



**Auroville Centre for Scientific Research  
Auroville Water Harvest**

**The organisation of water in Auroville  
Luxury or necessity**

# Preface

*This report has been prepared in the context of an externally financed project analysing the organisation of water in Auroville and proposing a model for an organisation for water in Auroville. The initiative originated in the context of an integrated water management project for Auroville.*

*It is felt that Auroville is on the verge of a large jump forward: the purchase of land has resumed and the Masterplan will be developed in further detail. Under these conditions, there appears to be a need for coordinated initiatives in drinking water, rainwater harvesting and waste water in Auroville within the context of the Masterplan.*

*Vitens Flevoland (Hydron Flevoland before merging at October 1, 2006) initiating this project, is also financially supporting the Kottakarai project. Vitens Flevoland is also of the opinion that apart from the internal urge for such an organisation, also externally such organisation would help in coordinating applications for financial support for infrastructure for water management.*

*Vitens Flevoland delegated one of its staff (Eri Salomé) and contracted 2 independent international consultants Jeen Kootstra from the Netherlands and Israel Gev from Israel, both familiar with Auroville and its struggle with water resources) to carry out this project. The team was guided in Auroville by Gilles Boulicot, executive director of Auroville Water Harvest. Vitens Flevoland explicitly stresses that this project is carried out without any vested interest from her side in Auroville in particular or India more in general. It is merely from a genuine concern for a durable development of water resources both inside and outside of Auroville that this initiative has been taken. The Director of Vitens Flevoland, Toby Neumann, has been heading Auroville International in the Netherlands and has recently been elected as head of Auroville International.*



Project staff in Auroville during the mission in Auroville in September 2006. From left to right: Eri Salomé, Jeen Kootstra and Gilles Boulicot. Israel Gev did not participate in this mission.



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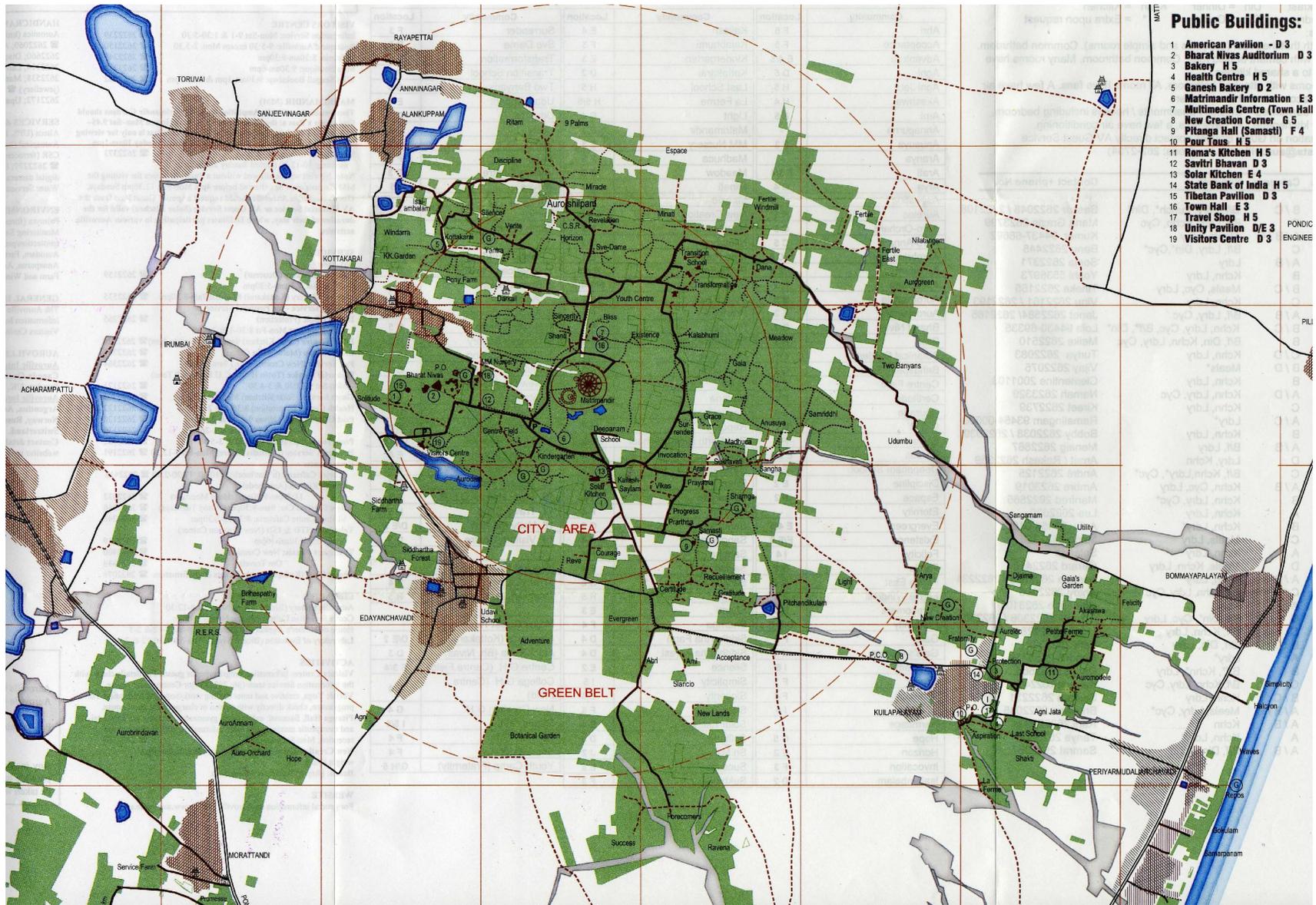
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[Picture Auroville plateau past]





Auroville map

## 1 INTRODUCTION

### *Water as source of life*

Since its inauguration in 1968, water has been one of the many pillars on which Auroville has been based. Water is the 'bringer of life'. It nourishes the thirsty workers, it binds cement, sand and gravel into concrete, it nourishes the thirsty trees and causes the trees to grow and provide shade. Auroville, as anything else, can not exist without water.

### *Looking back*

Before the foundation of Auroville, the area was barren due to the cutting of tree for firewood and overgrazing by cattle. Its surface was scarred by the rainwater flushing away the fertile topsoil and forming deep canyons. The eroded soil eventually reached the sea colouring it red as though the area was bleeding.

### *Water today*

At present the situation has completely changed: the plateau on which Auroville is located has been turned in a large green area. Everywhere initiatives have been taken, by individuals and groups, to develop measures to prevent rainwater from running off and cause land erosion. Rainwater is caught and guided to infiltration areas, tanks for irrigation purposes are rehabilitated, reuse of water promoted, all in order to reach a sustainable situation for all natural resources, including water.

### *Still far to go*

Sustainability in water is still far fetched. The situation in and around Auroville has been classified as critical in relation to the exhaustion of groundwater resources. The cause of this over-extraction is multiple:

- agriculture is using huge quantities of water;
- rainfall is barely more than the evapo(transpi) ration and with about 1250 mm per year within a few months difficult to 'manage';
- There is little water conscience amongst users.

### *Auroville not a good example*

Although most Aurovillians are very well aware of the situation, they use in average more than users in western countries let alone compared to Indian standards. On top of this, Auroville envisages a growth of its population from the present 2,000 to 50,000 in the final situation.

### *Auroville as laboratory*

Auroville has been recognized by the Government of India as a spiritual gift to the world. The initiatives and results in area as forestation, building technologies, renewable energy, waste water treatment systems and so on are highly appreciated and renowned. Auroville considers herself also as a laboratory and continues to innovate and develop.

### *Water organised*

The giant challenge for water management in a sustainable way in Auroville, now and in the future is only feasible under the guidance of a strong and respected water organisation. This Water Organisation will also have

to deal with the Indian Government at all required levels to prevent “mistakes” and to bring in the required knowledge of water management aspects in the discussions.

*But how?*

Water has been a focal point in Auroville for the last 4 years: the study by Harold Kraft in 2002, opposing reports from concerned Aurovillians in 2003 and a seminar on ‘sustainable water resources management for Auroville and its Bioregion’ in September 2004. From the waterconference, a pre-feasibility on water resources for Auroville and its Bioregion was started, a pilot project with an integrated approach for water management in Kottakarai was started. A self appointed ‘watergroup’ has been active in Auroville since 2004. It was this watergroup, supported by several others that signalled the need for the organisation of water in some way.

Vitens Flevoland (former Hydron Flevoland), a water supply company from the Netherlands, has taken it up to finance this initiative.

*Who is Vitens Flevoland*

Vitens Flevoland is a water supply company from the centre of the Netherlands. They provide annually some 19 million m<sup>3</sup> of potable water to over 300,000 private customers and 8,000 companies. Their director, Toby Neuman is the President of Auroville International Netherlands and has recently been chosen as President of Auroville International.

## 2 AIM OF THE PROJECT

The development of Auroville since its origin in 1968 has resulted at present in a city of about 1.800 inhabitants as the first step towards a final situation of a city of 50.000 inhabitants. In the beginning when the population was still small, strategy and goals were clear; choices for technical, economical and political solutions could be made in close consultation with all involved parties.

With increasing complexity the chosen solutions are not always unambiguous and do result inevitably in not well balanced elaborations as individual interest is not weighed in the context of the general interest for the best thinkable development of Auroville.

One of the main issues for Auroville is the serious deterioration of the “water situation” in the city and the bioregion. This has been recognized since many years, resulting in a lot of reports on this matter, and finally in the UNESCO-seminar in September 2004. The outcome of all reports and the seminar is basically the same: urgent action is required. This statement has been adopted on large scale by many inhabitants, and actions in this matter, of which part of it has started long ago, have been intensified.

But until now actions only result in technical measures, often elaborated individually or in small groups.

Lack of overview, lack of general planning, lack of a well defined goal and a road, leading towards it results in low consistency of the technical measures subsequently to

less quality solutions for the whole of Auroville and its bioregion.

The first serious attempt to get order in the Auroville water management has been presented in the pre-feasibility study “Water Management, Auroville Universal Township” (Ingenieurburo H. Kraft, February, 2003). This study has invited to a lot of discussions. The result of these discussions lead to a revision of these study, which is actually executed under supervision of Mr J. Kootstra. A comprehensive study on water management, to be adopted by the Auroville community, is urgently required.

But the environmental situation, especially for water, is deteriorating quickly. It is felt that immediate action is required while the studies are ongoing.

This feeling has been picked up by Vitens Flevoland, a Dutch water company, directed by Mr Toby Neuman (also closely related to Auroville).

For a proper coordination of all water management aspects within AV, in the neighbouring villages (actually a water management project is carried out in Kottakarai by aid of Aqua for All, a Dutch funding organisation) and to represent and to look after the interests of Auroville versus the Indian authorities, a water management organisation is absolutely required.

The aim of this project is to create support for the establishment of such an organisation within due time.



Overhead storage tank of the Invocation water supply system

### 3 WATER SITUATION IN AUROVILLE

#### 3.1 Water facilities

##### *Drinking water*

Auroville's water is provided by the community and is often organised per community. In the early years, groundwater was the only reliable source of water. Wells were dug where the water table was shallow and drilled where the water table was deeper. There was not much concern for planning of wells with respect to groundwater resources and centrally operated systems were not practical and unaffordable.

Water is generally provided to users in private houses or community buildings. The water supplied by the systems in the communities does not (always) meet the WHO standards of potable water. Some of the reasons are that:

- wells are not always closed;
- wells are not or have not been disinfected;
- storage systems fall dry or are not always closed;
- water stays in storage too long;
- distribution systems not being pressurised permanently and are leaking.

As a consequence, most households have purification systems at home. Some households fetch their water from

central purification units provided by Aquadyn<sup>1</sup>. These are the only public standposts for drinking water that are available in Auroville.

##### *Recycled water*

Water is recycled where possible. Waste water is virtually everywhere treated and reused for irrigation. In case the treated waste water is not used, it is allowed to infiltrate in the underground replenishing groundwater reserves. Any new building by rule has to have a waste water treatment or has to be connected to an existing facility for its waste water.

The use of separate grey water in house or in a community is nowhere practiced.

##### *Rainwater*

Most houses in Auroville have some sort of rainwater retention system. In several case, there is a channel around the house against crawling insects which is fed by rainwater. Also rainwater is collected in surface or underground storage tanks and used for gardening or irrigation.

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<sup>1</sup> Aquadyn is an Auroville unit producing highly sophisticated centralised drinking water supply units based on reverse osmosis and activated carbon filtering.

### 3.2 Water requirements

Population figures from the Masterplan or subsequent related documents issued by Auroville's Future, such as the Masterplan 2004 have been compiled and presented in the table below.

Zone	2008		2010		2025	
	Fixed	Variable	Fixed	Variable	Fixed	Variable
Residential zone	3,750		12,000	150	40,000	500
International zone	100		180	450	600	1,500
Industrial zone	300		540	3,000	1,800	10,000
Cultural zone	100		180	1,050	600	3,500
City centre	450		1,500	450	5,000	1,500
Green belt	300		600	0	2,000	0
<i>Total</i>	<i>5,000</i>	<i>2,000</i>	<i>15,000</i>	<i>5,100</i>	<i>50,000</i>	<i>17,000</i>
<b>Grand total</b>	<b>7,000</b>		<b>20,100</b>		<b>67,000</b>	

The spread of the population is not homogeneous. The city plan of Auroville has different zones each with its own density pattern. The main demand will be from the residential zone and the cultural zone.

General consumption figures from Auroville over 2004 and 2005 show an average consumption of 180 l/c/day, which is however not based on meter readings. At present, the total consumption is about 600 m<sup>3</sup>/day domestic water. Certain communities are using however much more water. For example, detailed water use figures from water meters

in Auromodel, show about 300 l/c/d for household use (data from Dirk Nagelschmidt).

The Kraft study has been based on 150 l/c/day as demand figure for household water, separated in 50% water of potable quality and 50% water from rainwater and storm water harvesting. The Auroville 2004 Masterplan assumes 200 l/c/d of which 130 l for domestic requirements and 70 l for gardening, construction etc. In the context of this study, a water supply figure of 200 l/c/d will be used.

The irrigation demand from Auroville itself is limited to the gardens and some small plots in the area. In 2004 and 2005, a number of 1,570 – 1,580 m<sup>3</sup>/day has been estimated for irrigation which is about 62 % of the total water production.

The irrigation demand for the future is difficult to estimate. Much will depend on the development of agriculture and irrigation and the habit of people in gardening. The 2004 Masterplan estimates about 10% to be used for irrigation of gardens.

Harald Kraft has made an estimate of irrigation requirement of Auroville in 2025 (50,000 inhabitants) at 7.9 – 18.9 Mm<sup>3</sup>/year based on 1,485 Ha green space. This is based on the assumption that:

- For parks and the green belt, the irrigation demand is determined as the precipitation minus run-off. Hence no additional irrigation is required;

- For gardens and irrigated areas, the irrigation requirement is estimated as the potential evapotranspiration.

The irrigation demand in the surrounding areas is off course much larger. Figures are currently being prepared from Harvest Water Service and will be available in a later stage.

### 3.3 Water organised

#### *The past*

Auroville's growth has been mainly organic and to a very limited extent guided by the Masterplan identifying a particular zone for residences. As such it is not surprising that a practical issue such as water is organised per community. Due to a lack of coordination from the start, there is no standardisation in well design, materials or equipment or tariffs.

#### *The present*

This situation still exists: water is organised per community that imposes its own tariffs, arranges its own operation and maintenance and decides how much water is used for what. This is working well at community level. Fees in general are based only on electricity charges and occasionally a small maintenance budget. There is no budget for repairs or replacement, these are paid when they occur.

At a higher level, Auroville has come to some sort of regulation. The drilling of wells is prohibited unless clearing is obtained from APDC<sup>2</sup>. A building permit for houses is only provided if a house is equipped with waste water treatment and disposal and rainwater harvesting.

#### *Failed attempts*

Some initiatives have been launched with respect to the organisation of water. A Water Service was launched in the 90's aiming to operate and maintain several systems as well as to take care of billing and payment. Due to a lack of budget, workmanship and motivation this Water Service failed. The failure of the water service caused an hesitant attitude towards an outside water organisation creating dependence from an organism outside the boundaries of a community.

#### *Small successes*

Due to the failure of the Water Service, one of the residents in the supply area (a contractor) felt obliged to intervene and take over. Rolf from Invocation gradually built up a proper functioning system with a healthy financial basis covering Invocation, Surrender and Grace. Some 80 households in these communities are now supplied from 4 wells.

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<sup>2</sup> Auroville Planning and Development Council, see also paragraph Annex 1.

### 3.4 Ongoing initiatives

Daily practice as described continues. As most Aurovillians are reluctant towards losing control of their water supply, there is no initiative towards a more centralised organisation or linking schemes from separate communities in order to share resources.

#### *Building stop city centre*

Meanwhile the lack of water has stopped further construction of residences in the centre area. The water supply scheme of Invocation is not capable of supplying more water. Water resources in the centre are scarce and the transfer of water from the Auromodele area where there is an abundance of groundwater to the city's centre is under consideration.

#### *Pre-feasibility study Auroville Water Masterplan*

The ongoing 'Pre-feasibility study to Auroville Water management' should give answers to how the water management in Auroville should develop in the coming years in the context and boundary conditions of the Auroville Masterplan. This study will be completed by the end of 2006 and is carried out under supervision of a self appointed water group and APDC.

#### *Kottakarai project*

Several other initiatives are ongoing, mainly in the direct surrounding of Auroville not covering the area of Auroville itself. The most important is the Kottakarai integrated water management project financed by Aqua for All and

Vitens Flevoland, both from the Netherlands. This pilot project covers all aspects of water (water supply, drinking water, sanitation, waste water, agricultural water use, solid waste management. All supported by a large awareness campaign.

### 3.5 Upcoming projects

Several projects are upcoming and are in different stage of formulation, submission for financing and approval.

#### *Kottakarai extension*

The pilot project in Kottakarai will be extended to some 3 more villages. As the Kottakarai integrated water management project is a pilot, some aspects may be changed. From small scale village level the project will jump to regional level. This may also require the construction of some superstructures such as interlinking village ponds, rainwater harvesting at regional scale, collective waste water treatment and solid waste.

#### *IAMWARM*

This project covers Tamil Nadu state and aims at improving efficiency in the agricultural sector, reducing the use of groundwater, improving groundwater recharge from rainwater harvesting and rehabilitating existing tanks and irrigation systems. The result should be an improving groundwater table and a growing concern for water resources and groundwater in particular.



Aerial photograph (Google Earth) with location of most relevant projects indicated and Auroville in the red circle.

#### *Pondicherry waste water*

At present, the Pondi waste water plant is treating some 13,000 m<sup>3</sup> sewage per day. The capacity of this plant will be doubled through UASB<sup>3</sup> and lagoons. The present effluent of this plant is infiltrating into the underground at a remarkable speed. It is unknown where this water is going to and how it affects the many boreholes and open wells in the area. As the effect of the sewage on the environment and the exact contents of the plant is not known, it can not be said whether the extension of the plant is a threat or a blessing. It certainly forms a matter for further investigation and if usable forms a considerable source of (irrigation) water for Auroville and the surrounding area.

#### *Kaluvelly Swamp*

The Tamil Nadu Public Works Department is seriously looking at Kaluvelly Swamp as a fresh water resource. Proposals are on the shelf to repair the shutters, construct bordering dikes along the swamp's borders and raise the water level. The swamp thereby is converted in a fresh water area and water can be piped to Chennai. Apart from the ecological effects of such measures, Kaluvelly may well be used as a fresh water resource for Auroville directly through a canal or pipeline or indirectly through groundwater recharge in the aquifers being used in the area.

#### *Buckingham Canal*

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<sup>3</sup> Anaerobic Upflow Sludge Blanket

Early September 2006, the Indian Union Government approved budget for the upgrading and extension of the Buckingham Canal from Kakinada up to Pondicherry. The route of the Canal is not yet known, but it is clear that the construction of such a channel will have a tremendous impact on Auroville and the urbanisation of the region on its eastern boundaries.

#### *Pondicherry Airport Extension*

Pondicherry is planning to extend its local airport for daily commercial flights to Chennai and other Indian cities. This would require extension of the runway, extension of buildings and improving accessibility from the east coast road and from Pondicherry.

#### *Nationwide urban renewal programme*

The Chief Town Planner of India has invited Auroville's Future to submit a proposal for urban development. The funds are only to be used for the city's infrastructure. The proposal has recently been submitted.

### **3.6 Auroville in the region**

At present Auroville lacks the internal coordination to open a dialogue to all these regional developments. Failing to do so on the long term will undoubtedly lead to solutions that are not favourable for Auroville or for the principles it stands for. A water organisation could speak on behalf of Auroville for the sector of water. Although this would be far from being enough, it would make a good start.

## 4 OVERVIEW OF THE DISCUSSIONS

From 7<sup>th</sup> until 18<sup>th</sup> August some 20 meetings were held with local authorities, regional authorities in Pondicherry and Chennai, senior retired officials from regional government and individuals and groups in Auroville.

### 4.1 Programme and authorities met

Beneath a list with people and organisations met has been given.

#### *Local authorities*

Panchayat President Bomaiyarpalayam  
Panchayat President Irumbai  
Panchayat President Alankuppam

#### *Regional Authorities*

TWAD Pondicherry  
PWD Pondicherry  
Groundwater Department Pondicherry  
Agricultural Department Pondicherry  
Tamil Nadu Water Supply & Drainage Board  
Central Ground Water Board  
Public Works Department

#### *National experts*

Dr. Agrawal  
Mr. Dattatri  
Mr.V.Gopalswamy

Mr .C.Anandhane

#### *Aurovillians and Aurovillian entities*

Aquadyn  
Auroville Future  
Auroville Planning and Development Council  
Farm group  
Water group  
Working Committee

For detailed minutes of meeting for all meetings, reference is made to Annex X. In this chapter, per group of authorities, the most important findings have been presented.

### 4.2 Regional authorities

Regional authorities in Cuddalore, Pondicherry and Chennai were visited for discussions.

Several programmes are ongoing or upcoming in respect to water. Some programmes focus on rainwater harvesting and groundwater recharge, some programmes focus on water saving practices through tank rehabilitation, alternative irrigation methods and less water demanding crops.

In general authorities are aware of the difficult situation with respect to water. They believe that the programmes will help to reduce the water drawn from groundwater resources. The main aim is however to find more water

resources and not to control demand. They do agree that the most difficult issue is that electricity for irrigation is free in Tamil Nadu (not in Pondicherry Union Territory) and that there is very little motivation for the farmers to reduce the amount of water used for irrigation.

They have little to no complaints about the organisation of water. The authorities feel that there is little doubling or gaps in responsibilities.

When talking about the position of Auroville in water management, they all emphasise that Auroville could play an important role and should play an example role in regional water management. They all support the concept of the pilot project in Kottakarai and all agree that regional authorities do not need to come in at this stage. Once the project is a success and the approach is duplicated to other villages, then the regional authorities should be actively involved. Until then, they can be kept informed.

### **4.3 Local authorities**

The three Panchayat presidents were met during one meeting. The Panchayat presidents are aware of the difficult situation in their village. The distribution system is in poor shape. Unofficial public connections are made to prevent long queues at official standposts and to ensure that people obtain water before the system runs dry. Also these unofficial standposts are created closer to the houses so people do not have to walk.

As there is little confidence in the system, the system is abused. The abuse in itself causes failure of the system and the fear of the people for lack of water is confirmed. On paper, there is sufficient water for all. The presidents emphasize that more standposts must be created to prevent illegal connections. Preferable all people are given house connections.

Payment of the water fees is poor, so little money comes in to ensure operation and maintenance. There is little knowledge and awareness of the natural water system surrounding each village, of the vulnerability of the system to pollution, etc.

All presidents would welcome the intervention for Auroville. They do not believe that it is required to involve regional authorities. That can be done at a later stage. The presidents are very positive about Auroville and believe that Auroville can help and set a good example.

### **4.4 Aurovillians and Auroville's organisations**

Within Auroville, there is a general concern for water in general and groundwater in particular. First of all, everybody is aware of the surrounding villages and farmers that are using large quantities of water for irrigation. Second, there is some concern for Aurovillians using excessive amounts of water mainly for irrigation.

There is a general agreement on the necessity of a water organisation of some sort. Some Aurovillians feel that it should have done much earlier. The failure of the previously operating water service causes much scepticism.

The main issue is the people that will run this organisation, to whom it will have to report, from where it will get its operational budget, how water supply schemes can be taken over, in which area of Auroville to start etc.

#### **4.5 Overall conclusions from meetings**

Auroville is aware of the difficult situation with respect to water. At the same time in general there is a particular laziness in water saving practices applied at households. Many Aurovillians do not realise that their functioning is exemplary for the surrounding villages and the authorities. The relative high standard of living in Auroville also does not help the discussion with the locals very much.

Local and regional authorities do realise that problems exist with respect to water, but at the same time are very passive in solving these programmes. A tendency exists to believe in government programmes, in government and international assistance and not to tackle the problems at the source.

All authorities agree that Auroville could and should play a prominent role in water supply, sanitation and water management. At a small scale, this materialises in the

form of the Kottakarai project but this could be developed much further. Already a committee has been established in Auroville to deal with surrounding villages and to coordinate assistance to these villages. As mentioned earlier, Aurovillians should form an example for the population of surrounding villages.

At a large scale, Auroville could facilitate and participate in government and internationally financed programs and projects. Auroville has developed an extensive hands-on experience in dealing with water resources, water supply and sanitation in its Bioregion and has developed sustainable and water saving techniques in these fields.

## 5 WATERBODY IN AUROVILLE SETTING

To cope with all challenges and threats, it will be necessary that, with the growing complexity of the “water situation”, somewhere and somehow within Auroville a general overview of all these (related) issues will be kept. This would help on one hand to take the right technical/economical decisions and on the other hand to develop, to maintain and to communicate within Auroville and outside Auroville a straight, clear and unambiguous strategy.

The expression “water body” is introduced, anticipating on a future organisation, which is at present not (yet) formally embedded. This water body is dedicated to all aspects of water management in Auroville and its’ surroundings.

### 5.1 Definition of an organisation

An organisation could be defined as collaboration between people with common aspirations, common ideals and common objectives. Off course within an organisation a range of sub goals, sub tasks etc. can be discriminated, generally divided over different levels of responsibilities. But all are leading towards a commonly shared goal.

#### Translation to Auroville requirements

The task of an eventual water organisation, preceded by the water body is of course not to formulate the general strategy for Auroville. But this organisation should develop her own goals and strategies, related to her tasks, i.e.

water management in Auroville and the Bioregion. These goals and strategies should be clear, to the point and in line with the general Auroville goals. This would help to justify the existence of a water organisation in Auroville as well as improve the acceptance of such organisation.

From the interviews, and the previous section in this report, the conclusion can be drawn that sustainability is the key word. The concept of sustainability needs to be elaborated as the meaning is not clear as such. But the feeling is good and generally shared.

The staff of the water organisation (to be) should consist of people, knowing very well the local circumstances, local politics and being loyal to the general goals of Auroville. Loyalty however includes a critical attitude towards existing practises and possibly conflicting interests. The staff should be sufficiently qualified to deal with these issues. As a water body will precede this organisation, the staffing of this water body should also meet the same requirements, because the water strategy will have to be elaborated in a sustainable way.

### 5.2 Reasons to set-up an organisation

#### 5.2.1 General

Organisation is required when increasing complexity of actions leads to inconveniently arranged activities and sub-optimal results. The functioning of the organisation can be expressed in effectiveness (reaching of goals) and

efficiency (smart use of resources). The need for an (improved) organisation is felt when problems in a certain area are increasing, when standardisation is necessary, when the surrounding is changing quickly, when a clear strategy and vision is required and has to be communicated.

When an organisation is equipped for all its tasks, it will operate with increasing efficiency: it will achieve the goals, maximising the use of available means.

#### Translation to Auroville requirements

The need for a water organisation in Auroville is urgent for several reasons in different areas of attention:

#### 5.2.2 Technical/economical issues

The city has grown to 1.800 inhabitants at present and will reach ultimately 50.000 people. A small number of people, using a limited number of wells is very well manageable without particular measures and taking into account the interest of all users. At present wells are dug at personal interest and not always at the best suitable locations when considering future developments. Water mains and water towers are designed for local use, not taking into account future requirements.

Growth of population leads to increasing complexity of infrastructure. Infrastructure and utilities cannot be provided without a clear masterplan.

The existing plan concerning water aspects, the pre-feasibility study “Water Management in Auroville Universal Township” (the Kraft report, 2003), is not acceptable as such for Auroville. The elaborated technical outlines in this plan do not meet sufficiently the local circumstances. Therefore a second study is executed in order to fine-tune for the Auroville situation and also to provide a first indication how the required works for the final situation could be executed stepwise. This phasing of the works of the final project should be elaborated more in detail by the water body.

#### 5.2.3 Operation and maintenance of facilities

A main task of the water organisation will be the O&M of all components of the infrastructure. For several reasons the initial water body will have to carry out O&M in an outstanding way:

- Permanently good functioning of water (supply) systems is the best (the only) way to get confidence of and to be accepted by the users.
- Maximum use of skill and experience for the daily work and to maintain will improve the level of O&M, i.e. increasing the efficiency
- O&M scattered over a number of different locations and systems, and carried out by people, who are not all dedicated to these tasks, will never meet the required quality standards.

## 5.2.4 Finances

Costs of the water supply consist of investment for the extension of the network, cost of O&M of the network, cost for the running of the organisation including the salaries of the employees should be covered by water fees. The cost should be paid in a certain ratio by all users. If services are good and equal to all users, payment of all expenses should be equally divided, e.g. in costs per m<sup>3</sup> of water.

To achieve this situation, an estimate of all expenses for the coming years should be made. Based on this estimate, and on the (growing) number of users, a tariff structure should be developed in such a way that all costs, also “unforeseen” and considerable capital investments, would be covered by the tariff structure. Water tariffs should develop gradually e.g. for a period of 10 years.

For these calculations, the required capital investments will be based on the (phased) works in de feasibility study. An extra reservation of 20 % of these investment costs will be required to cover unforeseen expenses, to be detailed later on. O&M is generally estimated at about 5% of the investment costs, which includes staff salaries.

It is clear that a professional water organisation should be responsible for these financial aspects. Skill and experience must be available in this organisation.

As the water body should be able to make a concept for the financial set-up, and the tariff structure, financial expertise is necessary from the beginning.

## 5.2.5 Policy

Every organisation has interactions with its environment. This environment consists of stakeholders: people or groups of people which have a certain interest in the activities of this organisation, or, in the negative sense, which are troubled by these activities. For a proper functioning of the organisation the interests or inconveniences of these stakeholders must be taken into account.

In relation to the Water Organisation in Auroville it is relevant to make a distinction between the stakeholders in Auroville and those outside Auroville.

### Inside AV

- Water users at household level

Within Auroville the availability of water varies in a wide range from abundant (up to far more than 500 lcd) to scarce (interrupted water supply as sources are limited). In case of abundant availability of potable water, the present user groups take care of their own interest and have organized also O&M. A new organisation, taking over responsibilities and activities might be considered as a threat to their independency and their own interests. For users with water problems, the organisation might be welcomed as a possible improvement of the situation.

The introduction of a water tariff, based on real costs will not be received with open arms by everybody in Auroville. Measures to reduce strongly the water consumption will not be accepted easily either. These measures however will become more acceptable when a reasonable water fee has to be paid. Paying more per unit but consuming less may at the end balance and lead to

- Water use for industrial purposes

In Auroville the water consumption for industrial purposes is still limited as not much industrial activity is taking place. Due to the awareness of the business units and due to the limited size of the activities, water use and treatment of polluted water is not yet a problem. In the future however, with increasing activities in the Industrial Zone, water management will become more important as water use and water pollution will require adequate treatment of waste water, also at unit level. Wherever possible the reuse of effluent should be applied.

Adequate (industrial) water management requires an organisation to set the rules, to communicate, to stimulate and to maintain (sanctioning) them.

- Water use in agriculture

The largest consumer of water all over the world is the agricultural sector. The same is true for AV. Far more than 70% of the total water requirements is necessary for the “green areas”. Of course an important part of this amount is provided by some kind of rainwater harvesting in ponds.

Reduction will certainly be possible: development of sophisticated irrigation methods in combination with special crops should be possible. Some of the present farmers do experiments at small scale.

This research and the corresponding pilot projects are however too expensive or too inconvenient for common (Tamil) farmers without any subsidy. One of the tasks of the water organisation would be to assist in development of techniques for reduction of net water use.

- Water in relation to urban development

In the western world the last decades a learning process has started about the role of water in regional, national and international context. As an example may serve the situation in western Europe. In the Netherlands water is now leading in urban development, as dikes and polders and canals cannot always cope with the “water requirements” in case of wrong choices for urbanization (flooding). Southern Europe suffers from drought due to over extraction of groundwater. The Colorado River discharge is not sufficient anymore for recharge of groundwater and agricultural purposes as Las Vegas, built in the middle of the desert, needs tremendous amounts of water.

Water is more and more the guiding principle in development of regions.

Also in Auroville the role and place of surface and groundwater are still in discussion. In fact it is one of the main arguments to reconsider the Kraft study. A water

organisation should be able to have a professional overview of all water related problems (and opportunities), also at regional level as administrative boundaries are not relevant in this matter.

#### Outside AV

- Villages close to AV

The water situation in and around the villages near Auroville is alarming for three main reasons:

- **Quantity.** Extraction of groundwater exceeds by far the natural recharge by rainwater. The tanks, for irrigation, were abandoned some decennia ago and replaced by a numerous wells, as electricity was free of charge. This resulted in an enormous lowering of the groundwater table. At present Harvest and Palmyra are carrying out large rehabilitation programs for these tanks. Drinking water is of bad quality, either due to the bad condition of the infrastructure, or due to the bad quality of the “raw water”.
- **Quality.** The quality of water is poor either due to poor quality at the source or due to poor water supply infrastructure. Quality of water at the source is affected by leaking sanitary facilities, biocides in agriculture, saltwater intrusion from underlying aquifers or seawater or due to pollution from solid waste.
- **Social.** Low level of awareness for care of water quality and quantity. The operation and maintenance of the water supply system is not organized. Re-use of water is only applied at

very small scale. The urge for preventing pollution is limited. There is no priority in water saving techniques in gardening, households or agriculture.

Water and above all a sustainable water supply is of mutual interest for both Auroville and the surrounding village. Reduction of water use and (artificial) recharge of groundwater is important for both parties. The quality of potable water will be increased by available techniques in Auroville. Knowledge and experience is available in Auroville. Transfer of knowledge, cooperation in development of agricultural techniques, available techniques at CSR, availability of labour, etc. are all reasons for a good cooperation. O&M of infrastructure for water management should be a responsibility of the water organisation, as coordination between this and other villages, and Auroville should be considered as mutual interest.

And beyond everything: a good neighbour is always important.

- Regional authorities

The discussions with the regional authorities have made very clear that actions from Auroville in the field of water management will be most welcome. Regional authorities are generally very limited in their possibilities due to the political impact of nearly every action and limited budgets for specific projects only. Auroville would be able to act more freely and initiate whatever is necessary in this area.

These actions will be tolerated and even supported if viability is proven.

As the situation worsens and the knowledge of the authorities is not always sufficient, and as the pressure from other regional activities increases more or less daily (see previous section) , it would be very desirable that Auroville will act as a local authority, defending regional interests in a professional way.

Actually some discussions with surrounding authorities take place. No one is however allowed to speak on behalf of Auroville. People only speak for the group or unit they work for. In this matter the water organisation must have the mandate to speak in the name of Auroville in order to mobilize the required skills and to negotiate and to deal with external parties.



Elevated storage reservoir in Kottakarai



Unauthorised tapping points in Kottakarai, leading to unhygienic conditions, loss of water and deterioration of the distribution network



Broken taps are not replaced but improvised blocking is used leading to unhygienic situations and loss of water.

### The Kottakarai project

In Kottakarai a pilot project has been launched for integrated water management, funded by Aqua for All (a Dutch organisation for development of projects, financed by the Dutch water companies).

The problems in Kottakarai are very similar as described in the previous chapter concerning the policy with respect to the villages outside AV:

- Bad water supply: twice a day about half an hour;
- Bad quality, mainly due to the bad condition of the infrastructure (provisional “house connections” by breaking the distribution line in front of the property);
- Water consuming crops;
- No savings in water use for agricultural purposes;
- Very limited re-use of water;
- Pollution by bad sanitation provisions, no adequate handling of solid waste, application of pesticides, etc.;
- Low level of awareness.

This project covers all water aspects: potable water, sanitation, water harvesting, irrigation, reuse of water, and even solid waste. Awareness and involvement of the villagers is one of the main components of this project. Only improvement of techniques for using less water for the growth of the crops is not included at a large extent in this pilot project.

The main part of the Kottakarai project will take about one year for realization. After that year monitoring and possible further elaboration of certain aspects (e.g. reduction of

water spillage in the agriculture) will remain. But in case the pilot is successful, in other villages the same concept will be initiated in a continuous process of improvement.

### Relation with Auroville interests

Water, and in a broader context the environment, is an important (the main) link between Auroville and the bioregion. Shortage of groundwater, pollution (pesticides, sewage), spillage of water in agricultural use, salt intrusion, etc. are collective problems. In the Kottakarai project all these problems are addressed (not all solved) and in close cooperation with the Panchayat and the villagers a start will be made for the solution of the problems. As it concerns shared interest, close cooperation to come to solutions would be logical, for technical reasons and political reasons.

As it concerns a pilot project, the possibilities for a cooperation between all “similar” work areas in Auroville and the village should be explored. Experience and expertise can be exchanged and knowledge of innovative techniques in Auroville should be introduced in the villages.



Wrap up session of the September mission presenting the preliminary findings.

## 6 STEPWISE PLAN FOR A WATER BODY

### 6.1 A water body in Auroville setting

In the past several attempts have been done to set up a water organisation. These attempts were not successful, due to non acceptance by AV, due to a lack of interest of the members and due to a lack of urgency.

Problems are becoming more serious:

- Within Auroville the uncoordinated individual activities require immediate action as the groundwater level is lowering dramatically. A coherent strategy for water management is necessary;
- The consumption of water should be strongly reduced. The costs of (potable) water should increase sharply with increasing consumption. An adequate tariff structure must be developed and implemented;
- Operation and maintenance of existing and new to build systems should be carried out in order to minimize the failures, to prevent pollution of the water and to level out as much as possible peaks in costs for investments, replacements and O&M;
- The Auroville potentials on innovation and knowledge should be used to reinforce and support the developments in the region;
- In the villages close to Auroville the situation is so much worse, that the differences will not be accepted forever. Support from Auroville for design, execution and O&M of water management projects will be very

helpful to reach a sustainable improvement of the relations between Auroville and the regional partners;

- The regional authorities are still waiting for Auroville to take action (take the lead?) in matters of water management;
- The regional developments around Auroville with a possible threat for Auroville will have to be monitored closely and to be adjusted whenever necessary and/or possible. Therefore an organisation should be able to work out a firm strategy for sustainable water management, to recognize undesirable developments and to represent the interest of Auroville at all required levels.

All these problems should be addressed very soon (within a year). It might be already (too) late to act in some undesired (regional) developments or in developments that could be used in the interest of Auroville (such as Kaluvelly swamp). The only way to deal adequately with all these problems is to have a group of people, who have the knowledge, the power, the means, and on the other side the confidence of the other Auroville organisations and the authorization to speak and, if required, to act on behalf of Auroville.

As the matter is urgent, and the set up of an organisation in Auroville is very difficult, it is proposed to start with a water body, a group of people with enough experience and expertise to tackle the problems and to develop the required strategy.

As this water body has to prove itself within the Auroville context, it is proposed to start in a practical way: external funds will be sought to start up the water body. The start up should last for 1-2 year to allow sufficient time for embedding of the water body in the Auroville organisation.

During this first year 2 main tracks have to be followed: a practical/technical track and at the same time a track on the development of strategy and policy.

## **6.2 Track 1: practical/technical development**

To gain confidence as an executing agency in O&M it will be best to start with 2 or 3 “business cases” as discussed during the wrap up meeting in august 2006: existing water supply schemes where a higher level of O&M would be most welcome. During the first year this could be extended to more cases with a growing social basis.

Secondly the water body should assist in the pilot project of Kottakarai as all aspects of water management, and O&M, are main issues in this project. Besides the possible practical input, it is important to consider the possibilities (experience and expertise) of getting Auroville more involved in these activities. Off course participation should be approved by the Panchayat.

## **6.3 Track 2: policy and management development**

The water body should start as soon as possible with an inventory of all the problems within and outside Auroville

concerning water (management). A long term strategy should be developed and discussed with all relevant Auroville groups an, in a later stage with the Indian authorities at different levels in the region.

As it is urgent to participate in meetings and discussions with external parties (special members of) the water body should be empowered to do this. It should be arranged in some engagement how to deal with responsibility: to the external parties and to the Auroville groups, the water body is representing.

A second important task of the water body is to develop a financial strategy. All activities concerning water supply, sanitation, irrigation, water management should have a solid financial base, covered by payments of the consumers/users. Therefore tariff structures for water and other services will be necessary.

For reasons of decisiveness and obviousness it should be clear to whom (from which groups) the water body is responsible. It is imaginable that representatives of the water group, the working committee or the residents assembly could fulfil this role. The water body itself could be incorporated, at least for the first year, in CSR.

## **6.4 Composition of the water body**

The water body, and later on the water management organisation, should consist of people with a large variety

of skills, expertise and experience. For the initial set-up of the water body is necessary:

- Team manager (full time)  
Team player with experience in water supply, preferably also in groundwater and water management
- Operations and maintenance staff (full time)  
Hands on and practical approach in water supply.
- Financial expert (full time)  
Expert with experience in water supply infrastructure and in developing cost recovery systems, tariff structures, long term financial planning.
- Water supply designer (half time 1st year, then full time)  
Expert with experience in designing water supply schemes at small scale.
- Civil/structural (half time 1st year, then full time)  
Expert with experience in design of civil works, water reservoirs, small buildings etc
- Awareness (full time)  
Expert in awareness campaigns in water-related issues, ability to deal with Aurovillians of international and local background and with Tamils

#### Other conditions

- The team manager should be an Aurovillian, the remaining staff members could be from outside AV, preferably Indian nationality.
- Beside awareness, training for technical issues on water supply, water sanitation etc will be required at

different levels. For the time being it is expected that in the first year sufficient capacity is available within the staff of the water body for this purpose.

- In general for all staff, experience is less important than communication.
- Of course all relevant logistics as resources and tools, and housing, must be provided to the team. As well as a location to keep tools and spare parts in stock.

## 6.5 Tentative time schedule

**The barchart represents the tie time schedule discussed below.**

### **12-2006 / 01-2007**

Preparations for the organisation of the water body. Discussions with Auroville to reach an agreement about the necessity of a water body and about the conditions to launch this body.

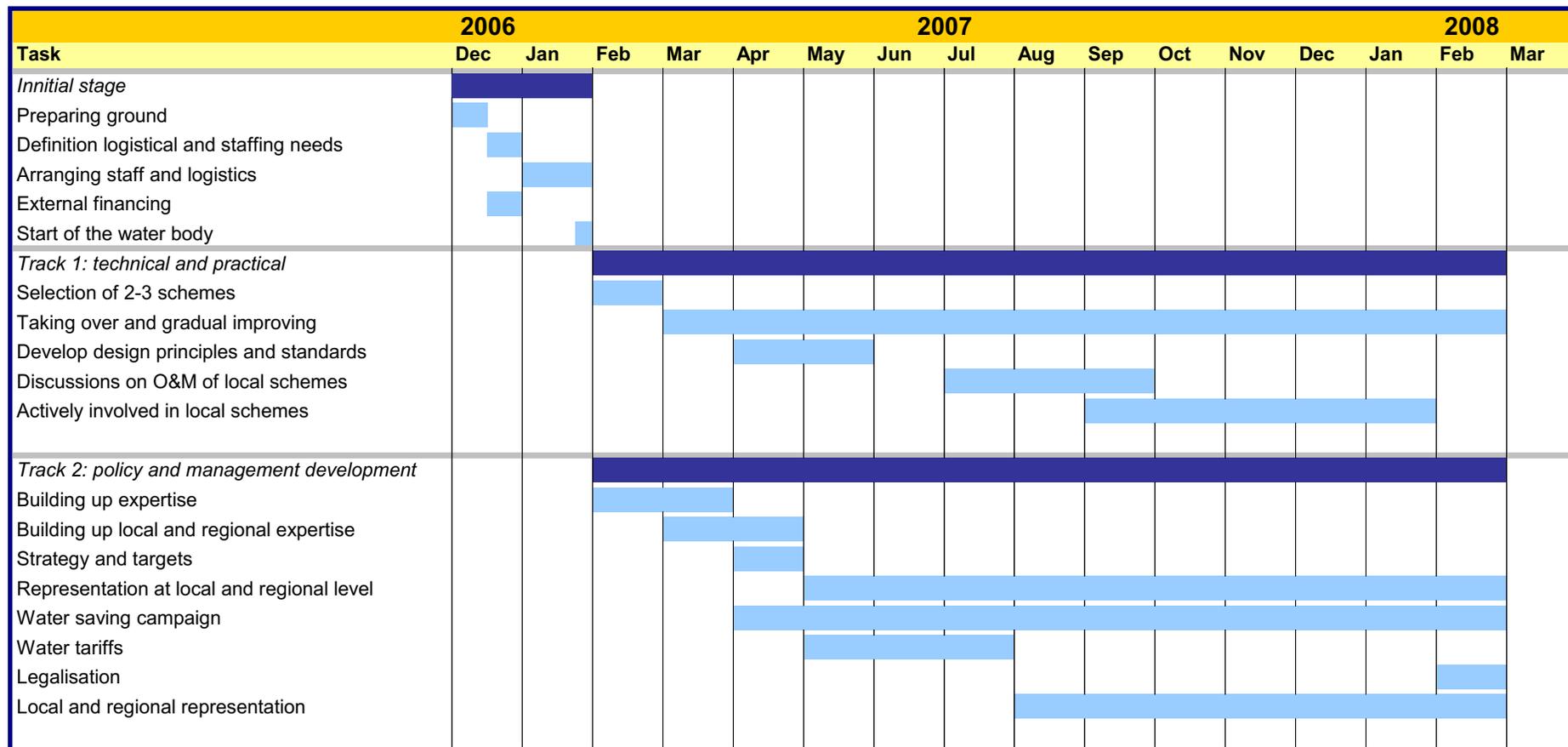
After the discussions with Auroville in December and possibly January 2007, the initial size of the water body, the requirements and responsibilities should be defined in sufficient detail.

Logistics and housing must be arranged.

External financial arrangements should be made to enable the water body to start with her tasks for the first year.

### **02-2007**

“Official” start of the water body



**Track 1: practical/technical development****02-2007 / 03-2007**

Selection and kick-off for 2 or 3 schemes to be handled by the water body for O&M

**04-2007 / 02-2008**

O&M for the adopted schemes will be gradually improved up to the required level.

Design criteria of the existing schemes will be studied.

Proposals will be made for a uniform design concept, fitting in the structure of the masterplan in the feasibility study. Standardization of design and equipment will be developed and implemented as much as possible.

In consultation with the Panchayat the water body should assist in (or take over) activities concerning O&M in the local schemes (experience, expertise, training etc.). For these services should be paid (in due time).

**Track 2: policy and management development****02-2007 / 03-2007**

Exploration of the work field, review of existing studies, inventory of water problems in Auroville and the region, discussions mainly within Auroville. Of course use should be made of existing knowledge and experience (Harvest, water group members, Aquadyn, etc)

Start with a development of the strategy and targets for the water body, fitting in the general policy for AV.

Make proposals how to give shape and content to a clear and uniform representation of Auroville for water aspects at regional (and national) level.

**04-2007 / 02-2008**

Finalize strategy and targets for the future water management organisation, to be installed early 2008

Represent Auroville for water aspects at regional level in close consultation with responsible organisations within Auroville (RA, APDC, working committee, watergroup)

Initiate campaigns for water saving

Develop a uniform water tariff for Auroville. Promotion of relations between Auroville and the bioregion, based on expertise and possible application of new, innovative methods of working and new, innovative materials

**After 02-2008**

“Legalization” of the water body to the “Water Management Organisation” in AV

Expanding the work field to all aspects of water management, at Auroville level and at regional level (and national level if required).



## 7 CONSIDERATIONS/CONCLUSIONS

### **Auroville general**

Auroville is on the verge of a considerable leap forward. Organisational issues are being dealt with, land purchasing has resumed, Matrimandir is nearing completion, work on the Matrimandir gardens has started, the Masterplan is being worked out to implementable level and portions.

### **Auroville and water**

In this development there is an increasing focus on water and funding is coming in to deal with water issues around Auroville organised and executed by Auroville. There is a shortage of water in certain areas of Auroville and construction of living accommodation is postponed for the moment.

The lack of water, the threatening deterioration of water resources in the direct surrounding of Auroville, the excessive water use inside and outside Auroville calls for organisation and coordination.

### **Auroville and its environment**

Auroville's environment is developing in very rapid pace. Not only urban development is taking place from Pondicherry, but also along the transportation axes running north and south of Auroville and from the villages surrounding Auroville.

Apart from urbanisation, there is a rapid development on water-related issues such as the Kaluvelly swamp, the Buckingham Canal and the Pondicherry sewage farm.

Although Auroville maintains contact through designated committees with the surrounding villages, these contacts are not regular but relate to particular matters and occasions. Also contacts with authorities responsible for or involved in the regional developments as mentioned are not being maintained. Auroville tends not to get involved as most developments.

These developments could threaten the position of Auroville in the region and the value of the land. The increasing value of the land makes it again more difficult for Auroville to purchase essential plots for the execution of its Masterplan.

### **Need for organisation in Auroville**

To cope with all these developments, some sort of organisation of water and water-related issues is required. Attempts in the past have failed, partly due to lack of supportive finances.

Such water organisation should be involved both in internal and external water issues. Some 6 staff on technical and commercial issues are required, some equipment and logistics are required and operational budget is required. The expenses are within limits and may well be financed from Auroville or an external financial source as there is a growing international

concern for water-related issues and the role Auroville could play in this matter for its bioregion.

The setting up of such organisation in an informal way without the formal consent of Auroville could be completed in half a year. First actions should aim at taking over water supply schemes in Auroville, setting standards for water budget per capita, equipment and materials, link water supply schemes, execute selected works from the feasibility study (yet to be completed) and carefully plan development of sources and a network in view of the city's extension in the coming years.

Support in water supply and water management (including water saving campaigns and sustainable management of water resources) would be a next step.

The organisation should be institutionalised, embedded in Auroville's organisational structure, after it has proven its existence and role in the water supply of Auroville. This could be well after 2 years.

### **Long term perspective**

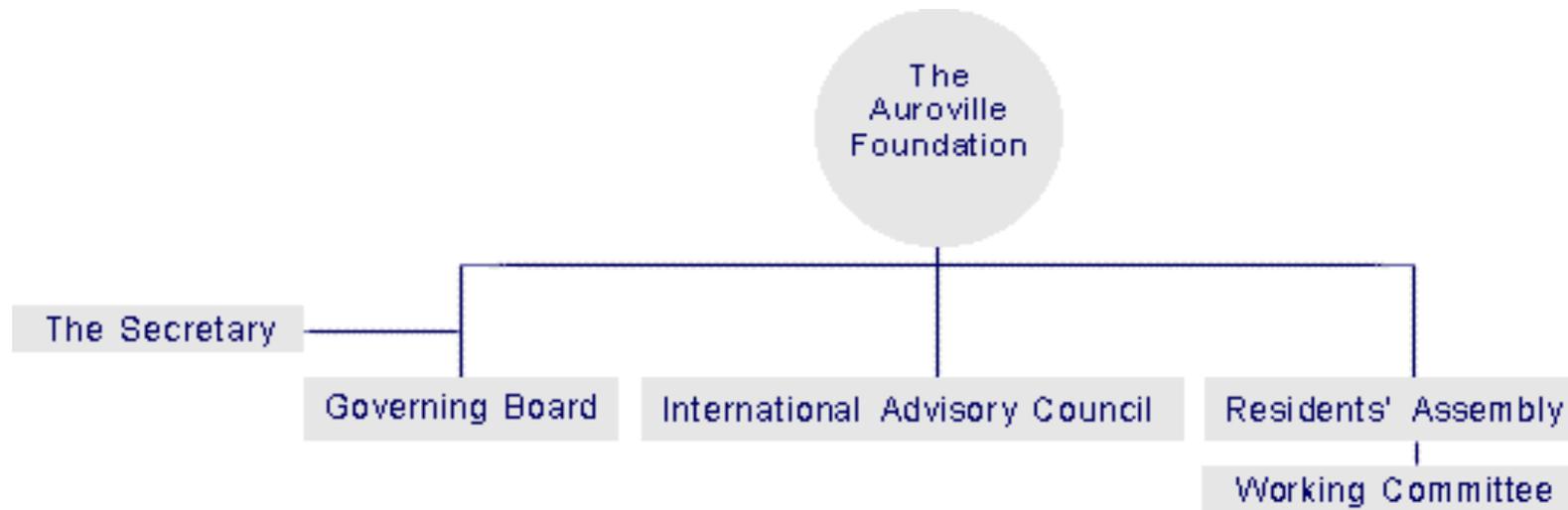
Ultimately, Auroville should have a proper water organisation responsible for the supply of water throughout Auroville and being a partner in discussions on water resources management. This water organisation should also be a discussion partner for the local-, regional- and national level government aiming at a sustainable development of water resources and forming a role model for integrated and sustainable management of water and

water resources. This falls well within the principles on which Auroville was founded.



## **ANNEX A**

### **The organisation of Auroville**



### **Auroville Foundation Act**

The Auroville Foundation Act (1988) created a separate legal entity, the Auroville Foundation, with three authorities: the Governing Board, the International Advisory Council and the Residents' Assembly. The Act also specifies that there will be a Secretary.

### **The Governing Board**

The Governing Board consists of seven members to be nominated by the Central Government from amongst persons who have;

- rendered valuable service to Auroville;
- dedicated themselves to the ideals of life-long education synthesis of material and spiritual researches or human unity;
- contributed significantly in activities that are being pursued or are envisaged to be promoted in Auroville, including activities relating to the environment, afforestation, arts and crafts, industry, agriculture, humanities, sciences and integral yoga;
- and of two representatives of the Central Government itself.

The members, who do not live in Auroville, hold office for a period of 4 years. The Governing Board meets at least twice a year in Auroville.

The general management of the affairs of the Foundation is vested in the Governing Board. Its task is to promote the ideals of Auroville, to review and approve basic policies and programmes, to secure the proper management of all

properties, to prepare the master plan and co-ordinate fundraising. Most of these functions are executed in consultation with the Residents' Assembly.

### **The International Advisory Council (IAC)**

The International Advisory Council of the Auroville Foundation consists of not more than five members, nominated by the UNESCO unit of the HRD Ministry of the Government of India from persons who in its opinion are devoted to the ideals of human unity, peace and progress. The members of the International Advisory Council meet once a year in Auroville.

The powers of the International Advisory Council are advisory only. When giving advice to the Governing Board, the Council endeavours to ensure that the ideals for which Auroville has been established are encouraged, and that the residents of Auroville are allowed the freedom to grow and develop activities and institutions which further the aspirations and programmes envisaged in the Charter of Auroville.

### **The Working Committee**

The mandate of the Working Committee is to assist the Residents' Assembly in discharging its functions under the Auroville Foundation Act as follows:

- Represent the Residents' Assembly in interactions with Governing Board, International Advisory Council and the Secretary of the Auroville Foundation (in collaboration with relevant working groups).

- Call meetings of the Residents Assembly whenever a decision or policy needs to be ratified by a meeting of the Residents' Assembly and maintain minutes and resolutions of such meetings.
- Submit regular activity reports to the Residents Assembly
- Maintain public relations with state and central Government at all levels
- Oversee VIP reception
- Recommend Visas, in collaboration with Residents' Service
- Recommend Land purchases, in collaboration with LEM
- Coordinate relations between Auroville and local villages, in collaboration with all panchayats and village leaders and relevant working groups
- Recommend appointment of executives & trustees, in collaboration with FAMC
- Recommend constitution of new units and trusts, in collaboration with FAMC
- Finalizing of accounts and signing of Balance Sheets of AVF, in collaboration with Accounts Coordination Group and FAMC
- Supervise Income Tax Exemptions for Auroville in collaboration with FAMC
- Facilitate Police Liaison, in collaboration with STF
- Finalize Annual Reports, in collaboration with all Working Groups
- Prepare meetings of the Governing Board and International Advisory Council, in collaboration with Residents Assembly

- Notify the Secretary of the Auroville Foundation of major decisions and policies of the Residents' Assembly

### **The Residents' Assembly**

Auroville's Residents' Assembly consists of all the residents of Auroville aged eighteen years and above. The powers of the Residents' Assembly are to advise the Governing Board and to make proposals for approval by the Governing Board. It also has the power to grant and terminate the right to residence in Auroville. The Act prescribes that a Working Committee of the Residents' Assembly shall assist the Residents' Assembly and the Governing Board in discharging their duties under the Act. The Residents' Assembly chooses a Working Committee of not more than 7 members from time to time. The Residents Assembly itself determines the method of selection and the term of office of the Working Committee.

#### *Powers and functions of the Residents Assembly*

The composition and functions of the Residents' Assembly shall be those as specified in Section 18 and 19 of the Act.

#### *Meetings of the Residents' Assembly*

- 1) Meetings of the Residents' Assembly shall be called whenever necessary.
- 2) All meetings of the Residents' Assembly shall be called by the Working Committee, either on its own initiative, or on the requisition of 60 members of the Resident Assembly.
- 3) The Working Committee shall cause the agenda for the meeting to be made public and to present the policy to be

ratified at least 14 days prior to the date of the meeting through every media available (N&N, Intranet, message boards, etc.) In extra-ordinary cases, the period of 14 days can be shortened by following the process ratified by the Resident Assembly on March 11, 2004 .

4) The Resident Assembly Meeting will be chaired either by a member of the Working Committee or the Auroville Council or if necessary by any other person chosen among the residents.

5) The quorum for a meeting of the Residents Assembly shall be 60 members of the Resident Assembly. If within half an hour from the time appointed for holding a meeting, a quorum is not present, the meeting can discuss the topics on the agenda but cannot make any decision. In this case the meeting will automatically stand adjourned to the same day two weeks later, at the same time and place.

6) If at the adjourned meeting also, a quorum is not present within half an hour from the time appointed for holding the meeting, the members present shall be a quorum.

7) Decisions of the Residents Assembly will be made along the process describes in the annexure.

8) The Working Committee will be responsible for maintaining the minutes of the meeting, which will be open for inspection by any resident one week after the meeting at the Working Committee office.

### **The Executive Council**

The role of the Executive Council, described as dealing with all matters affecting the internal functioning of the community, often overlaps with that of the Working Committee. Generally the two groups work closely together on issues of common concern.

### **The Auroville Council**

The mandate of the Auroville Council is to assist the members of the Residents Assembly in organizing their activities as follows:

- To maintain and harmonize the various mandates of the working groups of Auroville and to see that the working groups function according to their mandates.
- To harmonize the interaction among the working groups and the activities of the Residents of Auroville
- To coordinate a short term plan and budget, in collaboration with the APDC , SAIER, ABC and the FAMC, and other working groups to be presented to the Residents' Assembly for yearly ratification.
- Encourage the generation of programs and policies for the realisation of these objectives.
- Oversee the observance of policies and decisions approved by the RA in collaboration with the Working Committee and address non-compliance with established Auroville policies.
- Deal with emerging issues that fall outside the purview of other working groups.
- Establish and oversee review and arbitration bodies when required.
- Report regularly to the Residents' Assembly on its activities.
- Ensure that the principles of natural justice are observed in Auroville such as providing relief from arbitrariness in decision-making.
- Convene regular General Meetings

## **The Auroville Planning & Development Council**

### *Mandate*

This following Mandate and Functioning of the Planning and Development Council has been worked out after long discussions. It is not an edict hewn in stone, but will be reviewed and adapted as the need arises and the Council gains working experience. The first review is scheduled for the end of December 2003, after three months of functioning.

The Auroville Planning & Development Council (APDC) is a standing body to draw up five year development plans in accordance with the Master Plan. It is the official workgroup in charge of preparation, implementation and monitoring of development plans. It is expected to maintain excellent communication channels with the concerned individual groups and the community at large.

The Auroville Planning & Development Council is also charged with preparing the acceptance of the Master Plan with the relevant authorities of the Tamil Nadu and Pondicherry governments. The Auroville Planning & Development Council has also the task to evolve and secure the implementation of building permission guidelines and procedures.

### *Membership*

Members shall be the representatives of the four Zone Groups (2 each), the Auroville Planning Office (a service of Auroville's Future) (2), Green Group (2), City Center/Matrimandir (2), Building Permission (1). Up to 6 members may be co-opted, knowledgeable in areas such as water and electrical infrastructure planning, land service, housing needs and economy.

### *Functioning*

The Auroville Planning & Development Council shall meet at least once every two weeks. The members nominate a Chairperson who will serve in this capacity for a period of at least one year. If the Auroville Planning & Development Council cannot arrive at a decision by consent the issue will be referred to the Auroville Council. It is the role of the Auroville Council to facilitate a process of finding agreements between all parties involved. However, in case of administrative or other non principle type issues the Chairman may seek from the group approval to take a decision based on a two-third majority.

The Chairperson will be responsible for calling meetings, preparing the agenda, maintaining the minutes of the meeting, and for regular publishing of meeting reports in the News & Notes and on AVNet. It is essential that a well functioning secretariat be established.

The Auroville Planning & Development Council may constitute sub-groups whenever necessary.

## **Auroville's Future**

The role of Auroville Future is

- To operate a Town Planning Office under the direction of Roger Anger
- To provide a Drawing Office service to the Town Planning Office.
- To provide a Drawing Office service to the APDC
- To execute projects for non-Auroville bodies, which can subsidise its operating expenses.

*The bulk of Auroville's administration is carried out by working groups. While these are theoretically empowered by the Residents Assembly or community-at-large, it is not always clear what the respective working groups do and what their parameters are. We therefore have recently requested the various groups to give a resume of their mandate or a general policy paper pertaining to their activities.*

The following groups have given their mandates / policy papers.

### **Specialised working groups**

In addition to the bodies groups that deal with general matters, a number of working groups have come into existence that have specific mandates. Therefore, their functioning is smoother and generally more accepted than that of the Working Committee and the Executive Council. They have usually grown from a basic need and are non-hierarchical in nature. An overview of these working groups and their task follows in alphabetical order:

**1. Auroville Board of Commerce (ABC)** is a group composed of all executives of commercial units, and concerns itself with matters affecting units and ways and means of financially supporting the township.

**2. Auroville Village Action group (AVAG)** works in 35 villages surrounding Auroville through its team of 20 development workers. The main aim of AVAG is to raise the consciousness of the local people by creating awareness of their social, cultural and environmental conditions while bringing general benefit to them.

**3. Development Council** is a coordination and planning group established to ensure that the development of the Auroville township is in accordance with directives or guidance given by the Mother.

**4. Economy Group** monitors Auroville's internal economy, and is responsible for the income and expenditure of the Central Fund. Its income is received from contributions from commercial units, donations and guests; the expenditure covers the requirements of over 35 Auroville services.

**5. Entry Group** processes all applications to join Auroville and oversees the entry procedures.

**6. Farm Group** coordinates Auroville's farming activities and shares information with a view to increasing Auroville's self-sufficiency in food production.

**7. Forest Group** is involved in the planting and maintenance of Auroville's forested areas, particularly the GreenBelt around the township.

**8. Funds and Assets Management Committee (FAMC)** was created at the request of the Governing Board of the Auroville Foundation. It advises the Governing Board on the utilisation of funds, the management of Auroville assets, taxes and audits, and the sale, acquisition and utilisation of immovable assets. The FAMC consists of representatives of all the major Auroville working groups. The Secretary and the Finance Officer of the Auroville Foundation are also members of the FAMC.

**9. Green Group** consists of representatives of the Farm Group and the Forest Group. It reviews issues pertaining to the development of the Green Belt, and makes recommendations to the community regarding the protection of the environment.

**10. Land and Estate Management** is responsible for land purchase and the management of those lands that do not have a particular steward. It is responsible to the FAMC.

**11. Matrimandir Coordination Group** is responsible for the manifestation of the Matrimandir and its gardens, and takes care of the Matrimandir nursery.

**12. Project Coordination Group** prepares all grant proposals for Auroville projects to ensure maximum effectiveness and non-duplication of approach to potential donors.

More groups do exist, some self appointed, some on request of the community at large or one of its groups. Groups also are dissolved if they do not function or if their task has been accomplished.

## **ANNEX B**

### **Requirements for a Water Organisation**



## STAFFING REQUIREMENTS

### Team manager

Team player with experience in water supply, preferably also in groundwater and water management. Socially intelligent and good communicator, straight, firm, persuasive but open to other opinions. Academic or technical education. About 15 years experience in this field. Full time function.

### Operations and maintenance staff

Hands on and practical approach. Good in communication with Tamil staff for repairs and operational aspects. Familiar with water supply installations, water reservoirs, pipelines etc. Both mechanical and electrical. About 10 years experience in this field. Full time function.

### Financial expert

Expert with experience in water supply infrastructure and in cost calculations (also for preparation of tender documents), developing cost recovery systems, tariff structures, long term financial planning. Full time function.

### Water supply designer

Expert with experience in designing water supply schemes at small scale. Able to do pipeline design, well design, pump design for small and medium scale schemes. About 7 years experience in this field. Half time function during initial period of 1 year. Full time function for second year and subsequent.

### Civil/structural expert

Expert with experience in design of civil works, water reservoirs, small buildings etc. About 5 years experience in this field. Half time function during initial period of 1 year. Full time function for second year and subsequent. Financial expert (full time)

Expert with experience in water supply infrastructure and in cost calculations (also for preparation of tender documents), developing cost recovery systems, tariff structures, long term financial planning

### Awareness Expert

Expert in awareness campaigns in water-related issues, ability to deal with Aurovillians of international and local background and with Tamils. Experience with both oral and written media. Good communicator, willing to work under the coordination of the team manager. About 10 years experience in this field. Full time function.

In general for all staff, experience is less important than communication.

## OFFICE AND OTHER LOGISTICS

- Office space in 2 rooms, totalling 50 m<sup>2</sup>.
- Storeroom for equipment, tools and spares of about 15 m<sup>2</sup>.
- 3 computers and 2 printers (A4 laser, A3 colour).
- Small photocopying machine.
- Simple design software for wells, pipe networks and pumps.
- Simple database for operation and maintenance issues.
- Billing and payment software.
- Small library in relevant subjects.
- Two mopeds with steel frames (for tool box and parts) for operation and maintenance purpose.
- Toolbox for operation and maintenance purpose.
- Stock in most used parts.

## **ANNEX C**

### **Minutes of meetings**



### Minutes Aquadyn

at Aqua Dyn office

August 8, 2006

Present:

for Aqua Dyn: Maurice ...  
Baghwandas  
Uthra

for Dutch mission: Jeen Kootstra  
Eri Salomé

### Remarks

According to Aqua Dyn, people should always pay (something) for water. If not waste and irresponsibility for water will continue.

### Introduction

Research, innovative experiments and (small scale) pilot projects was, and is, the main business of Aquadyn. Several attempts have been made to become independent of subsidies and gifts but until now priority has been given to R&D. Most of the finalized products are still considered as part of R&D, serving the well being of humanity. As such the revenues of the main part of the activities (products) do not cover the costs.

Aquadyn has started his activities some 30 years ago in the field of (sewage) water purification and filtration units for domestic swimming pools. After that the main focus was directed on purification and (re-)dynamization of potable water. For the purification process international developments have been followed closely, so reversed osmosis (to replace chlorine) has been investigated as soon as possible, in the nineties.

Actually basically 4 types of water preparation are available:

for water with low and high turbidity, and for brackish and saline water, based on microfiltration, active carbon filters, UV or reversed osmosis and all provided with an electronic device for biodynamization.

The capacity ranges from 2,000 l/day (single household) upto 20,000 l/day (or even more, as modules can easily be placed parallel).

### Present activities

The present activities concern mainly the implementation of the different types of waterfilters. Some 4 years ago Aquadyn started placing machines in Auroville, upto 25 at present. An additional 15 have been placed in the surrounding villages and 15 in northern India. The feeling is that interest in the Aquadyn machines is increasing. At present an order from France for small machines at household level is being prepared.

Until now Aquadyn is responsible for O&M (electrical equipment, replacing of filters, membranes, pumps, etc.) of the big machines.

The "all included" water price should be 15-20 paesa /l in average.

### Role in Auroville Bioregion and further

Discussions with Health Service are slowly developing. Reliable statistics are not yet available, but there is a strong feeling that the health situation for people, using water from these machines, is improving considerably.

Also discussions are held with the Water Supply Board (TWAD). Authorities are reluctant to admit that water quality improves (for obvious reasons). But they are willing to allow cooperation in this matter if the machines are destined for tourism.

### Vision, plans

Aqua Dyn is willing to cooperate with all organizations and authorities in order to improve the quality of potable water. But cooperation is not always easy as there is often a lack of transparency. Cooperation with Basic Water Needs has been tried, but until now not very successful.

## Minutes local authorities

at Harvest office

August 9, 2006

Present:

for Panchayats: Mr Radhakrisnan, President Bommaiypalayam  
Mr Rajavel, President Irumbai  
Mr Veeragavan, President Alankuppam  
for Dutch mission: Jeen Kootstra  
Eri Salomé  
Gilles  
Shiva

### Introduction

As user of the water facilities, it's important to know how the Panchayats are involved in the whole process of design, execution, O&M. The 3 presidents represent 2 Panchayats in Tamil Nadu 1 in Pondicherry. The first 2 have similar experiences and are also very much interested in the activities of the project in Kottakarai, financed by Aqua for All, which will start soon.

The panchayat in Pondicherry can be characterized as somewhat more urban. Situation and problems are slightly different.

### Present activities

For the Tamil Nadu panchayats the realization of the schemes has been carried out by TWAD (wells and overheadtank) and by DRDA (pipelines and standposts). For Pondicherry the Commune was responsible for the realization of the scheme. Only very recently elections have been held, resulting in the forming of the Panchayat. Since this situation is very new, it is not yet clear how responsibilities between community and panchayat will work out.

In general O&M is carried out by the panchayat: one person has been made responsible for the pumping equipment.

The situation of the schemes is very poor. People are cutting the pipelines as they are possibly not satisfied by the fact that some have house connections and some have to go to standposts. Breaking the pipes is a mean to "create a connection nearby". The panchayat "agrees" with these arguments of inequality and allows these actions. And nobody pays for water, also not for house connections in the present situation "because to often water supply is disrupted".

In case the present schemes will be repaired and rehabilitated, the only way of preventing the return to the present situation would be an equal distribution for everybody. This could mean houseconnections everywhere. The discussion has not made clear this point.

In the present situation part of the people are willing to walk a certain (short) distance to get more reliable (Aqua Dyn) water. But if the distance increases, people do not care anymore. Possibly the distance between stanposts could be reconsidered (now theoretically 150 people are served by 1 post).

It's considered that people are willing to pay an average of Rs 30 for water on a monthly base. For the present houseconnections Rs 1000 have to be paid once. Nobody does.

### Role in Auroville Bioregion and further

The role of the panchayats is limited while they are empowered to act. Awareness of possible pollution of the groundwatertable and forthcoming results for firstly the panchayat itself, but possibly also with consequence for a larger area is limited.

### Vision, plans

Clean, reliable water in every house is a clear wish for the future. Additional to the project in Kottakarai the panchayats are eager to add their own funds in order to speed up and to enlarge the project. This has also to do with coming elections.

### Remarks

## Minutes

Present : Tency – CSR  
 Gilles B – Harvest  
 Lucas – Dewats  
 Maurice – Aquadyne

Absent : --

Date : 8th August 2006

Copy : All

Our reference : AV/MoM001

**Subject : Bla**

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Item No.	Subject	Action by
1.	<p>Introduction</p> <p>Jeen briefly explains the aim of this subproject and the planning for this and next missions. The aim is to investigate if and what kind of organisation could be established in and preferably also around Auroville for water management at large and water supply in particular..</p> <p>The main aim of this mission is to make an inventory amongst AV groups and local and regional authorities in this respect. By the end of this mission, a general concept would be developed and reported back during the wrap-up meeting. The second mission will be used to work this general concept further out, present it to all concerned and generate as much support as possible. A third mission should complete the project and make it ready for implementation.</p>	
2.	<p>Discussion on approach and procedures</p> <p>Tency agrees with this approach but stresses that a vision has to be developed in line with the suggestion of Israel Gev. He also mentions that it should be practical and realistic.</p> <p>Jeen enquires whether a procedure would be more appropriate than a committee. The tendency was to agree on that provided that this would result in a framework and eventually an organisation.</p> <p>It was stressed by all to prevent a paper exercise but to come with something feasible that would receive the support from a large group in the community.</p> <p>There was some confusion about the timeframe as on one hand it should be prevented that this drags on too long and people loose interest. It should not be hurried either as ground needs to be prepared for the ideas to land properly in the mind of all concerned.</p>	

3. Local and regional authorities  
 Eri asked if the fact that local and regional authorities were part of the schedule was supported by all present or that more because the team asked so. All stressed that the meetings with the authorities may not be very useful, but have to be seen as 'preparing ground' for a next phase when implementation is done.
4. Meeting was closed at 4 pm.  
 Internal conclusions:
  - the team does not feel comfortable with the fact that so many authorities are listed on one hand and the team is very limited in its freedom of speech on the other hand;
  - AV's tend to be very sceptical towards the feasibility of such project while at the same time they will have to be the people that will have to implement it;
  - Although there is a general consensus on the approach through procedures, it is strongly

## Minutes Rolf – Residential zone water supply

at Rolf's office at Invocation

August 9, 2006

Present:

for Residential zone

water supply: Rolf

for Dutch mission: Jeen Kootstra

Eri Salomé

Gilles Boulicot

### Introduction

Rolf is running the water supply for 7 communities in the residential zone. It is the single largest scheme in Auroville and therefore a good source of information for the experience of running a (small) water supply scheme in Auroville.

### Brief history

Auroville used to have a water service that mainly repaired pipes and well pumps. Their budget was not cover the depreciation of own tools and equipment and as a consequence the service could not fully operate and maintain the system that was constructed in the residential zone. Apart from the budget, also the service lacked suitable staff at that moment to develop towards a full water supply company. This resulted in a variety of problems from manholes on an overhead storage tank being left open to billing being 6 months behind. Rolf being a contractor came in to do repairs, but ended up taking over the entire system.

In setting up the water supply in the residential zone, the company took a loan to cover the construction expenses and in exchange charged a connection fee of 30,000 – 40,000 Rps to be connected to the network and 12 Rps/m<sup>3</sup> consumed. The break-even for the loan was 100 connections of which 80 have been realised until now covering 250 people (registered users). The amount of water anticipated for production was 150 – 200 lcd.

Not all communities in the residential zone ended up connecting to the scheme. Although clear initial (though verbal) agreements were made that a well was allowed to be drilled on condition of a connection to the system, the connection was not establish. The main reason was that the water system could not guarantee safe drinking water (water of several wells being mixed and passing through an overhead storage tank) so the community decided to use the well only for their own community and later extended the supply of water to neighbouring communities against payment of water fees.

### Present practice

The system is functioning well, though the quantity of 150-200 lcd was exceeded due to domestic staff of people and gardening. Today an average of 300-350 lcd is being used. As a result of this and ill-performing wells, the system can not handle the demand fully. The system has 3 wells in total, of which one well can only operate 3 days per week. So the wells never run simultaneously but run by turn to prevent overuse and running dry. The other days the well supplies the community in which it is located. One of the other wells is not

functioning properly and should be flushed and regenerated. As a result of this stretching of resources, the system (overhead tank and pipes) occasionally falls dry. The wells have auto-switches against running dry. These break down due to lightning and power surges. As a consequence, the system can not be run fully automatic but needs presence permanently. During the night, production lies still if no staff can be made available.

The water quality is monitored on a regular basis at the taps. Water quality in general is good, but the taste is not as good as in Auromodele. Particularly in the rainy season, the taste becomes mineralised and turbidity is higher. A yellowish deposit is left on filters, in pipes and in toilets. E-coli are slightly higher during the rainy season which is generally observed due to the inflush of surface water.

The system is fully metered and 10-20% is unaccounted for. Due to the turbidity in rainy season, flow meters are not working properly. The flow meters also do not work at very low yield. The water is therefore only administratively lost, not physically. The leakage is believed to be as low as 10%. As the meters are monitored daily to weekly, excessive consumption indicating leaks is easily discovered.

The water fees for those connected are being paid without problem. The connection fee also has not been a problem. Price indexation is applied every 3 years (25%). The fees cover operation and maintenance and an emergency fund. Depreciation of the entire system is not covered. If this would be included and the resources would not be limited (limited resources cause little water to be sold, thus increasing the cost per m<sup>3</sup>), then a fee of about 18 Rps/m<sup>3</sup> would be the result. This would still be reasonable in the regional context (Pondi and Chennai: cost at 16 Rps/m<sup>3</sup>, fee heavily subsidised by the government at 4 Rps per m<sup>3</sup>; Bangalore cost at 25 Rps/m<sup>3</sup>, fee heavily subsidised by the government at some 8 Rps per m<sup>3</sup>).

At present no extra connections are allowed until the sources have been extended with another well.

Rolf is managing the scheme and has 1 operator for operation and maintenance.

### Development and plans

It is planned to construct one or two extra wells after which the scheme could be extended. Also it is planned to introduce another 25% for the year 2007 to cover price indexation over the past 3 years.

Rolf is not willing to hand over the scheme unless it has proved to work for at least 1-2 years properly.

The main hurdle in getting a water supply organisation from the ground in Auroville in his opinion is the lack of 2-3 Aurovillians willing and able to take responsibility for the entire scheme. In general the maintenance received in exchange may not be sufficient to stimulate Aurovillians to keep such an organisation in proper conditions. Outside staff at management level could not be sufficiently motivated and non-Aurovillians heading such a service department would not be acceptable for the community.

In planning future extensions of the scheme, it is difficult not to have clearer plans for the residential zone. These clearer plans could bring in more settlers willing to invest in a house and a water connection.

Another hurdle is that many facilities are constructed by communities and fully under their control. People from the community would be reluctant if taken over by a water organisation.

The communities now having their own water supply from wells in general only consider the electricity as the operational expense of the system. Repairs and replacement are separate. As such the actual operation and maintenance cost is not paid on a regular basis. It is anticipated that the required increase to cover these in case of taking over by a water organisation would be a major struggle.

#### **Remarks**

## Minutes TWAD/PWD – Water management and groundwater

at TWAD office in Cuddalore

August 10, 2006

Present:

for TWAD: Superintending Engineer in charge of Cuddalore and Villapuram  
for PWD: Ass. Director Geology  
for Dutch mission: Jeen Kootstra  
Eri Salomé

Gilles Boulicot

### Introduction

After the formal introduction much time was spent on the Kottakarai project, Harvest and Auroville. TWAD initially felt it as if the system was ill-performing and the project was going to fix this. Much time was spent on explaining the integral character of the project. Several ‘dogma’s’ were brought forward on the probable cost, the likely dimensions of the scheme including the replacement of all PVC pipes by cast iron pipes. There was also much discussion and explanation required on the principle of pilot and stepwise expansion.

### Finances

TWAD receives budget from the State Government for water supply. The budget is based on survey of projects and projects approved for financing. TWAD will give priority to the villages with the lowest coverage or no water supply at all. Villages that grow over time can apply and eventually will receive an extension of the water supply scheme through an extra borewell, overhead tank and distribution system. TAWDC does maintain schemes as well. How many, on what basis and at what cost was not discussed. Those schemes under their maintenance are regularly checked for the water quality. Samples will cost 250 IRps for a complete analysis so it is doubtful if these samples are requested for by the village.

TAWD confirms that a house connection will cost 1000 Rps connection fee and 30 Rps per month. They also confirm that water from standposts is generally free of charge but that it is up to the village Panchayat to impose a fee for every inhabitant of family using the standposts.

### Relation with PWD

TWAD submits project proposals for PWD for their specific input on groundwater, location and design of the well, pumping capacity etc.

### Groundwater and environment

They claim that there are few problems with salt water. If salt water is found, the well is abandoned and a new well is drilled. Salination is not really an issue.

There is no policy on a prohibited zone around a production well. Fertilizers and biocides in groundwater are not an issue.

Pollution is dealt with by the Central Pollution Control Board.

### Rainwater harvesting

TWAD promotes rainwater harvesting and has prepared several brochures to assist with rainwater harvesting. In particular large institutions are practising rainwater harvesting. New constructed houses also have to do this but it is not always enforced. Where for larger blocks together this would require coordination and suitable areas to store or infiltrate the rainwater, this is not (always) happening. For infiltration soil quality (suitability) maps are required and these appear to be available.

### Integral approach

TWAD confirms that they favour an integrated approach whereby several water aspects are integrally addressed in project context. They were willing to support this initiative in a platform with all relevant authorities (drinking water, groundwater, sanitation, forestry) and even willing to take a leading role in this respect. The Dutch team suggested to organise a workshop by the end of the pilot project to discuss findings and extension of the project.

### Closing

The participants to the meeting were thanked for their time and it was agreed that they were kept informed about the progress of the project.

### Remarks

- The consultants feel it is wise to prepare a brief synopsis of the project in the form of a coloured brochure explaining the framework, the aim and the different components of the project accompanied by simple pictures;
- It is doubtful that everything is as well organised, working and simple as claimed by the superintending engineer and chief engineer of TWAD. For example, it is strongly doubted that infiltration maps are available, that salination or pollution of groundwater in wells is not occurring and that rainwater is harvested as well as described.



## Minutes TWAD – Water management and groundwater

at TWAD office in Chennai

August 11, 2006

Present:

for TWAD: Chief Hydrogeologist Dr. T.P. Natesan  
Jeen Kootstra  
for Dutch mission: Eri Salomé

Gilles Boulicot  
Shiva

### Introduction

After the formal introduction much time was spent on the Kottakarai project.

### DANIDA project and water supply

The DANIDA project started in 1996 and lasted for 7 years. During this project the DANIDA team worked integrated with the TWAD staff. The project covered water supply to the entire state of Tamil Nadu with emphasis on coastal villages. Aim was to provide standposts for every 150 inhabitants. The Panchayat provide houseconnections if needed. Minimum fee is 30 Rps per month, connection fee is 1000 Rps. To change, one has to go through District Administration.

DRD sometimes provides maintenance grants

When water supply schemes are regional, TWAD provides maintenance. Their maintenance cost is 3.5 Rps/m<sup>3</sup> in rural areas and 4.0 Rps/m<sup>3</sup> in urban areas. The actual cost of an entire scheme (operation, maintenance and depreciation) is estimated at 25-30 Rps/m<sup>2</sup>. The state government is to decide about the water pricing and the subsidising and impose a fee for example standpost connections. It is not foreseen that the subsidising will be strongly reduced in the coming year, so subsidised water supply will remain the case.

### Monitoring and regulation

TWAD jointly with PWD and CGWB determines the rate of exploitation of the different blocks in the state.

Chennai metropolitan authorities are responsible for monitoring of groundwater and the provision of drinking water in the Chennai area. TWAD is responsible for the same but outside Chennai.

The Chief Engineer is able to generate some graphs with groundwater level development over the past year in general for Tamil Nadu. Such a graph does not signify much, but the detailed data from which this graph is constituted is also available. Regular reports are published with data and shared with relevant authorities in the state.

### Groundwater and environment

There is much legislation with respect to groundwater and pollution. Pollution rests with the Central Pollution Control Board and cases reported to this board are not followed up by TWAD as this is not their responsibility.

### Rainwater harvesting

Rainwater is promoted and supported by TWAD. Infiltration suitability maps based on GIS and remote sensing are available. Harvest is promised such a map on soft copy. The map can not be made available immediately.

The water act of 2003 promoting rainwater harvesting, also introduced the recycling of grey water. Houses are now equipped with a grey-water (kitchen, sinks, bathroom) treatment unit that allows recycling of the water for gardening and parks.

A general brochure is available (same as obtained previously from TWAD in Cuddalore) and the Chief Engineer shows a presentation with a remarkable initiative from a man from a village. This man is harvesting rainwater from his roof, filtering with coconut fibres and storing it in a concrete storage under his house. The stored water has been sufficient to provide himself, his family and 2 tenants with drinking water continuous for 8 years.

Within Chennai, the metropolitan authorities are aware of old open wells, tanks, lakes etc to where the harvested rainwater can be guided. The authorities are not afraid of contamination although the recharge is not fully controlled. The water supply for Chennai comes from outside Chennai and is not immediately endangered by pollution in the urban area. Many private wells however do exist in Chennai.

In general, several awareness campaigns are ongoing for rainwater harvesting and pollution control.

### Integral approach

TWAD agrees that an integrated approach such as applied with DANIDA in their project is required. They have no objection if an outside entity (NGO, project group etc) is taking initiative in an integrated water management project. NGO's already are active in this field. Passive involvement (information exchange) would be recommendable. Upscaling such a project would also no require immediate involvement of all authorities. They find it difficult to indicate when the authorities should be actively involved.

They mention that demand management is very important

### Closing

No remarks.

### Remarks

- There seems to be an unwillingness to provide data on infiltration suitability to external (outside TWAD, PWD, CGWB) organisations.

## **Minutes PWD-GWD – Water management and groundwater**

at PWD office in Chennai

August 11, 2006

Present:

for PWD-GWD: Chief Engineer Mr. S. Natarajan  
for Dutch mission: Jeen Kootstra  
Eri Salomé

Gilles Boulicot  
Shiva

[www.groundwatertnpwd.org.in](http://www.groundwatertnpwd.org.in)

### **Introduction**

After the formal introduction much time was spent on the Kottakarai project and the Kaluvelly swamp. He is clear that Kaluvelly will be taken up by the authorities within years. The prime function will be to supply water to the Chennai Metropolitan authorities.

### **IAM WARM project**

The IAM WARM project will soon start. This project works at the reform of the agricultural sector, groundwater recharge structures, aiming at reduction of water demand and rehabilitation of the groundwater reserves.

### **Monitoring and regulation**

PWD-GWD has 1700 monitoring wells throughout the state, the quality pre-monsoon and post-monsoon and the level every month. They also monitor 600 rainfall stations on a daily basis. Raw data as well as reports are exchanged with other authorities carrying out monitoring. The budget for monitoring originates from the state budget.

Infiltration suitability maps are produced by TWAD and PWD jointly. The maps of the entire AV Bioregion are given for photocopying. The maps are prepared by ANNA University – Institute of Remote Sensing.

Also for the block classification, PWD-GWD is involved. Blocks are classified according to their groundwater potential or balance between recharge and production. The recharge is determined based on the soil conditions, average rainfall, underground conditions. Production is based on crop patterns obtained from the district office of statistics (area or percentage of various crops) and the average water use per crop. The classification is reviewed on a yearly basis. In the near future the classification will be done per watershed or sub-watershed.

### **Groundwater and environment**

Cases of pollution are occasionally found and reported to the Central Pollution Control Board. It is not known what is done with the report afterwards. As CPCB is responsible, PWD-GWD does not consider it as their task to follow up.

Legislation is available but sometimes not effective and when effective legislation is rarely applied. The legislation is a political very sensible subject. Enforcement would result to complaints at the address of politicians and invariable results in withdrawal of claims.

### **Rainwater harvesting**

Rainwater is promoted actively and brochures are available.

### **Integral approach**

PWD-GWD confirms that much has improved and that water resources are doing better. They also claim that it is not yet too late for India's water resources. Politics and willingness to enforce legislation is though still a weak point.

It is better to start with the people in the field and for that the IAM WARM project and the DANIDA project in the past are good examples.

They confirm that they encourage an integral approach in projects and that such approach can best be simply started in the form of a project not yet involving all authorities concerned actively. That can be done in a later stage if the project grows.

### **Closing**

It is agreed that Harvest would send some concise data about Kaluvelly and the proposed infiltration of excess floodwater in the Vanur aquifer. The maps are returned after having been photocopied.

### **Remarks**



## Minutes CGWB – Water management and groundwater

at CGWB office in Chennai

August 11, 2006

Present:

for PWD-GWD:Regional Director Mr. N. Varadarajan

for Dutch mission: Jeen Kootstra

Eri Salomé

Gilles Boulicot

Sivasubramaniam

### Introduction

The purpose of the mission is briefly explained.

### CGWB tasks and developments

CGWB is responsible for monitoring of groundwater nationwide. They fall directly under the responsibility of the Union Ministry of Water Resources They represent national policy at state level contrary to all state authorities (TWAD and PWD-GWD) that look after state interests. CGWB also mediates in groundwater discussions between states. They look at the deep aquifers (>300 m). They furthermore only come in if there are particular difficulties, very low yields, salt water, deep boreholes.

A state water authority is presently being formed. They are to take over some of the issues presently proposed to CGWB. They will have staff from PWD-GWD and TWAD as well as from CGWB. This will be a task oriented committee within PWD-GWD.

Drilling is carried out by CGWB for own purpose (researches and observation wells) and on contract basis. For the construction of boreholes, the CGWB has guidelines. These are however not obliged and thus not always respected.

### Monitoring and regulation

CGWB monitors groundwater at national scale. Data are exchanged with other authorities.

Little is known about the shallow coastal area. Although the Oil and Natural Gas Company (ONGC) has extensively drilled off the coast of Tamil Nadu, little data from this area are available. The ONGC hardly looks at the first 500 m which are essentially important for groundwater.

Legislation is available but is not always effective.

At national level there is a committee directly under the Prime Minister. This committee promotes rainwater harvesting, groundwater recharge and demand management.

### Groundwater and environment

Pollution does occur, but this is the concern of the Central Pollution Control Board (CPCB). Wells for industrial purpose are the responsibility of CPCB. They consult CGWB for information.

### Rainwater harvesting

This is one of the main solutions to the groundwater problems. CGWB promotes rainwater harvesting and groundwater recharge.

### Integral approach

Rainwater harvesting, groundwater recharge and demand management are very important for the groundwater resources. It is very good if initiatives are taking in this direction. CGWB advises to

start and not to involve all authorities concerned. Once best practices are developed, then this can be used to promote these in other areas. When the scale of the project increases, then it is time to involve the relevant authorities.

### Closing

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### Remarks

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## Minutes Palmyra

at Palmyra office

August 12, 2006

Present:

for Palmyra: Mr Jurgen Putz, director

for Dutch mission: Jeen Kootstra

Eri Salomé

### Introduction

Palmyra, as it is now, started in the nineties with the foundation of the Palmyra Centre for Ecological Land Use, Water Management and Rural Development. The first activities in the bioregion concerned mainly land reclamation and health related projects.

Actually Palmyra works in many different fields: land reclamation, forestation, tank rehabilitation, water conservation, and also women's empowerment, education and sport.

### Present activities

Palmyra is well known, and respected, for its ability to create awareness and community mobilization.

Concerning water management in relation with the authorities, Palmyra is (a.o.) participating in such a project : the Pondicherry Coastal Zone Management Authority. This project shows the ability of the Indian government to execute plans with the involvement of several authorities.

### Role in Auroville Bioregion and further

For the subject of water management, Palmyra is experienced in cooperation with the Indian Authorities.

Concerning monitoring of water quality, Palmyra can dispose of a well equipped laboratory (Environment Monitoring Service, a separate entity), where many water analyses can be carried out. A list of possible tests is available at Igor's laboratory. Detailed figures on the results of monitoring are available.

### Vision, plans

Palmyra will continue its present programs according to own vision without too much involvement of other activities in Auroville.

For water management, this means a further development of cooperation with the government authorities and also, very important, further development of programs for awareness and empowerment of the involved users in the villages.

### Remarks

Jurgen is very sceptical about the possibilities to come to a kind of "water body" in Auroville. He thinks that rationally required technical measures will be made impossible by emotional feelings. As long as there cannot be dealt with this gap, it is useless to try to come to such a body.

However, he is convinced that such a body is necessary for adequate relations with the social, administrative, economical etc. developments in and around the bioregion of Auroville.

To come to a first step Jurgen is convinced that we have to:

- Make a straight plan
- Follow our own direction and be not influenced by the different clans in Auroville
- Accept the reality (concerns the case of the Matrimandir lake)
- Make it clear by practical results

## Minutes Aurofuture

at the Town hall

August 12, 2006

Present:

for Aurofuture: Mr Luigi

Mr Pashi

Mr Joseba

for Dutch mission:

Jeen Kootstra

Eri Salomé

### Introduction

Aurofuture is responsible for the overall planning (master plan) and the execution of this plan. The activities of Aurofuture concern the (inter)national relations about town planning, funds raising, communication etc., the technical coordination of the design works to be done in Auroville and planning of required infrastructure.

### Present activities

Aurofuture is elaborating many aspects of the master plan to a detailed level. Notwithstanding the stagnation of the growth actually, Aurofuture expects anyway that the foreseen 50.000 inhabitants final situation are a realistic estimation. Planning will therefore be based upon these figures. Concerning water aspects actually an important point of discussion is the position of the Matrimandar Lake.

### Role in Auroville Bioregion and further

Aurofuture considers internal relations in Auroville and external relations to the Indian Government at all required levels as very important. It is felt that Aurofuture has not been involved sufficiently in the ongoing feasibility study. Nevertheless the results of this study are expected to be of major importance for elaboration of the detailed studies by Aurofuture.

### Vision, plans

The master plan is clear. The supporting detailed studies will be developed as soon as possible. Discussions on and communication about these studies are required. Concerning the formation of some waterbody, Aurofuture agrees as long as it will not have some kind of legal status. According to the Foundation Act Auroville is a "autonomous statutory body". A legal authority would have a program and that is legally not possible.

But it doesn't exclude the formation of an "informal" body (sort of NGO), because Aurofuture strongly supports the idea that Auroville should speak with one "water" mouth asap. This body should be able to take the necessary steps to cover water management in and around Auroville. Aurofuture prefers to consider first the results. Maximum 6 months later the outline of this water body should be established.

Items at least to be considered soon:

- Water supply of wells
- Reuse of waste water
- Rain water harvesting (roofs)
- Water capture of roads

And within maximum 2 years (the water situation is urgent), it should be mandated to take the necessary decisions by majority.

### Remarks

An important reason to consider the water supply situation is the excessive use of water in some parts of Auroville (ranging from 300 up to even 900 l/c/d). And at costs far below cost level. Taken into account that a pilot project in Kottakarai is at hand where design criteria still has to be established, but the consumption will certainly not surpass 40 l/c/d, it is to be expected that sooner later a major problem of inequality will rise.

## Minutes Pondicherry PMW-GWD – Water management and groundwater

at PMD office in Pondicherry

August 14, 2006

Present:

for PWD-GWD: Mr. V. Radhakrishnan Hydrogeologist II  
for Department of Agriculture: Mr.A.Subramanian, Additional Director,

for Dutch mission: Jeen Kootstra  
Eri Salomé

Gilles Boulicot  
Shiva

### Introduction and regulation

An overview is given of regulations and legislation responding to the ever worsening situation of the groundwater resources in Pondicherry state:

April 1980 Limitation to construction of tubewells, restriction to well spacing.  
Year 1988 Limitation to tubewells in coastal area (< 6 km from coast) and further limitation of wells spacing;  
Year 1991 Limitation of well spacing in alluvial aquifer  
Year 2003 Enforcing groundwater act, limiting construction of wells  
Year 2004 Groundwater authority is set up  
Year 2005 Pondi becomes a notified area where the 2003 legislation can now be applied which expresses the problems for the groundwater situation.

Under the 2003 water act, the government clear an application for the drilling of a well. This power has been delegated to the groundwater authority. The clearance is limited to the safe amount for groundwater abstraction. Although there is a 170% abstraction of groundwater, Pondi is not declared a black block. It would be impossible to ban the construction of wells completely.

Income in the water sector comes from the fees on water supply and on the tanker trucks provided with drinking water.

Present status of groundwater in Pondi is very problematic. The agricultural sector is the main cause with water consuming crops as paddy rice and sugar cane. Groundwater levels in the Vanur aquifer have dropped from -5 m in 1982 to -60 m at present. It is known that the Vanur aquifer goes as deep as 150 m.

### Monitoring

Monitoring is done in Pondi, both qualitatively and quantitatively with some 60 tubewells. Waterlevel is monitored every 2-3 months and the waterquality twice per year.

PWD-GWD has 5 focus points, being recharge, conservation, development, monitoring and evaluation.

A new project is underway to increase the number of monitoring wells and to provide a laboratory for PWD. The project will also cover a groundwater model, rainfall monitoring stations, the management and integration of information and the integration of activities from Agricultural and the Public Works Departments.

### Groundwater and environment

PWD agrees that there is little control on pollution and that a large risk on groundwater pollution exists from the infiltration wells and all private wells.

### Rainwater harvesting

Rainwater harvesting is promoted and all government buildings are no provided with rainwater harvesting systems. Old dugwells in the town and outside are renovated and used for groundwater recharge.

### Integral approach

Pondi government promotes the integral approach in groundwater resources with subsidies. In the 5-year plan 2002 – 2006, 2 Crore Rps per year were available for subsidies. This amount will be reviewed upward in the next 5-year plan starting 2007. Initiatives subject to subsidy are:

- rehabilitation of dugwells for groundwater recharge;
- changing from flood irrigation to drip or sprinkler irrigation;
- using low water yielding crops;
- replacement of open channels by pipes in irrigation.

Subsidies often mount to 90 % of the total amount. In general the most effective subsidies (irrigation method and crops) are the least used. The money for the subsidies is not paid to the beneficiary but to his supplier (in case of farmers) or to an industrial corporation (in case of an industry).

Main aim for the Vanur aquifer in the coming years is recharge and conservation.

The main problem in Pondi is that the farmers have free and permanent power supply, that often a small plot is bought in Pondi providing water via pipes to large plots situated in Tamil Nadu where the power supply is very limited. Despite these limited hours of pumping, the agriculture in Tamil Nadu does not have a problem. Therefore the cost of 1 hour pumping for farmers has reduced from 15 Rps/hr in 1987 to 5 Rps/hr at present.

The efforts in extraction reduction and recharge have slightly improved the situation (less negative) but it is clear that it is not realistic to change 170% exploitation can be reduced to some 80% exploitation.

The main cause, being the free electricity is untouchable for several years to come. No politician is willing to face riots as a result of imposing charges (however small) on electricity in agriculture.

### Closing

The staff from PWD-GWD ask for the possibility for technical knowledge exchange and training from the Harvest or its foreign partners in the frame of the new starting project. Harvest will take this up with Hydron.

Meanwhile they are willing to cooperate with and support any NGO working in this field as well in projects carried out by these NGO's.

**Remarks**

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### **Minutes Mr Gopalswamy – Retired Dep. Director Geology**

At home address in Pondicherry

August 14, 2006

Present:

Pondicherry: Mr Gopalswamy

for Dutch mission: Jeen Kootstra  
Eri Salomé

Harvest Gilles Boulicot  
Siva

#### **Introduction**

Mr Gopalswamy is actually retired. Previously he was Deputy Director geology. He was very much involved in groundwater matters and the concerning legislation. He was also involved in the Danida project, in which a Danish NGO has provided a lot of waterschemes in the region.

#### **Organization-legislation**

Mr Gopalswamy shows as an example the model of the Danish organization for (ground) water management: a well functioning set-up with clear responsibilities (Danida project). In India all legislation in this matter is still provisional, to be completed latest in 2020.

At Panchayat level so far nothing is available. That should be the level where practical issues in water management should be taken care of. "Power to the people" (included in legislation though the Panchayat Raj legislation) should be the base. Actually in general no technical expertise whatsoever is available at Panchayat level. In this way it is also easy for higher level authorities to manipulate the Panchayats.

Anyway, proper action always has to start with the concerned people.

#### **Groundwater and environment**

Appealing to the Environmental Act is only possible in case of overexploitation of groundwater. The whole state has been divided in areas of overexploitation, critical areas and some more classes less than critical concerning the groundwater situation. The Auroville region has been classified as critical, however in reality it is overexploited.

Harvest receives a document concerning the situation of the groundwater per area in the whole state.

#### **Rainwater harvesting**

For infiltration only rainwater is suitable because of the risk of pollution.

#### **Integral approach**

Main problem is the free power supply, and mostly free water also. There are no incentives to save water or electricity. And the level of awareness at Panchayat level is not sufficient to tackle these problems.

It might be helpful to make use of the new scheme of funding for social development of the people. Is available for Panchayats (forthcoming from the Green Revolution). And could be used for instance to introduce other crops (biodiesel, carbontrade).

#### **Remarks**

Interesting information:

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November 2006

## **Minutes Working Committee**

at the Town Hall

August 16, 2006

Present:

for Working Committee: Anandi, Roy, Selvaraj, Raman,

for Dutch mission: Jeen Kootstra  
Eri Salomé

For Harvest Gilles Boulicot

### **Introduction**

The Working Committee (WC) assists the RA in communication to the (Indian) authorities. The WC is only responsible for a proper handling of the responsibilities and activities of the RA. As such the WC can only work on formally accepted groups / authorities within Auroville.

### **Present situation**

The relation with the (neighbouring) villages was until recently not very good. The panchayats were convinced that the (water) activities of Auroville were aggravating the water situation in the panchayats. Cooperation was very difficult as there was this mistrust. Continuous talks and positive results of the measures, taken by Auroville, provided recently a good base for further cooperation.

As in Auroville many people and groups are involved in development of Auroville and the region, it happened often that very different opinions and measures (even contradictions) were proposed. Panchayats did not understand that or, in bad cases, they abused these different information and action channels for their own advantage.

Therefore the Village Development Councils has been created for 2 villages (Edayanchavadi and Kulappalayam) a well structured cooperation between the panchayat and Auroville. These councils consist of members of both communities and show good results. It is planned to create similar structures in the other villages of Auroville's surrounding.

These councils are also very important for Auroville as also interest of Auroville can be taken into account (f.i. pollution of groundwater has to be prevented, but in the villages the security is rather low)

### **Remarks**

To constitute an official body, a proposal should be made to the secretary of the Auroville Foundation (actually Mr. Murthi).

According to one of the members of the WC privatisation might be also an option (this will/may work for water supply but certainly not for proper water management)

## Minutes APDC

at Town hall, APDC office

August 17, 2006

Present for APDC: Carel  
Lucas  
Joseba  
Suhasini  
Ruslan

for Dutch mission: ....  
Jeen Kootstra  
Eri Salomé  
Gilles Boulicot

## Introduction

Gilles briefly introduces the mission and explains the main purpose.

## Mandate

The Auroville Planning & Development Council (APDC) is a standing body to draw up Five Year Development Plans in accordance with the Master Plan. It is the official workgroup in charge of Preparation, Implementation and Monitoring of Development Plans. It is expected to maintain excellent communication channels with the working groups concerned and the community at large.

The Auroville Planning & Development Council (APDC) has also the task to evolve Building Permission guidelines and procedures.

## Tasks of APDC

One of the tasks of the APDC is to formulate a development plan that will study and propose steps for the growth of Auroville for a population of 3000 persons. Each of the zonal groups has been asked to study and prepare reference documents that outline the following:

1. Present land ownership and land use within the zone.
2. Present infrastructure within the zone.
3. Identify development potentials based on surveys, potential activities and needs within the zone. This could include access to the zone from within and without, infrastructure needs, economic and environmental sustainability of the zone and integration of the present resources (human and material) into the future plan for the zone.
4. Identification of lands that would be needed for development and prioritization of non-Auroville owned land for purchase.

At the same time the APDC also asked individuals, groups and services to study and submit documents for land consolidation, water and sanitation, energy, education, economy, and infrastructure such as roads, telecommunications and electricity. With this, the APDC formulated a "Development Brief" that outlined the directions for the Development Plan-3000, and created a road map to be able to formulate this plan.

Besides the work of producing the Development Plan-3000, the other tasks of the APDC are:

1. Planning & development co-ordination with the local authorities, villages and state bodies. Auroville has formally taken steps to participate in the preparation of a larger Regional Plan in partnership with Town and Country Planning Departments of Tamil Nadu and Pondicherry Governments.
2. Project evaluation and monitoring with the help of the zonal groups.
3. Project prioritization and fund raising.

## Role APDC in water

APDC advises/decides in matters of well drilling and water system construction for new buildings or existing buildings in so far this is brought to their attention. Well construction is only allowed after approval of APDC.

## Necessity for integral water management and its organisation

APDC agrees that the water situation in Auroville is problematic and that an organisation would help the possibility in improving the situation.

Ruslan mentions an initiative in demand management, the proposal for which will be sent to the team by email.

APDC generally agrees that a group that would start and prove to be successful in water supply would earn the respect from the community at large and may result in the formalisation of the group as the water organisation for Auroville. Such formalisation would however not be granted. To start with the formalisation and based on this start the work has little change of success.

Unwillingness to transfer the operation and maintenance from the users/caretakers of the wells cannot be underevaluated. Few areas are potentially ready to transfer the activity and should be targeted at first. Through time and demonstration of capacity and efficiency, it may be expected that the water supply systems will be transferred little by little to such organisation.

All Aurovilians involved in water management would in one way or another be part of such a new group.

Joseba mentioned that the Masterplan should be the physical and planological framework for water supply development.

Any watergroup should work on the basis of a sort of waterplan.

Auroville should be cautious about linking and involving the surrounding villages to their scheme as this may lead to a complete drainage of the scheme and its resources.

APDC agrees that if funding for the operation of such group would be found for a period of 1-2 years, this may well help to start off the group and after 2 years the funding may be taken over by Auroville or the funding could be on an auto-reliance basis (operational expenses being paid from the income this group generates).

## Remarks

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## **Minutes Dr. Agrawal**

at Harvest Office

August 17, 2006

Present: Dr. Agrawal  
for Dutch mission: Jeen Kootstra  
Eri Salomé  
Gilles Boulicot

### **Introduction**

Dr. Agrawal worked with the Central Pollution Control Board (CPCB) during the early 80's. After that he has been Professor at the University of Kanpur. Occasionally he worked as a consultant. He is retired and living in an Ashram in the north of India. He has become involved in Auroville over the past 5 years. He has prepared for example a write-up on water supply for the seminar in September 2004 and have been involved in the validation of the Dewats technology by the authorities as well as R&D on innovative designs.

### **Role of CPCB and responsibility**

The water pollution and control act from 1977 and successive amendments resulted in the formation of the Pollution Control Boards and provided a legal framework for its functioning. The board dealt with pollution in urban and industrial areas only. Through the withholding of a consent for groundwater exploitation or a conditional consent they influence the exploitation of polluted areas or areas sensitive to pollution.

A Supreme Court ruling resulted in the transfer of responsibility or rather the confirmation of responsibility for ground water with the Central and State Ground Water Boards. Surface water remained with the CPCB.

### **Present practice in groundwater pollution**

It is confirmed that the responsibility for groundwater pollution is not clear as authorities argue about this responsibility and this Supreme Court ruling apparently has not been conveyed to or its implications are not fully understood by the Central Ground Water Board.

The result is that pollution is not a common concern but invariable pushed towards CPCB that can not act in groundwater pollution.

It is also found that authorities think too simple about groundwater pollution, in particular with respect to the recharge projects both in urban and rural environment. The main concern for pollution is the economic concern. It is Dr. Agrawal's opinion that little can be done to change the behaviour of the people.

### **Remarks**

The lack of clarity about the responsibility for groundwater pollution needs to be clarified by legal aspects. If so, this as an important issue for the Indian Government to resolve.

## Minutes Wrap up meeting

at CSR

August 18, 2006

Present:

for : Tency  
Gilles  
Kireet  
Lucas  
Maurice  
??  
??

for Dutch mission: Jeen Kootstra  
Eri Salomé

### Introduction

The primary impressions of the mission have been presented by Jeen and Eri. A PowerPoint presentation was prepared for this purpose. Series of statements were prepared to facilitate the discussions.

### Presentation

The presentation will be made available to people present at the meeting and also to people interested in the subject.

#### Questions about the presentation

Q: Which authorities have been interviewed

A: The list (the agenda) will be made available

Q, Gilles: Time frame for the water body to start?

A: It is urgent, Aurofuture has indicated 2 years, 5 years is definitely too late.

Presuming that in 6 months this small project will be finalised, during the 6 months after completion the process of forming such a water body should start. In this context the financing of a water body for 2 initial years would help a start-up. Such funds could be made available from external gifts and provided that an organisation of some kind will result, sources will be willing and able to finance such a water body for a limited period of time.

Q Why only Kottakarai as pilot. Parallel it would be good to start up something in AV as developments in villages are of long duration.

A: Agreed. But it would be good also if the knowledge and capacity of AV could be used also in a more extended way for the villages.

Q, Tency: Is it possible to have an overview of the reactions of the authorities outside and the different groups and persons in Auroville.

A: In the report that will be submitted in September, the minutes as far as relevant will be included. Also a brief compilation of opinions will be given.

Remark: A proposal has been prepared to reduce the enormous water consumption in AV.  
Would be good to consider that proposal in this framework.

### Discussion

4 series of statements were prepared about the possibilities and the responsibilities of an Aurovillian Water Body (AWB). The intention was to discuss in 4 groups about all series of statements. But the number of those present was too small for 4 groups. 2 groups have been formed around the first 2 groups of statements: position of AWB in Auroville and position of AWB on regional/national level

#### Position in the Auroville community

1. Within a year AWB has overtaken all responsibilities for water supply
2. AWB is formalized after one year for all water management aspects (quantity and quality)
3. AWB sets the water tariff structure

#### Position in the region / national

1. Without AWB AV will lose definitively the regional battle with the present head-in-the-sand politics
2. AWB cannot explain the present AV waterstandards to the bioregion
3. AV is useless for the bioregion without making available her capacities and knowledge for the benefit of the region
4. AWB is the only body for practical regional cooperation: by the "water management way".

#### Tasks – responsibilities – authority/power

1. AWB is solely responsible for sustainability in water in and outside AV
2. AWB will realize within one year an economical healthy system for water supply (including tariff structure)
3. Tariff is independent of location
4. Tariff depends on quality

#### How to arrive to the AWB

1. An "hired" expert group will start the activities beginning 2007
2. By the end of that year all water responsibilities have been taken over
3. The AWB will expand the results of Kottakarai project.

#### Position in the Auroville community

1. *Within a year AWB has overtaken all responsibilities for water supply*  
Actually 186 wells are used in AV, all of them controlled by individuals. To take over these facilities, 2 main problems have to be considered:
  - a. The people will be reluctant to shift the responsibility as long as there is no trust in the new (informal) body. In the past people often have organized their own supply as there was no proper organization to be trusted.
  - b. The high number of small schemes, the complexity of interconnection of schemes and the probably low degree of cooperation will not allow for a one year target. More time will be necessary. The best way is "to pluck the ripe apples", to start with schemes which can be overtaken easily. Those schemes should serve as an example for the rest. It is easy to identify at least 3 schemes to start with and to operate these schemes completely within one year.

1. *AWB is formalized after one year for all water management aspects (quantity and quality)*

As only part of the schemes will be managed and operated by the water body after one year, the formalization of the water body will not be possible. Within AV this is not a problem. The water body can be extended nevertheless.

What should be possible to recognize by AV after a year or so would be the management set-up of the body, serving as a base for further technical development (e.g. for the next 5 years) of incorporation of existing water schemes etc.

2. *AWB sets the water tariff structure*

It's fully agreed that a tariff structure is required as nothing will ever be achieved without people, paying for the services.

Position in the region / national

1. *Without AWB AV will lose definitively the regional battle with the present head-in-the-sand politics.*

The group fully agreed with this statement. The regional battle in this case is for example the uncontrolled dumping of solid waste by solid waste collection organisations (not under AV) and individuals in sensitive areas such as swamps, canyons or the overexploitations of aquifers downstream leaving AV will their wells dry in the upstream area.

2. *AWB cannot explain the present AV waterstandards to the bioregion.*

It was agreed that in terms of waterconsumption, it was embarrassing to have to acknowledge that AV is average consuming 3 times the nominal consumption in urban areas and 5 times that in rural areas. In the plenary discussions, the issue was brought up that there are several ways of dealing with this, simply accepting that this is the case and still working on reduction of demand outside AV.

3. *AV is useless for the bioregion without making available her capacities and knowledge for the benefit of the region.*

It was agreed that the knowledge and capacity are assets of AV that can be 'exported'. In fact this is already done by several groups under AV but not as being AV. This also is still difficult in view of the lack of internal cooperation towards external entities. It was mentioned during the plenary session that this may not be the first task to be taken up by the AWB. If AV is exporting knowledge and

4. *AWB is the only body for practical regional cooperation: by the "water management way".*

It was already shown in the past that few organisations (Harvest, Palmyre) are capable of introducing integrated water management programmes. As such AV is the only organisation in the area that is capable of doing this. It should not be necessary to wait until a water body is operative. In fact, several groups within AV are already active and should continue to do so. Coordination between the groups would certainly help. It is also mentioned that when all projects can be considered as AV projects, then an impressive list can be produced.