

Auroville Farms Assessment

Acknowledgments

The assessment team would like to take this opportunity to thank the donor Stitching De Zaaier and the Auroville farmers for supporting the undertaking of this appraisal. There are relatively few examples of Auroville groups that have been willing to open themselves up to such an undertaking and this bodes very well for the future of the group.

Background

This section of the assessment report focuses on the overall findings of the farming part of the assessment. The report serves to bring together the findings of the individual farm presentations and draw out the underlying themes, as well as compare and contrast the farms to a limited extent.

The report initially follows the same basic format of the individual farm assessments, using the main objectives as headings. After a short narrative, the main action points arising from the findings of the assessment conclude each section.

Health and Well-being

Farmers

On the whole, although health and well-being as a specific objective was appreciated by most of the farmers as being essential, and in some cases a priority, very few of them had much to say about it at this stage. Perhaps there is a reluctance to mix personal issues with professional ones. Whatever the reason, this was a shame from the assessment team's point of view, especially as recruiting farmers and farming related human resources for Auroville is a critical constraint at this point in time.

Farming is a stressful occupation in most circumstances, not least because of the responsibilities attached to it. The remainder of this section is reserved for attempting to identify these responsibilities, as well as making a number of tentative recommendations for improving the current state of affairs.

Finance

In Auroville, as in other parts of the world, farming is a relatively expensive operation. Establishment and running costs are high and increasing. With the exception of personal finances and a very limited number of external donors, there are currently very few sources of funding.

Historically this has resulted in a skewed cross-section of Auroville farmers, when compared to the general population. Farmers tend to be those with either personal resources, and / or the ability to access these, using the right kind of language and / or personal connections and influence. This does not necessarily overlap with the kind of people who have the practical or theoretical skills to be successful farmers.

Newcomers or Aurovillians with the appropriate skills and enthusiasm need to be identified and actively encouraged to take up farming and related activities. One activity that would help in this regard is to establish the necessary financial structures for this to happen. For example, specially allocated start-up accounts and ongoing commitments from specific donors.

Currently, personal living expenses are only partially met by the maintenances paid for through the central fund. This is especially the case for farmers, who currently do not receive the same kind of maintenances as other professions in Auroville, such as administrators and teachers, despite the fact they generally work far longer hours and tend to have very limited holidays, if any. In many ways, this particular issue is to do with a feeling of not being appreciated by the community as well as purely finance. “Is farming seen as a less important contribution to Auroville somehow?”

On the other hand, if the AVFG maintenance is lower because it is understood that farmers will be able to supplement their incomes by eating or selling their own produce for a profit, and then this should be clarified and clear codes of practices drawn up, including mechanisms to monitor the process. There should be no reluctance on behalf of the farmers to declare this indirect income if it is accepted practice. The main thing is that it should be discussed openly and a way forward agreed upon.

In parallel with the initiatives suggested above, improved support mechanisms in the AVFG would go some way in reducing the levels of responsibilities presently felt by the farmers. For example, support in distribution and marketing as well as the technical issues associated with farming. These support mechanisms would allow the farmers more time and energy to focus on their main goal, growing food for Auroville.

Action points

- Newcomers or Aurovillians with the appropriate skills and enthusiasm need to be identified and actively encouraged to take up farming and related activities.
- Appropriate financial structures need to be established to support the establishment and expansion of farming in Auroville.
- Guidelines on supplementing the income of farmers in-kind or financially need to be discussed and agreed upon.
- Establishing appropriate farming support mechanisms.

Farm animals

Cattle.

At the time of the assessment, cattle numbers were as follows:

Category	Number	Comment
Dairy cows	74	22 were dry, that is 30% of the total
Young stock 1 – 4 years	32	
Young stock .5 – 1 year	15	
Young stock < 6 months	7	
Working bulls	5	
Breeding bulls	4	
Male calves < 6 months	12	

The animals are spread over 10 herds, with numbers ranging from a single house cow at Kotakkorai, to Ayarpaddi with 26 milking cows. In fact 50% of the cows are in two herds, namely Brihaspati and Ayarpaddi.

Milk yields are in the range 2,500 – 3,500 litres per year.

The percentage of dry cows is a little high, suggesting some difficulty in getting cows into calf. There is also a tendency to keep problem breeders longer than would be considered viable in strictly commercial terms. Young stock numbers are understated, in that Ayarpaddi had sold the bulk of its young stock to raise the cash to buy milking cows; never the less numbers are relatively high partly due to the late average age of first calving.

Generally cows are well cared for and disease prevalence is low, and whilst some herds are overly fat there are no signs of chronic underfeeding in adult cattle. Housing, whilst acceptable, is often less than the optimum. The majority of cows in Auroville are tied by the neck, 24 hours a day, either in their shed or outside for a few hours. Whilst cows appear to adapt and show few, if any signs of stress, they do benefit from exercise and free association, such as would be provided by a well-designed, shaded loafing area, with permanent access to water and fibrous feeds. Certainly where behavioural observation is required, such as heat detection and the early signs of illness, a loafing yard is a great help. This is something that should be borne in mind when upgrading or replacing any existing cattle housing.

Feeding

With the exception of Aurogreen and Annapurna, all of the farms are dependent in varying degrees on bought in rice straw as a source of roughage feed. Annapurna uses rice straw to some extent but the difference is that it is from the farm itself. Most of the farms grow an area of cow grass supplemented by the excess biomass and crop residues produced during the wet season. Fodder trees are also widely used. Additionally concentrate rations are fed to make up for the perceived shortfall in roughage quality and provide for milk production.

On average concentrates are fed at around 1.5 kilograms per litre, however this figure hides a wide range. Somewhere within the big variety of recommended feed ratios, there lies an optimum, bearing in mind two main factors, one environmental, and one financial, the two may or may not match each other. It is a complex issue, and the assessment team had a shortage of information on which to make definitive judgements at this time.

Home produced feed vs. bought in.

Environmentally there can be little doubt that it is preferable to source as much feed on-farm. Otherwise, a reliable and local organic source needs to be found, not an easy thing in the Auroville context. The manure produced by a herd fed entirely on bought in non-organic feeds will be no freer of residues than “village compost”. However, at this time fully organic compost may be impossible to achieve. As far as the assessment team is aware, there are no truly organic milk producers in this part of India. This needs to be investigated, and if there are, the AVFG should contact them.

Financially the issue is far less clear. There is a need to evaluate the nutritional value of the various feeds used, compare their relative costs and therefore be able to make an informed decision about the most appropriate ration.

Nutritional values

Research on the internet has failed to provide feed values for many of the crops used here. Time and effort needs to be given to contacting the local agricultural extension services with a view to determining the least cost ration formulation for concentrates used, and seek advice with regard to fodder cropping, and total diet evaluations.

In terms of the use of cow grass, its nutritive value and cost of production needs to be evaluated. In addition, experimentation with other fodder crops should be investigated. For example, Sorghum with cowpea-maize and

cowpea-maize with cowpea is the recommended fodder crop rotation for Southern India. This may benefit from a green manure somewhere in the cycle. Such a mix would provide a balanced and high value ration but would have high compost, water and labour requirements. Yields are claimed to be in the region of 100 tonnes per hectare per year, sufficient for five to six adult cows, although this needs to be confirmed for organic production.

Farms with large vegetable output should seek to optimise the use of vegetable waste, crop residues and the by-products of weeding. In addition, the farmers could make better use of grazing and / or the cutting of excess biomass produced during the wet season. More fodder trees could be grown, particularly on the margins of fields and farms, between fields or as alley crops. Fodder trees provide a good source of high dry matter protein. However, some fodder trees, such as *Leuceana* is susceptible to periodic attack from aphids and care should be taken to avoid monocultures.

Labour and cultivation costs are still relatively unknown in the production of homegrown fodder. Improved accounting practices will go some way to identifying costs, but crop and labour records need to be kept before evaluating the viability of different systems. The response from the farms to the data collection process put in place by the assessment team has been generally less than hoped for. However, some farms have provided detailed records and these will be analysed as soon as the suitable human resources and time can be found. The results should give some insights, though more efforts need to be made to increase data collection.

Breeding

In the Auroville context in particular, it is difficult to generalise about the priorities of the farmers. From the outset of establishing a breeding programme, the primary objective of the farmer needs to be clearly understood. This statement applies as well to the practice of Artificial Insemination (A.I.) as well as natural breeding.

The need for cows to calve regularly on an approximately annual basis is obviously central to milk production. Healthy cows, good husbandry and observation are all that is required. There has been a problem in Auroville with getting cows in calf and this is reflected in the erratic nature of milk production over the years. An important causal factor in this was the dysfunctional nature of the Auroville A.I. service; it eventually became apparent that the semen had lost viability probably through failure to maintain liquid nitrogen levels. In addition, the A.I. operative is occasionally unreliable, not fulfilling on farm appointments. As a result, the majority of farms use local agencies. Or, in the case of Ayarpaddi, Brihaspati and Annapurna, their own bulls. Those still using the Auroville service are now getting excellent results, though complaints of unreliability persist.

The use of own bulls, whether home reared, or bought in, is a recent development in Auroville and worthwhile for larger herds if it helps maintain the calving interval. The pros and cons of AI will depend on what your priorities are. Investigations need to be made into the possible advantages of local stock in converting roughage that may be unrecoverable to some extent for exotic breeds. Currently, one criticism of AI is an overemphasis on exotic breeds or the wrong kind of indigenous breeds. However, it would be a pity to lose the advantages of past breeding and it is therefore advisable that the best cows in each herd be served by A.I., using a proven quality dairy bull at least once or twice before being put with the farm bull. This applies where bought-in bulls of unknown quality are being used.

Young Stock

With the exception of Annapurna and Aurogreen all the young stock are in varying degrees, underfed by accepted standards. Young animals have double the protein requirement of a mature non-lactating cow.

Ideally, calves should receive four litres of milk daily and free access to high protein concentrate and clean long fibre. Straw or its equivalent should be on offer from 4 days. At five to eight weeks, the farmer can reduce and stop the milk, once the calf is eating three to four kilograms per day of the concentrate. The protein content of the feed can also be slowly reduced with age down to about 16% at one year. This may seem expensive but will produce well-grown young cows calving at 2.5 years and able to continue growing whilst producing milk.

Charlie at Aurogreen regularly produces fully grown heifers calving at 2 years old, which go on to be high yielding cows. Any farmer wanting a few tips on how to increase the cost-effectiveness of calving would do well to speak with Charlie.

Cost-effectiveness

The accounting procedures used by the farm group prior to financial year, 04 – 05 make it impossible to make any accurate assessment of profitability. Whilst the AVFG office has kept detailed records of each farms production, these figures only indirectly relate to the accounts, where all food production is lumped together as a single category. Livestock expenses are similarly treated. Largely this can be attributed to a lack of access to the right human resources input at the AVFG level. The economics of dairy farming are deceptive; large sums of money are involved. Cash flow enables the farm to survive on a day-to-day basis, whilst the dairy may continue to lose money. Saying this, the importance of livestock as providers of manure in organic farming is obviously an added consideration, and may well be a deciding factor.

Dairy labour costs are high and often hidden, cows are great consumers of time and energy, all of which farmers have to pay for, and where cow numbers and production are low it becomes difficult to justify the fixed costs involved. Currently it is impossible to say with certainty but in the assessment teams' opinion, excluding the savings on compost, it is likely that any herd producing an average of less than 20 litres a day, cannot afford to use paid labour. Added to which dairying is by far the most management sensitive enterprise on any farm and even where labour is employed, it is essential that the farmer him / herself retains an active involvement and control over the daily routine.

Marketing

India, and particularly the villages around Auroville, where the presence of the cheese dairy and various initiatives to provide village people with cows, is over supplied with milk. The result is a downward pressure on prices. It is reasonable to assume that this pressure will increase, at least in the medium term. The government buys milk at 8 to 10 rupees a litre, whereas Auroville milk is priced at 16 rupees. There is no shortage of people prepared to deliver milk into Auroville at 12 rupees per litre. For this reason, several communities no longer buy their milk from Auroville farms.

It is safe to say that Auroville milk cannot compete on price alone, room for efficiencies exist but the economics of milk production within a subsistence economy are far removed from those of Auroville and there is little room for a downward movement in the price of Auroville milk. Indeed, Ayarpaddi, one of the most efficient milk producers in Auroville sells nearly all his milk to the Solar Kitchen discounted to 14.5 rupees a litre, and it shows in a profit margin insufficient to cover investment needs.

All of which leaves quality, continuity of supply, animal welfare and an appeal to "Aurovillianism", as areas in which we may be able to develop a competitive advantage.

Quality

There is a perception that Auroville milk is of better quality than village milk and while this is probably still largely accurate, the perception is less widely held than in the past. The quality of village milk has improved in recent years, hygiene and added water being less of a problem. The AVFG must make every effort to ensure that Auroville milk is in fact demonstratively better. Testing of milk would be useful as well as the introduction of minimum standards. Obviously if Auroville could produce milk organically, it would be possible to command a considerable premium. This is the direction that AVFG should try to move in.

Continuity of Supply

Auroville has a fluctuating population which peaks during the tourist season and is severely reduced during the summer when many Aurovillians are elsewhere, preferably in cooler climates. This poses a very real problem for milk producers and while much could be done in terms of calving patterns to more accurately match supply and demand, there is very little the individual producer can do in the face of such an extremely fluctuating demand.

AVFG needs to market collectively to guarantee supply; this is now being done by most of the farms on an ad hoc basis and may be sufficient for the current needs. The whole issue of collective supply needs very careful thought. The theory may be right but the execution would require considerable infrastructure and human resources, which AVFG may not be equal to, or able to justify given the volume of milk involved.

Judging from the market survey, most Aurovillians would prefer to buy Aurovillian. This is something we can build on. We need to actively engage the market and give value for money and a reliable supply.

Poultry

A wide range of rearing methods is used, ranging from relatively intensive systems to extensive free-range. Whilst most farms have a few chickens only four farms produce eggs commercially; Aurogreen, AuroOrchard, Djaima and Buddha Gardens. With the exception of Buddha Gardens all are barn reared, those at Aurogreen have access to a run but this only provides for exercise, not the foraging required to produce a free range egg.

The economics of egg production are extremely tight and the margin over feed and replacement costs measured in paisa per egg. Labour inputs however are low and a chicken unit should not entail a discernable increase in labour costs.

Marketing though is problematic, and although egg production in Auroville is only a small proportion of overall consumption, only 24% of eggs sold in Pour Tous are from Auroville, producers still have difficulty in selling their eggs. The reasons for this are usually given as price and availability, Auroville eggs retail at 2.75Rs. each, Pondicherry sourced eggs at 1.5Rs.. Many consumers resent this price difference, for little apparent qualitative difference.

Commercially, egg production is an essential a mass production enterprise game and there is no way Auroville egg producers can compete with the 20,000 chicken units on price. This would once again suggest that the AVFG should focus on producing a higher quality egg.

At Buddha Gardens, a permaculture-based concept is being used to produce what is widely acclaimed to be a superior quality egg. This involves giving the chickens access to three runs over which the chickens and crops rotate, crop residues and foraging the fallow yards provides a vital part of the chickens needs, whilst the chickens

provide fertility for the following crop. So far, results are encouraging, particularly when viewed in terms of the total production from the area of land involved. Consumer reaction to the “Buddha Garden “egg which sell at 3Rs. each is extremely favourable and many have said they would pay more for them. The only comparable product available is the village egg and these sell at 4 – 5 rupees each.

The current feeding regimes require further investigation and preferably inputs from an expert, something that no member of the assessment team can claim to be.

Action Points

- More emphasis by farmers should be given to the animals’ ability to freely exercise and associate.
- Investigations are needed to establish the best feeding rations for cows and chickens, keeping in mind the differing priorities of the farmers, the suitability of breeds available, and the resources that are locally obtainable. Extension services should be contacted to help determine least cost rations and possible organic sources of feed.
- Determine the economics of home produced fodder. And if possible extend its use in AV. Student help needed.
- Improved networking with centres of best practice in dairy and poultries should be investigated.
- More consistent and useful animal data is required through more detailed accounts and logbooks.
- A shift in breeding practice is needed from simply what is most easily available to the specific priorities of the farmer.
- Testing of Auroville animal products in order to establish and improve their quality is fundamental, if the high price of AV milk is justifiable.
- The option of marketing perishable animal products cooperatively should be investigated.
- The ongoing experiment with free range egg production on Buddha Gardens needs to be closely monitored with a view to replication or adaptation by other farms.

The Physical Environment

Soil

It should be clearly stated at this point, that soil-testing, mapping and particularly interpretation has been a big gap in the development of Auroville farms, if not Auroville as a whole. In fact, overall, farmland has not been chosen for its appropriateness in terms of soil fertility. For the farm group in particular, much greater attention needs to be given to building and developing the soils in the most appropriate and cost effective ways.

pH

Although there is a certain amount of variation, sometimes within a small area, most of the soils in Auroville are slightly acid or neutral, with the exception of Annapurna, where soils are Alkaline in nature. Neutral soils are largely the best for growing crops. Fortunately, for Auroville, most of the soils are not overly acidic, at least as far as soils in the tropics are concerned. Having stated this, from a farmer’s point of view, it is always helpful for the soils nutrient availability to be as close to neutral as possible. The most appropriate way to adjust pH from an organic point of view is to increase the organic matter levels. This has been achieved in Buddha Gardens where within a very small area, where an inherently very acidic soil has been changed to a neutral soil through huge inputs of organic matter.

A number of farms, which have very large variations in pH, would benefit from particular attention to pH on certain plots, if this were cost effective. These farms are Solitude, Ayarpadi, and Djaima. In these instances, on the most acidic plots, the one-off application of wood ash or lime would be very worthwhile.

Texture

pH or the acidity of the soil is strongly linked with the texture of the soil, which has an affect on the nutrient retention capacity of soils. In general, the soils on Auroville farms have a reasonable texture with a predominance of loams or soils with a good balance of clay, sands and silts. Once again, the exception to this is Annapurna farm where the soils are clay.

Whereas a soils texture cannot be easily changed, other factors are more or less manageable from a farmer's point of view. Therefore, the good texture of the Auroville soils is a very good start and bodes well for its ongoing development for growing crops.

Organic Matter

As to be expected in almost all of the tropics, the soils are generally low in nutrients, in particular carbon, in the form of organic matter. The exception to this rule, is with soils that have been changed by people. In Auroville the clearest example of this is with Buddha Gardens, where the soils in the vegetable plots are very high in organic matter and therefore fairly well off in the other nutrients. In contrast, the surrounding soils are very deficient on organic matter.

Discipline, Aurogreen, and Annapurna have also managed to increase their organic matter levels to a significant degree. With regard to organic matter, Service Farm has notably low quantities of organic matter.

In many ways, the key to successful organic agriculture is in the organic matter levels in the soil. Adequate levels of organic matter can lead to improvements in the levels of soil microbial activity, nutrient levels and retention capacities, as well as the water holding capacity of the soil. In this way, soil organic matter levels are one of the key leverage points in the Auroville farms, leading to a positive cycle of improvement. Progress in this area can lead to improved crop productivity and biomass production leading to greater self-sufficiency in terms of income and animal production. Improved animal production will in turn allow for greater quantities of compost, and therefore organic matter...and the cycle continues.

It should be noted that increasing organic matter levels is not an easy thing to achieve and requires investments of time and energy and therefore financial resources. Improving organic matter levels is therefore a key area of investment for the Auroville farms. It should be noted that the process of increasing organic matter is considerably assisted by including animals on the farm, or within the locality.

While organic matter levels are relatively low in the tropics, biomass production is relatively high, assuming a reasonable water supply. AV farms could optimise the use of their land by encouraging the development and utilisation of biomass, particularly biomass that is relatively high in nitrogen. Much greater use could be made of fodder trees and the vertical spaces on farms. In addition, most farms could make greater use of green manures within the crop rotations, as well as strategic cutting and removal of weeds before seeding, for incorporation in to the soil.

It is advisable to use high quality biomass for compost production or direct incorporation into the soil. On the other hand, lower quality, bulky biomass will generally be more effective as mulch. Many experts now advise mulch applications of 20 centimetres or more to increase soil fertility, reduce weed infestations, as well as

extend the effective growing season by lowering soil temperatures and increasing soil moisture levels. In this way the increased use of mulch could also have a more important role on AV farms.

Currently the farms are receiving a large proportion of their compost from village sources. There is no way of guaranteeing the organic nature of this compost and therefore it is always preferable to make greater use of on farm resources for increasing soil fertility. Based on past experiences, it is also worth considering forest leaves, either as mulch or for inclusion in compost, as a slower but possibly more effective solution than village compost in the long run. The improved collection and distribution of forest leaves from the city area as well as Auroville forests would be another very positive way forward. Forest leaves make a much more effective mulch than straw, which is expensive and a poor source of nutrients.

Nitrogen, Potassium and Phosphorus.

In terms of nutrients, and their availability, it is very difficult to generalise. Nitrogen is probably the limiting factor on most farms at this time. However, nitrogen availability and uptake by the plants is strongly linked to the availability of the other nutrients, in particular phosphorus, as well as pH and water. An acidic soil, i.e. a pH of less than 6, will limit the availability of all of the macronutrients and may lead to problems of toxicity for a number of micronutrients. A lack of water or too much water, can also lead to deficiencies as well as toxicities. It is a complex issue with no hard and fast answers. Details of specific nutrient deficiencies and ways to resolve them are given on a case-by-case basis in the individual farm reports.

Action Points

- Most farms in the AVFG need to give much greater emphasis to building soil fertility, in particular soil organic matter, to see any substantial increase in production. This will necessarily require substantial investments, especially in time, and energy.
- A number of farms have chronic problems with acidic soils in certain plots. If increases in production are required, these will require on-off applications of wood ash, lime and / or organic matter.
- All farms could make better use of their own currently available biomass for compost. In addition, most farms could increase the overall availability of good quality biomass.
- Much greater use could be made of poorer quality biomass through the application of substantial quantities of mulch.
- Increasing the collection of forest leaves from within Auroville; to be deposited on farmland has been shown to be an effective, organic way to increase soil fertility.

Water

Over the last five years, water levels in the aquifers underneath Auroville have been falling dramatically. The short-term response has been to dig deeper well and boreholes. Clearly, this solution will simply make the situation worse in the longer term. In terms of accessing sustainable sources of water i.e. rainwater and surface water harvesting, only Annapurna has made a serious attempt, by establishing large surface reservoirs, which should provide enough for the irrigation needs of the farm through out the year. However, for the smaller farms with little land, large surface reservoirs are not appropriate. Instead, every effort must be made to reduce the runoff of water from the land by bunding and to be more efficient with the water that is used for agricultural purposes.

In terms of overall availability, currently, most of the farms have access to sufficient water. The exceptions are Kottakorai, and Windarra. However, both of these farms have plans within the immediate and near future to resolve these problems.

Farms in general are not very efficient with water use, either in terms of the quantity supplied or the timings at the different growth stages of the plants. Overall, there is not an awareness of specific crop requirements particularly for fruit trees. A relatively simple programme such as CropWat that the assessment team used could be a very effective tool in terms of improving this situation. However, this would require the focussed attention of one person, possibly a student, for four to six months. In addition, farmers would have to make a commitment firstly to record the necessary data, and secondly to use the results when they become available.

In addition to the overall amount of water available to each farm, there is the issue of efficiency in distributing the water in the field. In an ideal world, drip irrigation is the most efficient way of providing water to crops. However, this is costly to establish, as well as extremely labour intensive to maintain. In a number of cases, insufficient drips have been provided to satisfy the needs of the plants. Sprinklers have been used quite effectively in Discipline for growing vegetables. This is an effective way of generating large quantities of biomass, but will not be suitable for all crops, due to the increased humidity. Flood irrigation is the most common irrigation technique currently used. This is cheap and easy to use but requires huge quantities of water and if misused over the long term can lead to problems depending on the type of soil as well as the crop regimes.

The issue of using the most appropriate energy sources for pumping has plagued the AVFG for many years now, with a devastating impact particularly for AuroGreen, which will never consider using TNEB for pumping needs again. Despite the environmental risks, as well as escalating fuel costs, the government recently announced the resumption of heavily subsidised electricity for agricultural pumping. Auroville is to make full use of this scheme with connections under this scheme to Brihaspati, AuroOrchard, Ayarpadi, Discipline and Djaima farms. While this will enable these farms to increase production in the short term, in the medium term, dependency will increase once more to the dangerous levels of the mid- nineties. This issue requires more analysis and research. However, a key area for medium term investments may be a switch to renewable energies for pumping as well as increasing water efficiency through improved irrigation schemes.

Action Points:

- Water efficiency at both the micro-and macro-levels can be increased substantially on most farms. However, the focussed attention of one person, possibly an irrigation student, is required for four to six months, at the farm level in order to confidently suggest where water efficiencies can most appropriately be improved.
- The AVFG urgently needs to discuss and agree upon a strategy for reducing the current reliance on unsustainable government electric pumping subsidies.

Research and Education

Although research and education was included as an additional objective for farming in Auroville, the basic requirements for facilitating this process are largely missing. These requirements include improved documentation, networking and the human resources to make the best use of the information available, both within Auroville, and further a-field.

Data collection

Although all of the farmers recognise data collection as crucial for the improved management of the farms, largely, there is still a lack of importance attached to its collection. Notable exceptions include Annapurna, Windarra, Aurogreen, Service farm and AuroOrchard. To some extent, the assessment team made a start to changing this state of affairs during the second half of 2003. Data collection forms were drawn up and rewritten based on feedback from the farmers, and numerous visits and follow up was made to each farm. This approach was successful to a limited extent. However, it remains to be seen which farms will continue to collect consistent information after the end of the assessment process.

It would be very helpful for data collection if AVFG had one cross-platform database for the entry and retrieval of necessary information. These kinds of software packages are available off-the-shelf in the UK and America and also presumably in India. Research needs to be carried out into their availability, price and relevance. Currently, John is well placed to carry out this research.

Networking

In terms of research, the AVFG needs to determine what their practical priorities are and begin to make contact with the appropriate institutions and individuals who may be able to help. Initial investigations of the local government agricultural extension system indicates that there are many relevant sources of technical information, within Tamil Nadu and Pondicherry, including agricultural universities, institutes of animal husbandry and general agricultural resource centres.

Within India, there are a number of agricultural institutes of global importance, including the Indian Council of Agricultural Research (ICAR), and the International Crops Research Institute for the semi-arid tropics (ICRISAT). In addition, Auroville receives an increasing number of students from Agricultural universities in France, Germany the UK and America. Despite the best intentions, a common comment about Auroville is a tendency to re-invent the wheel in many areas. In this sense the AVFG could benefit greatly from more contact with the outside.

Human Resources

Experiments related to agriculture do happen on an informal basis on most of the farms within Auroville. However, results and lessons learnt very often remain unrecorded and are known only to the farmer and one or two acquaintances. Iyanar from Brihaspati farm has suggested that AVFG should begin informal focus groups on various topics such as dairy, poultry, fruit and vegetables. This is an excellent idea. The very least that could be done in this regard is to rotate the farm group meetings between the different farms, to allow more time for interaction on issues of a more technical nature. These kinds of discussions would be especially useful for new farmers. It should be stated that this type of interaction has been tried in the past with limited success due to a lack of interest. The success of this kind of interaction will always be limited without the necessary documentation of on-farm experiences as well as an analysis of the results. Some basic guidelines in terms of best practice could be developed if the right kind of people were involved.

A person with some knowledge of agriculture as well the ability to network would be ideal for this role within the AVFG. John's new role in this regard, is a very positive step forward.

Action Points:

- John will carry out investigations into the availability of a software programme suitable for the AVFG purposes.
- Priorities for research and advice for the AVFG and individual farmers needs to be identified and specified.
- For the AVFG it would be very beneficial to network with relevant institutions and people to assist in carrying out this research.
- A person needs to be found to fulfil the role of “research and education facilitator”.

Food supply

Quality

In line with the comments in the dairy section, it is safe to say that Auroville produce is not likely to compete on price alone. All of which leaves quality, and continuing to cultivate customer loyalty. AVFG members currently get at least a 10 % premium price for two reasons: one is to support Aurovillians to farm, second is to support AV farmers to produce food in an environmentally friendly way. However, there has been no monitoring of production practices and no definition of what practices are deemed “environmentally friendly”.

Currently "Organic" in Auroville as a catch phrase for marketing is readily exploited, and misuse benefits from the lack of information. AV farmers have widely different standards, and consumers have widely different expectations. What is missing is clarity, and transparency on the current state of affairs. Information about quality, including a particular production process, such as organic/eco-friendly or an “Auroville product”, should be added only after minimum requirements are fulfilled.

Labelling of AVFG produce is, in general, poor. The basics of content, weight, and date of manufacture, are not adhered to. If this situation continues it will make it more difficult to convince AV consumers to buy AV produce, and AV farmers will gradually losing the market share to conventional and / or organic growers from outside. There is a need to decide on AVFG policy towards labelling, standard setting and monitoring

The opportunity should be taken to set standards by producers and consumers in Auroville together. Besides a guarantee for consumers and improving communication, this process can function as a learning tool for producers. The AVFG would have to involve a representative group of consumers in order to choose for a set of standards. Existing examples include:

- UK „local” standards, written by a Local Food NGO
- Kerala “local organic” standards, written by Keystone
- Indian organic standards, written by Institute Integrated Rural Dev., Aurangabad
- EU organic standards, based on IFOAM International Basic Standards.

New standards can also be drawn up. The Organic Farmers Association of India (OFAI), are starting this year with a farmer led certification scheme.

To implement any set of standards a monitoring system is necessary, this can be as formal / informal as required. Existing examples include:

- consumer group inspection, for example in Community Supported Agriculture
- producer peer inspection, for example the Internal Control System as endorsed by IFOAM
- NGO inspection, for example Keystone in Kerala
- Commercial inspection, for example certification companies such as SGS, SKAL, IMO, etc.

It is often stated that Auroville produce is of better quality than the village or Pondicherry equivalent and therefore it is necessarily more expensive. It is up to the AVFG to clearly demonstrate that this is indeed the case. Testing of produce is therefore important.

One conclusion from the AVFG sub group meeting that was initiated by Gijs, was that every farm should produce a description of their farm, with statements on the particular standards of their farm. Lucas has facilitated this process and the information made available in Pour Tous for customer information. However, as made clear in the market survey, much more needs to be done before Pout Tous becomes a place where AVFG farms are adequately represented.

The quality and presentation of Farm Group produce an issue that needs to be addressed. Complaints regarding fruit not ripening and fruit and vegetables infested with “poochies” are commonplace. Traditionally buyers of organic food have been prepared to tolerate the occasional bug , this is no longer the case. Increasingly the market expects the highest quality. To produce an unblemished product organically is expensive and requires that the farmer accepts a considerable degree of waste. It may be that a system of grading should be introduced, with first Quality attracting a premium reflecting the extra costs involved with second quality priced at a considerably lower level. Such an approach would, however be difficult to implement; firstly, it assumes a single marketing organization and secondly would require full understanding by consumers and producers.

Presentation of fresh produce at the present Pour Tous shop is poor. It is an accepted fact of marketing that fruit and vegetables sell best when the customer can handle and select their own purchases, this is not the case at Pour Tous. At present produce is not presented to advantage, is often difficult to identify and has to be queued for. In mitigation, the shop is small and conditions cramped. New premises are being built adjacent to the Solar Kitchen and this represents a real opportunity for the farm group to be involved from the outset in designing the layout and the marketing process.

Animal Welfare.

For many people this could be a deciding factor in deciding whether to buy AV milk and eggs or not. Auroville dairies and poultries should be centres of excellence and open to the consumers at all times.

Action Points:

- In order to create a fair situation for the organic farmers and transparency for consumers, the AVFG needs to agree on: 1. a code of conduct for labelling; 2. standards for local and / or ecological products; 3. a relevant monitoring system.
- AV farmers need to establish commonly agreed codes of practice on animal welfare.

Quantity

Apart from Annapurna farm, none of the Auroville farms has measured yields in terms of the area or tree numbers from which it has been produced. This makes comparison or estimation of yields difficult to determine, none the less the general impression is of low yields.

In order to have a clearer idea of trends in the quantity of food produced, it is important for all farms to submit their production records to the AVFG for all produce from the field, including that which is consumed on-farm or sold outside of Auroville. In addition, field records, along the lines of those drawn up by the assessment group would be a big step in the right direction. These records need to be corroborated with the records for farm income, in order to improve transparency. Once again, it is clear that a comprehensive database would be a great help.

Production varies considerably from farm to farm and is largely determined by water availability and use, soil fertility and management. Obviously, in the absence of crop records it is impossible to state with any degree of accuracy, but from direct observation it is unlikely that there are consistent year on year improving yields one would expect to see as a result of well managed organic farming. On the other hand, rice yields at Annapurna in the last years have shown a steady improvement rising to the current production levels of just over 3.75 tonnes per hectare. This is encouraging.

Given that the constraints imposed by water supply and low fertility could be overcome, and with a commitment from the farmers to improve yields, the quantity of output from Auroville farms could be significantly increased. These are largely technical problems and as such are relatively easy to address. Additionally, many farms have cultivatable land that is unused.

However a more fundamental constraint on quantity is, as things now stand imposed by the market and the logistics of distribution which is beyond the scope of this report.

Distribution

There has to be a collective response to distribution for the Auroville farms to move forward. At present, each farm markets and distributes its own produce, a supply chain analysis of this process would be revealing. A disproportionate amount of resources is already devoted to deliveries, any increase in output would only exacerbate the situation and for many farms, extra investment in transportation and human resources would be required.

Interestingly, apart from at Aurogreen and Buddha Gardens, farm gate sales are minimal or non-existent, this is option that deserves some more investigation. The experience of Aurogreen and Buddha Gardens is largely positive and both farms have an extremely loyal customer base.

The market

Most, if not all farms experience difficulty in actually selling their produce, and yet Auroville farms only supply a small proportion of the food consumed in Auroville. Although the statistical section of the market survey is incomplete, a rough analysis of Pour Tous sales and Aspiration Community reveal that even for those foods that can be produced in Auroville with ease, the bulk are brought in from outside. The reasons given for this are price, availability and quality. The farm Group needs to address these issues before making any significant increase in the quantity of food produced.

Currently some members of the AVFG meet with the solar kitchen to coordinate the supply and demand of food for the solar kitchen. This system should be extended to other major consumers. The AVFG could initiate the formation of an informal consumer's network, including all the major outlets for AVFG produce. This group would meet on a quarterly basis to meet with the farmers and agree on the food requirements for the following period.

Stability

AV prices are fixed throughout the year. Currently, this does not reflect reality. Discussions have been initiated with Santos from Pour Tous. This kind of interaction with the main outlets and retailers needs to be developed and formalised as much as possible as outlined in the section above.

Auroville has a fluctuating population that peaks during the tourist season and is severely reduced during the summer. This is especially a problem for those farmers whose crops fruit in the summer. While the AVFG would not recommend increased processing on farm at this time, the fact is processing may be the vital ingredient for increasing the value of AV produce, extending it's shelf life and increasing it's access to markets, in Auroville and beyond.

Action Points:

- Improved record keeping of production both on-farm and for the AVFG as a whole requires a comprehensive database and a commitment from farmers to account for all production is required.
- Options for the collective collection, distribution and marketing of farm produce should be investigated.
- Another priority is the formation of a consumers group that would have regular meetings with the farmers to agree on the needs for the following period. In addition, discussions could be initiated on adjustments in the current pricing policy.

Basic income and profit

Whilst no one expects to become wealthy from farming in Auroville, all of the farms give a high priority to basic income and profit. This would be defined by most, as the farms ability to generate sufficient cash from its activities to cover costs, provide for management and produce a surplus for investment. In the AV context, increasing profits should also include a commitment to reduce or stabilise prices, where this is possible.

A major problem in assessing basic profitability is the lack of any meaningful accounts. The accounting system used up until 04 – 05 takes no account of opening and closing valuations or debtor / creditor status, includes no asset register or depreciation and fails to differentiate between the various farm enterprises or capital and non capital expenditure. Auroville farms though generally small, are complex with a multiplicity of enterprises and as such require financial analysis using a cost accounting methodology. John is currently putting this in place and it is most likely that the current years accounts will show a more realistic picture.

Most farms more or less break even on year on year basis, a small profit in one year is most often followed by a similar loss in the following year. This situation is only possible however, due to relatively high prices and in many farms, large financial and / or material investments. It is impossible to tell from the accounts how much of this external cash goes into infrastructure investment and how much is spent merely on running costs and keeping the farms solvent. Generally, the older established farms enjoy a higher level of external funding and this reflects not so much the relative needs of the farms but the farmer's ability to raise such funds¹. The whole question of over / under investment is complex; whilst it is true to say that many of the farms are in varying degrees undercapitalised, some of the farms have received fairly large sums of money over the years. Often projects are under funded in the first instance, needing further funding in subsequent years. This kind of funding in instalments contradictorily can lead to greater dependency; see the Funding section below for details.

Farming, even in India, is surprisingly capital intensive. For those farms that do not have a link to external capital, trying to become established and sourcing the investment needed is a real problem. It would be beneficial to take a collective view on this issue and it is expected that this will be one of the outcomes of the strategic planning processes.

There exists, in the assessment teams view, considerable room for improvement in basic profitability; crop yields are generally low and in varying degrees all the farms would benefit from increasing their variable inputs, particularly organic fertilisers. Labour costs are relatively high and where numbers cannot be reduced, every effort must be made to increase productivity. This may be partly achieved by improving the farmers access to basic information and technical advice. See the Research and Education section above for additional details.

Funding

Currently the majority of external funds are distributed on a relatively ad hoc basis to the members of the AVFG. In addition, most farms are still at the establishment stage in their development. What is required is a longer-term aim for each farm and the activities required to fulfil these, more or less in line the overall aim of the AVFG.

Improved communication with the current and former donors of the AVFG is required in order to draw out lesson learnt and explore the possibility of possible future funding. More regular and relevant reporting would help in this process. Donor profiles are a useful tool in improving the targeting of AVFG proposals.

In line with this, as an outcome of the strategic planning, the AVFG should build on the recommendations of this assessment to draw up a list of priorities and policies for funding. These priorities should be based more on the collective need of the AVFG, than the current practice. These may be written up into a series of proposals and

¹ See page one “finance” and this section below for more details.

targeted at the appropriate donors. Research needs to be carried out into additional potential donors that may be able to match the requirements of the AVFG. In turn, the AVFG has to make a commitment to reducing their dependency on external funding and be able to demonstrate how this is being achieved.

Action Points:

- Investments in AV farms should be accompanied by a commitment to greater production in the medium to long term. This should in turn, result in stabilising the price of produce attempts to lower prices in line with reduced costs of production.
- AV farms need to continue to submit detailed accounts, inline with the new system. This system may be expanded upon for each farm to improve their own financial management.
- Improved record keeping and documentation should be accompanied by a more collective approach to accessing external funding.
- A comprehensive five-year plan for funding is needed. This should be matched with a database of potential donors and a long-term commitment from the farmers to become more self-reliant.

Employment

This objective received a universally low priority by the farmers, which given the nature of labour both as a major source of profit and everyone's largest single expense was surprising. Wages are low, yet labour costs are high. Agricultural work is generally held in low esteem in Indian society, and the quality of labour is, by western standards low. Workers though skilled in what they do, are generally unmotivated beyond the minimal fulfilment of immediate orders, and both need and expect, constant supervision. Theft and general time wasting are widespread. The foreign farmers particularly find labour relations deeply frustrating and a considerable source of stress. On the other hand, the Tamil farmers do not express the same levels of frustration, possibly because expectations are lower; communication is obviously easier which must help. It would be helpful if an agreement could be made between the AVFG and a outside body, such as SEWA, to assist the farmers as and when required, in their communications with their workers.

Where the farmer is able to maintain close supervision over a small labour force problems do not arise to the same degree. Unfortunately, for a number of reasons, this is seldom the case and the lack of effective middle management is a real problem. Recently Priya initiated a project to develop trainee managers from the local villages. If successful, this could be a very constructive step towards developing another level of management on Auroville farms, people with the right communication skills as well as a certain degree of initiative. If possible, a number of farms may greatly benefit from having trainee managers on work placement. This option should be explored by the AVFG office with Priya.

The relationship between Auroville and the villages is complex, our major interface is as employers and the relationship is often paternalistic. Many of our employees live in conditions of extreme poverty and for them working in Auroville is a lifeline. To hire and fire causes considerable stress. As employers, AVFG should adhere to generous minimum wages and conditions for our workers, whilst at the same time keeping permanent labour to a minimum and developing strategies to ensure improved productivity.

In the assessment teams' opinion, employment or rather human resources should emerge as a specific strategic objective to be addressed during the strategic planning workshops in September.

Personal skills

The majority of farmers who work in Auroville do not have a background in agriculture and if they have, it is in a very different context, which is unlikely to prepare them for the environmental and social conditions in Auroville. An additional longer-term proposal for the AVFG would be to make relevant opportunities and funds available to encourage farmers to attend training programmes, or make exchange / field visits, with the agreement that they return and expose other within the group to their experiences.

Closer contact between the AVFG and the entry group as well as “Connections”, would be useful in beginning to increasing the profile of the AV farms as an option for a useful and satisfying occupation.

Action Points:

- If required by the farmers, the AVFG could seek the help of an external body to assist the farmers in negotiations with their workers.
- As an outcome of the strategic planning workshop, minimum labour standards should be drawn up by the AVFG based on the current best-practice, with or without the assistance of an external body such as SEWA.
- Trainee farm managers may be drawn from the apprentices on Priyas’ project or from newcomers and / or Aurovillians. This option needs to be explored and a way forward determined.
- Options for relevant on-going training for those AVFG farmers who are interested needs to be explored.

Conclusion

Viability etc.

At this stage in the assessment, it is necessary to revisit the central question posed in the terms of reference. Is farming in Auroville viable? In the opinion of the assessment team, viability has three distinct aspects to be taken into consideration namely: economic, environmental and social viability. Without taking into consideration all three of these issues, long-term sustainability will be brought into question.

It should be recognised that organic farming is different from conventional farming in its emphasis on knowledge and skills as a critical resource, as well as the fact that farming in the tropics, while inherently being more challenging has greater potential for higher returns.

The survival of farming in AV depends on its ability to serve the community. Should we continue to invest in farms? Is farming going to continue to make an essential contribution to the vision of Auroville, or will it become increasingly marginalised in parallel with the growth of the city? What is required is a shift from a subsistence rural mentality to a determined effort to produce a surplus for the growing urban population, using the best methods available to us.

Environmental viability

Environmental viability implies the need for investment in terms of resources and knowledge. This is not an option. We owe it to ourselves and our customers to farm in the most environmentally sensitive way possible. Whilst in the short term the twin needs of basic profit, and farming organically may seem opposed in the long term this is not so. In organic farming, the focus needs to be on ensuring a positive fertility cycle in the soil,

followed by the efficient use of water. This is potentially a win-win situation; if we can improve the environment this will allow for an increase in the organic production of food that is good for Aurovillians and paves the way for profitability.

In the Auroville context, as in most of the tropics the land is inherently marginal for farming. Soils tend to be very old and weathered and the climate extreme. In addition, support mechanisms tend to be less sophisticated and are often limited in their scope. Saying that, given good farming practices, adequate fertility, integrated pest management and attention to detail, the organic farm should be more productive than a non-organic farm, this is especially true in the tropics. Organic farming is knowledge heavy and farmers need all the technical support possible.

So how environmentally viable is AV farming? In the opinion of the assessment team, although significant progress has been made, especially when compared to local farming practices, a great deal more needs to be achieved to reach the win-win situation outlined above.

Economic viability

A shift is required in the AVFG from what has been a largely welfare system to targeted start ups, with the ultimate aim of self-financing. However, this will require an ongoing commitment from donors and a firm commitment from farmers to be accountable and increasingly efficient.

External funding is still a key resource for the survival of the AVFG and is likely to be for the following five years to be covered by the strategic plan. Initially, it is likely that there will be an increased need for substantial funding. This implies that the AVFG is yet to be economically viable and yet it should be borne in mind that the majority of the farms are still in the establishment phase. With the aim of reducing dependency, increasing efficiencies and in the longer-term, improving quality and stabilising prices, there should be no reason why this cannot be achieved.

Social viability

The AVFG needs to continue to emphasise the connections between the community at large and the farmers. This is arguably the greatest strength of AV farms. On the other hand, the farmers need to be careful to avoid not taking the loyalty of the consumer for granted. A number of suggestions have been given in this report to try to reinforce this positive relationship between farmers and consumers.

For the continued social viability of farming in Auroville the continued influx of people into the farming sector needs to be ensured. It should be recognised that many of these are more than likely to be Tamil with fewer resources accessible to them than their predecessors.

Education in the broader sense has an important role to play by encouraging increased responsibility for the food people eat and therefore encouraging organic farming through their continued support. Auroville is a place for research, this should be married with lifting the profile of farming as a serious subject for experimentation and progress, as well as directly benefiting the farms.

Within the context of the AVFG itself it will be important to set up structures to make sure that there continues to be improved decision-making and communication while avoiding a monopoly of power. A rotating core group of farmers supported by “advisors” in the AVFG would be an important step in this direction

So is farming in Auroville socially viable? Currently the answer is yes, however it is up to the farmers to ensure that this situation is maintained by continuing to justify the support of the wider Auroville community.

Is farming in Auroville viable? As things stand, probably not. This is largely owing to an overdependence on external funding, high prices, and relatively low outputs. However, by building on the support of the customers as well as investing in the environment and moving closer to that market in terms of quantity, quality and realistic prices, there is no reason why it cannot be. The strategic planning process is a big step in the right direction.