

David Hogg and Diana Joseph

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## **Forging a Template for Sustainable Rural Development - The Araku Way**

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**Abstract.** India, as in most parts of the world, suffers from forest depletion. The marginalised communities dependent on these forests for their sustenance and well-being are the most affected. The Forestry Department's post-colonial regulations further exacerbate the plight of these people – they have long since lost their sense of shared custodianship of forest and as consequently their nutrition and livelihoods are severely challenged. Under these stressful circumstances there is no incentive to preserve or restore the remaining forest cover.

This trend needs to be reversed. This programme outlined is designed to facilitate bringing forests and forest ecosystems to these communities within their own lands. It is this template that is designed to be implemented as the livelihoods and nutritional security panacea. The Adivasi community in Araku already has a robust food cropping rhythm that is subsistence by nature. However the realities of modern life mandate that there is sufficient cash income for health, educational and other purposes. In consultation with the Adivasi community Naandi Foundation evolved a horticultural development template on marginal, unproductive community lands to enrich their local nutrition, their ecosystem and augment the farmer's disposable income.

The **Araku Valley Livelihood Programme** [Naandi Foundation/Livelihoods Fund/Mahindra social enterprise initiative] aims to demonstrate and evolve this template in the tribal communities of Araku nestled in the northeast region of the state of Andhra Pradesh adjacent to Orissa. Here in this mineral rich eastern mountain range of peninsular India this social enterprise partnership with the Adivasi (original inhabitants) community is creating a community portfolio of fruit and forest trees that will sustain a healthy carbon rich ecosystem and new found prosperity.

Naandi Foundation has been working in the field of education, health care and coffee with the Araku marginalised communities since 2001. Naandi assisted the community with their coffee plantations to ensure the quality was upgraded and they got good access to markets for their produce. In 2010 Araku tribal farmers evinced interest in restoring their ecosystem by restoring forests of fruit trees that would yield nutritious fruits and cash income from the sale of the extra produce. In collaboration Naandi/Livelihoods Fund/ Mahindra and Mahindra and the tribal community drew up a plan to plant out 6000 hectares of fruit, forest and coffee trees over a first phase five year period pre-financed by the Livelihoods Fund and Mahindra.

Naandi is facilitating the supply of the quality trees, assisting in establishing local tree nurseries, training farmers in horticulture while the community provides their marginal lands and pledges their time for planting and protecting the trees. Despite logistical issues of coordinating 300 village communities and collecting baseline and GPS data the programme is now successfully into its third year. So far 2.4 million trees on 6000 hectares have been planted and nurtured successfully. The entire tree planting will be completed 2012/13 after which over a 2 year period till 2014 monitoring and assessment mechanisms will be developed to ensure the sustainability of this 20 year programme. Coffee saplings are to be planted in year four and five ie 2013 & 2014.

The goal is sustainable livelihoods pre-financed by anticipated carbon credits. It is an integration of community mobilisation through village development committees, agro-forestry and LEISA agronomical practices. By providing initial support to this tribal agricultural community the aim is to make viable its artisanal farming. This support is multi-fold – in equitable market access, in nutritional support/advice especially for mother and child via education initiatives, through support for affordable energy, and access to finance – this cultural change we call the “Araku Way”.<sup>1</sup>

**Key words.** Adivasi, carbon credits, global positioning system, GPS, low external input sustainable agriculture, LEISA, livelihoods, Patta, village horticultural coordinator, VHC, village development committee, VDC, millennium development goal, MDG

<sup>1</sup> The Araku Way concept is articulated in India's Sustainable Development Model - A Framework for Local Nutritional Security (Mathai & Hogg), a Strategy Paper for Indian rural development 2010-2015.

## 1. Introduction

About 8 percent of the Indian population belongs to a category listed as “Scheduled Tribes” enumerated in the Schedule to Article 342 of the Constitution of India (Census of India, 2011). It is one of the poorest, most undereducated, and most deprived groups in the country, with illiteracy rates and poverty rates about twice those of the national average, despite the protection guaranteed to them by the Indian Constitution.

Mostly rural (+90%), the tribals (known as Adivasis or “original inhabitants”) have been traditionally associated with the forests, hills and remote areas, practising a unique life style, having a unique set of cultural and religious beliefs.

Andhra Pradesh, a state in South India, is home to 33 tribal communities constituting 6.75 percent of India’s total tribal population. Although the state’s tribals comprise only 6.59 percent of the state’s population, they account for the largest tribal concentration in Southern India and are spread across 6000 villages in nine districts. This zone forms the traditional habitat of 30 tribal communities.

In some districts the tribal population is spread thinly and they live along with non-tribal communities. The indigenous tribes are mostly concentrated in contiguous tracts of the nine districts that have been designated as scheduled areas administered by the Integrated Tribal Development Agencies (ITDAs).

Visakhapatnam districts is the home of about 19 tribals groups and second largest district in tribal population size in the state. The Agency area consists of the hilly regions covered by the Eastern Ghats with an altitude of about 900 metres dotted by several peaks exceeding 1200 metres.

In Araku too, the tribals are in a transition phase from a forest centred lifestyle to a rural, settled cultivation lifestyle, but the production from agriculture is not commensurate with the food requirements, while the scope for supplementation by way of intake of natural foods is diminishing due to depletion of the forests.

Recognising this, tribal development strategies need to go beyond the obvious land-based livelihoods and should aim to innovate on these practises. Introduction of land-use options that increase resilience and reduce vulnerability of the tribals is fundamental to livelihood improvement and adaptation to environmental change. Therefore, agroforestry as a land-use adaptation can provide livelihood improvement through simultaneous production of food, fodder and firewood as well as mitigation of the impact of climate change.

Drawing on this, Naandi Foundation (See Appendix) in collaboration with the local tribal community, funded by the Livelihoods Fund<sup>2</sup> and Mahindra<sup>3</sup>, designed a multifunctional

agroforestry system in Araku providing the tribals with nutritional security, a potential option for livelihood improvement, climate change mitigation and biodiversity conservation.

Non Government Organisations like Naandi find it increasingly difficult to get up-front funding for rural development projects especially in agriculture. Even Corporate Social Responsibility Funding is rare in this sector. But the need is great and fundamental for rural communities like the Adivasi Tribals for they have no access to markets and very little support for their subsistence agriculture especially in upgrading cultivation technique and investing in primary processing and effective storage. The pre-financing model of the Livelihood Fund and its support from the Livelihood Network ([www.livelihoods.eu](http://www.livelihoods.eu)) is therefore a welcome innovation and promises to be a game-changer in the rural development front. The latest of sustainable agricultural techniques can be shared with these vulnerable communities and both nutritional security crops and cash crop yields can benefit.

The accent and thrust of the programme is Livelihoods opportunities and the 20 year carbon finance element assures that support for the community is not just for 5 years but persists for a full 20 years. This allows the community time to “stand on its own feet” and begin developing its own self reliance and social and business entrepreneurship. Critical to this model is the choice of trees – they are revenue generating fruit and timber trees along with judiciously chosen nutritional trees like papaya and drumstick (*moringa oleifera*). Intercropping with medicinal herbs and vegetables is also supported. The fruits of this functional forest belong to the community of farmers and the programme has a built in guarantee to assist the community sell their produce at a fair price. The programme is organically and fair trade certified assuring a further dividend to farmers. This uniquely symbiotic relationship is the key to its success.

## 2. Programme Objective

The overall goal of the programme is to improve the livelihood of small and marginalized tribal communities in the Araku Valley of Visakhapatnam district in the state of Andhra Pradesh in India. The programme will turn a low carbon landscape into a high carbon multiple use landscape improving food security and generating additional income for the community. The programme area will cover 6,000 ha, comprising 300 villages reaching out to over 100,000 tribals (25000 families) and 6 million trees (3 million fruit & timber trees and 3 million intercropped coffee saplings) will be planted.

Based on ex-ante estimates the programme will sequester the following amount of carbon (tree/ shrub biomass carbon and soil carbon)

Total carbon offsets (20years)	1,330,791tCO <sub>2</sub> -e
Annual carbon offsets (tCO <sub>2</sub> /year)	66,540 tCO <sub>2</sub> -e
Carbon sequestration rate (tCO <sub>2</sub> /ha/year)	11.1 tCO <sub>2</sub> -e

The carbon credits are reserved for the Livelihood Fund as per the contract while all products from the fruit and timber

<sup>2</sup> **Livelihoods Fund** is a unique carbon investment fund that mobilizes companies, financial institutions, and large foundations to invest their money in a mutual fund. The Fund uses this money to finance the programs in the field. In return, the investors will get carbon credits to offset their own CO<sub>2</sub> emissions or sell the credits if they are not interested in carbon offsets.

<sup>3</sup> **Mahindra** is an India based multinational company with a presence in automotive industry, aerospace, aftermarket, components, consulting services, defense, energy, financial services, logistics, real estate, retail, and two wheelers. Mahindra contributes via its national Corporate Social Responsibility funded “Haryali” (Greening) Programme. Mahindra is not associated with the carbon credits element of the programme.

forest belong to the farmers and community.

The tribal communities living in the programme area are Bhagathas, Valmikies, Kamaras, Porjas and Kondhs. They converse in a dialect of Adivasi Oriya and Kui. The area is very secluded and still many of the villages are inaccessible by vehicles.

The livelihoods of the tribal communities in the region have a distinct set of economic characteristics which differ widely from the plains adjoining this area of Visakhapatnam, with respect to climate, soil, rainfall, habitat, flora, and fauna. Subsistence agriculture is the primary livelihood for nearly 99% of the tribes and special characteristics are:

- Rainfed agriculture (for food crop security) within their titled lands around the village. The crops commonly cultivated are traditional paddy (rice), millets, sweet potato, vegetables and pulses. (The destructive slash and burn practice on hill slopes, known as Podu cultivation, is now declining.)
- Gathering of Non Timber Forest Products eg honey, medicinal herbs etc
- Cattle and backyards gardens.

The current annual average income of households in the region ranges between INR.15, 000 to INR 18, 000 (USD 350-400) (Reddy et al., 2010). Indiscriminate Podu cultivation in the past has resulted in barren lands with increased soil erosion leading to environmental degradation has contributed to poverty and deprivation in the area. Dependence on forest and land has become extremely difficult for the tribal way of life. The rate of growth in population and diminishing forest cover makes the community extremely vulnerable.

Therefore, an integrated, holistic development approach revolving around building their local resources and skills to improve the agriculture and Non Timber Forest Produce [NTFP] needs to be adopted to address the issue of tribal poverty and build their economies.

### 3. Programme Implementation

The five year programme began in June 2010 and this first phase will be completed in June 2014. The remaining 15 years will be governed by renewable monitoring contracts between the community, Naandi and the Livelihood Fund/Mahindra.

Like all other developmental interventions of Naandi, this programme activity began with a process of social immersion. Naandi has been working with this community for more than a decade in health care, education and coffee production/market linkage so mutual respect and trust is strong. Several months before the programme activity began, the Naandi staff consulted with the marginal tribal farmers understanding their problems and their situation and identifying suitable marginal plots unconnected to their existing food crops lands. The programme implementation is explained in the steps below.

#### 3.1 Village Sensitisation Process

Naandi made use of its established partnerships and institutional set-up with farmer groups to spread word about village

level meeting to discuss the Horticulture programme. In participatory community meetings, the purpose of this programme, its major objectives and possible impacts were introduced. The eligibility criterion were also explained and discussed with the villagers (non-forest condition, degraded land). After intense discussions and consultations with the village assembly, suitable plantation plots were jointly identified for each village.

#### 3.2 Participatory village land analysis and Identification of land

An intensive stakeholder consultation was then carried out following standard participatory rural appraisal (PRA) methodology. Facilitated by the Naandi staff, farmers participating in the programme joined in a group based analysis to sketch each village showing details concerning different land use, land use changes over the last 20 years and the identification of the planting plots. The village sketch (Figure 1) was jointly elaborated using visualization techniques. Using a set of questions related to the general information on the whole village, the Naandi team collected details like the annual cropland, 6-months cultivated cropland, 3-months cultivated cropland, access to roads, location of watercourses and hills, location of forest and, if changed the location of forest in 1990, the main cropping systems, specific identification of degraded land, the exact location of the programme planting plots within this identified village land, basic information on households and livestock etc.

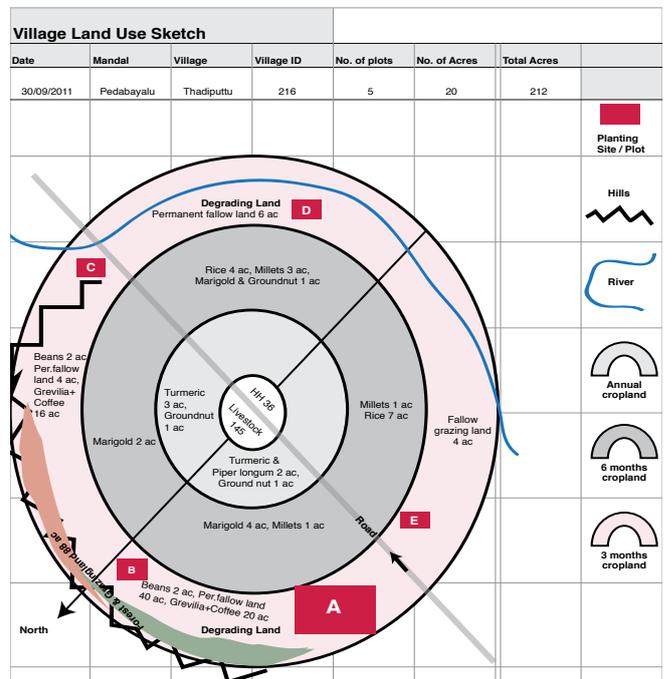


Figure 1. Land Use Sketch of Thadipattu Village

#### 3.3 Participatory Field Assessment

After the group-based analysis, the Naandi team together with the farmers participating in the programme assess the

plots in the field. For this, a set of plot specific questions are analyzed including the testimony whether plot was forested in 1990. After this, each farmer participating has to confirm the village and plot specific analysis with his/ her signature. The Naandi team also verifies the title of the land by referring to the ‘patta’<sup>4</sup>. The plots are geo-referenced and the details noted down in the survey questionnaire.

### 3.4 Village Horticulture Coordinators

The Naandi team identified an active tribal farmer, part of the programme, from each village as a Village Horticulture Coordinator (VHC). The role of the VHC is to mobilise the community and facilitate activities of the programme. The VHCs went through a capacity building process to emerge as key resource personnel for driving the programme agenda. Exposure visits, training, linkages with relevant institutions and government bodies formed part of this process.

### 3.5 Formation of Village Development Committee

The VHC, along with local village leaders and programme farmers formed the Village Development Committee (VDC) in each village. The VDC mobilises the farmers to share the responsibilities of clearing the land, digging the pits, applying the manure, collecting and planting the saplings, harvesting water, constructing tree guards, fencing the plots and nurturing and protecting the young saplings. Thus, creating a sense of ownership among the beneficiaries by involving them in every stage of the programme implementation – to ensure its and sustainability thereafter.

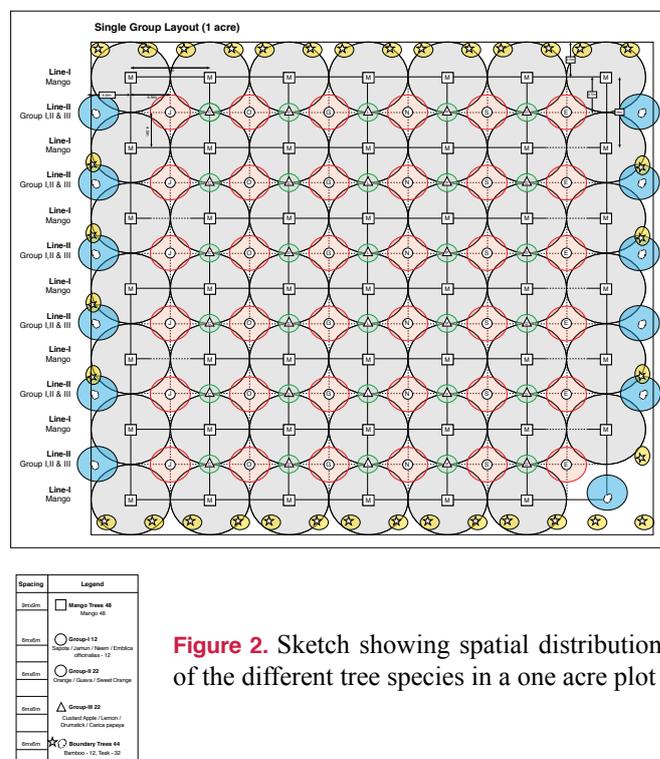
### 3.6 Sapling Identification

A scientific methodology (species suitable to the soil and climatic conditions) was followed for selection of trees. Farmers part of VDCs as well as horticultural/forestry experts were also consulted so as to maximize the yields and survival rate, keeping the overall aim of the programme i.e. carbon sequestration and improving the income of the farmers, in mind (Table 1). It was also ensured that trees which were selected had a fruit bearing time/ maturity time between 8 months (Papaya) to 20 years (Teak) so that the farmers do not lose interest in the plantation.

**Table 1.** Tree species and varieties planted

Treespecies	Common name
Mangifera indica	Mango
Bambusa arundinacea	Bamboo
Tectona grandis	Teak
Psidium guajava	Guava
Annona squamosa	Custard apple
Citrus sinensis	Sweet orange
Citrus aurantifolia	Lemon
Emblica officinalis	Amla
Moringa oleifera	Drumstick
Myristica fragrans	Nutmeg
Eugenia caryophyllata / Syzygium aromaticum	Clove
Azadirachta indica	Neem
Citrus nobilis	Orange
Syzygium cumini	Jamun
Carissa carandas	Koranda
Achras zapota / Manilkara zapota	Sapota
Coffea arabica	Coffee

Figure 2 displays the spatial distribution of the different tree species groups within the 1 acre planting sites.



**Figure 2.** Sketch showing spatial distribution of the different tree species in a one acre plot

<sup>4</sup> Patta is the document issued by revenue department in the rank of revenue administrative officer of the Taluka. A Taluka is the sub-division of the District. This document ensures that the land is owned by the patta holder i.e., the name mentioned in the patta and that it is not a government land. This also records the type of land in the land registry of the Govt about the type of land, owner of the land and other statistical information required by the Govt.

At all stages of the programme the VDCs were consulted and the minutes of the meetings recorded as part of the due diligence process. An MOU was taken up with the VDC towards the implementation of the programme.

As the plantation of horticultural saplings was carried out for the benefit of the local communities, they would have exclusive possession and use of all the natural resources produced including their fruits or other valorised outcomes, with the only exception being the carbon credits generated by programme. The carbon credits generated by this restoration are exclusively allocated to Livelihoods Fund.

### 3.7 Procurement of Saplings

Seedlings of the saplings identified are produced in central and village nurseries established and promoted by the programme. For other fruit trees grafted varieties are procured from recognized nurseries and horticulture research stations.

### 3.8 Land Preparation

Herbaceous vegetation is cleared at the sites to be planted, as it competes for nutrients and light. The vegetative matter is used for composting, mulching as well as fencing within the plots. Land tilling will be done as part of the programme activity, apart from establishment of planting pits. The clearing and planting work is done by individual farmers and community.

### 3.9 Spacing and Plantation density

The plantation density or the number of trees per hectare is dependent on the spacing maintained for the species. Spacing for the different species of saplings is given in Table 2.

**Table 2.** Species Planting Density

Species	Spacing
Mango Group	
Mango	9m X 9m
Mixed Group 1	
Sapota	6mX6m
Jamun	6mX6m
Neem	6mX6m
Aamla	6mX6m
Mixed Group 2	
Orange	5m X 5m
Guava	5m X 5m
Sweet Orange	5m X 5m
Mixed Group 3	
Custard Apple	4mX4m
Lemon	4mX4m
Drumstick	4mX4m

Papaya	4m X 4m
Teak Group	
Teak	6mX6m
Bamboo Group	
Bamboo	6mX6m
Coffee Group	
Coffee arabica	2m X 2m

### 3.10 Planting

The seedlings are transported from the nursery to the beneficiary's property. The plant material remains for the shortest possible time at the unloading site, which has water, shade and protection to avoid possible damages. The seedlings are planted on the same day. Transportation from the unloading site to the planting point is done by the communities themselves by carrying them to their fields in wooden/iron plates. The planting process is carried out in assistance with Naandi field officers.

### 3.11 Plant Protection

To protect the plants, biological pest control agents (eg pan-chakhavya) and fencing is being done. The villagers take great care to ensure that the animals are systematically shepherded during their grazing. A large number of plots have also been fenced to ensure that the cattle don't stray into them. Traditionally in these areas there is a practice of live fencing of *Jatropha*, agave and other local fencing varieties.

## 4. Monitoring, Recording and Verification

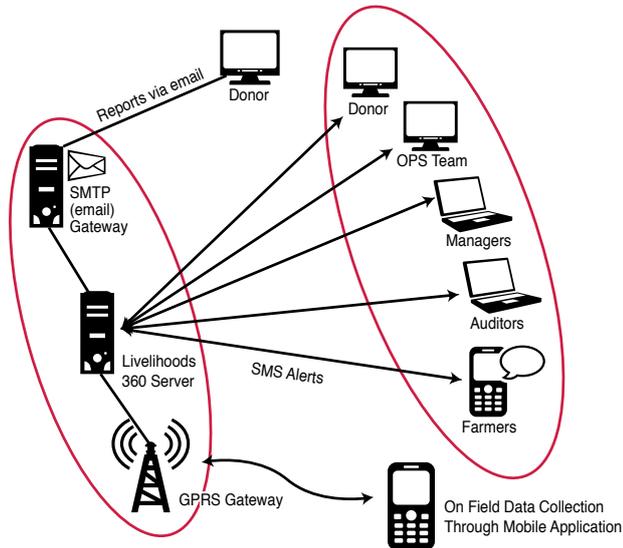
The monitoring aspect of the agroforestry program is an exacting task involving a lot of paperwork for the validation of the carbon audit and also from a general best practice perspective. Naandi identified information technology as an option to efficiently track, monitor and review work across the vast and tough terrain. It is also useful in forecasting and procurement of agricultural produce in minimum time, and in marketing activities. A mobile phone application named Livelihoods 360, which integrates 'on-field' process and data management requirement from operations, monitoring and audit perspective has been introduced. The application integrates the cultivation & marketing of the existing main cash crops – coffee and pepper and in future will assist in the monitoring the quantum of carbon sequestration through mobile data capture of vitals like height, girth, survival rate etc.

The application, Livelihoods 360 (cf. Appendix) has been designed with an aim to capture end to end data.

The application has been enabled for data entry at two points, mobile & online – keeping in consideration Naandi's requirements and operational constraints. The mobile application has been re-engineered to work both in offline and online mode to cater to low or no-signal strength in the valley. This data is sent real-time to a central server over GPRS connection from various field sites. The entire operation is now able to function on

a 'Just-In-Time' allotment of resources and forward planning. This data can be viewed by accessing the server online and also insightful Quality and Operations reports can be generated from accurate data that has been captured.

The larger objective of Livelihoods 360 is to capture realistic demographic information encompassing the entire fold of activities in a village in order to understand the overall impact of the intervention and also help identify areas for future interventions. (See Livelihood 360 document, see Appendix & Figure 8)



**Figure 3.** The chart below shows the end to end data management mechanism of Livelihoods 360

## 5. Accomplishments

- So far, 14120 committed farmers from 300 villages across three mandals have been involved in this programme as of November 2012.
- A total of 2.45 million trees of diverse varieties (such as Mango, Neem, Bamboo, Teak, Guava, Custard Apple, Orange, Lemon, Papaya, Sapota Drumsticks (Moringa) etc.) have been planted on 6000 Hectares
- Organic Demo and production units producing CPP (Cow Pat Pit – a bio dynamic biofertiliser), liquid manures and compost have been established at 50 nodal villages for the healthy maintenance of the saplings.
- Baselines of flora, fauna and GPS mapping of fields is done to monitor and ensure survival of trees.
- A complete audit of all assets in the 300 villages has been done as a baseline for monitoring progress in the coming years
- Local tree nurseries supported by the programme have been developed from the second year and in Year 3 (2012) 70% of the saplings were sources from these local nurseries. The intention is to hand hold these nurseries so that they become viable businesses catering to the needs of the community in the future

## 6. Challenges

The terrain in Araku is challenging. Villages are spread across undulating hills which are inaccessible by roads and often require an uphill trek between five and 10 kms. These villages are remote with very poor communication network and power supply. This often makes reaching out to the villages quite difficult.

- Moreover, the identified plots are spread across similar terrain making it extremely difficult to dig pits and fitting the required design of saplings per acre.
- The programme commenced at a time when the monsoons were almost over. Additionally poor rainfall in the past couple of years added to the problems. Providing additional watering to plants through water tanks has been cost and labour intensive.
- Even after taking due care in selection of the saplings the survival rate of 2 to 3 species of saplings was not as per expectations.
- Farmers showed a preference and demand for mono culture plantations like mango and teak. However continuous engagement and discussions with the farmers has led to an understanding of the importance of biodiversity and an assurance from the programme management side of market access for all products.

## 7. Impact and Implications for sustainability

The programme is designed to have multiple impacts.

### 7.1 Environmental impact

The programme will sequester carbon (above ground biomass carbon and soil carbon). The additional trees in the landscape will enhance the wildlife habit value and biodiversity. In addition, the soil water storage capacity will be enhanced and soil erosion will be reduced. As a consequence the resilience of the land use systems against climate change, in particular droughts, will be increased.

More specifically, environmental impacts, including impacts on biodiversity and natural ecosystems include (among others):

- Afforestation and reforestation activities can have negative impacts on biodiversity, if taken up in forest ecosystems with already existing biodiversity value. Conversely, if planting is being promoted on land that is degraded or with no trees, it will have a positive impact on biodiversity.
- Forestry on degraded lands without any trees on them has a positive impact on biodiversity, regeneration of vegetative cover through leading to soil and water conservation and protection of watersheds, and increased supply of biomass, which is essential as sustainable development issues of mitigation projects.
- Among the many environmental services they

provide, the most critical places are soil conservation i.e. protection against erosion and maintenance of fertility, shelter against wind and shade.

- Decreases vulnerability to current climate change and climatic variability
- Forestry on these degraded lands will enrich the soil by fixing nitrogen, improve drainage, and promote efficient nutrient cycling. Forestry is an opportunity to optimize land productivity and diversity in output to meet domestic needs and improve the household economy of farmers.
- The programme area is devoid of trees in most of the parcels of lands. A few parcels of land have trees on the bunds which are mature and these trees will not be uprooted. Thus the disturbance to soil will be limited.
- The species proposed are well known and indigenous to rural India

## 7.2 Socio-Economic impact

The economics of the agricultural mitigation activities has not been analyzed yet, but it is expected that most of the benefits from carbon sequestration are related to the expected crop yield increase. In the region farmers produce between 100 and 900 kg of Arabica beans per hectare, while in other countries up-to 1,500 kg/ha are produced. Farmers operating at the lower range have a huge potential to increase production by adopting best coffee and agricultural practices.

Apart from the potential to increase cash crop yields the proposed integrated livelihood development approach will improve public health, education, product valorisation and subsistence farming activities.

Further, the programme will strengthen community structures which will also help to mitigate conflicts between different tribes living in the area. In this view this project aims to:

- Develop innovative approaches that links climate change mitigation, agriculture to upscale soil restoration,
- Investigate added solutions to sustainable development
- Contribute to environmental sustainability and building new relevant partnerships;
- Exploring new ways of financing development, based on community mobilization, built upon Naandi's outstanding achievement on coffee certification and farmer's cooperatives.

## 8. Conclusions

The programme contributes directly to Millennium Development Goal (MDG) 1, target # 1: reducing extreme poverty and target # 2: reducing hunger; and MDG 7- ensuring environmental sustainability. It is designed to help rural tribal farmers in the Araku valley achieve sustainable

nutritional security and meet other basic rural livelihood needs that are in harmony with the environment.

In the long-term, farmers practicing agroforestry using fruit trees, timber trees and coffee will create nutritional security as well as additional income—thereby contributing to hunger and poverty reduction in the communities.

In terms of the environment, the benefits are multiple: Chemical free, sustainable organic practices will lead to improvement to the natural environment, including increased water retention in soils from higher organic carbon, improvements in the water table, reduced soil erosion combined with improved organic matter in soil, leading to better carbon sequestration and increased agro-biodiversity.

The success of a programme lies on the one hand in its ability to achieve its objectives, and on the other hand, its ability to sustain these achievements for the 20 year lifecycle. The sustainability of the project is ensured through the strong involvement and participation from programme design to implementation of the tribal community, along with the tangible economic and livelihood benefits that the community is already receiving and will receive in the future. The project interventions too, have been designed with a gender lens so that women can participate in programme activities.

With minimal or no external inputs required and utilisation of locally and naturally available material to produce high-quality produce, the programme encourages a holistic approach to farming that is more diverse and resistant to external pressures. With nutritional crops assured, support for coffee production and marketing and a robust agro-forestry component the community is evolving a wide portfolio of agri-options that derisks it from economic vulnerability.

Naandi envisions that the approach of working with nature, instead of using chemicals and pesticides to fight nature, will thereby evolve a replicable development template which will empower the communities to explore their own means of sustainable prosperity.



**Figure 4.** Village Development Committee meeting-Thadiputtu, September 2011



**Figure 5.** Naandi personnel explaining the plantation plan at the village



**Figure 8.** Capturing data through the Livelihoods 360 application



**Figure 6.** Farmers transporting the saplings for planting



**Figure 7.** Nurturing and protecting the young saplings by building bio fences

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## APPENDIX

### Livelihoods 360

#### Context

In order to meet the objectives of the program over the scale of operations in the area, it is imperative that we introduce the use of technology for optimum utilization of both time and resources. The idea of collating the entire set of data under one organized set which is time dependent is very challenging keeping in mind the sheer numbers, the connectivity to internet & telephone and the cost involved.

The application in mind had to perform with minimum effort and maintenance integrating the cultivation & marketing of the existing main cash crops –Coffee & Pepper and also be able assist the monitoring aspect of Carbon Sequestration Program leading to the cultivation & marketing of the produce from the planted trees.

#### Background

We decided to design and develop an application that works at standardizing the end to end data management cycle.

#### Solution

This application is an integration of the ‘on-field’ process and their data management requirement from an operations, monitoring and audit perspective. The application is designed on a light weight java platform.

- The application has been enabled for data entry at two points, mobile & online – keeping in consideration the tough terrain requirements and operational constraints.
- The mobile application has been re-engineered to work both in offline and online mode to cater to low or no-signal strength in the valley.

Post the set-up and roll-out of the designed application it will be easier to record any data mode in terms of quality and quantity from all the farmers across different regions, and look at the cumulative collection of data on a daily basis. This application will also facilitate any other information surrounding the process.

The application will hold static data such as Farmer identification, Farmer details, Farm information etc on the server maintained by offshore and the data can be accessed through a website from anywhere.

The dynamic data which can be categorically defined based on the use of the application will be downloaded on the mobile phone of the field staff. The staff member can use the mobile phone to enter the requisite data which will be stored offline [in case of no network] and transmit immediately to the server.

For example, the Horticulture application will involve a customized solution for baseline data of the existing trees on the plot to the number of trees planted to monitoring the health and survival of the plant for the coming five years. As this is a cumbersome task involving a lot of paper work to provide for the validation of the carbon audit and also from

a general best practice perspective, we came across the SMS/GPRS based solution as the most prudent and economical.

#### Naandi Foundation

The economic reform process started in 1991 in India had forced governments to become leaner and forge public-private partnerships as the new path to growth and development. After the mid-term review of the first decade of reforms, it was clear that these arrangements were not helping the government for improving the provision of basic services to the poor.

Against this backdrop, the state government of Andhra Pradesh, one of the large, agrarian states from Southern India, came up with the idea of creating an autonomous, secular, apolitical and professional NGO headed by an eminent board of leaders, mostly from business and industry. It was hoped that this institution will serve the unmet needs of the government in reaching out to the underserved populations in rural and urban areas.

Accordingly, **Naandi Foundation** was established in 1998 as a Public Charitable Trust with a vision to eradicate poverty. Naandi was mandated to scout for large scale government programs in areas like provision of safe drinking water, basic healthcare, elementary education, water and other agricultural input support to small farmers, etc. Naandi was to get government funding for implementing these programs. Naandi was also encouraged to forge partnerships with international governments, global developmental organisations, UN bodies, global business corporations and other philanthropic bodies for starting new initiatives or for complementing existing government programs.

**Naandi Foundation** did all of the above and in the very short span of a decade, managed to successfully carry out numerous large scale programs for the poor. Run by a professional team of over 5,500 employees, **Naandi Foundation** has now become the largest multi-sectorial not-for-profit in India, impacting 5 million lives. Their flagship programs include supplying hot nutritious meals to one million school going children everyday; providing academic support to over 200,000 children in 2,000 government schools; ensuring access to safe drinking water for over 3 million people; and liberating 100,000 tribal farmers from poverty through sustainable agriculture and access to global markets (the ‘Araku Way’).