

**. The following boards have been fixed in the watershed area at prominent locations**

**Watershed Development Fund funded by**

**NABARD**

**Sriramapuram - Malvarpatty Climate Proofing Watershed Project**

**(Seal/loge, if any)**

**A cooperative effort of people of Sriramapuram - Malvarpatty Village watershed Committee ( PIA)**

**(CIRHEP- PFA)**

**11. Signatories**

**NGO: CIRHEP**

**VWC: Sriramapuram - Malvarpatty**

**Village**

**watershed Committee**

**(i) Signature: \_\_\_\_\_**

**(ii) Signature:**

**Name: K.A.Chandra**

**Name: K. Karuppiah**

**Designation: Secretary**

**Designation: President**

**Enclosures:**

**(i). Xerox copy of the updated VWC bank account jointly operated by NGO & VWC (after closing of the account). : ENCLOSED**

**(ii) Certificate/document to show the closure of the account (Audit reports of VWC/NGO joint account and NGO project management account):. ENCLOSED**

## Soil and water conservation measures

CIRHEP was provided the opportunity for the Climate Proofing of the watershed. Based on the participatory situation analysis, scientific analysis of soil, water temperature, rainfall, ground water and cultivation practices available, animal population and people attitude the following program were completed

### a. Area Treatment

- Well Recharge Pit – 104 Units
- Summer ploughing – 397 Ha
- Deep Tillage – 115 Ha

## *Outcome No. 1. – Improved soil and water regime for better crop productivity and resultant increase in income of farmers*

The main thrust of this outcome is to enhance crop productivity and increase in income of farmers. This is to be achieved through improving the quality of soil and water regimes.

Crop productivity depends upon the quality of soil and water available for crops. Soil and water conservation is absolutely necessary to increase crop productivity. Fertile top soil, combined with availability of water for crops at critical stages of crop growth will result in increase in productivity of crops and increase the income of farmers. There was an over dependence on water intensive crops, flood irrigation methods without much investment in improving water table and vegetation cover, leading to increased vulnerability among small and marginal farmers due to reduction in yield and income. In order to improve the climate resilience and better adaptation to the situation, the project looked at improving the soil and water regime through various vegetative and mechanical measures. Though a number of measures are suggested in order to achieve this outcome, only three of these measures including summer ploughing, deep tillage, and well recharge pits were actually included in this outcome for this project.

### Summer Plough :

Summer ploughing is one of the ecological agricultural practices. The main primary purpose of summer ploughing is to open the soil crust with deep plough while at the same time turning the soil for disinfection with help from sunrays. To recharge soil profile, offseason tillage i.e., summer ploughing is very important during pre-monsoon showers in May month. Summer ploughing increases the water content of soil and reduces soil erosion. This ploughing reduces weeds and controls pest. In order to

achieve the above outcome, summer ploughing was completed in 397 hectares of land. A total of Rs. 6,94,750 was utilized in summer ploughing. (photo of summer ploughing.

Our fore fathers utilized the rare summer rain to do summer ploughing deeply which would make the leaves and residues to mix with the soil, prevent the weeds, destroy the eggs of the insects and bring up the bottom soil to the top and preserved the air and moisture of the soil. Then late when the rainy season comes they did their cultivation practices successfully.



### Deep Tillage :

Deep ploughing turns out large sized clods, which are baked by the hot sun when it is done in summer. These clods crumble due to alternate heating and cooling and due to occasional summer showers. This process of gradual disintegration of clods improves soil structure and including quick rain water infiltration. The rhizomes and tubers of perennial weeds (world's problematic weeds viz., *Cynodondactylon* and *Cyperusrotundus*) die due to exposure to hot sun. Summer deep ploughing kills pests due to exposure



of pupae to hot sun. Under this project, deep tillage was completed in 100 hectares. It is expected that this would have definitely contributed to the enhancing the soil structure and thereby enhancing the quality of the soil for better crop productivity. (Photo of deep tillage)



**Well Recharge Pit**

Well Recharge pits are made near the wells to divert the surface runoff water that the mineral rich top soil into the open well through filter pipes and conserve the water resource by raising the ground water level.

The purpose of well recharge pit is to ensure that rainwater percolates into the soil. A recharge pit allows the rainwater to replenish the groundwater by recharging the underground aquifers. Because of recharge pits, the water table in the wells have increased than its level prior to construction of well recharge pits. Total of 104 well recharge pits were completed during the project period each with a unit cost of Rs. 4500.(Photo of well recharge pits)



The above three activities have facilitated the improvement in soil and water regime, better crop productivity and resultant increase in income of farmers which is the main outcome envisaged. Summer ploughing, deep tillage and well recharge pits, has to a certain extent helped in enabling recharging of ground water by harvesting rain water to percolate deep into the soil. Summer ploughing had helped in loosening the soil to enable water infiltration.



#### Afforestation and Pasture land Development

#### *Outcome No. 2. Increased adaptation to climate change through climate resilient farming systems approach and diversification of livelihoods:*

This outcome envisages improvement in existing cropping systems to reduced dependency on water sensitive crops and introduction of hardy varieties apart from introducing farming techniques that are resilient in water scarce situations. In order to achieve this outcome, the following activities have been proposed for CIRHEP. They include (i) Afforestation and Pasture land development with sub activities including – fodder development, providing chaff cutter, establishment of nursery of forestry species, and agroforestry in channels. (ii) Other climate resilient farming / livelihood support including vermicomposting, compost pits, drip irrigation, micro sprinklers, integrated farming systems, tank silt application,



minor millet cultivation, kitchen gardening, (iii) Energy efficient systems including Bio – gas system establishment.

#### Azolla Development

It easily grows in rice field and can grow under controlled condition also. It can easily be produced in large quantity required as green manure in both the seasons – Kharif and Rabi. It can fix atmospheric CO<sub>2</sub> and nitrogen to form carbohydrates and ammonia respectively and after decomposition it adds available nitrogen for crop uptake and organic carbon content to the soil.



#### Fodder Development

Fodder is an important component in any livestock unit for the sustainability of the unit. The importance of fodder starkly comes into focus during drought period, when due to lack of availability of fodder, farmers are forced to sell of their livestock units especially dairy units. This leads to reduction of assets for farmers. It also leads to loss of income source. Moreover, since the sale of animals happens during the time of shortage of

availability of fodder, it is a distress sale and the farmer does not get the real value for the livestock unit sold. Most of the time, since the farmers are always in short of cash needs, the cash proceeds available through sale of cattle, is spent on immediate needs of the family, and if the farmer is left with no cash to purchase cattle unit when the fodder situation improves. In order to mitigate this situation, the project envisaged establishment of fodder development with 105 units with a unit cost of Rs. 4200. A total of 142 fodder units were established and the amount was fully utilized. Due to this activity, fodder availability increased in the project area. Fodder crops including Co4, CoFS 29, Subabool, Sesbania etc were raised to augment fodder availability in the project area. They were raised mostly under irrigated conditions. Fodder availability increased among those who have raised these crops and as a result of this, the number of livestock units has increased in the project area. This has led to increase in assets among farmers and a sustained source for income for farmers. Due to increased number of livestock units, the potential for availability of organic manures has also increased. This also is expected to contribute to the increase in soil organic matter in crop lands. (Photo of fodder crop of Hybrid napier and CoFS 29)

- Increased availability of grasses and green fodder for livestock and milch cattle in summer.
- Improved health of livestock and milch cattle, thereby leading to increased milk production for family consumption and sale in milk cooperatives.
- Cultivation of improved grasses for fodder is a specific climate proofing initiative in watersheds especially in rain fed lands/dry lands. This increases the resilience of communities to adverse climatic stress conditions.
- Ensures fodder security for livestock and milch cattle is crucial for drought proofing interventions especially during drought years.
- Farmers need motivation and skill training for cultivation of improved grasses like hybrid Napier grass – CO 2 and CO 4 varieties, Agathi and Suba grass which provides better yields to meet the fodder needs of livestock and milch cattle even in drought years.





## Korangad Development



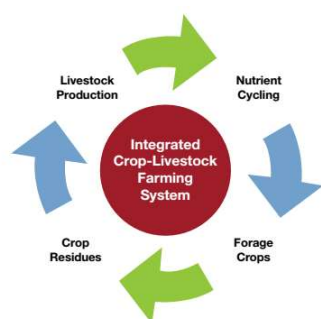
### Other Climate resilient Farming /Livelihood Support

#### *Achievement of outcome No. 2*

1. Shifting of cultivation of single cut fodder towards multi-cut fodder. This has led to increase in availability of fodder almost through out the year. Availability of fodder throughout the year has led to reduction of distress sale of cattle due to non-availability of fodder especially during the dry season. Earlier farmers used to cultivate annual crops of red sorghum and after threshing out the grains, the chaff was provided to cattle within the farm. Farmers had to sow these single cut fodder species every year. Now with multi-cut fodder including Co4 Super Napier, CoFS 29, farmers are able to meet their fodder requirements throughout the year
2. Increased in diversity and quality of fodder species has resulted in increase in quality and quantity of milk. Fodder diversity is an important factor for the overall health of cattle. Various types of green fodder has been made available by which the quantity as well as the quality of milk (in the form of increased fat and SNF) has increased reasonably. Apart from the diversity of fodder, construction of cattle water trough tanks has ensured clean water available for the cattle, sheep and goat of the village. This has ensured an assured supply of clean drinking water contributing to increase in milk production.
3. Availability of fodder throughout the year is another factor. Due to multi-cut fodder made available through the support from the project, fodder is now available throughout the year and also in

diversity. This has led to retention of cattle and avoidance of distress sale of cattle during peak summer when there is no fodder for cattle.

4. Increased availability of diverse vegetables at household level has been made possible through support from this project. Due to kitchen garden activity, there has been an increased production and consumption of vegetables within the household. On an average there has been a 20-25% increase in availability of vegetables grown within the household. This has led to corresponding decrease in purchase of vegetables from the market. This has also contributed to reduction in expenditure within the household. On the other hand, it has also helped in contributing to increase in nutrition security of the households in the project area. The extent of this contribution to nutrition factor is to be assessed.
5. Increased productivity due to high quality organic manure (vermicompost, compost, bio gas slurry and tank silt application) was noticed among farmers who have been benefited from undertaking this activity. Farmers who have applied vermicompost, compost and tank silt application has benefited the farmers through increased yield and this was possible mainly because of the improvement in soil physical and chemical properties. This in turn has led to increased water infiltration and moisture retention in the soil. Application of tank silt has significantly improved the soil properties and has led to increased yield among a number of crops
6. Increased efficiency in irrigation / increase in area of irrigation and subsequent increase in production was noticed wherever sprinkler, micro-sprinkler and drip irrigation has been introduced. Farmers who were earlier using flood irrigation for their fields were able to irrigate their fields only for 2 hours. Introduction of sprinkler, micro-sprinkler and drip irrigation has led to increase in the number of irrigation hours without reduction in yield. On an average farmers are now able to irrigate for 5- 6 hours due to increased efficiency in irrigation through sprinklers, micro-sprinklers and drip irrigation. This has been made possible because through drip and micro-sprinklers, water is made available at the root zone instead of flooding everywhere. This has also contributed to reduced water demand and subsequent exploitation of groundwater.
7. Reduction in external inputs due to increase recycling within the farm where Integrated Farming System was introduced. The output / by product of one sub-system within the farm becomes to input for another sub-system within the farm. On an average, an integrated farming system farm had a minimum of 5 subsystems include (i) household subsystem which acts as the core which manages all other sub-system in the process of nutrient flow from one sub-system to another and this subsystem consists of the farming family which is running the integrated farming system (ii) cattle/livestock sub system which includes milch animals, goats and poultry. The overall welfare of these animals are taken care of by the household system while the nutrients

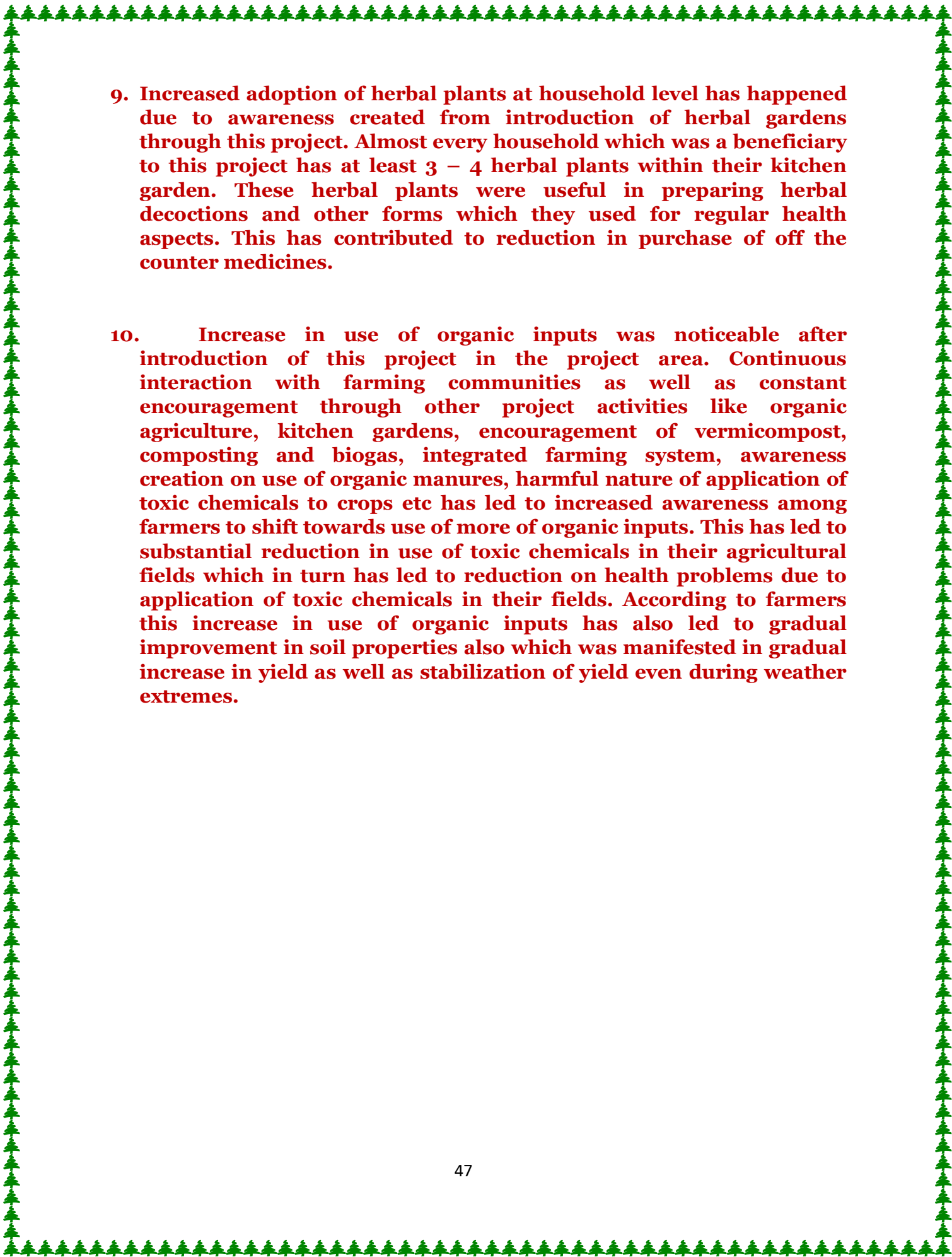


which includes milch animals, goats and poultry. The overall welfare of these animals are taken care of by the household system while the nutrients



(fodder) for the animals are raised within the farm and the agricultural residues (hay / straw) and green fodder comes from the cropping sub system. The animal sub system contributes cattle manure (dung) to the energy sub system (bio-gas) and the cropping system within the farm thereby helping in recycling nutrients within the farm itself. Introduction of bio-gas within the farming system has led to reduction in GHG emission wherein methane (which is more dangerous than carbon-di-oxide) is used up in heating / cooking purpose within the household. (iii) cropping sub system consists of all crops (annual and horticultural crops and fodder which are raised within the farm. This cropping sub system receives nutrients from animal sub system within the farm and management inputs from the household. Outputs from the cropping system in the form of crop residues, fodder etc become animal feed (iv) energy sub system consists of harnessing bio-energy in the form of bio-gas from cattle dung available from cattle which receives nutrients from the cropping system. Bio-gas is a sustainable form of energy within the farm and it is also a permanent and free (not purchased) source of energy. Introduction of Bio-gas in the farm has led to reduction in purchase of LPG gas. This has also contributed to reducing GHG emission (v) Tree components within the Integrated farming system has lead to enhanced availability of biomass through leaf fall as well enhancing the ecosystem services available for the farm as a whole. It has helped in moderating the micro-climate within the farm and has enhanced the “living” comfort of the farm as a whole for both the household as well as for the animals. Introduction of tree components has also increased in bio-diversity within the farm with more small animals and birds within the farm. Annual leaf fall from trees was a significant source of bio-mass available for composting and manuring which again contributed to nutrients for the crops.

8. Shifting from mono crop to mixed cropping (millets+pulses+cotton) has happened in many of the farmer beneficiaries of the project. Multiple / mixed crops has reduced the risk of crop failure which was the norm during monocropping days. Mixed cropping of millets+pulses has enhanced the availability of millets and pulses thereby increase in protein availability for the farming family. Some farmers had also introduced mixed cropping within cotton and that too cotton raised with indigenous seeds (karunganni) cotton. This has led reduction in conventional pests like boll worms in cotton. Along with indigenous seeds of cotton as well as due to mixed cropping within cotton, has led to overall reduction in pest and subsequent reduction in pest management costs. Some of the farmers who had been cultivating paddy before had shifted to millets and pulses and thereby reducing water demand.

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9. Increased adoption of herbal plants at household level has happened due to awareness created from introduction of herbal gardens through this project. Almost every household which was a beneficiary to this project has at least 3 – 4 herbal plants within their kitchen garden. These herbal plants were useful in preparing herbal decoctions and other forms which they used for regular health aspects. This has contributed to reduction in purchase of off the counter medicines.
10. Increase in use of organic inputs was noticeable after introduction of this project in the project area. Continuous interaction with farming communities as well as constant encouragement through other project activities like organic agriculture, kitchen gardens, encouragement of vermicompost, composting and biogas, integrated farming system, awareness creation on use of organic manures, harmful nature of application of toxic chemicals to crops etc has led to increased awareness among farmers to shift towards use of more of organic inputs. This has led to substantial reduction in use of toxic chemicals in their agricultural fields which in turn has led to reduction on health problems due to application of toxic chemicals in their fields. According to farmers this increase in use of organic inputs has also led to gradual improvement in soil properties also which was manifested in gradual increase in yield as well as stabilization of yield even during weather extremes.



## **Integrated Farming System**



increased frequency of extreme weather events. Growing crops and animals together will help in increasing the adaptive capacity of the community by raising the productivity, profitability, and sustainability of the farm. Integrated Farming Systems helped in recycling of byproducts from one component to another which led to environmental safety. It also supported in income and employment throughout the year. In the project area, a total of 5 Integrated Farming systems were established with a a cost of Rs. 28500 per unit with a total grand utilization of Rs. 1,99,500. The components included agriculture, agro forestry, goatry, poultry, dairy, vegetable cultivation, fodder cultivation etc, within each farm. Each of these components were set up in such a way that they were complementary to each other avoiding competitions both above the below the soil. Integration of agriculture and livestock components enhanced the availability of organic manures to the farm. In some of the Integrated Farming Systems, introduction of bio gas also helped in providing additional energy component to the farming family. On an average, the income through integrated farming system increased by 50% compared to the pre-project stage.(Photo of IFS farm)





**Kitchen gardening – As environment concerns broaden, and diet-related health and**



nutritional problems increase, national governments and development partners across the world are increasingly getting interested in kitchen gardens. Today given the urgent need for food security, environmental protection, and better nutrition, potentials of kitchen gardens are changing towards promotion of good diet and nutritional security of the families. Recognizing the need for meeting the nutritional needs of a family, establishment of kitchen garden is gaining ground. In this project too, kitchen gardens were to be established with the aim of supplementing the non-staple food needs (vegetables and fruits, tubers and leafy vegetables). Accordingly kitchen gardens were established in 20 landless SC families who are beneficiaries of this project. so a total of 20 kitchen gardens were established each with a cost of Rs. 1500/- with a total utilization of Rs. 60,000. The main outputs expected out of this activity includes increased availability of vegetables to supplement the requirement of 20 families. (photo of kitchen garden)

#### VermiCompost - Demo

Vermicompost contains adequate quantities of NPK and several micronutrients essential for plant growth, which will maintain soil health. It is also eco-friendly, non-toxic and consumes low energy input for composting and is a recycled biological product. 10 units of vermicompost production units (5\*1\*0.06m size) were established with a cost of Rs. 6000 per unit from the project. A total of Rs. 60,000 was utilized for the project for construction of 10 vermicompost units. This vermicompost is being applied for kitchen gardens, and in crop lands. This

has also contributed to increased organic matter in the soil. Establishment of vermicompost units has also helped in recycling organic manure especially in the process of enriching organic manure.

- Develops roots of the plants.
- Improves the physical structure of the soil.
- Vermi composting increases the fertility and water-resistance of the soil.
- Helps in germination, plant growth, and crop yield.
- Nurtures soil with plant growth hormones such as auxins, gibberellic acid, etc.



### **Drip Irrigation**

**Drip irrigation involves dripping water into the soil at very low rates from a system of small diameter plastic pipes fitted with outlets called emitters or drippers. In the project area, 5 units of drip irrigation were established at a cost of Rs. 18000 per unit with a total utilization of Rs. 90000. Three additional units were established with revised sanction making it a total of 5 units with a total support of Rs. 90000. This has reduced water requirement of perennial tree plants which were irrigated through flood irrigation has converted to drip irrigation thereby reducing water requirement for irrigation. (photo of drip irrigation)**

### **Micro Sprinkler**

**Through micro sprinklers, water use has been reduced by 40 – 60% and increased efficiency of irrigation. A total of 4 micro sprinkler irrigation system has been set up for floriculture purpose and 12 farmers have installed micro irrigation systems with government subsidy.**



## Tank Silt application

Irrigation tanks formed many centuries ago, as water harvesting structures to offset the vagaries of monsoons, serve the purpose of not only collecting rain water, but also nutrient rich top soil eroded from their catchment areas. Thus the tanks facilitates to conserve the prime and scarce natural resource, namely the soil and water while providing multiple services with the running water deposited as silt in the tanks. So there is an imperative need for effective utilization of silt collected in the tanks by transporting it to the agricultural lands which in turn will help in restoring the tank's storage capacity as well as improving the productivity of farm lands applied with tank silt. Many research studies have proved that tank silt is useful in release of nutrients such as total nitrogen and beneficial to sandy and alkaline soil. Application of tank silt to rainfed agricultural land is an age old traditional practice in south India. Application of a mix of tank silt and farm yard manure in agricultural land before the onset of monsoon replenished the soil nutrients and also improved the soil texture and its moisture retention capacity. Tank silt was applied mostly in dry land conditions in the project area as a substitute to fertilizers. In the project area, support was provided to 11 farming families for the application of tank silt in their agricultural lands with a cost of Rs. 7500 per family for 15 tractor loads of tank silt. The total grand utilization for tank silt application was Rs. 82500. This helped in increasing the yield of dry land crops especially in groundnuts, millets and other dry land crops. Farmers attributed the reason for increase in yield to enhanced retention of moisture in the soils and improvement of soil texture, increase in water infiltration and reduction of water stagnation during heavy rains. Farmers have utilized the opportunity to supply more quantity.(tank silt application photo)





## Minor Millet Cultivation

In the project area, mix of major and minor millets were encouraged. Normally in the project area, millets such as sorghum and Barnyard or cotton with inter crop of red gram or country beans or black gram are cultivated. Through the project Ragi and Kudiraivali (*Echinochloa crusgalli*) were encouraged. These crops are hardy and quite resilient to varied agroclimatic adversaries and plays an important role in marginal agriculture in the semi arid regions and is also regarded as a highly valued fodder. Another important aspect to be noted in the project area is that many of the farmers who were cultivating paddy, shifted to millet cultivation. This greatly reduced the water demand in



the project area. This shifting of paddy to millet cultivation also played a major role in mitigation of climate change by reducing the emission of methane and nitrous oxide from paddy fields. Instead, cultivation of millets led to sequestration of carbon in the soil. It is also a climate change adaptation strategy thereby shifting from high water demanding crop to low water demanding crop. A total of 110 acres was brought under millet cultivation in the project area. The support provided for millet cultivation ranged from Rs. 9685 to Rs. 10000 per ha with a total grand utilization of Rs. 55,000. Out of this the original number of acres which were provided with support for millet cultivation was 50 and another 30 ha was supported through revised sanction. (photo of minor millets field)

## Energy Efficient System

### Bio Gas – Demo

1. Bio-gas is a renewable energy source used for cooking, lighting purposes. It is a mixture of gas that is mainly composed of Methane (40 – 70%), Carbon-di-Oxide ( 30 – 60%) and other gases (1-5%). The calorific value of Bio-gas is about 16-20 MJ per meter cube of gas. Bio-gas is a sustainable source of energy which can be managed and used indefinitely without degrading the environment. Use of bio-gas reduces the dependency on natural and forest resources for the energy requirement for cooking, lighting and heating purposes. Many research studies conclude that there is a 65% reduction in use of fuelwood after the introduction of bio-gas. This works out to a reduction of emission of 3826 kg (3.8 tons) of Carbon-di-oxide equivalent due to introduction of bio-gas. This is one of a very



important source of mitigation of climate change which directly aims at reduction in Green House Gas (GHG) emission into the atmosphere. In order to encourage people using bio-gas technology support was provided for installation of 4 bio-gas units with farmers who have enough number of cattle dung available with them. Each bio gas unit was established with 2 cum

capacity of Drum model at a cost of Rs. 22,000





## Risk Mitigation :

### *Outcome No. 3 – Reduced climate change vulnerability with improved risk mitigation measures*

This outcome envisages climate vulnerability risk mitigation strategies through various means which are indirectly related to providing advisory services to crop cultivation under rainfed conditions. In order to attain this outcome, certain activities were proposed in the project which include (i) RML Subscription (ii) dissemination of crop advisory services (iii) Geo-hydrological study and crop water budgeting.

#### RML Subscription

- On a cluster basis and dissemination of crop weather advisory to farmers linked with IFFCO Kisan Sanchar Ltd.
- Validity period - 1 Year
- Rs.450 Per beneficiary.
- 90 farmers benefited in this scheme.
- 2 Voice Message & One Text Message per day.
- First Voice Message will be based on agriculture activities of the project.
- Second Voice Message will be based on agri allied activities ( Animal Husbandry , Health, Sanitation, Women development, Livelihood education, Government sponsored scheme etc).

IFFCO Kishan has a very low productivity with high input costs exacerbated with limited access to technology, services, high quality inputs and markets to sell produce, all resulting in poor profitability. Reuters Market Light (RML) Information services provided the necessary information services through mobile SMS – text and voice messages. Project beneficiaries were linked to this services through subscription with RML. Through dissemination of crop advisory services, farmers were able to take suitable decisions with regard to input and farm management. This also acted as one of the inputs which helped in adaptation to cope with the situation and most of the farmers were well prepared.

Crop advisory services were provided to farmers in addition they were also provided with (i) daily market prices, update for two crops, and markets for each crop, highest and lowest prices and arrival of crops (ii) Crop advisory /

best practices for major crops in the area which included relevant timing for sowing and other crop management practices (iii) weather forecasts on temperature, rainfall probability and relative humidity (iv) agriculture and rural news. Support to the extent of Rs. 150000 was provided as subscription to RML to ensure that agro-advisory services are provided to farmers in their own mobile phones in vernacular (tamil) language both through SMS as well as voice messages.

### Instrumentation, e.g. Runoff Measurement



### Gio Hydrological Study





### *Achievements in outcome No. 3*

1. Due to prediction of rainfall pattern, farmers were able to avoid sowing / cultivation of paddy when they received information that the rainfall may not be sufficient enough to take up preparatory activities for paddy cultivation. This has led to reduction paddy cultivation area and this paddy cultivation area has been substituted by increase in millet cultivation especially Kudiraivali. Increase in area of kudivali has led to increase in availability of millet for household consumption and for nutritional needs of the family. Reduction in paddy cultivation has led to reduction in water demand in the area
2. Better adoption of plant protection measures by beneficiaries was possible due to increased access to technical information through RML subscription for crop, weather and market. There were instances where farmers have reduced application of toxic chemicals to crops due to timely availability of information of plant protection measures.
3. Timely vaccination of livestock was possible due to this subscription. RML subscription not only provided information on crops but also on livestock providing information in advance to farmers regarding the need and importance of cattle vaccination. Moreover this has also led to increased awareness about cattle vaccination among farmers which helped in enhancing discussion among farmers on this issue and also in contacting the local veterinary officials for vaccinating cattle before the onset of season.
4. Improvement in knowledge about agricultural input and marketing was made possible due to bundling of information access through RML subscription. Some farmers were able to sell their surplus agricultural produce to a higher price due to information available regarding status of procurement price at different markets near the project area.
5. Many farmers had access to insurance facilities through this information which led to a reasonable increase in demand for insurance subscription.

## ***Outcome No. 4 – Knowledge Management***

This outcome envisaged a strong knowledge management system established which enabled documentation and dissemination of knowledge and lessons learned from the project to different stakeholders including policy makers and planners. Based on the project's learning, dissemination materials, audio visual materials were developed for knowledge dissemination. Certain specific activities were designed to achieve the outcomes which are as follows:

### **Knowledge Management**

#### **Posters and Pamphlets, Educational Kit manual climate change Adaptation**

These are instruments by which mass awareness is created. These posters and pamphlets are also low cost items. Pamphlets of vermicomposting, rainfed indigenous cotton, Covid – 19 safety and precautions, fodder management for milch animals, cattle insurance scheme, goat rearing, bio-gas plant construction and usage, micro-irrigation systems, package of practices on cotton and pulses, preparation of plant growth promoters and dryland farming practices. Among posters, vaccination table for milch animals, vaccination for goat and sheep, Integrated farming system, climate change adaptation measures, agro-advisory services, comparison of micro irrigation and flood irrigation, Preparation of concentrated feed, Bio gas construction process, Watershed – issues, solutions and interventions, beneficial insects, 7 tips for doubling farmer incomes and watershed maps. Totally Rs. 25000 was utilized for this purpose.(photo of photos and pamphlets)





### Centre for Improved Rural Health and Environmental Protection - 'சிறப்'



#### பலன்கள் :

- ✦ மண் வளமும் நீர் வளமும் மேம்படும்
- ✦ நிலத்தடி நீர் மட்டம் உயரும்
- ✦ விவசாயத்தில் மறு மலர்ச்சி ஏற்படும்
- ✦ இடம் பெயர்த்தோர் திரும்பி வருவார்கள்
- ✦ விவசாயிகள் தன்னிறைத் தேவைக்கு ஏற்ப பயன்படுத்துவார்கள்
- ✦ காலநிலை மாற்றத்திற்கு ஏற்றார் போல் விவசாய முறைகளை மாற்றிக் கொள்வார்கள்
- ✦ காலநிலை மாற்றத்திற்கேற்றார் போல் புதிய தொழில் நுட்பத்தைக் கையாளுவார்கள்
- ✦ வங்கிகளுடன் தொடர்பு ஏற்பட்டு, உள்நாட்டில் அதிக வட்டிக்குப் பணம் வாங்கும் அவலநிலை மாறும்
- ✦ வேலைவாய்ப்புகள் உருவாக்கப்பட்டிருக்கும்
- ✦ பொதுப்பணிகளில் சமதாயப் பங்கேற்பு இருக்கும்
- ✦ பெண்கள் பொருளாதார முன்னேற்றம் அடைந்திருப்பர்
- ✦ விவசாய நிலங்களின் எண்ணிக்கை கூடும்
- ✦ விவசாயிகள் புதிய தொழில் நுட்பத்தைப் பயன்படுத்துவதால் விளைச்சல் அதிகரிக்கும்
- ✦ நிலைத்த, நீடித்த வளர்ச்சி ஏற்படும்

'சிறப்' நிறுவனம், 1994ஆம் ஆண்டு, திண்டுக்கல் மாவட்டம், திலக்கோட்டை தாலுகாவில், Society actன் கீழ் பதிவு செய்யப்பட்ட தொண்டு நிறுவனம் ஆகும். இது கடவாக்குறிச்சி என்னும் பாதுகாக்கப்பட்ட மலைவயச் சுற்றி உள்ள நீர்வடிப் பகுதிகளிலும், அதுபோன்ற வேறு சில நீர்வடிப் பகுதிகளிலும் தனது மண் மற்றும் நீர்வள மேம்பாட்டுப் பணிகளைச் செய்து வருகிறது. இயற்கை முறை விவசாயம், விவசாயிகள் குழு, பெண்கள் மேம்பாடு, சுற்றுச்சூழல் கல்வி மற்றும் பெண் குழந்தைகளின் உரிமைகள் என அனைத்து ஒருங்கிணைந்த மேம்பாட்டு பணிகளையும் 'சிறப்' செய்து வருகிறது.

### The Centre for Improved Rural Health and Environmental Protection

கதவு எண்: 11-2-6, E.B.காலனி முதல் தெரு, திலக்கோட்டை, திண்டுக்கல் மாவட்டம்.

|                                                                |                                         |
|----------------------------------------------------------------|-----------------------------------------|
| Srirampuram - Malvarpatty Watershed Climate Adaptation Project |                                         |
| Funded by :                                                    | AFB and NABARD                          |
| Facilitated by :                                               | CIRHEP                                  |
| Implemented by :                                               | Srirampuram Village Watershed Committee |

### காலநிலை மாற்ற தகவமைப்புத் திட்டம்

#### Climate Change Adaptation Project



## Awareness and mobilization /Capacity building training

On drip irrigation, herbal garden awareness, bio-gas plant, fall army worm in maize, environment conservation awareness, Indigenous cotton awareness, vermicomposting, livestock maintenance and tree growing in dryland areas, awareness on veterinary care, soil and water management, rainfed crop cultivation practices, and climate change awareness were conducted during the project period. A total of Rs. 50,000 was utilized for the purpose



## Exposure Visit and Peer Learning

**Agrotech exposure visit at Horticulture College, Periyakulam, Exposure to FPO in SEEDS – Mallankinar, Exposure visit to TNAU Coimbatore, Exposure visit to Alagarsamy Drumstick farm &MSK organic farming, Vadipatty. (photographs in all these activities**







#### *Achievements of Outcome No. 4*

1. Importance of rainfed lands for food security compared to cash crops in irrigated land. This was a very important message that was provided to farmers through knowledge management. Most of the rainfed crops consist of millets and pulses. These contribute to the bulk of protein requirement of rural communities. Increased area under millets and pulses due to mixed cropping has led to increased availability of these nutrients. On the other hand irrigated lands were mainly used for cultivation of cash crops which does not result in direct nutrient benefits to the farm household.
2. Reduction of risk in rainfed land. Increase in awareness on management of rainfed land through various knowledge management activities has led to reduction in risks in rainfed land. This was possible due to increased access to technologies which help in reduction of risk in rainfed land due to lateral extension of knowledge and information from farmers practicing certain technologies which reduce risk in rainfed land to farmers who were in need of such technologies to reduce risk in rainfed lands.
3. Importance of marketing. Exposure visit especially to FPO in Mallankinar has led to increased demand for institutionalization of farmers as well as creation of marketing infrastructure among farming communities. Farmers also felt the need to joint efforts in enhancing their abilities through collective means. This was clearly noticed after the exposure visit to FPO in Mallankinar. The next

**step will be to mobilize farmers towards the goal of institutionalizing marketing efforts by farmers themselves. (Photo of farmers visit in Mallankinar)**

### **Human Resource envelopment**

- **Exposure visits**
- **Awareness creation**
- **Providing need based training**
- **Demonstration**
- **Skill development**

### **Women development**

- **Strengthening women development activities**
- **Enhancing credit and savings**
- **Organizing health and veterinary camps**
- **Promotion of kitchen gardens**

**This project was to be implemented through Srirampuram- Malvarpatty Watershed Committee and given below are the members of the Watershed Committee. This committee was formed during the Full Implementation Phase before the implementation of the present project.**

### **NABARD Mumbai TEAM visit**





## Success stories

### Bio-Gas

In Sonaputhur, in survey no.685, a bio-gas unit has been constructed in the house of Mr.Ramraj.

Method of making the unit:



By allowing the cow dung to undergo fermentation, it releases a colourless and odourless gas, which can be used for cooking. For a family of four members, it needs a cylinder body, made up of drum and sand with 2 q.m. thickness and 25 kg. of cow dung, which can be collected from two or three cows daily. The unit has to be in a high place under the sunlight, near the kitchen. Every morning we have to mix cow dung and water with 1:1 ratio

and pour it through the inner tube. We should not use soap water for this. From one kg.of cow dung, we get 0.04 q.ft. of gas. The output of this structure is pushed out through the outer tube, which can be used to form a vermi compost unit.

It is an alternative energy, which is a clean source, comparatively to firewood. It makes a smoke free kitchen and saves money and energy. Above all, unlike the LPG, it is very safe to use and there is no need to fear for combustion. An LPG cylinder costs around Rs.800/- and this gas is very cheap and moreover, this gas can be used instead of electricity for the functioning of tube lights, fans, etc. In this way it is very economic and does not make any pollution. On the other hand, it is eco-friendly.



By using the bio-gas, Mr.Ramraj's family saves monthly approximately Rs.750/-, which would increase in course of time when they extend this.

## DRIP IRRIGATION

In the land of Mr.Rengaraju, he practises drip irrigation, which is a necessity of time. The ground water level decreases gradually day by day. There is electricity problem in our state, which is not dependable to utilize motor pumps. Hence, with the lesser availability of water, to cultivate in a large land, drip irrigation is the best way of doing agriculture, as it consumes  $\frac{1}{5}$ <sup>th</sup> of the regular water need. In the drip irrigation, there is no need of any hard work to water the land. Just a single person can open the gate valve and



water even a hundred acres of land easily. By this method, the upper soil of the land does not turn rough and hard. The soil gets aerated and so the growth is even and gives a good harvest. It prevents the growth of the weeds and saves time, energy and money for plucking the weeds with the help of labours and the cost.

Mr.Rengaraju, cultivates guava plants in his land and earns Rs.30,000/- per acre, per annum. He gains this amount as he sells the fruits at his land itself. If he sells them in the open market, he would get more profit; but the transport charge, labour charge, etc., would make up the difference in the amount. So, from his 5 acre land, he earns Rs.1,50,000/- in a year. Through drip irrigation, he himself works in his land (without any labour support), with this regular income, he has got his four daughters married and leads a happy life.



## WELL RECHARGE PIT

To raise the decreasing ground water level and to increase the available water resource, well recharge pits helps in a great way. These pits have to be made in the lower part of a land.

The WRP should be made up of 5 ft. cross section and 5 ft. depth. In this we



have to fix 4 cement rings of 2"thickness, 4.5 ft. cross section and 1.25 ft. height. The distance between the well and the Pit should be 8 to 12 ft. In that distance we need to make a channel of 1.5 ft. width and fix a pvc pipe of 4" thickness from the bottom of the pit into the well to pass on the water. In the bottom most cement ring, we need to fill it up with gravels. Upon them we have to add 40 m.m. baby stones and

upon them 20 m.m. baby stones should be added and above that for a ht. of 1 ft. we need to add sand and leave 1 ft. space on the top. In front of the WRP, we need to make a filter structure of 6 ft. length, 5 ft. width and 2 ft. depth to filter the organic rich soil. When the rain comes the water runs down into the pit, soil is filtered and overflow into the well, which in turn will raise the ground water level considerably not only in the particular well, but also in the surrounding wells.

In Srirampuram, in K.Palaniyappapillai's land Survey No : 351, a well recharge pit has been made, through which, the water level in her well has increased, her millet cultivation gave a good yield and she had a good harvest and earned a good income.

## Panthal Garden

Making a Panthal garden is the economic way of growing three types of crops in a single land at a time almost. Over the panthal, bitter guard can be grown. Under that, chilly or tomato and green leaves can be grown. The green leaves can be harvested in 45 days. Chilly or tomato ripe in 3 or 4 months and give yield. Following that, the bitter guard grows well for harvest. Thus, a panthal garden gives three yields successively.

So, it saves time, energy, quantity of water, money and gives continuous income also. Because of this, the life standard of the farmers rises, they can provide education to their children and build concrete houses for them.

In Srirampuram, in his land, Mrs. Mythili alteen has set a Panthal garden. She has grown snake guard on the Panthal and below onion. She told that the onion below should be harvested before the snake guard covers the panthal. Otherwise, the growth of onion will be affected. The timing should be taken care vigilantly. By this method, she has earned Rs.90,000/- through snakeguard harvest and Rs.18,000/- through onion harvest in a year successfully.

## SUMMER PLOUGHING

Our fore fathers utilized the rare summer rain to do summer ploughing, which would make the leaves and residues to mix with the soil, prevent the weeds, destroy the eggs of the insects and bring up the bottom soil to the top and preserve the air and moisture of the soil. Then later when the rainy season comes, more rain water is absorbed well and they did their cultivation practices successfully.

In Mariamangalapuram village, situated in Srirampuram watershed area, there lives a farmer Mr. Palaniappan, who has a land of **2.5** acres (survey no. **351** ). In the last five years, as there was not enough rain, he did not do any cultivation. So, the soil in his land became air tightened.





At this stage, under the NABARD and Climate Adaptation Project fund, we intervened and helped him to do Summer Ploughing in his land. Now his land is ready for sowing, when the rain comes and he looks forward with hope for a bright future.

### **AZOLLA**

**Azolla is an alternative fodder plant, which grows in the water bodies and spreads fast. It can be grown in shady ponds easily.**

#### **Growing method:**

**We can grow Azolla in a water tank, either a readymade one or a built up one. In the tank, we have to add rich soil and cow and cattle dung together, in which we may add panjakavyam or tholluyir solution also. And then we have to let the azolla float on the water surface, which would grow and spread well within a week.**



**We can mix this Azolla with the fodder and feed the cows and hens. As this is a calcium enriched nutrition, the cows that feed on this, give two or more litres of milk than the regular yield. Hens give stronger calcium rich eggs and above all, Azolla mixed foods are liked very much by the cattle and hens, they feed well and grow well.**

**In Srirampuram, farmer Mr. Stephen Paulraj (survey no. 82) has grown Azolla in his land in a small shady place and daily he feeds his cow with nearly one kg. of Azolla and his cow eats it well and grows well.**

## Vermi compost

*Vermicompost unit to increase the use of natural organic manure to enhance the soil fertility with low cost.*

Mr.Arockiyam, Survey No : 51 set up a Vermi composting unit in his farm with the project support. Vermi compost is prepared by using agricultural crop residues and organic matter available in the farmland along with Cow



dung and applied in a ratio of 3:2 on the beds, sprinkled with water (for maintaining temperature and humidity crucial for earthworms to survive) along with improved varieties of earthworm (*Incineafotida*).

The earthworms accelerate the decomposition process and produce vermin compost. A temporary shed is prepared to regulate the temperature, especially during summer.

Vermi compost has proved to be beneficial for enhancing the soil fertility and yields of crops. Mr.Stephen is now able to produce organic manure and use it in his fields. The crop production has shown a significant increase by using the vermi compost.

- Vermicomposting activities have proved to be beneficial for farmers for reducing their input costs for cultivation and enhancing soil fertility.
- Increased crop yields especially in small farms and kitchen gardens.
- Additional vermin compost can be sold in the market at high rates thereby increasing the household incomes of small and marginal farmers.
- Help check weeds on farmlands.

This is a specific climate proofing initiative in rain-fed areas/drylands for protecting the land and improving soil quality even during extreme climate stress conditions. There is a good demand for Vermi compost in the market. Farmers can sell additional vermin compost for better prices in the open market and enhance their household incomes.



## FODDER DEVELOPMENT

On the account of decreasing rain fall, water and fodder scarcity for the



cattle has arisen. So, the village people sell their cattle as they are not able to grow fodder for them, which affects their livelihood. In this situation, to prevent this, methods of fodder cultivation have been brought up.

In Srirampuram Malvarpatty watershed Mr.A.Saverior is the owner of 3.5 acre of agricultural land (Sur.No.**314** ). He was fascinated by the concept of cultivation of fodder as that of other food crops. He got fodder sticks from the CPP project and grew them well in his land. He has two cows and the milk collection has increased from 20 to 30 litres per day and simultaneously his income also has increased from Rs.400 to Rs.600 per day.

It has also created employment for one person in his family. The income from the dairy has helped in continuing his children's education. The cattle excretion is used as a nutrient manure for the crops and give better yield than before.

Hence, he has given up his original idea of selling the cattle. Because cattle are their livelihood, for which fodder development is very helpful and life changing.

## Impacts created in

### Sriramapuram - Malvarpatty watershed Climate Proofing

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#### Project

#### I.Land Development

1. Undertaken of summer ploughing, Tanksilt and Farmyard manure application activities in the Rainfed crop land area has improved in soil structure, nutrients, water infiltration and moisture retention capacity result in enhanced crop production upto 10% to 15%.
2. By undertaken of soil and water conservation measures on FIP phase, even though prevailed monsoon failure for the period of 2016 to 2019, the cultivation area and production was not affected.
3. Under minor millets cultivation of 27 ha of rainfed tank ayacut area was brought under minor millets cropped area. It reduced paddy crop cultivation and cost saved from crop failure. Instead of mono crop cultivation, mixed crop cultivation practices are being encouraged. Introduction of minor millets reduced use of ground and tank water consumption.
4. Crop water budget exercise consultations with community clarified over extraction of ground water to the farmers. Based on the recommendation of crop water Budgeting study, farmers are willing to adopt Micro-Irrigation Systems and low water intensive crops with organic manure application.

#### II. Livestock Development

5. Fodder and Water availability is most important components in livestock development. Introduction of green fodder Co4, Super Napier, Cofs29, Subabul and Sesbania fodder in 74 acres sufficient to increased animal population of 768 dairy animals and 3192 small ruminants.



**Cattle drinking water tanks are utilized throughout year, veterinary training and vaccination camps are being organized periodically. Therefore, cattle wealth and income has been increased additionally for 285 families @ Rs. 9500 / Family per year.**

**6. Integrated farming systems has proved on sustainable development and regular income. Farmers are come forward to shift their settlement to garden land location for establishing integrated farming.**

**7. Priority was given to establish kitchen garden programme to land less families. They are getting fresh vegetables, fruits and its protection ensured by creation of pukka fencing.**

**8. Herbal gardens have established in two locations at Urappanur Higher Secondary School and Pungangulam temple premises. Due to awareness creation on conservation and traditional use of medical plants, people are willing to plant in their homestead area and use it as herbal healing practice.**

**9. Under Agro advisory services, farmers are getting and adopting technical information on agriculture, Livestock, human health, marketing trend and Government Schemes.**