partnered with allopathy, availability of modern technology And in India there is a surprise everyday.

Teaching at Transition School became a real joy, instead of a "job". The work there is similar to other schools where I've taught, but the atmosphere at Transition is supportive, relaxed, appreciative and professional; there is a deep commitment and concern for the individual child and the community and the teaching team. A different value is placed on time so it is not stressful to work there.. And I can do it with bare feet and shorts!

For the first time in my life, I have Time! Time to sit, Time to reflect, Time to enjoy the moment. What a luxury! I am



As the first academic year came to an end, I found myself dreading the dinginess, stress and smallness of Paris life and asked for (and was granted) another year's leave of absence from my school in Paris. And the following year, I found it again impossible to leave. I realized that every day, something made me think, "This is the life! This is the way life should be. The 'real' world may not be the way it is supposed to be..." so I asked Paris for another extension.

Now, again, I am facing the same "annual dilemma" and by February I must decide. But this time, I have another grandchild arriving in the spring... and my daughter says it's time to take on some of my "grandmotherly chores..." I used to plan these things well in advance but have learned to be able to "let it happen" and I always seem to get clear directions.

*A touch can alter the fixed front of Fate.
A sudden turn can come, a road appear.
A greater Mind may see a greater Truth
Or we may find, when all the rest has failed,
Hid in ourselves the key of perfect change.*
Savitri II.X.

On the spiritual level, I appreciate the value placed on the spiritual and meditative dimension of life and am exploring my own path. I am continuing to practise living simply, detachment, compassion and delight—and trying to find the Divine in myself and others.

In doing so, I hope I am contributing in my small way to the evolution of a new Humanity—a *raison d'être*, full of pleasure and meaning for me.

Marval

living in the present moment at all levels: on the physical level, I cycle everywhere, ride horses regularly, do T'ai Chi and body awareness exercises. On the mental level, I read, teach, go to classes and discussion groups, learn constantly. On the vital level, I am learning more about myself, expressing myself through painting and poetry, going to musical and theatre productions.

Invocation of Peace

*Peaceful be the heavens, peaceful the earth,
peaceful the broad space between.*

Peaceful for us be the running waters, peaceful the plants and the herbs!

*Peaceful the firm mountains be to us,
peaceful the victorious Lord of the atmosphere,
the Infinite peaceful to us with its laws.*

*Peaceful to us be the signs of the future,
peaceful what is done and undone,
peaceful to us be what is and what will be.*

May all the Gods grant us Peace.

By this invocation of Peace, may Peace be diffused!

*By this invocation of Peace
may Peace bring Peace!*

*With this Peace the dreadful I now appease,
with this Peace the cruel I now appease,
with this Peace all evil I now appease.*

*To the Heavens peace, to the shy and the earth,
to the waters be peace, to the plants and all trees,
to the Gods be peace, to Brahman be peace,
to all men be Peace!*

Peace also to me!

(This text was sent to AUROVILLE TODAY by a friend on the occasion of the end of the year. We wish to share it with our readers as it surely is a powerful invocation for 1998 too! From a translation by Raimundo Panikkar and David Frawly of the Atharva Veda and the Yagur Veda.)

Last year we published

THE MONSOON

X-mas approaching, no-one can

Mauna's poetical report on the endless rain that poured down during the monsoon—we didn't think it could get worse. However, this year Auroville—and Tamil Nadu as a whole (see adjoining box)—suffered almost double the average rainfall for the year, of which 75% fell within the monsoon time. The monsoon this year started on the dot, and at the time of writing (with

predict how and when it will end... Auroville roads have suffered badly, and some buildings at Bharat Nivas got flooded. As a consequence we'll have to do without our precious Library for some time till it has found a new location, as the floor has partially collapsed. The Centre for Indian Culture and Nandini/Freestore buildings have had to be vacated and cleaned.

Monsoon facts and figures

Rain figures for 1997 in centimetres (based on data provided by Navoditte, Jaap and Alan)

January	1.7
February	0.0
March	0.0
April	3.5
May	2.0
June	0.8
July	14.0
August	23.5
September	4.5
October	32.0
November	76.0
December	57.0
TOTAL:	215.0

NOTE: The average annual rainfall in Auroville is approximately 125 centimetres. The total this year is, as far as we know, the highest recorded since Aurovilians began systematically measuring rainfall in the early 1970's.

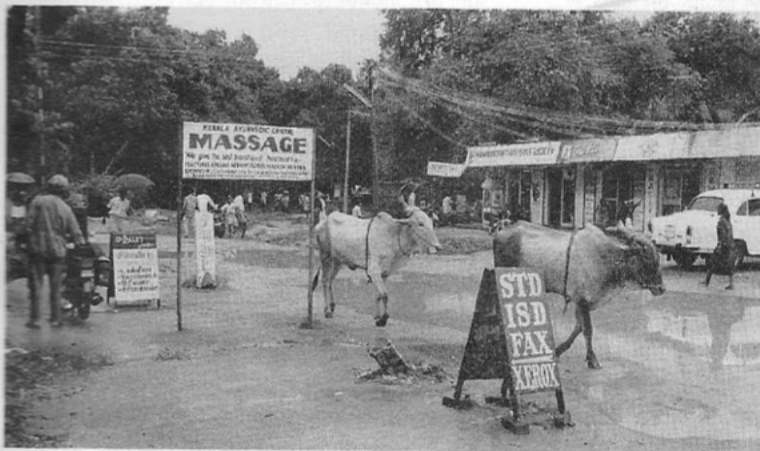
During the official monsoon period (15th October - 15th December), it rained on no less than 40 days. The heaviest rain was on 6th December: 22.5 centimetres.

MONSOON DAMAGE ESTIMATED AT RS. 176 CRORE (\$44 MILLION)

"Tamil Nadu has received bounteous rain during the current North East monsoon with copious supplies to irrigation and drinking water sources. The rains have also caused extensive damage to roads, bridges and other infrastructure in 10 districts, totally estimated at Rs. 176 crores, besides loss of life and private property. Incessant rains and flash floods in the districts during the period between October 1 and December 7 have taken a toll of 207, the break-up being males 82, females 72

and children 53. As many as 9,000 huts have fully collapsed and 38,000 partially. Nearly two lakh hectares of agricultural crops including 1.9 lakh hectares of paddy are under water in the delta and non-delta districts and assessment of the damage caused is being ascertained. All the districts in the State under the influence of monsoon have experienced more than normal rainfall during the period between October 1 and the first week of December."

From: *The Hindu*



Kuilapalayam during the monsoon

Boom Town Kuilapalayam

There were always the rudiments of a nice downtown corner in that area of Kuilapalayam village where the main road passes through to Aspiration. You had the small ayurvedic massage parlour and a couple of run-down grocery stores where Aurovilians could buy cigarettes but not much else; a tailoring service and a photocopying service owned by villagers but with pretentious names like "Aurodass Tailor Mart" and "Auroxerox". Then

somebody went a step further and put up a round-the-clock phone booth with a bright sign that proclaimed itself the Auroville phone booth. This caused a flurry of protest from the actual Auroville Telephone Service who were then finally motivated to move their back-lane booth out to a better location and offer a better service. But the copy-cat phone booth still corners most of the lucrative market of foreign visitors, and has an edge in that it has now

extended its services to include fax (using of course the same telephone line) and photocopying services.

One bright Aurovilian caught onto the idea of quick money and put up a bright new handicrafts store. Another Aurovilian who runs a Taxi Service occupied the store next-door, parking all his taxis right in front, close to the ever busier road. But nobody bothered about improving the road that runs through this boom town, which in the monsoon turned into a small lake, and big, shady tamarind trees have been cut down to make space for all this development. The latest addition is a new Tamil-style hotel with those ubiquitous sea-green tiles, that sells you those delicious, flaky parathas (south-Indian bread) with spicy curry. Let's hand it to the villagers, guys, they have more business sense and better ideas of development than us. With its lights and sounds carrying well into the night downtown Kuilapalayam, within the space of a few months, looks more like a city than does Auroville after 30 years.

Bindu

Book Review

It sometimes happens that one chances upon a small jewel, casually hidden amidst ordinary things. One of those jewels is the book *At the feet of Mother India*, a compilation of poems, writings and speeches—illustrated with photographs—written by India's great souls on Bhawani, the Mother of India.

Sri Aurobindo, The Mother, Ramakrishna, Vivekananda, Shankaracharya, Subramania Bharati, Rabindranath Tagore, Bankim Chandra Chatterji: they all paid homage to the Great Mother. It is a joy to read and reread their inspiring words, and to let the mind sink into silent contemplation. The beautiful photographs of Olivier Barot, which tell a tale of India in their

"IN THE LAP OF THE MOTHER THE SOUL SEES"



own way, serve to enhance the pleasure of listening to the chants of the sages on the infinite glory of Mother India.

The book is published by Editions Auroville Press International, the second title in the Vande Mataram series, as "token, on behalf of Auroville,

the city of Sri Aurobindo, of our gratitude for Her love, Her guidance and Her caring—for is it not said in the Rig Veda that, 'in the lap of the Mother the soul sees'?"

Title: At the feet of Mother India Auroville Press, pp.59, Rs.245 (postage and packing charges extra).

UNDERWATER EXCAVATION OF DWARKA

Krishna, according to the Mahabharata, lived in the fabled city of Dwarka, the city that was submerged by the sea shortly before he left his human incarnation. Indian archaeologists now claim that they have found the remnants of that city under the waters of the Gulf of Kutch, nearby present day Dwarka on the west coast of India. Recently Aurovilians were given a treat by Dr. S.R. Rao, one of India's foremost marine archaeologists, who showed a video and lectured on the finds at Dwarka and their historic

importance. Dr. Rao, who earlier in his career had discovered fifty Harappan sites in Gujarat and who deciphered the Indus script, argued forcefully that the finds prove that the well-known theory of the Aryan invasion has no basis in reality and should be scrapped from the textbooks on Indian history. Another video showing the ongoing underwater excavations of the ancient city of Poompuhar on the east coast of India proved that more of India's history is submerged than was originally thought.

Carel

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BY AIRMAIL
BOOK POST

AUROVILLE TODAY

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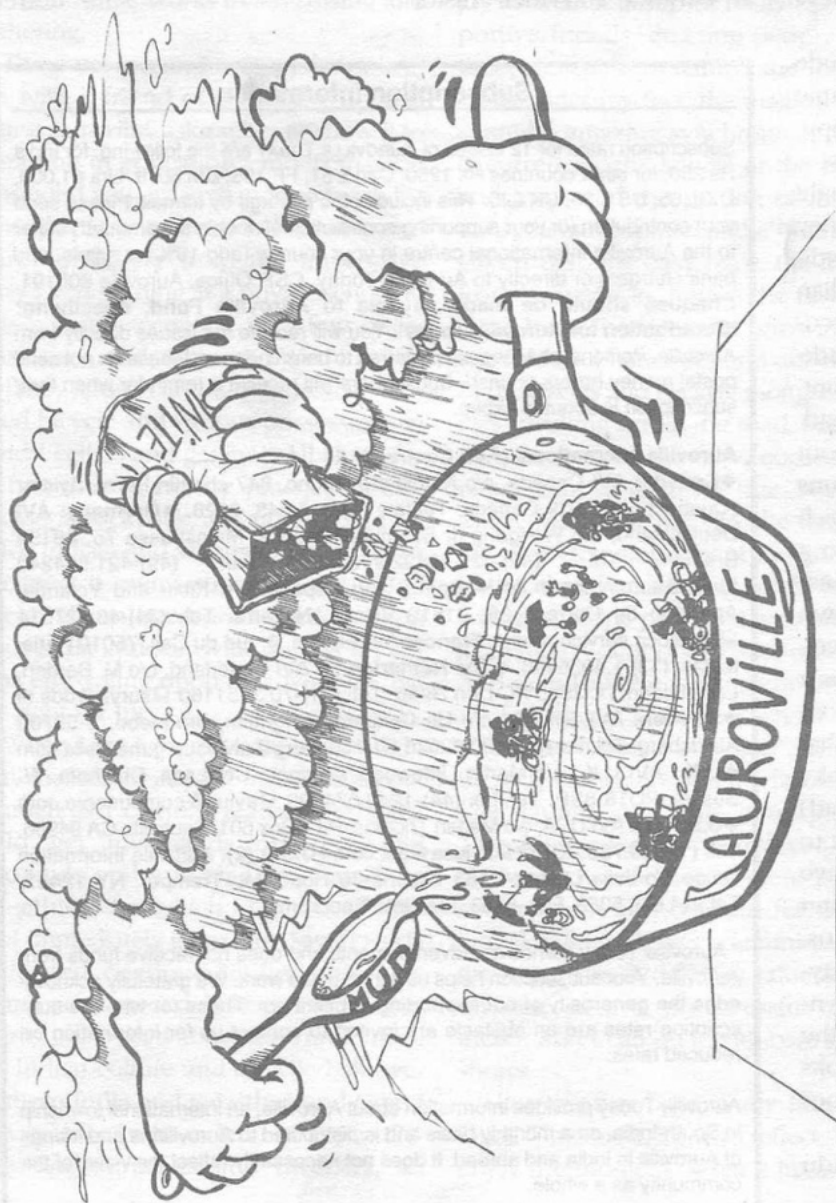


IN THIS ISSUE:

- A DECADE OF RENEWABLE ENERGY
- THE HOUSING CRUNCH
- A PERSONAL STORY
- IT WAS THAT KIND OF MONTH...

AUROVILLE ARCHIVES
C/O KRISHNA T.
BHARAT NIVAS
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CARTOON BY EMANUELE

Monsoon...

It was that kind of month

Alan describes how monsoon-watching can become a spectator sport

In spite of farmers' and tree-planters' concerns that the El Niño effect would result in a drier monsoon than usual this year, the total rainfall in Auroville in November alone was over 80 centimetres, more than twice the average for the month.

As the guide book dryly puts it, "In November, it often rains in south India". "Rain". Such an innocent little word, the soft syllable conjuring up images of gentle showers swaying across clipped lawns. Here, however, it is a little different. You are far from shelter, the clouds approach, the skies darken. Within a few seconds the rest of the world disappears behind a grey flannel curtain of water, your clothes are cling-film, your mind silenced by the cranial percussion, while you slither and slide on the viscous sludge that's suddenly formed beneath your feet.

In other words, the best place to be during a monsoon downpour is undercover. Preferably overlooking a stretch of busy road. Because then monsoon-watching becomes a spectator sport *sans pareil*.

But let me explain. The condition of the roads in Auroville run the full gamut from bad to unspeakable. One of the latter runs (or collapses) from Kuilapalayam village down to the beach road. After years of negotiating potholes and rift valleys on this bone-jarring ride to the sea, everybody was happy to note, some months back, the appearance by the roadside of neat piles of "blue metal"—razor-sharp granite chips used in road surfacing. However, as week succeeded week without any further hint of road restoration activity, these lethal little chips started spreading across the road, skidding cycles, lacerating tyres and generally making the fortune of motorcycle Mani, whose repair shop is strategically located at the foot of this assault course.

After the first major monsoon rains, and the transformation of this road into a slither of knee-deep Flanders mud, somebody of a humorous disposition in the local panchayat saw an opportunity to have some fun. Thus, one wet morning a palmyra tree strewn across the top-end of the road casually announced that road surfacing work had finally begun.

Now road surfacing in the tropics is a vast topic, with its aficionados and competing schools of theory and thought (the deconstructivists appear to hold the upper hand at the moment). The local orthodoxy, as I dimly understand it, is this. A substrate is laid of red earth. This is then moistened and the blue-metal chippings spread across it. A heavy roller is then used to pack the chippings into the earth. It then dries out and there's your new road... for the next few days.

In the particular case of the Kuilapalayam-Chinnamudaliarchavadi National Highway, however, the substrate was already 45 centimetres of glutinous mud, which meant that the blue-metal immediately disappeared into it like chocolate chips into porridge. The road-roller managed to squelch some of the mud to the roadside, exposing some of the venomous little chips, while the next rain only succeeded in reducing the partly-compacted surface to the consistency of a skating-rink.

The best place to enjoy the ensuing fun was outside the Auroville bakery. Here you could stand, hot cake in hand, and watch Aurovilian motorcyclists, laden with gas bottles and shopping and disguised as mobile mud patties, des-

perately trying to negotiate the treacherous bend while avoiding assorted cows, goats, lorries, carpenters on permanent tea breaks and jovial road construction crews. The spectators awarded points for style and speed: a controlled skid through the chicane formed by wrecked or incapacitated vehicles was always greeted by prolonged applause.

After a few days of this, the telephone service people—who always enjoy a good joke—decided to liven things up. If you skidded off the road before, the worst that could happen would be that you encountered a tree or made an unforeseen visit to New Creation Corner. Now, however, came the decision to lay new telephone cables, and suddenly miles and miles of deep trenches began appearing by the roadside, dug by men with extremely sharp pickaxes and an extremely dull sense of where the existing telephone cables and water pipes were located.

This added a whole new fun dimension to the game. Imagine the scene. You've gone—for some unimaginable reason—to Pondy in the monsoon season and you're returning in the rain. Night falls. You see nothing in the murk, but somehow you manage to avoid the potholes which swallowed those trucks last week, you slither and skid up the new road to Kuilapalayam, you negotiate, to scattered applause, the Bakery corner. Heaving a sigh of relief, you prepare to turn into Fraternity. BUT YOU'RE NOT HOME YET. Because there in front of you, spanning a bottomless trench which has been dug since you left, is a greasy four-inch plank which you must drive across to get to your house. You position the front wheel, shut your eyes, repeat the mantra and slip the clutch... Believe me, until you've tried this, you've never really lived.

In other words, this is that time of year when the cosmic forces of disorder and entropy, which never exactly go on holiday round here, gather themselves for something of a fling. This is the time when you run out of gas but no new deliveries arrive from Pondy; when your windmill develops an ominous wheeze but the engineer cannot reach you because your road is underwater; when your telephone ceases functioning; when your solar system batteries are so low that you go to bed at 8 p.m. Day after day of this wet porridge weather turns everything, including your synapses, mouldy, and everybody begins to slouch around with sunken, apathetic eyes, looking as though they've just emerged from under stones.

This year there was the added *frisson* of a serious cyclone warning. Fortunately we had an Aurovilian who had apparently been trained by the Civil Defence Corps to prepare the populace for a nuclear attack. His advice, in the event of a cyclone, was to unscrew all the doors and lie flat on the floor. This memorable instruction was followed, a few weeks' later, by an announcement in the Auroville News (which became increasingly illegible as the month progressed, finally resembling a piece of limp fungus) offering Aurovilians cut-price coffins made out of Work Trees if they ordered now.

It was that kind of month.

Alan