TECHNOLOGY MISSION IN MANIPUR

The Department of Horticulture & Soil Conservation was established during 1978 when the erstwhile Agriculture Department was trifurcated into three entities namely, the Agriculture Department, the Horticulture & Soil Conservation Department and the Command Area Development Authority with the objective of taking up programme implementation for horticulture development and soil & water conservation measures. Over the years, the programmes implemented by Horticulture & Soil Conservation Department slowly gained importance and popularity among the farmers. Alongside, the higher allocations made to Horticulture Sector in the Central Budgets during VIII, IX and X Plan gave a boost to Horticulture programmes in the State, as elsewhere in the Country. In fact, Central assistances currently extended to the State to promote 3(three) major Horticultural and related Schemes - the ***Technology Mission for Integrated Development of Horticulture in the State****, the* ***Macro-Management Agriculture Mode for management of Watershed in Rain fed Areas*** *and the* ***Additional Central assistance to State Plan for management of Watershed in Shifting Cultivation Areas*** *has enabled the Department to undertake developmental activities of production for conservation and conservation for production. The annual Budget allocation made to Horticulture & Soil Conservation Department from the State Plan merely meet the requirements of staff salaries, wages of muster roll labourers and other Office expenses leaving no balance to take up developmental activities.*

The state has rich resources in terms of land and soil fertility, rain, water, vegetation etc. and the prevalence of suitable Agro-climatic conditions ranging from temperate to tropical and sub-tropical zones provide scope for development of horticulture in the state. Despite these natural advantages, growth of horticulture in the state has remained lackluster till recently due to the wide gap between the technologies generated and their adoption by the farmers in their fields and orchards. Resources constraint for investment in horticultural activities is another major factor for lack of development of horticulture in the state. A planned approach towards horticulture development in the state was undertaken a few years back when a survey was conducted in collaboration with the National Horticulture Board to identify potential areas for horticulture development in the state. The survey report indicates that about 2, 77, 064 Ha. constituting 12% of the total geographical area of the state are available for horticulture and allied activities. Out of this potential area, only about 14% has been brought under different horticultural fruits and vegetable crops. However, during the last 2 / 3 years the areas under these crops are being expanded rapidly in all the districts of the state.

The Govt. of India appreciating the large potential available in the North Eastern States for Development of Horticulture launched the Technology Mission for Integrated Development of Horticulture in the region including Sikkim during 2000-2001, as a special package. However, actual implementation of the Mission took off only from the year 2001-2002. Effectively, therefore, the Mission is in the 3rd year of its operation in the state. The Mission operates on an end-to-end approach and towards achieving this objective a strategy of Technology transfer for production to appropriate post harvest management and effective marketing of fresh as well as processed horticulture produce has been evolved. Till 2002-2003, the State Horticulture Department has implemented schemes under Mini Mission -II only i.e. area expansion. In the annual Action Plan for the year 2003-2004, the Department has submitted proposals for taking up post harvest management under Mini Mission -III. Given the guidance and encouragement extended by Dr. H.P.Singh, Horticulture Commissioner and Dr,J.S. Mann, Addl. Horticulture Commissioner, Government of India to the functionaries of the state Horticulture department and the farmers , it is expected that Technology Mission will bring about tremendous change in the Horticulture scenario of the state, in due course, to generate self sufficiency in fruits and vegetables which will also provide higher income of the farmers. It should be the endeavor of Officers and staff involved in the implementation of Technology Mission to work like Missionaries, and as for the progressive farmers, to aim at producing surplus for export. To achieve these goals, unstinted cooperation and support of people of all walks of life in the state would be required.

1. AREA EXPANSION PROGRAMME (Technology Mission-MM II)

(a) Horticulture Fruit Crops:

Among the fruit crops planted under the programme Pineapple, Banana, Papaya, Orange, Lime & Lemon, Guava etc. occupy major areas of the farmers fields, particularly in the Hill Districts of Manipur where large potential areas are available for promotion of these fruit crops. In some of the locations/areas/belts where temperate type of climate prevail, particularly in Mao-Maram area of Senapati District, Shirui and its surrounding villages of Ukhrul District, cultivation of temperate fruit crops like Peach, Pear, Plum, Apple etc. has already been taken up. A new improved low-chilling variety of Apple has also been introduced to these areas with planting materials procured from Himachal Pradesh.

Pineapple cultivation at Ukhrul District

Passion fruit cultivation is a new area to which thrust is being given. Cultivation of this fruit crop has been taken up on a large scale mainly in Senapati and Ukhrul Districts where agro-climatic condition is most suitable. Since marketing facilities of this fruit crop either in fresh or as processed product is available in the state, the cultivation of this crop is fast gaining popularities among the farmers of Hill District.

The Northern part of Senapati District is a temperate/ sub-temperate climatic Zone which is suitable for growing temperate fruits like Peach, Plum, Pear & Passion fruits. Quite a large number of beneficiaries have been given assistance for growing Passion fruits under Technology Mission. The beneficiaries have been supplied with ***Passiflora edulis*** *(Flavicarpa) variety of seedlings which is identified jointly by Horticulture Department and ICAR, Imphal Centre as suitable planting material for the area. The growers used only FYM/compost and neem based pesticides in growing Passion fruits. Passion fruits can be harvested throughout the year. However, the main harvest is done in the months of September and October. From a properly managed 1 Ha. passion fruit garden a farmer can easily earn Rs. 80,000/- per year.*

Passion Fruit cultivation at Senapati District

Harvested Passion Fruit at Senapati District

Food Value Per 100 g of Edible Portion (Purple passionfruit, pulp and seeds)

Calories	90	Iron'	1.6 mg	Calcium	13 mg	Ascorbic Acid	30 mg
Protein	2.2 g	Potassium	348 mg	Carbohydrates	21.2 g	Thiamine	Trace
Fat	0.7 g	Vitamin A	700 I.U.	Sodium	28 mg	Riboflavin	0.13 mg
Ash	0.8g	Niacin	1.5 mg	Phosphorus	64 mg	Moisture	75.1 g

A Passion fruits Processing Unit has been set up at Punanamei Village, Mao, Senapati district, Manipur by the Good Samaritan Social Service Association with assistance from the

Food Processing Ministry, Government of India, the Small Farmers Agri- Business Consortium, New Delhi and Financing Institutions. Raw materials for this Unit are already available. The Good Samaritan Social Service Association is relentlessly working to find a way out for export of its processed Passion Fruit juice outside the Country. Area Expansion Programme under Technology Mission for cultivation of Passion fruits will enhance availability of raw materials to feed the Unit. It is expected that the concerted efforts of NGOs, Horticulture Department and the Farmers will promote cultivation of Passion fruits in larger scale which will ultimately enhance the income of the Farmers.

(b) Vegetable crops:

The prevalence of diverse agro-climatic conditions and abundant rainfall offer immense scope for growing different types of vegetables in the state. However, despite these favourable natural conditions, the cultivation of vegetables in the state are mostly confined to backyard homestead gardens, and are characterized by low yields.

Off-season cabbage cultivation at Ukhrul District

Improper post harvest management, poor marketing facilities etc. result in poor returns to the growers. Tones of different vegetables which cannot be marketed in time go waste on account of lack of knowledge of post harvest management and lack of infrastructure for storage. Attempt is being made to provide the required information on latest technology to the farmers through package of practices on vegetable crops under Technology Mission.

Area expansion of vegetable crops under MM-II of Technology Mission with emphasis on improved varieties and transfer of Technology to the farmers' fields constitute the most important feature on vegetable development. ***Cabbage, Cauliflower, Knolkhol, Turnip, radish, Carrot, Bhindi, Tomato, Beans, Cucurbits, Brinjal Onion etc****. are the main vegetable crops grown. Production of off-season fresh vegetable crops such as Cabbage, Tomato, Pea, Beans etc. are also gaining popularity in the areas where irrigation facilities are available during the dry spell.*

(c) Root and Tuber Crops:

Tapioca cultivation at Yaigangpokpi, Ukhrul District

In an effort to introduce new variety of vegetable crops, department of Hort. & Soil Conservation also lay emphasis on cultivation of improved varieties of Tapioca, Sweet potato, Colocasia etc. The area under these crops is being increased in some part of the state as the income from sale of these crops in the local markets enhances the annual income of the farmers.

(d) Spices:

Emphasis is also being given to promotion of cultivation of Low Volume, High Value & Less Perishable crops especially in the Hill Districts where due to poor road communication, transportation of large and bulky volume crops has not been possible. Spices like Ginger, Turmeric, chilly, Cardamom etc. occupy fairly large areas both in the valley and hilly regions. Other spices crops such as Black pepper, Garlic, Onion, Cinnamon, Coriander etc are also grown in the potential areas of the state with a view to enhance their production in the near future to meet the increasing demand of the consumers.

Ginger cultivation at Senam, Chandel District

(e) Development of Floriculture:

Gladioli cultivation at Ukhrul HQ

Flowers are beautiful and have their own particular fascination. In Manipur, different religious and social functions are performed throughout the year both in the Hills and Valley. Uses of flowers in such functions have become common. Cut flowers, bouquets etc. are slowly gaining markets and a humble beginning is being made to promote cultivation of Gladioli, Tube rose, Jasmine, Marigold etc. Art pieces of dried flowers have also surfaced in the markets

which appear to be a better source of income for the Floriculturists. Department is planning to train few Entrepreneurs in this trade.

(f) Aromatic and Medicinal Plants:

Manipur has a hidden treasure of innumerable Medicinal and Aromatic Plants. In the olden days, Manipuris solely depended on local Ayurved Doctors who prepared medicines from herbs and treated patients. Even now, when Medical Science has highly developed, some people opt for treatment of their ailment with Aromatic and Medicinal Plants. A beginning is being made to promote cultivation of Aromatic and Medicinal Plants.

Java citronella, Mint, Patchouli (Pogostemon patchouli) are some of the important aromatic plants grown under the scheme. Out of these plants, more emphasis is given to Patchouli. It is a highly aromatic bushy under-shrub. It is cultivated for its highly fragrant leaves which contain a very sweet smelling oil of lasting sticky odour. It has a very characteristic aroma and blends well with other essential oils. The oil is used in scenting soaps, cosmetics, aftershave lotions, detergents and many fancy products. In very low concentration (2 ppm) the oil is also used to flavour foods, beverages candy and baked products. The whole parts of the shrub are used for oil extraction, either in green or dried plants.

Safed Muslin, Amla, Khashi kateri are some of the medicinal plants proposed under this programme. Out of these, emphasis is being given to Khashi kateri (Solanum viarum). This is a steroid bearing perennial tall bush. Its berry pulp is rich in solasodine alkaloid, which is a starting chemical for production of steroids. It is used for production of contraceptive pills, corticosteroids and sex hormones.

About 300 different species of efficacious Medicinal plants, herbs, shrubs and climbers have been identified in Manipur. For Commercialization of Medicinal and Aromatic plants (MAPs), Small Farmers' Agri-Business Consortium, Manipur has decided to take up a joint venture with ***Reliance Life Science*** *on the following:*

i) Developing a Data Base of Medicinal plants of Manipur; and
ii) Selection of specific Medicinal plants for large scale cultivation.

(g) Plantation Crops:

There are two hot zones in Manipur. They are; Moreh of Chandel District and Jiribam areas of Imphal East District. These zones can be exploited for growing plantation crops like Coconut, Areca nut, Cashew nut etc. In Manipur use of Coconut and Areca nut are an

indispensable component of every religious function. Hence, improvement and area expansion of these plantation crops need encouragement.

2. CREATION OF WATER SOURCES.

(a) Construction of Water Tanks:

The climate of Manipur is undergoing changes from year to year, though the changes are not easily perceptible. In recent years, the changes have been hastened due to wanton destruction of forest for jhumming in the Hill areas, extraction of timbers, extension and development of urban areas. Most of the fields where Kharif crops are grown are rain fed particularly in the hilly regions where farmers entirely depend on monsoon rains for production of vegetables and other crops. Agriculture/Horticulture being the main productive sector and also a contributing factor for improving socio-economic conditions of the people of the state, any development in this sector is closely linked with the joy and prosperity of the people of the state.

With this objective in view, construction of community tanks has been taken up in all the Districts of the state with the aim of harvesting rain water during rainy season and utilizing the same during the dry spell of the year. In some locations these community tanks are constructed with brick and cement in order to prevent seepage of water especially in higher elevation where the soils are porous and water retention capacity is low. Water harvested in these community tanks during rainy season will ensure availability of water for irrigation and other purposes.

Community Tank at Nachou, Bishenpur District

The bench terraced fields in the hills is another area that could be tapped for growing Rabi vegetables after the main Kharif paddy is harvested. But due to shortage of irrigation water, most of the farmers so far are not taking up cultivation of vegetables in

these fields during Rabi season. With irrigation water stored in these community tanks, farmers are now hopeful of taking up cultivation of off-season vegetables and Rabi crops which will enhance their annual income.

(b) Installation of Tube Well:

In Manipur there are some pockets where ground water table is reasonably high and water can be drawn all the year round eg:- Sekmai areas of Imphal West district, Kanglatombi and Motbung area of Senapati District, Moreh and Aimol areas of Chandel District, Jiribam areas of Imphal East District and Churachandpur areas of Churachandpur District.

In these areas boring of Tube wells/ Hand pumps have been introduced to draw ground water which can be used for growing Rabi and off-season vegetables. With this component vegetables production can be enhanced through assured irrigation.

3. ON FARM WATER MANAGEMENT:

(a) Construction of low cost Green House:

Traditionally Greenhouses and other technologies for controlled environmental production system are associated with the off-season production of vegetables, rare ornamental plants and food of high value in cold climate areas where outdoor production is not possible. The primary environmental parameter controlled is of course temperature, usually providing heat to overcome extreme cold conditions. However, environmental control can also include cooling to mitigate excessive temperature, light control either shading or adding supplemental light, carbon dioxide level, relative humidity, water, plant nutrients and pest control.

Green House Constructed at Ukhrul HQ

The choice of crops to be raised in a greenhouse depends on the physical size of the structures and the economics of crop production. Hence, high value, low volume horticultural crops are more popular for cultivation in the greenhouses. Roses, Gladioli, chrysanthemums, Carnations, Gerberas and ornamental pot plants, besides Tomato, Capsicum, Cucumber etc. are some of the important crops grown under greenhouses in Manipur.

In pockets of temperate zones, farmers growing vegetables find that they can substantially increase income if they can raise nurseries in a greenhouse earlier than outdoors and bring their produces to market early, when higher prices prevail. The greatest advantage of growing crops in the greenhouses is that these can be grown throughout the year irrespective of change in climatic conditions outside. Further, plants and flowers grown in the greenhouses will be blemish-free to a great extend. There is also upward trend in the demand for attractive house and garden plants.

(b) Shade net and anti-hail net:

Some ornamental plants like flowers need partial shade for luxuriant growth and some fruit plants need protection from seasonal hail during the period of flowering for ensuring bumper harvest. In order to protect these crops from the unexpected natural calamities use of shade nets and anti-hail nets for selective crops and places are indispensable.

(c) Mulching:

During winter and summer seasons, the crops need protection with conserved moisture in the soil as there is less chance of rain during these periods. And during rainy season, weeding of crops is required to avoid congestion and competition for nutrient, space, sunlight etc. To overcome these problems, plastic mulching sheets are used to cover the spaces between row to row and plant to plant.

4. PRODUCTION OF PLANTING MATERIALS:

Seed Bed preparation for Big Nursery at Ukhrul HQ

The area under Horticultural fruit crops in Manipur during 2002-2003 is around 24,979 Ha. with production of 1,24,895 tones annually as per report of State Coordinator, MM-I. However, the production and yield per Unit area in the state is very low as compared to other parts of the Country. Fruit production in Manipur can be increased by utilizing the vast potential areas available in the Hills and foothills at different altitude/location in the state.

To bring the large potential areas under the new programme of Area Expansion for Fruit crops cultivation under MM-II, large quantities of quality planting materials of improved varieties of different fruit crops well adapted to local environment are required. With the objective of producing required quantity of planting materials free from disease and pests, big nurseries and small nurseries have been established in all the Districts of the state.

5. PROMOTION AND POPULARISATION OF ORGANIC FARMING:

Concern for sound health coupled with the increasing awareness of the need to conserve the environment through development of sustainable agriculture without dependence on external inputs has given rise to a rapidly growing demand for organic farming and organically grown products all over the world during the last decade.

Organic Cultivation of French Bean at Bishenpur District

The growth in demand for organic products has been most evident in Europe, North America and Japan. While these Countries have stepped up efforts to bring more land and crops under sustainable organic agriculture, a tropical country like India with its wide biodiversity, different agro climatic Zones and traditional practices in agriculture has the potential for supplementing the requirements of organic products through cultivation and export of a number of ethnic food crops to these markets. The entire process is gaining importance and a systematic approach for the production of organic food is assuming significance.

Till the time Green Revolution enters into Manipur (1967-1968), the primitive and traditional system of farming still existed which is a pure form of organic farming. In the hill districts of Manipur, where jhum cultivation is still prevalent, use of chemical fertilizer and pesticides are insignificant. This weakness is proposed to be converted into strength by adopting appropriate technology of Organic farming. Under this programme assistance are provided under two components viz: (i) Vermiculture / Earthworm Unit and (ii) Incentive organic farming.

❖ Vermiculture biotechnology:

In Vermiculture biotechnology, the potentiality of earthworms is being exploited as natural bio-degraders of non-toxic organic waste for soil improvement and nutrient mobilization. Earthworm population in organic matter enrich soils, act as natural bioreactors, harness beneficial soil micro flora, destroy soil pathogens and convert organic waste into valuable products such as bio-fertilizers, vitamins, enzymes, antibiotics, growth hormones and protenaceous worm biomass. Earthworm gut is a tiny fertilizer factory where raw materials enter from one end and the finish product comes out from the other end.

Vermiculture Multiplication Unit at Ukhrul HQ

Selection of suitable strain is an important factor for Vermiculture biotechnology. Selection is based on biological and ecological parameters like habitat, characteristics, and distribution in soil or feed media and trophic functions. In India only two peregrine strains namely Eisenia foetida and Eudrius eugeniae are being extensively used for Vermi- composting.

Under "Incentives" for organic farming, farmers are given incentives to the tune of Rs. 10,000/- per ha. for growing different crops by using organic fertilizer, FYM etc. At present emphasis is being given to cultivation of "U-MOROK" (Capsicum pendulum) and other spices in organic farming systems which have a great demand for export.

6. Promotion and popularization of Agriculture Equipments:

Shri O.Ibobi Singh, Hon'ble Chief Minister distributing Agri -Equipments

In the hill areas of Manipur, the farmers predominantly practice primitive, expensive and labour consuming method of land preparation (i.e. digging manually with spade). In an effort to introduce farm mechanization in the hill areas and to enhance the same in the valley areas, distribution of Power Tillers, Pumping sets and sprayers at subsidized rates have been taken up under this programme.

Distribution of Power Tillers will greatly mitigate the suffering lot of the

farmers, assured them of irrigation of their fields with the pump sets and quicken the process of Area Expansion of Horticultural crops and enhance the production of the state. Power Tillers can also be used for transportation of farm produces by fitting trailers with them.

Sometimes sprayers (both Power & manually operated) can also be utilized for foliar spray of vermin wash, neem based insecticides and pesticides etc,.

Diesel Pump sets and Power Tillers on display for distribution at 1st MR Parade Ground

Table showing number of Agri-Equipments distributed under TM-(MM-II)

Sl.No.	Particulars	Year 2001-02	Year 2002-03	Total
1.	Power Tiller	19 Nos.	55 Nos.	74 Nos.
2.	Diesel Pump sets	22 Nos.	91 Nos.	113 Nos.
3.	Power operated sprayers	189 Nos.	51 Nos.	240 Nos.
4.	Manually operated sprayers	300 Nos.	800 Nos.	1100 Nos.

7. TRANSFER OF TECHNOLOGY:

The theme of Technology Mission is application of advanced technology developed in Research

Centres like ICAR and Agricultural Universities which are to be blended with the traditional and primitive methods of cultivation, wherever feasible, for yielding high production of quality products. This requires transfer of the technologies to the farmers' fields through trainings and extension services.

Planners, field functionaries and farmers involved in the execution of schemes under Technology Mission have to be trained so as to provide them with a working knowledge for transfer of technology to the fields. There is no substitute to training and exposure for successful implementation of the Mission's objectives. National, State and District Level Workshops, Seminars and training have been conducted to which progressive farmers from all the districts have participated. In addition, farmers field visit-cum-training both outside and within the state have also been conducted. These activities will continue to be implemented.

Closing function of Women Training at Moreh

It is heartening to note that our farmers have taken keen interest in capacity building trainings and are able to interact with the Resource Persons in such trainings. Another important aspect of Technology Mission is the training of the trainers. Many Officers have been trained in Trainers training programmes both inside and outside the state, and more such trainings outside the state are being organized

R.K.Thekho, Hon'ble Minister (H&SC) sending off farmers' for training at Jalgaon, Maharastra.

for the field functionaries to update their knowledge so that they may be able to cope themselves up with the changing trend of technology development.

8. PROMOTION OF INTEGRATED PEST MANAGEMENT (I.P.M):

In the changing scenario, if there is increasing demand for organic products due to more concern for safety food and sound health, this component has become more and more relevant. In order to promote use of bio-pesticides like neem based pesticides, Bacillus, Thuringinesis, Pheromones & Trichoderma and use of biological control in vegetables & fruit plants financial assistance to the tune of Rs. 1000/- per farmer is given to the selected beneficiaries.

9. MUSHROOM CULTIVATION:

Mushroom Cultivation has already been introduced in the state. However, large scale production of this food crop has not taken off mainly due to lack of adequate information, non-availability of sufficient spawn within easy reach of the farmers etc. Seminars have been conducted at the State and District Levels to create awareness among the participants and to identify farmers who are interested in taking up mushroom cultivation. In one of such seminar organized at Senapati District Head Quarters a group of women and individual farmers have exhibited mushroom cultivation they have taken up and submitted a report on the activities they have taken up for development of mushroom cultivation in Senapati District. A member of the women group has been trained in Japanese Technology of Shitake Mushroom cultivation and the group has successfully adopted the technology.

Mushroom Production Unit under construction at Senapatoi HQ

To back up the efforts of Area Expansion Programme undertaken by the mushroom farmers of Senapati District, the Integrated Mushroom Development Unit allotted during 2002-03 has been established at Senapati District Head Quarter. This unit will concentrate on

Mushroom Production Unit under construction at Senapatoi HQ

'Farmers Training' and production of sufficient spawn to meet the requirement of not only farmers of Senapati District but for the whole state. The Unit will also provide other facilities to the farmers.

Shitake Mushroom and Pleurotus Mushroom grown at Senapati District

With the establishment of the Integrated Mushroom Development Unit at Senapati District Head Quarter most of the problems of Mushroom farmers will be solved.

DISTRICTS MARCHING AHEAD WITH TECHNOLOGY MISSION

❖ ***SENAPATI DISTRICT:***

- ***Community Tank constructed at Makhan under Technology Mission (MM-II, 2nd Phase, 2002-2003).***

At the choice of the farmers, a community tank of the size of 50' x 19' x 5' has been constructed at Makhan Khullen, a tribal village in Senapati district with brick and cement works, concrete flooring strengthened by 10 concrete posts and two parallel lintels around the walls of the tank—one at the base and the other at the top of the walls. The tank is fitted with two stop corks of 2" dia and ½" dia for regulating release of water from the tank. The choice of the farmers to have a pucca tank constructed for storing water has obvious reason. Due to porous soil in the higher hill slopes a dug tank will not retain water. The best alternative for the higher hill slopes is to go in for construction of such Community tank with brick and cement works.

The tank is fed by a perennial water spring which has a holding capacity of 35,532 gallons or 1, 34,505 litres of water when filled. During lean season the volume of the spring water gets reduced to about half an inch dia. Water stored in the tank during raining season, and continually replenished from the spring throughout the year, will ensure availability of water in the tank at all times for irrigation purpose. This Community tank will provide water for irrigation to bench terraced fields for cultivation of paddy during Kharif season and vegetables during Rabi season.

In the bench terraced fields in the steeper hill slopes, use of mechanized ploughs like Power Tillers, Tractors etc are not possible. Hence, ploughing is done manually which is labour intensive. Cultivation of such field in the hill slopes which are rain fed has the problem of seepage. More often than not, farmers have to give up cultivation of their fields, after having put in much labour in ploughing their fields manually, due to shortage of irrigation water when there is less rainfall during the cultivation season. The water stored in the Community tank will now supplement rain water to ensure cultivation every season. The farmers are very happy with the construction of the Community tank.

The bench terraced fields are also suitable for growing vegetables during Rabi season. However, due to shortage of irrigation water so far most of the farmers have not been able to take up cultivation of vegetables during Rabi season. Farmers who will be benefited with the construction of this Community tank are now hopeful of taking up cultivation of Rabi crops in the following years which will enhance their annual income. Emphasis is being given to construction of more and more Community Tanks under the Mission's programme.

- ***VERMICULTURE AT SENAPATI HEAD QUARTER UNDER TECHNOLOGY MISSION (MM-II, 3RD PHASE OF 2002-03).***

A farmer by the name HRAI started Vermi Compost Project in a small Unit with his own resources. The Compost Unit turned out to be quite successful. With the product of vermicompost manure the farmer started growing flowers and vegetables in his field. A fair income from the sale of vegetables, flowers and vermicompost manure was generated and the farmer could expand his vermicomposting into 4(four) pits.

The Project needs to be expanded continuously to benefit larger number of farmers. The Department of Horticulture & SC, Manipur stepped in to encourage the farmer and extended assistance for one Unit of Vermiculture under Technology Mission (MM- II, 3rd Phase of 2002-2003). With this assistance the farmer expanded his Project by 5(five) more pits and now the project has a capacity to produce 6-8 MTs Vermi manure per annum, multiply Vermi worms @ 6,000 cocoons per week on an average and with 2,000 young worms the project can now multiply to about 9,000 adults in 3(three) months.

With the addition of 5(five) pits the farmer is now hopeful of generating better income and serve farmers and other entrepreneurs of the district better by supplying them with compost and Vermi worms.

- ***BIG NURSERY AT REGIONAL PROGENY ORCHARD, MARAM SENAPATI DISTRICT:***

*Under the component for production of quality planting materials a **"Big Nursery"** has been implemented at the Regional Progeny Orchard, Maram with fund released in Phase - III (TM), 2001-2002. Implementation of this big nursery began with land preparation of 3 (three) ha. in the area of Nursery bed of the Progeny Orchard. For raising healthy Seedlings of Orange, Kachai lime, Peach stone (root stock for grafting and budding), Passion fruit, Tree bean, coffee, Wang, Uningthou seeds have been sown and new mother planting materials of Kiwi and Passion fruit (Var-Kaveri) cuttings, Cherries (local), Nectarine flowers of Gladioli, Jasminum and spices of Puleimanbi (local), Ginger have also been transplanted.*

Raising of Nurseries inside the Poly-green house in poly-bags are found successful. About one lakh seedlings of different varieties have been raised and are growing in good condition. Some of the seedlings are ready for sale to farmers. The nursery will meet part of the requirements of planting materials for the schemes taken up under Technology Mission as also the requirements of other Departmental farms. Free distribution of seedlings to the farmers of surrounding villages can also be made available from this nursery. In the coming years grafting, budding of Plum and Peach, and multiplication by vegetative propagation of Kiwi, Passion fruit (Var-Kaveri), etc. will be taken up. The Orchard is now hopeful of generating revenue for self sustenance.

▪ *DRIP IRRIGATION AT NEW MAKHAN (1ST INSTALLEMENT OF 2001-2002) :*

A drip irrigation system was allotted to Mr. James Dhale of New Makhan, Senapati District as a component of the Centre of Excellence set up in the village. For this component a small pucca tank of 12' x 8'x5' has been constructed to store water. The wall is of 10" thickness and fitted with a tap. Main pipe line is connected with the tap, whenever required, for distribution of water to subsidiary/ lateral pipelines which are laid at the root zone of fruit plants. During dry spells and winter months also this drip irrigation system will supply water to the fruit plants and ensure luxuriant growth of fruit plants / flowers/vegetables. Drip irrigation system ensures judicious use of irrigation water.

Before the installation of this system in his field, the farmer had to put in much labour during winter and dry spell in watering his garden plants.

With the installation of the system the woes of the farmer has drastically been reduced and he is now a very happy farmer.

Before the installation of the system, the farmers living in the surrounding villages including the beneficiary himself were doubtful of the usefulness of the system to the farmers. After having installed the system and demonstrated its operation and usefulness to the farmers by the field functionaries of the department, the farmers are now confident that use of the system can greatly help irrigation of crops with judicious use of water. The system can save irrigation water by about 40-60% with expected increase of yield of vegetable and other crops by about 30-50% as the system can simultaneously regulate irrigation and application of fertilizer.

❖ *CHURACHANDPUR DISTRICT:*

▪ *Construction of Community Tank at Khoushabung Village:*

The tank is excavated in the field of Mr. Thangtinpao Gangte S/O Lalkhopao Gangte of Khousangbung village under Samulamlan Block, Churachandpur District during 2001-2002 under MM-II, (3rd installment). The length, width and depth of the tank are respectively 140ft, 50ft and 5ft. During rainy season rain water is harvested in this Tank.

The accumulated water in the tank is used for irrigation of fields in the adjoining areas where Rabi crops like beans, bhindi, brinjal etc. and Kharif crop like paddy are grown. Raising of paddy nursery and field preparation for transplantation of paddy seedlings are other agricultural activities to which the tank provides irrigation water. In the peak of lean

season when water becomes scarce, the water stored in the tank is also used for washing and drinking.

The tank now provides water in time of need not only for irrigation but also for other purposes and the villagers feel that the tank is an additional asset of the village.

■ *Cultivation of Bhindi at Ngathal Village, Churachandpur District:*

Smt. Lali W/O Khukolal of Ngathal village, Churachandpur Block, Churachandpur District has been selected as a beneficiary under Technology Mission for the year 2002-2003 (II-installment) for cultivation of Bhindi of 1(one) ha. She was given a sum of Rs. 13,000/- as subsidy for the cultivation including purchase of seeds, fertilizers/compost, Neem based P.P. Chemical etc. She was supplied with Bhindi FI hybrid seeds from a recognized seed agency.

Proper field preparation was done by applying Farm Yard Manure under the supervision of the technical staff. The seeds were dibbled / sown properly. Attack of pest was timely controlled by the application of neem-based pesticides at an interval of 15 to 20 days. The plants grew luxuriantly and it was expected that the farmer will have a good harvest.

Later, the farmer visited the Office of District Officer (H&SC), Churachandpur to report that she had good harvest. The Bhindi were sold at the main market of Churachandpur District Head Quarter @ Rs. 10.00 per Kg. When the harvest started she carried the Bhindi to Churachandpur Head Quarter every alternative day for sale. She is happy with the benefit she earned from the scheme. She will continue to cultivate bhindi in the following years.

■ *Ginger cultivation of Samulamlan, Churachandpur District :*

Shri Khuprengban S/O Shri Akhup of Samulamlan, Churachandpur District was a selected beneficiary for cultivation of Ginger under Technology Mission for the year 2002-2003 (II installment). He has about three Ha. of land. The land slope ranging from 2% to 5% has rich top soil which is most suitable for Ginger cultivation. Prior to TM, the farmer used to grow rhizomes of local variety with indigenous technique of cultivation. Due to resource

constraint he could not expand his area of Ginger cultivation. With the assistance extended to him under Technology Mission the farmer could extend by one Ha. of Ginger cultivation.

Before plantation he applied Farm yard Manure (FYM) provided under the scheme and the land was properly prepared. He planted 2(two) varieties of Ginger viz., Singlei and Thingpui maintaining proper spaces. The plants were free from insects, pest and diseases. He applied neem based insecticide i.e. Neem oil.

Application of modern Technique of cultivation has helped the farmer harvest more who reported that he harvested good quality Ginger rhizomes having attractive colour and size. He could get as many as 150 quintals of rhizomes per ha. There was no problem of marketing. He sold his ginger at the rate of Rs. 5 to 8 per kg. With the profit he earned, the farmer hope to expand his ginger field further in the following years.

- ***French Bean cultivation at Gangpibul Village, Churachandpur District:***

One ha. cultivation of French bean was given to Shri Minthang s/o Lamkholet of Gangpibul village, Samulamlan Block, Churachandpur District which is about 18 Km. away from Churachandpur District HQ. He was given seeds (Var. contender), adequate quantities of Farm Yard Manure, Neem cake and Neem oil. Proper guidance was given for sowing seeds and other cultural practices by the field staff of the department. The plant growth was good and he could harvest 1-1.5 Qt. of green pods on alternate days and sold the same in the market of Churachandpur District HQ at the rate of Rs. 10 to 15 per kg. An estimated harvest of 3000 kgs of green pods was made by the farmer. He could earn about Rs. 24, 000/- from the cultivation. He is satisfied with the profit he earned and is grateful for the benefit extended to him under Technology Mission.

- ***Cultivation of Brinjal at Pearson Village, Churachandpur District :***

The selected beneficiary Shri Sumpi from the Pearson village Churachandpur Block has been given assistance for cultivation of 1(one) Ha. Brinjal under Technology Mission in the year 2002-2003 (II- Phase). The village is 3 Km. away from Churachandpur town. In the previous years also the beneficiary cultivated Brinjal crop and other vegetables using local variety seeds. Application of fertilizers and pesticides were also not practiced. Consequently, the yields were poor and not remunerative. Yet, the farmer had to continue cultivation of brinjal and other vegetables crops to earn income, however un-remunerative it might have been, to maintain his family. Under this scheme the beneficiary was given improved varieties seeds of Brinjal (Pusa Purple long and round) with adequate quantities of FYM. Cultivation was done following improved cultural practices. Timely application of neem pesticides was also made. With the adoption of modern technique of cultivation and application of manures and pesticides the farmer could harvest about 1-2 Qt of brinjal on alternate days and sold the same at the vegetable market of New Churachandpur. The estimated yield of brinjal per ha. is about 22 tones which is three times higher than the yield he was receiving from his field earlier. The farmer earned income of about Rs. 30,000/- from this scheme.

❖ *IMPHAL EAST DISTRICT:*

▪ *Poly Green House (LOW cost).*

*Shri L. Sanahal Singh of Kalika, Imphal East District who is a marginal farmer has constructed a Low cost **"Poly Green House"** under Technology Mission, MM-II in the year 2002-2003. Shri Singh is a conscious farmer, and the Low cost Poly Green House given to him has given him the satisfaction to have a shed that will protect the vegetable seedlings that he regularly raises from rain, minor hail storm and frost, and at the same time promote for their healthy growth. He uses to raise seedlings in advance for early production of vegetables for his own use and for sale in the vegetable markets.*

Shri Singh sold seedlings from his Green House to farmers and Kitchen gardeners. He also raised seedlings for off-season crops which are grown in some parts of the state. Sale of

seedlings earns him a regular and profitable income. He is satisfied with the benefit he gets from the Poly Green House.

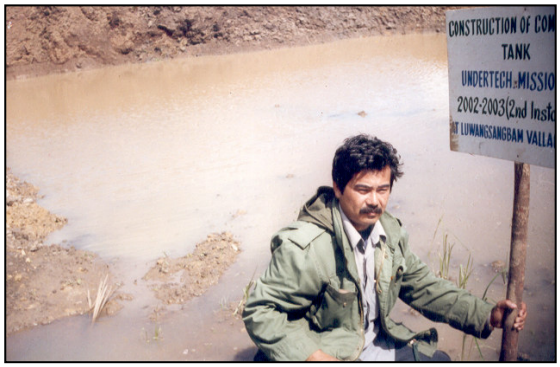
▪ *Small Nursery at Palace Compound, Imphal East :*

Shri M. Robindro Singh of Palace Ground, Imphal East District started a Nursery in a small scale without proper infrastructure. At the beginning, he raised seedlings of vegetables and some fruit plants. With the assistance given to him under MM-II of Technology Mission he has now the required infrastructure viz, Poly Green House, Shade Net, Tools and implements, irrigation facilities and good quality planting materials etc.

He now produces quality planting materials of different crops like vegetables, fruit plants, ornamental plants, forestry plants, Medicinal and aromatic plants etc. About 2,00,000 seedlings of fruit plants like Lime, Lemon, Orange, Papaya, Jack fruit, Amla, Hatkora etc. and 2 to 3 lakh of vegetables seedlings are produced each season at this small nursery. He also produces about 50,000 seedlings of Medicinal and Aromatic plants like Piper Logum, Aloe Vera, Terminilia Chebula, Terminilia Arjuna, Brahmi, Patchouli, Geranium and about 50,000 seedlings of different varieties of flowers. He has already sold more than one lakh seedlings of different crops this season. The successful establishment of this small Nursery has motivated other farmers.

▪ *Community Tank :*

At Luwangsangbam village, Imphal East District a Community tank has been excavated with Shri L. Ratan Singh as the work Agency under Technology Mission, 2002-2003. The irrigation Command Area of the Tank is 1 ha.



Rain water harvested during rainy season and stored in the tank provides source of irrigation water to paddy fields which surround the tank. The Community tank also facilitates the farmers to take up cultivation

of Rabi vegetable crops and also help in raising paddy nursery for the main Kharif.

Earth Worm Unit :

A beneficiary who was at first doubtful that an Earthworm Unit can generate income took up implementation of the Unit under Technology Mission on a trial basis. He is Shri Th. Herojit Singh of Chingkhu Ching, Imphal East District who has successfully established a Unit of Vermiculture and Vermi Composting under the constant technical guidance of the field staff.

With the Unit made operational the beneficiary started seeing prospect of earning good return from the Unit. Learning that some other farmers with the same type of Unit are earning income through sale of Earthworms and Vermi compost, Shri Herojit Singh is now paying good attention to his Unit and is confident that sooner than later his Unit would start giving him returns.

Cultivation of Turmeric in Jiribam :

Turmeric is commonly used as an important and popular food item in Manipur as elsewhere, though the cultivation of this crop is taken up in the state in a limited scale. With the introduction of cultivation of Turmeric under Technology Mission it is expected that the cultivation of this crop will become popular among the farmers.

Shri Thanga Hmar who held from Jiribam Sub-Division is one of the beneficiaries of cultivation of Turmeric under Technology Mission. He cultivated Turmeric in his gently sloping field using compost, neem based fertilizer and insecticides. Manual labour required for preparing the field was entirely provided by the family members of the beneficiary.

The operation of cultivation was carried out under proper supervision of the technical staff of the Department. Shri Thanga is expecting harvest of 4 to 5 tones of fresh Turmeric rhizomes which will fetch him between Rs. 22,000/- to 25,000/-.

❖ IMPHAL WEST DISTRICT:

■ Area Expansion of Spices (Turmeric) at Langol Lai Ningthou :

Here is another unit of 1 ha. Turmeric cultivation taken up at Langol Lai Ningthou under Technology Mission. The beneficiary is Shri L. Koiphao Singh. The luxuriant growth of the turmeric plants are indicative of the care and interest with which the beneficiary has taken up the cultivation.

Farmers are picking up interest in the cultivation of turmeric. To encourage them to take up cultivation in larger scale and meet the requirements of the state, Department of Horticulture & Soil Conservation has to look for a variety most suitable to the conditions of the state.

■ Community Tank Constructed at Wangoi Thoudam Leikai :

In some localities, especially in the Valley areas, where habitation are set up nearby paddy fields, a Community Tank serves a variety of purposes. Apart from irrigation for raising Rabi, Pre-Kharif and Kharif crops, the Community Tanks also provide water for drinking and washing during lean season. At times Community fish rearing is also taken up in such Community tanks.

Here is a Community tank dug by the Members of the Village Development Committee (VDC) of Wangoi thoudam Leikai under Technology Mission. The size of the Tank is 100' X 50' x8'. The Members of the VDC expect that the community Tank will provide different facilities to the Community.

■ Establishment of Small Nursery at Progressive Nursery, Langol under

Technology Mission MM-II 1st Phase, 3rd Installment 2001-02:

Area Expansion programme under MM-II, other Government programmes and the private requirements of the farmers require large number of quality planting materials. Use of local planting materials has to be progressively replaced with improved variety quality planting materials. Technology Mission provides assistance for raising Small Nursery in the private sector.

Shri A. Prafulla Singh Progressive Nursery, Langol, Imphal west is a beneficiary of Small Nursery, MM-II, 3rd Phase for the year 2001-2002. The Nursery is doing well. A recent inspection of the Nursery confirms that the Nursery has raised more than one lakh seedlings of fruits, vegetables and flowers. Apart from serving the farmers in meeting their requirements of quality planting materials, the Nursery also provide employment to educated unemployed youths and help them in generating income

■ *Establishment/Construction of " Vermi-Compost" at Lairenkabi:*

Vermiculture and Vermi-Composting is a horticulture activity recently introduced in the state as a component of Technology Mission. To popularize the component for adoption in all the districts, units have been spread to all the districts for implementation.

Shri Y. Manglem Singh, Lairenkabi Village Imphal West-I is a beneficiary of "Vermi- Compost". He has constructed two Compost pits of the size of 2m x 1.5m x 1m. He use Eudrillus Euginiae and Eisenia foelida earthworm Species procured from Vermiculture farmers of Senapati and Canchipur. Total quantity of earthworm procured by the farmer is 1 kg which approximately contained 1000 Nos. of earthworms. Raw materials used for composting are water hyacinth, agriculture waste,

forestry waste, kitchen waste etc which are abundantly available anywhere. Conversion of these raw materials to Vermi-Compost takes about 30-35 days. The alternative to chemical fertilizer is Vermi-Compost manure which is used for production of organic food items.

▪ *Establishment of Small Nursery at Singjamei Thongam Leikai:*

Opposite is the photograph of another Small Nursery raised at Singjamei Thongam Leikai under the component of Small Nursery of Technology Mission with the objective of producing sufficient number of quality planting materials.

Shri N. Samananda Singh of Singjamei, Imphal West is the beneficiary.

❖ *CHANDEL DISTRICT:*

▪ *Cultivation of French Bean at Kangshang village:*

Kangshang is a Tribal village in Chandel District under Machi Sub-Division. The village is situated at the foot hill not far away from Pallel Bazar. Beans are important leguminous food items popular among the people of this area. Among the beans cultivated by the people, French bean is perhaps widely consumed. However, most farmers use local variety seeds which are low yield and not remunerative.

Under Technology Mission selected beneficiaries are given hybrid variety seeds. Latest technological methods of cultivation of beans are practically demonstrated to the farmers and they are informed of the importance of the use of Farm Yard Manure such as

cow dung and other animal waste. Farmers already knew use of the leafy plants as green fodder and green manure. Farmers are made aware of the Nitrogen fixation in the soil by the roots of beans which improve soil fertility.

- ***Cultivation of Ginger at Kangshang village:***

Gingers are grown as an important crop for their aromatic rhizomes which are used both as spices and medicines. Despite popularity and increased consumption, there has been almost no change and development both in the variety and yield of ginger crop in this area due to continued practice of same old traditional method of cultivation and use of local variety ginger.

To break the traditional method of cultivation of ginger and switch over to modern method of cultivation, the farmers are provided with rhizomes of Maran variety. Under supervision of the Technical field staffs improved variety of Ginger rhizomes were sown. Organic farming norms were followed by applying only organic manure like FYM and vermiculated compost supplied by the earthworm unit taken up in the Centre of Excellence set up in this village. The end result has been very satisfactory and encouraging.

- ***Low Cost Green House at Aigijang Village:***

This village is situated in the Indo-Myanmar Border area. Green House was, probably, never introduced or made familiar with the farmers of this area till the launching of Technology Mission. Farmers have neither seen nor heard of it and they have no knowledge of the benefits of a Green House. A beneficiary by the name Shri Doungam of Aigijang village has been selected to implement a Low Cost Green House in his village.

Shri Doungam has no wet paddy field for cultivation of crops. His main occupation is cultivation of vegetable crops which he sales in the nearby markets and villages. The Green House was set up under supervision and assistance of the departmental field staff. He has been taught how to grow

crops and raise seedlings in the Green House. Shri Doungam is a hard working and dedicated farmer and it is expected that he will make the best use of the Low Cost Green House in cultivation of vegetable crops.

Technology Mission, indeed, has made its presence felt even in the interior villages.

▪ *Community Tank at Aimol Kodomphai:*

A Community Tank has been constructed at Aimol Kodomphai village with Mrs. Achum W/O Sangkikhup as the leader or the work Agency. The size of the tank is 100' x 60' x 8'. When fully filled, this tank can contain 13, 59,210 liters of water. Apart from providing irrigation water the Community tank will also serve other purposes like washing and drinking.

❖ *BISHNUPUR DISTRICT:*

▪ *Installation of Tube Well at Khoijuman village:*

Khoijuman village of Bishnupur District is known for vegetable production. However, due to lack of irrigation facility, farmers could not get proper remuneration from the Rabi vegetables despite exemplary efforts and hard work. The water table in the area of this village is high and could be exploited for irrigation purposes by installing tube well. To take advantage of this feasibility, financial assistance for installing 1(one) tube well was provided to the farmers of this village. Drilling of the well was done with expert masonry up to a depth of 30 ft. A hand pump has been fitted in the well and water is pumped out as and when necessary for

irrigation purposes. The villagers also use the tube Well water not only for irrigation but also for washing and drinking.

With the installation of this tube well Rabi vegetables can be grown successfully in the fields around the tube well.

Bhindi Cultivation:

A ha. area of Bhindi cultivation was allotted to Mr. Th. Ingocha Singh of Khoijuman Village. Quality inputs like hybrid seeds, neem based pesticides, neem cake, etc. were supplied to the farmer for organic cultivation. The cultivation was done under supervision of Technical staff/Officers of the Office of DO (H&SC), Bishnupur.

In the previous season, the farmer used to grow bhindi crop using ordinary seeds of local variety which have low yield. But now after using hybrid seeds he could get bumper harvest and increase his income 2-3 times more than the previous seasons. On seeing the bumper harvest of bhindi crop of Mr. Ingocha, farmers of surrounding villages are also willing to switch over to hybrid seeds for Bhindi cultivation.

Construction of Community Tank at Nachou Village:

As per the need and potential available for vegetable cultivation, one Community tank was allotted to Mr. Th. Shyamkumar Singh of Nachou village at Khajing Khong Loukol.

The soil of the proposed site is clayey in nature and water can be stored very easily without the risk of seepage loss. The size of the tank is 100' x 60' x 6' and excavated manually. The tank can store about 10, 19,400 liters of water when filled which is used for irrigation to grow Rabi vegetables. There are no other irrigation facilities available in the village.

During the pre-Kharif season water from this tank is used both for raising nursery and paddling for transplantation of paddy.

❖ TAMENGLONG DISTRICT:

■ Digging of Community Tank at Nungtek Village:

Based on the need of the village, construction of a Community Tank was taken up at Nungtek village during 2002-2003. The villagers entirely depend on Monsoon rain for cultivation of paddy and vegetables. When there is less of Monsoon rain cultivation became difficult. Cultivation during Rabi season is practically not possible due to lack of water for irrigation and the fields remain fallow. The soil of the fields is otherwise clay in nature having high water retention capacity. A Community Tank can be of great help to the villagers as it can provide water for irrigation and also for other purposes.

The work for construction of the tank was awarded to one Shri Kh. Athon S/O Gaithaoni of Nungtek village. The financial assistance extended for construction of a Community Tank of 1 hectare command is Rs. 1 lakh. The villagers constructed the tank having the size of 30m x 20m x 1.5m. During lean season availability of drinking water become scarce and villagers have to walk long distance to fetch drinking water. With the construction of the Community tank the problem of carrying drinking water from a long distance has also been solved.

■ Cauliflower Cultivation at Marangjing village:

One Ha. Of Cauliflower cultivation was awarded to Mr. Siuntangong s/o Late Langei of Marangjing village under Area Expansion of vegetables during 2002-03. Though Mr Siuntangong is a progressive framer, his technical know how was to be updated with the latest technology. He uses only ordinary seeds from local market for vegetable cultivation.

After introduction of TM, office of the D.O. (H&SC), Tamenglong supplied him with good quality Hybrid cauliflower seeds and other inputs. Not only this, field officer also gave him technical guidance during the field preparation upto maintenance and inter culture operations. The crop growth was so luxuriant and the farmer was optimistic that he could get upto 3-4 MT of fresh cauliflower vegetable which he sold at the rate of Rs. 10/- per Kg. at local market. Thus he earned good income from the cultivation of cauliflower.

▪ *Construction of Green House at Songparam village:*

Construction of one green house (medium) was awarded to Mr. Nambi S/O Mr. Namku of Songparam village, Tamenglong District. For construction of the unit, the department has supplied to the beneficiary U.V. Film of 200 micron thickness for 250 Sq.m. area coverage. The construction of the unit was done with technical guidance of the departmental field staff.

Often agriculture equipments supplied to the farmers go waste due to lack of knowledge for proper utilization. Knowing this problem fully well, departmental Officers/Field staff has been deputed to help beneficiaries in putting up Green Houses. Instructions on the beneficial use of the Green Houses in raising nurseries and also for growing vegetables to meet the limited requirements of the households of the beneficiaries were also given by the Field staff at the time of putting up the Green Houses. Shri Nambi, the present beneficiary was also given the same instructions and it is expected that he will make the best use of the Green House given to him.

❖ *UKHRUL DISTRICT:*

▪ *Cultivation of Cabbage:*

Not only favoured with the world famed Shiroy Lily (Lilium maclineae), Shirui village also offer tremendous potential for growing vegetables & temperate fruit crops. Cultivation of cabbage is taken up under Area Expansion programme MM-II of Technology Mission in this

village. Mr. M. Shingnaihao is one of the beneficiaries selected under the programme of cabbage cultivation. He owned an area of about 2 Ha. of cultivable land which is utilized mainly for jhum paddy cultivation. The return from his jhum field was negligible and he could hardly manage to meet both ends meet.

He was given assistance for taking up of 1 (one) Ha. vegetable (cabbage) cultivation. High Yielding Variety of F1 -cabbage seeds was introduced in his fields. Latest scientific method of cultivation, judicious use of F.Y.M/ compost, use of Neem cake/Neem oil etc were adopted in his field. Technical supervision was given by the Departmental Officers/Field staff at the time of implementation of the scheme. There was good response to the introduction of this improved technology. The yield per hectare was around 12 M.T. which is not low compared to the yields in other parts of the country. He has started production of off-season cabbage. All his produces are sold in the market of state capital, Imphal and the neighbouring state- Nagaland. From the sale of these cabbages he is able to earn good income. He has given up jhum cultivation of paddy.

- ***Cultivation of Tapioca:***

Farmers of Phungyar Sub-Division of Ukhrul District, particularly those inhabiting villages in the foot shills adjoining the valley area of Imphal East District, traditionally grow tuber crop like Sweet potato etc. Some of them have recently picked up cultivation of root crop like tapioca. Root and Tuber crop foods are used as delicious refreshments by the farmers and they are carried by students for their Tiffin items.

With the purpose to introduce use of good planting materials for cultivation of Tapioca, Ms. M.S. Somiwon of New Canan Village, Phungyar Sub-Division was selected for taking up 1 Ha Tapioca Cultivation.The ICAR, Imphal Centre indicated Nongdam Tangkhul Missionary Centre for procurement of good planting materials. The pastor of the said Missionary Centre had brought cuttings of improved variety planting materials from Kerela State. Ms. M.S. Somiwon was supplied with the improved Tapioca planting materials procured from the Missionary Centre and the seedlings were planted under Supervision of the technical staff.

Tapioca planted with the improved variety grew luxuriantly and the beneficiary is optimistic to get good harvest and more income.

■ *Construction of Community Tank :*

Community Tanks were constructed at different locations in the District with the aim of harvesting rain water during rainy season. The rainy season in the district starts from March-April and continued upto August-September, and rest of the year remain dry. Acute shortage of drinking water and water for irrigation purposes are the hallmarks of these dry months. Water stored in this tank during rainy season and continually replenished from a natural water spring throughout the year ensured availability of perennial source of water for irrigation and also for other purposes.

Although, there is plenty of scope for growing off-season vegetables and other root and tuber crops throughout the year, the farmers have not ventured out to cultivate these crops due to shortage of irrigation facility during dry seasons of the year. With assured irrigation from the water stored in the Community tanks, some farmers have started cultivation of off-season crops.

■ *Organic Farming (Vermiculture) :*

The aims of organic agriculture/farming are production of Agri-Horticulture crops which contains no chemical residues, the development of environment friendly production methods and techniques that restore and maintains soil fertility. As part and parcel of organic farming, preparations and productions of compost are considered to be of prime importance. Composting is an excellent method for improving the fertility and the productivity of the soil which is gaining popularity among the farmers in this district. Composting units have been set up at different locations. Besides this, composting units by using earthworms (Vermicompost) have

also been taken up under this programme. A multiplication Unit of earthworm has been set up at Ukhrul District HQ. to meet the requirement of the farmers who are taking up this programme in the District.

Farmers of this District, as traditional practice of cultivation, fully rely on the use of bio-degradable materials to supplement lost of nutrients of soil in their fields. To strengthen the practice of organic farming, more composting units will be taken up in the following years under Technology Mission.

- ***Establishment of Small Nursery at Tuishen Shimin village:***

To keep pace with the ever increasing demand for quality planting materials small multi-crop nurseries have been established in the district under T.M. (MM-II). Tuishen Shimin village situated about 24 Kn. away from Ukhrul (HQ) is one of the villages where small nursery under private sector was established during the year 2001-02. The Nursery is raised and maintained by Y.Vicisy Shimray, an educated un-employed youth. The area of the nursery is about 3 Ha. Main components given for establishment of this nursery are construction of green house, shade net, creation of water sources (farm pond), agriculture equipments like diesel pump set, sprayer etc. Different kinds of improved high yielding varieties of Horticulture & vegetables seedlings have been raised in this Nursery besides plantation of improved varieties of Horticultural fruits crop as mother plants.

Among the seedlings raised in this nursery, more emphasis is given to raising Passion fruit plant. The varieties are Passiflora edulis (yellow fruiting varieties) and Passiflora edulis (flavicarpa, purple fruiting variety). These seedlings have been raised from the seeds procured from Senapati District where growing of this crop has already been taken up in a large scale. Recently, Kavery variety of passion fruit supplied by the ICAR, Imphal Centre, Manipur has also been planted as mother plants for future propagation. Besides these planting materials, seedlings of tree bean (Perkia roxburghii), tree tomato, neem (Azadirachta indica), guava (Psidium guajava), citrus (Citrus spp), amla (Emblica officinalis),

papaya (Carica papaya) are also raised in the nursery.

Before assistance was extended for taking up this Small Nursery Y. Vicisy Shimray, though highly educated, perhaps had never though of taking up any developmental activity in the field of Agriculture-Horticulture. Given the initial support and encouragement, Shimray is now deeply involved in awareness and other training programmes organized both within and outside the State.

Shimray has started selling seedlings to the farmers of his village and surrounding villages. Under Area Expansion programme for the year 2003-2004 department will also procure seedlings from this Nursery required for implementation of the Departmental programmes in the district. Shimray is now a committed farmer with assured regular income. In fact, the future of development of horticulture in the state will largely depend upon the extent of training extended and awareness created among the educated and committed farmers.

❖ THOUBAL DISTRICT :

The agro-climatic condition prevailing in the district is most suitable for growing different agricultural and horticultural crops. Most people of the District depend for their livelihood on agriculture and vegetable farming. This district is considered to be the granary of the state. With the introduction of Centrally Sponsored Scheme -- Technology Mission for Integrated Development of Horticulture, activities on development of Horticulture in the District have undergone gradual changes. Adoption of latest Technologies like Soil and Water management techniques, integrated pest management, use of HYV seeds/plants for cultivation of vegetables, root and tuber crops and fruits have increased yields per unit area.

■ Construction of Community Tank :

Community tanks were constructed in different sub-divisions of the district with the aim of harvesting rain water during rainy season. Most of the fields of the district are rain-fed. As a result, there is acute shortage of water for irrigation purposes during winter season. Water stored during rainy season in these tanks has ensured availability of perennial source of water for irrigation and other purposes.

■ Green House/Poly house/Shade Nets :

Constructions of Green house and Shade nets have been taken up in this district involving many progressive farmers. These structures enabled farmers to grow off-season vegetables and flowers in high rainfall region and under adverse climatic condition round the

year. Many progressive farmers of this district are getting higher income out of these green house/Poly house and Shade nets.

- ***Community Tank at Yangdong Village :***

A Community tank of 60' x 20' x 5' volume has been constructed at Yangdong village, Kakching Sub-Division, Thoubal district. The tank has inlet and out-let channels for collection and release of water to the fields for irrigation purposes. During the rainy season, this tank get water through its in-let channel and stored upto full capacity of the tank for use during off-season.

This Community tank provides water for irrigation both in Kharif and Rabi seasons. Though in a limited scale, the farmers having paddy fields in the Command Area of the tank can now raise double cropping, enable them to raise paddy nursery for the main Kharif on time and also take up Rabi crops cultivation.

- ***Small Nursery at Nepra Company :***

A small Nursery was established in the field of Shri Budhi Singh of Nepra Company. Shri Singh is a progressive farmer. He owned approximately a hectare of land for raising Nursery and production of quality planting materials of Kharif and Rabi crops. From his Nursery he is able to meet the demands of the local farmers, Agri-Horti related Organizations and Institutions. The sale of Rabi vegetable seedlings generates a good income for him.

❖ *Distribution of Agricultural Tools and Equipments :*

In a public function organized on 19th August, 2003 at the Parade Ground of 1st Bn. Manipur Rifles, Imphal with Shri O. Ibobi Singh, Hon'ble Chief Minister, Shri R.K. Thekho, Hon'ble Minister (Hort. & Soil Conservation) and Shri W. Brajabidhu Singh, Hon'ble Minister (M.I. & CADA) as the Chief Guest, President and Guest of Honour of the function respectively, 55 nos. of Power Tiller, 91 nos. of Diesel pump sets, 51 nos. of Power Operated Sprayers and 800 nos,. of Manually Operated Sprayers were distributed to the farmers. A number of Ministers and other dignitaries were also present in the function.

Shri O. Ibobi Singh, Hon'ble Chief Minister of Manipur distributing Power Operated Sprayer

19th August function was followed by other functions organized in all the District Hd. Qrs., one after another, in which U.V. Stabilized Films for construction of Green Houses, Mulching sheets, Shade Nets and Anti-Hail Nets were distributed to the farmers with Hon'ble Ministers from the concerned Districts gracing the functions as Chief Guests.

hang, Hon'ble Minister, (Social Welfare) & Mr. Henary K.Heni,
(H/SC) Distributing U.V. Films, Shade Nets etc at Chandel.

Shri Kh. Kiran Kumar, Director (H&SC), distributing shade net, U.V. film etc at Tamenglong HQ.

Shri Govindas Konthoujam, Hon'ble Minister (PHED) distributing shade net, U.V. film etc at Bishenpur HQ.

Mr. R.K. Thekho, Hon'ble Minister (Hort & Soil Conservation) and Mr. Francis Ngajokpa, Hon'ble Minister (GAD) distributing Shade N0et, U.V. film etc at Senapati HQ.

It is, indeed, satisfying to see farmers returned to their respective villages with the Agricultural Tools and Equipments which they have been longing for.

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