

## 0609. Model Plan for Dry Land Horticulture (Dec 1997)

*The Coolie Sangha decided to use its high degree of functional unity to take up the planting of mango and tamarind orchards on their dry lands, and move away from traditional cropping. Common water resources were identified, and watering arrangements set up. This activity has attracted the attention of Climate Change activists who identify it as a major CO2 sequestration effort. There is also an attempt (hitherto unsuccessful) to fund it under the Activities Implemented Jointly (AIJ) scheme.*

### 1. APPLICANT ORGANISATION

#### 1.1. Name & Address

Agricultural Development & Training Society (ADATS)

ADATS Campus,  
Bagepalli 561 207,  
Kolar district, Karnataka.

#### 1.2. Legal Status

Registration No: 97/78-79 under the Karnataka Societies Registration Act, 1960

UHM No: 094570001 under the Foreign Contributions Regulations Act, 1976.

#### 1.3. FCRA Bank Account

A/c No: 3 3 1 4 with Canara Bank, Bagepalli branch.

### 2. IMPLEMENTING ORGANISATION

#### 2.1. Name & Address

Bagepalli Coolie Sangha (BCS)

ADATS Campus,  
Bagepalli 561 207,  
Kolar district, Karnataka.

#### 2.2. Legal Status

Registration No: 350 of 86-87 dated 18-2-1987 under the Indian Trusts Act, 1882.

Registered as a Charitable Trust with the Commissioner of Income Tax, Bangalore, and bears Registration No: Trust/718/10A/Vol/BI/B-138 under Section 12A (a) of the Income Tax Act, 1961.

Union Home Ministry Number: 094570082 under the Foreign Contributions Regulations Act (FCRA), 1976.

#### 2.3. FCRA Bank Account

A/c No: 6 0 6 4 with Canara Bank, Bagepalli branch.

### 3. PROJECT TITLE

DRY LAND HORTICULTURE

#### 4. DEVELOPMENT PROBLEM BEING ADDRESSED

- ADATS was able to attract major funding for a Dry Land Development Programme (DLDP) from 1986 to 1990. Massive Soil & Water Conservation works were undertaken on about 9,000 acres of Coolie owned lands<sup>1</sup>. Coolie cultivation was boosted during these years, and it can be said to have reached a standard on par with Ryot farming.
- In view of the vast changes sweeping the country, the Coolies recognise that further improvements to their lands and more technical inputs are necessary if they are to have a future on the land.
- Off-farm opportunities are growing at a slow pace in this region, and mainstream peasant agriculture in this region represents an economic and environmental dead-end.
- Sustainable farming offers a way forward for Coolies to capitalise on their organised unity, experience and accumulated learning.

#### 5. DEVELOPMENT GOAL

- To improve the living conditions of small and poor peasant families by creating a food security and effecting a change in the cropping pattern and land use practices.
- To make an impact on the micro-climate by moving towards more sustainable land use practices.

#### 6. PROJECT GOAL

To assist 100 Member Coolie Families from 5 contiguous village Coolie Sangha Units (CSUs) to develop orchards on their dry land holdings and plant 4,000 Mango and Tamarind trees.

#### 7. EXPECTED OUTCOME

- The long term expected outcome of this Project will be that Coolies will have more income from their lands. Additional jobs will be generated, and the income will be sustainable.
- Expected short term outcomes include increased food production, rational use of groundwater, reduction of soil salination, reduction of soil erosion and reducing the threat of desertification.
- The investments proposed in these land improvement measures will have other indirect benefits of increasing possibilities for enterprise. Local economic conditions will be improved through increased biomass for food, fuel and fodder, as well as increased employment through horticulture management and sales.
- Expected long term benefits also include global benefits of carbon sequestration and avoidance which can be dealt with in monitoring and reporting formats as required.

#### 8. SITUATION ANALYSIS

Please see the *Annexure* where we place the Dry Land Horticulture within the overall Agriculture Policy and Strategy of ADATS and the Coolie Sangha.

---

<sup>1</sup> By their own self-definition, a Coolie is a small (land owning) or poor (landless) peasant who *does not* employ wage labour.

### 8.1. Location and Geography

Bagepalli taluk is a semi arid drought prone region situated 100 kms north of Bangalore city in south India. The taluk has a population of 133,564 persons (26,171 households) living in 228 villages and covers an area of 93,037 hectares.

Though located in Kolar district of Karnataka state, and in spite of being so close to a fast growing metropolis, the taluk skirts the southern border of the Rayalaseema desert belt and shares the same language, culture and social structure, as also the stark poverty that afflicts southern Andhra Pradesh. The dust brown rocky terrain is severely undulating, with small hill ranges and out-crops that stud the topography. There is no mineral wealth and only a very thin and fragile soil cover.

### 8.2. Agriculture and Livelihood Systems

In all, 47,504 hectares of land are cropped in spite of an adverse land:person ratio and strong thirst for cultivable land. This is because less than one-half of the total land is fit for cultivation, with the remaining taken over by the hills and rocky fields. Only 1,925 hectares (4.5% of the cropped lands) are irrigated by an age old network of rain-fed tanks (small lakes), each irrigating 2-5 hectares of wet land. The low water table is tapped through bore wells drilled to more than 100 meters depth, irrigating a paltry 648 hectares. Even these dry up in the summer months when temperatures rise to 38° Celsius.

The average rainfall is 560 mm a year and this is, moreover, erratic and spatial. As a result there is only 1 rainfed crop a year, whose stand is from late June till December. Groundnuts are grown on these dry lands, inter-cropped with red gram, cowpea, field beans, green gram, jowar, maize and castor on the field bunds. Irrigated groundnut, mulberry, onions and sunflower are the common bore well irrigated crops. Ragi and a coarse variety of paddy are cultivated on the command areas of irrigation tanks. Every sixth year is a drought, followed by near famine conditions.

Daily wages during the 7 cropping months of June to December fluctuates between Rs 12 and 15. During the off season these drop to as low as Rs 7 per day. Seasonal migration by agricultural labourers is an annual occurrence during the summer months. They come back every June in order to scratch a subsistence cultivation from small patches of scattered holdings, far away from the villages and hugging the hillsides, totalling to an average of 3.6 acres per coolie family.

### 8.3. ADATS & the Coolie Sangha

ADATS has been working with 3,507 Coolies families in 128 villages of Bagepalli taluk for the past 20 years. Strong village level CSUs were built up using an intervention strategy comprising of non-material and material inputs. These included an adult literacy effort, support to issues and struggles, the building up of a decentralised village level credit system, and the implementation of various economic programmes, including a dry land development project. Special attention was given to the problems of Coolie women and a separate fora called the Mahila Meetings was built up in each and every village. The CSUs have helped enhance the socio-political and economic position of the small and poor peasant families in the taluk.

### 8.4. Dry Land Development Project (DLDP)

ADATS implemented a Dry Land Development Programme from 1986 to 1990. Massive Soil & Water Conservation works were undertaken on about 9,000 acres of Coolie owned lands. These included pebble and boulder clearance, wasteland reclamation, contour bunding, ravine and gully checks, building check dams, digging diversion trenches on foothills, etc.

These measures were fundamentally designed to strengthen Coolies. The entire effort was labour intensive and self monitored.

Technical assistance was given by qualified Agriculturists on raising better dry land crops, soil testing, compost making, constructing vermicompost pits, vertical mulching, green manuring, seed procurement and treatment, deep ploughing and demonstration.

After a gap of several years for the new contours to settle down and introduced measures to become accepted practices, repair and maintenance works were taken up in 1994 and 1995. Coolie cultivation was boosted during these years, and it can be said to have reached a standard on par with *Ryot* farming.<sup>2</sup>

### 8.5. Present State of Coolie Agriculture

While Coolies today are in an incomparably better socio-economic position today than they were 20 years ago, the independent Coolie Sangha is desperately in need of technical backup to deal with declining yields and low productivity.

Immediately after we implemented the massive soil and water conservation works, something snapped. Production relations between middle peasants and Coolies changed. After a brief period of middle peasant harassment (as opposed to the earlier tyranny of oppression), the socio-economic position of Coolies changed for the better and they no longer had to struggle for mean and meagre concessions. Instead, their energies could be devoted to gainful pursuits.

However, trends are not all that clear. While on the one hand we do see a tremendous material betterment through the spectacular increases in monthly income levels, the Coolies still cannot be classified as anything but poor. They live in financial conditions which are so precarious that they still invite wonder and awed respect from us.

### 8.6. Women in Agriculture

Women Coolies are more bound to the daily labour of maintaining the family fields than men. They have no status as Agriculturists, being treated no better than draught animals. But agriculture is the reality of their daily life and the basis of their experience, and of their technical knowledge. To a great extent agriculture still forms the predominant framework of Coolie women's realistic expectations for themselves and their children. It is expected that as women gain confidence through training, they will capitalise on the new opportunity of horticulture by enterprising in many ways. Local dry land trees are a core part of their knowledge and experience.

## 9. ARGUMENTATION FOR THE NEED FOR THE PROJECT

### 9.1. Sustainable Livelihoods

Coolies believe that protecting and improving their agriculture and growing their own food for consumption and sale is an intrinsically useful activity. All Coolies grow a combination of subsistence crops and crops for the market, and in Bagepalli taluk there is a general reluctance to abandon subsistence crops even when water becomes available.

This reflects the tremendous economic strain which cultivators are under. It shows that unless and until agriculture can provide a minimum livelihood and a marketable surplus for cultiva-

---

<sup>2</sup> The *levels of disparity* between Coolies and *Ryots*, however, continue unabated. Average Coolie land holdings are only 3.27 acres of dry land and 0.23 acres of wet. When compared to the far more extensive *Ryot* holdings, the latter are by far more rich.

tors and non-cultivators alike, it will be difficult to infuse a more general spirit of enterprise which will allow more diverse types of economic activity to take off in this region.

## 9.2. Practicability

Only programmes which the Coolies themselves implement can contribute to strengthening the Coolie Sangha. Non-farm activities (other than brick-making, some new silk weaving, trading, and others which provide market opportunities which are accessible locally) require a collaboration with the neutral population which at present is slow to take off.

Trees, especially dry land trees such as Neem, Tamarind, Pongamia hold a special place in the ecology of the region. Women collect the produce of these trees and earn a supplementary living. Mango and Tamarind trees have a tested potential. Srinivaspur taluk, immediately across our border to the south-east, has flourished due to Mango orchards. Tamarind is easy to store, sell and process. The largest Indian wholesale market for Tamarind is Hindupur, hardly 30 km from Bagepalli.

## 9.3. Biomass production and Rational use of water

Women and men have taken up farm, off-farm and non-farm activities such as cattle, sheep rearing and vermicompost. But on the whole there is a simple biological limit to what is possible because of the scant biomass cover.

Water is a crucial and scarce resource. A few lucky Coolie families have invested in irrigation over the last 10 years. Crops which have been tried with various degrees of success include vegetables, mulberry, paddy and sunflower. But this is not a solution for everyone. It is only for a fortunate few who somehow manage to get a co-operative bank loan or government subsidy.

Dry Land Horticulture, on the other hand, offers a sensible alternative. Firstly, water usage can be rationalised with common irrigation wells catering to a large number of landholders. The actual figures speak for themselves. 2-3 acres of an individual's lands can be irrigated by a private borewell. On the other hand, 20-25 acres of orchards can be watered by a community borewell. And secondly, it creates an abundance of biomass – a vital prerequisite for off-farm ventures to take off.

The investments required are mainly in the setting up and managing of such common irrigation (or watering) arrangements. We believe that the Coolie Sangha has the maturity to do so. Furthermore, because the waiting period is relatively short at only 3-4 years after planting, risks are kept within reasonable limits.

## 10. PROJECT DESIGN AND STRATEGY

- 100 benefiting Families to be given subsidies to grow 40 trees on 1 acre each, in order to cover a total of 100 acres.
- 5 Watering Arrangements (bore well with bullock cart and tanker) to be established, 1 for each village of 20 orchards.
- Technical Support to be given.

## 11. PROJECT IMPLEMENTATION PLAN

1 acre of dry land per benefiting Family will be chosen to benefit under the Project. These plots will be relatively level and bunded fields, with slight gradient, on which extensive DLDP works were carried out in the late 1980's. 20 families will be selected from each village and 5 such villages will be grouped into a Cluster.

### 11.1 Selection of benefiting Families

- 5 village CSUs comprising a Cluster will be selected by all the elected Representatives of the Bagepalli Coolie Sangha to participate in the project.
- Member Families in each of these CSUs will come forward and declare their willingness to participate by putting aside 1 acre of land for raising trees. They will clearly state that they are prepared to make economic sacrifices like the daily labour of 1 person the whole year round for 4-5 years, giving up cropping the field for 2-3 years (in the 3rd and 4th years after planting) when there will be absolutely no returns, etc.
- All the CSU Members, women and men, will visit the plots that each family offers to grow trees on. They will satisfy themselves that good and suitable plots have been set aside for the project and that no one tries to “pass off” their bad lands just in order to get some benefits.
- The ADATS Agriculturist and DLDP Field Workers will then visit these selected plots and make their technical recommendations. They will ensure that the soils are properly suited, that good bunding works have been carried out and the lands are either level or with only a slight gradient, etc. If necessary, they will collect soil samples and analyse them at the UAS, Bangalore. They will then advise on whether Mango (which requires better land, more care and attention) or Tamarind is better suited for the particular land/family.

### 11.2. Subsidies

#### PITTING

In February and March, 100 benefiting Families will clear their plots and make field bunds. The Field Worker will mark 40 pits per acre, each measuring 1 cubic metre and 10 metres apart. Once dug, the pits will be aired for about 1 month and then fired with shrubs and leaves. For this the benefiting Families will each receive a subsidy of Rs 600.

#### FIELD TANKS

100 over-ground water tank measuring 2 metres x 1 metre x 1 metre high, will be built at convenient spots on each plot of land. The Field Worker will ensure the timely supply of bricks, sand, cement and water-proofing powder, and supervise the quality of work done by masons. This will cost Rs 2,500 each.

#### SAND, EARTH AND MANURE

In the month of April, red earth, sand and farm yard manure will be hauled onto the lands to fill each pit and make it ready for planting. Each family will receive Rs 400 for this purpose.

#### SUPPLY OF SAPLINGS

Depending on the benefiting Family's ability to care for the plants (age, physical disabilities, etc.), 40 year-old saplings of Mango or Tamarind will be procured and distributed with the onset on the first rains in July. We expect a survival rate of 60%. This means that another 16 saplings will be supplied in the 2nd year and yet another 6 saplings in the 3rd year. The cost of 66 saplings @ Rs 25 each works out to 1,550 per acre/benefiting Family.

#### TOTAL

The total expenditure for each benefiting Family, over a 3 year period, works out to Rs 5,050. Their own contribution, which includes labour to water the plants and care for the orchards (carry water from the Field Tanks to each individual plant, clear weeds, watch and ward, etc.), is extra. It is a full time job for 1 person from each family, the whole year long, for 3-5 years.



## RETURNS

For the 1<sup>st</sup> and 2<sup>nd</sup> years the families will be able to plough between the pits and grow groundnut, which will fix nitrogen. But from the 3<sup>rd</sup> year, branches will obstruct tilling and shade will effect crop growth. So there will be absolutely no income for the next 2 years. The plants should establish themselves in the 4<sup>th</sup> year and require no more summer waterings.

Fruiting at the rate of about 10 kgs per plant should commence from the 5<sup>th</sup> year onward and steadily increase from then onward. 400 kgs of Tamarind, at the lowest possible rate of Rs 5 per kg, should give an annual income of Rs 2,000 in the 5<sup>th</sup> year. We expect that yields will increase at a rate of 10 kgs per tree from then onward to stabilise at about 100 kgs per tree per year. Mango will give even better returns, but runs the risk of market fluctuation.

### 11.3. Watering Arrangements

#### WELLS AND BULLOCK CARTS

Bullocks and carts fitted with water tankers will be bought, one for each village CSU. Each CSU will select a Member Coolie to look after these – i.e. haul water for the 5-6 summer months, and use the bullock carts to earn a family income during the remaining months.

Borewells will be drilled on plots of land registered in the name of the Coolie Sangha, pump-sets fitted and energised. In some villages, the CSUs try to get Gram Panchayat and government permission to dig open wells in the tank beds since this can benefit the entire village and their cattle during the dry summer months.

#### FIELD TANKS TO BE FILLED TWICE A WEEK

Making 2 trips per day and working for 5 days a week, the bullock carts will be able to fill the individual Field Tanks on each benefiting Family's orchard twice a week. The benefiting Families will immediately hand pours this water at the rate of 32 litres (2 pots) per plant.

#### BI-WEEKLY WATERING FOR 5 MONTHS EVERY YEAR, FOR 3 YEARS

This will ensure 8 watering a month. It has been confirmed, at our organic farm in Bagepalli, that 40 such watering during the 5 summer months of February to June every year, for the first 3 years, are enough to firmly establish Mango and Tamarind saplings.

### 11.4. Technical Support

- Our Agriculturist and DLDP Field Workers have developed a set of simple practices for caring for Mango and Tamarind orchards. They will disseminate this information through various training sessions and continuous field visits. The Agriculturist will also experiment and demonstrate related practices.
- The Assistant Horticultural Officer, Government of Karnataka, has agreed to be fully involved in the project. Experts from Bangalore are willing to visit on a regular basis to give specialist advice on diseases, variety, etc.
- Professors from the University of Agricultural Sciences, Bangalore, want to be involved in order to assess the viability of the scheme and propagate it's effectiveness.
- The Centre for Ecological Studies, Indian Institute of Science, Bangalore, will continually monitor the Carbon sequestration capacity of this activity and link it to the global Climate Change Convention.

## 12. PROJECT MANAGEMENT AND EVALUATION PLAN

ADATS, the NGO which helped build up the Coolie Sangha, will offer every possible assistance to implement the Project, and also take moral responsibility. If required, ADATS is

prepared to be a co-signatory in the formal and legally binding agreement between the Bagepalli Coolie Sangha and the Funding Agency.

Project implementation will be monitored on a continual basis by 5 weekly village level CSU Meetings and Mahila Meetings, the weekly Cluster Meets, and monthly taluk level BCS Meetings.

Half-yearly Progress Reports which will be reflective in nature.

ADATS will assist in articulating experiences and writing these documents and also in any other dealings with the Funding Agency.

### 13. PROJECT BUDGET

#### SUBSIDIES

1.	Cost of constructing a storage tank measuring 2 metres x 1 metre x 1 metre high	2,500
2.	Cost of clearing 1 acre of land, digging 40 pits, 10 metres apart, and firing them @ Rs 15 per pit	600
3.	Cost of red earth, sand and farm yard manure	400
4.	Cost of supplying 40 year old Tamarind/Mango saplings in the 1st year @ Rs 25 per plant	1,000
5.	Cost of replacing 16 saplings in the 2nd year @ Rs 25 each (mortality rate - 40%)	400
6.	Cost of replacing 6 saplings in the 3rd year @ Rs 25 each	150

**Subsidy per benefiting Family/Acre/Orchard** **Rs 5,050**

**Subsidy for 100 benefiting Families from 30 villages to grow 4,000 trees** **Rs 505,000**

#### WATERING ARRANGEMENTS

1.	Cost of drilling a community bore well to be owned by the Coolie Sangha, energising it and fitting a pump set for a Group of 20 benefiting Families	50,000
2.	Cost of 1 pair of bullocks	15,000
3.	Cost of bullock cart and water tanker	20,000
4.	Maintenance cost (labour, fodder, repairs, etc.) @ Rs 1,000 p.m. for 5 months a year for 3 years	15,000

**Cost per village CSU** **Rs 100,000**

**Cost of watering arrangements in 5 village CSUs** **Rs 500,000**

**Total** **Rs 1,005,000**