# Measures to Mitigate Agrarian Distress in Idukki District of Kerala


## A Study Report by

## M. S. SWAMINATHAN RESEARCH FOUNDATION

## May 2008

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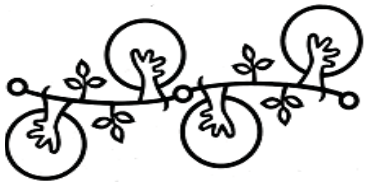

# FOREWORD

The Governments of India and Kerala had decided to add Alappuzha and Idukki districts of Kerala to the three other districts of the State, Palaghat, Wayanad and Kasaragod, for extending special developmental package to mitigate agrarian distress. The M. S. Swaminathan Research Foundation was asked by the Union Ministry of Agriculture to review the position relating to the ecological security of Alappuzha and Idukki districts and to suggest steps for enhancing livelihood security in an environmentally sustainable manner. The study team was headed by Dr. S. Bala Ravi, Advisor of MSSRF along with Dr. K.U. K. Nampoothiri, Director, Community Agro-Biodiversity Center, MSSRF, Kalpatta. A panel of eminent technical experts assisted the team. The Alappuzha report was submitted in August 2007 and the present report deals with the problems and possible solutions relating to Idukki district.

The Idukki district of Kerala is both an agricultural and scenic paradise. Although Idukki is generally perceived as a 'Spices district' or 'Plantation crop district', about 95% of the farmers here are small with tribal farmers constituting a substantial component. Public investment in agriculture in this district is very poor and this hampers agricultural progress and rural livelihoods in many ways. For example, provision of good rural roads, which do not collapse during rainy days, for easy input and produce transport from the interior regions isolated by the difficult terrain, rural drying yards, primary value addition facilities and rural warehousing may strengthen the capacity of farmers to improve productivity and quality of high value crops they grow and enable them to enhance profitability and prosperity. The major crops of Idukki such as pepper, cardamom, tea and coffee are under continuous risk of price shocks arising from price fluctuations in the international markets. If farm ecology and economics go wrong, nothing else will go right in agriculture.

As a result of high cost of production of major crops and its volatile prices, small farmers who constitute the majority of the farming population have accumulated debt burden exceeding Rs 700 crores. More than 80% of this debt is due to crop loans to small and marginal farmers. Important reasons for this debt are the low prices for pepper, cardamom, coffee and tea during the last four years and crop losses from

natural disasters like drought in varying intensities during 2002 to 2005 and very heavy rains in 2007.

Apart from spices and plantation crops, Idukki district has notable milk production. Crop-livestock integrated farming system is very common. Although the District has a natural endowment favourable for dairying, the dream of making it a 'milk shed' of Kerala remains unrealized. The genetic upgrading of the cattle initiated under the Indo-Swiss project in 1963 could not make tangible progress in enhancing milk productivity. Despite the natural advantage the district has for fodder and forage grass production, these are very scarce and highly priced. Declining paddy cultivation and shortage of paddy straw is adding to the woes of dairy farmers. Similarly, quality feed is not only scarce, but increasingly costly. All these are constraining milk production and enhancing its production cost. Unfortunately, the milk price has not shown commensurate change. Integrated steps to offer remunerative price, promote local production of fodder grass and feed, scientific approach for systematic breed upgradation and efficient milk procurement and processing are critical for turning the district in to the 'milk shed' of Kerala.

The proposed establishment of a Spices Park is a welcome initiative to promote value addition, product development and trade. It is important that value addition and increased trade expected through the Spices Park are designed to enhance the income generation capacity and profitability of tribal and small farmers. This can be facilitated by establishing a chain of primary processing, value addition and warehousing facilities across the District for different major spice crops and linking these units with the Spices Park in a hub and spoke model. The Spices Park should, through the value addition and product development, help to mitigate to some extent the economic loss to farmers due to unfavourable fluctuations in the prices of primary produce.

In the case of plantation crops, most of the programmes of the Government of India are administered through the respective Commodity Boards. Among these Boards, the effectiveness of the Rubber Board of India stands out with respect to the support to farmers, particularly the small farmers. The Rubber Board sets a good example for other Commodity Boards to emulate with regard to the relevance and impact of research for promoting production, technology delivery to farmers and better integration of research and development wings. Other Boards need to strengthen their research and extension work with efficient delivery and better coordination to create a tangible impact on the livelihoods of farmers.

Idukki district is notable for its largest area under tropical forest and its scenic high ranges. These have profound connectivity with the rainfall and ecology of the region. The laxity in forest conservation including the CHR forest area and increasing conversion of forestland has visible repercussions on the local and regional climate. Analysis of the meteorological data available for the last 50-70 years provides clear indications on changing climate and associated ecological deterioration. There is an unambiguous trend of declining rainfall during the South West monsoon, changing number of rainy days and rising maximum temperatures in different parts of the district. These seem to have good correlation with increasing forest loss. There is also increasing water shortage and declining water table in parts of the district. With losing forest and changing climate, the rain shadow region in the North Eastern part of the district is enlarging. This degrading ecology of Idukki district is getting further exacerbated with large scale *Eucalyptus* plantations, both in private and forest land. An immediate change over from *Eucalyptus* to other ecologically compatible tree species is an important environment imperative. Under this scenario, the private planters and tour operators have important role in strengthening measures to safeguard the ecological security and natural charm of the district. A degrading ecology may spell disaster to sustainable agriculture as well as tourism.

Women play an important role in all aspects of farming. Unfortunately, their special needs are yet to be attended in an integrated manner. The laudatory effort to organize farmwomen in income generating enterprises under the umbrella of 'Kudumbasree' or 'Ayakkoottom' is yet to make any tangible ripple effect. The departmental approach chosen for organizing and promoting these groups is hurting their integration with various development programmes. The present report recommends integration of women SHGs in different income generating programmes such as nursery activity, organic input production, work on eco-restoration, value addition, etc for their economic empowerment.

Both women and men farmers of the district will benefit substantially from the loan waiver scheme announced by the Union Finance Minister in the budget of 2008-09. The district should strive to gain more benefits from the numerous Mission programmes of the Government of India like the *Rashtriya Krishi Vikas Yojana*, National Horticulture Mission, National Bamboo Mission, National Bee Mission and various other programmes relating to water shed management and water use efficiency. There is urgency for achieving convergence and synergy among the

numerous projects being administered by the Government of India, the Commodity Boards and the State Government.

The recommendations in this report are made after giving due consideration to ongoing programmes and resources being made available thereof. These are mainly focused to the small, marginal and tribal farmers and other economically disadvantaged sections among the people with stress on sustainability of agricultural production systems and strengthening the regional ecology.

I wish to express our gratitude to Shri. Sharad Pawar, Union Minister for Agriculture and Food, the Secretary and all the concerned Officers of the Ministry of Agriculture for asking MSSRF to undertake this study and to Shri. T .K. A. Nair, Principal Secretary to the Prime Minister, Hon'ble Chief Minister, Ministers of Kerala Government, Members of Parliament and the Kerala Legislative Assembly for their interest and support. I thank the Idukki district officials, particularly the district Collector, the different Commodity boards, mass media, farmers, farm women, planters, farm and plantation labourers, community, non-governmental and Church organizations and all the others who so generously gave their time to share their views and to suggest solutions. I hope that these recommendations will help to save this agricultural and scenic paradise of our country by saving the farmers and farming of this district.

M S Swaminathan

# 1. ACKNOWLEDGEMENT

We owe our greatest gratitude to the people of Idukki who with great enthusiasm and hope traveled long distance and partook in the discussions and shared their experiences and views. The interaction with each one of them, the farmers, farm labourers, women, and youth, was a learning experience. Many of them also presented representations focusing on several issues and offering suggestions to solving them. We are profoundly impressed and influenced by the indomitable never-say-die spirit and the commitment of the people towards the development of their homeland. Our most grateful acknowledgements are due to each and every one of these participants.

The study would not have been possible in the manner it was conducted without the continuous support and assistance to the study team by the District Collector of Idukki district Mr. Ashok Kumar Singh IAS. When this study was initiated in August 2007, Mr. Rajunarayana Swami IAS, who was the then District Collector, also extended full support to the team. In addition, several senior officials of the Collectorate extended all support to this study. The help received from the Additional District Magistrate, Mr. P.P. Ramachandran and later Mr. Surya Narayanan, and Mr. K. Unnikrishnan, Assistant Information Officer, deserves special mention. We are also very thankful to many other senior officials of the district, the scientists of research institutions, representatives of different farmers associations, non-governmental organizations, media and private institutions for their help and support for successfully completing this study.

It has not been possible to list out the names in person, since such a large number of people have been involved. However we would like to list to few of them who have been major catalysts in this study.

The elected representatives of the district, Shri. K. Francis George, M.P., Shri. P.J. Joseph, MLA and former Minister, Shri. K.K. Jayachandran, MLA, Shri. Roshy Augustine, MLA, Smt. Biji Mol, MLA, Shri. S. Rajandran, MLA and Ms. Sushmita, District Panchayat President, took great interest in this study and assisted the study

team with valuable inputs. The deep commitment of Shri. K. Francis George, M.P. to this study with his presence and active participation in almost all the public hearing organized by this Commission needs special mention. Their valuable suggestions and guidance have been great strength to this Commission for making all recommendations. We also wish to thank all Block and Grama Panchayats Presidents for their participation in different meetings and suggestions with their deep experience and knowledge on different issues concerning the farming.

We would like to express our sincere thanks to Shri. S. Sivaprasad, the Principal Agriculture Officer, Idukki and his team who assisted this study in many ways during field visits organizing public hearing/consultations, providing required database and other information. Acknowledgement is also due to Shri. G. Mohandas, Dist. Animal Husbandry Officer, Shri. Shaji M. Manakat, APAO, Shri. R. Balachandran, District Soil Conservation Officer, Dr. G.S. Madhu, DMC, *Kudumbashree*, Shri. R. Ravikumar, Deputy Director, Dairy Development, Shri. K. P Suresh Babu, Assistant Project officer ITDP for their interest in this study.

Thanks are due to scientists and experts from Indian Cardamom Research Institute, Myladumpara, Cardamom Research Station of KAU, Pampadumpara, UPASI Tea Research Institute Vandiperiyar, Indian Institute of Spices Research, Calicut, Universities of Kochi, and senior development officials of Spices Board, Coffee Board, Rubber Board, Vegetable and Fruit Promotion Council Keralam, Tata Tea Limited, Munnar for valuable suggestions and erudite insights into the issues concerned to this study. We would specially thank Shri. Shri V.J. Kurian, IAS, Chairman, Spices Board and his senior colleagues at Spices Board office in Kochi, Dr. J. Thomas, Director, Indian Cardamom Research Institute, Dr. G. Sivakumar, Associate Professor, Cardamom Research Station, Dr. Sibi Mathew, UPASI Tea Research institute, Dr. V.A. Parthasarathi, Director, Indian Institute of Spices Research, Mr. Biju, Assistant Executive Engineer, Kerala State Electricity Board, Idukki and all others for helping this Commission with useful inputs and database related to major crops and weather of Idukki. Our special thanks go to Dr. T.N. Balasubramanian, former Professor and Head of the Department, Agricultural Meteorology, TNAU for his valuable help in assisting the analysis of the weather data.

Non-governmental institutions that have dedicated their work to the upliftment of the people of Idukki like the Peerumedu Development society and stakeholder associations such as Cardamom Growers Association, Cardamom Planters Association, Kerala Cardamom Growers Association, Kannan Devan Planters Association and Kerala Agricultural Development Society have been involved in facilitating our study right from the beginning. We thank them all. This study could closely understand the eminent contributions of innovative farmers like Shri. Sebastain Njallanil, Shri. Kalarikkal Baby (both won the National Innovation Award), and Shri. Pappachan and Shri. Gopi.

The Commission is immensely thankful to Shri. G.S. Iyar of NABARD, Idukki, Shri V. Ramananthan of Union Bank of India, Idukki, and Shri C.M. Abhram, GM, District Cooperative Bank, Idukki for their help in providing the details of agricultural loan.

The media of Idukki, visual, audio and print took great interest in this study and assisted the Commission in many ways. Many journalists provided very useful inputs and leads to this Commission in an interaction held at the Press Club. Our sincere thanks are due to all members of various media for all support and cooperation they had extended with great interest and enthusiasm. The critical role played by Shri. K. Unnikrishnan, Assistant Information Officer Idukki deserves mention again in this context.

Finally we wish to thank the Ministry of agriculture, Government of India asking M.S. Swaminathan Research Foundation to make this study, which gave us a memorable opportunity to come close to the people of Idukki and serve them to the best of our ability.

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SECRETARY
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D.O.No.12015/41/2004-Credit

April 17, 2007

Dear Prof. Swaminathan,

Please refer to your letter MSS/RM dated 7th April 2007 regarding taking up a study in Idukki district on the lines of the work done in the Allappuzha district.

2. I would like to inform you that based on the suggestions given by you vide your letter dated 17th November 2006, M.S. Swaminathan Research Foundation was advised vide this Department's letter No.R-12013/67/2006-Credit-I dated 19th December, 2006 for expanding the scope of study to cover Idukki district (copy enclosed).

3. May I request you to kindly take up the study in Idukki district on the lines of the work done in the Allappuzha district and submit the report at the earliest for further consideration.

Regards,

Yours sincerely,

(P.K. Mishra)

Prof. M.S. Swaminathan
Chairman
M.S. Swaminathan Research Foundation
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Chennai — 600 113

Encl: As above.

Secretary (A & C)'s Office
ISSUED
Date 18/04/07

# 4. STUDY AREA

Idukki means a gorge, suggesting the steep hills and mountains and deep gorges common in the district. The perennial river Periyar flows through a narrow gorge formed by two legendary granite hills called '*Kuravan*' and '*Kurathi*'. About 97 % of the total area of the District is covered by rugged mountains, undulating hills, valleys and forests. There are 11 peaks in Idukki, which exceed 6000 ft in height and *Anamudi*, the highest peak of Kerala (8,842 ft), is one among. The enchanting scenic views offered by the arrays of hills, mountains, thick forest, water falls, streams, lakes, rivers, dams, wildlife, orchids, sanctuaries, manicured tea gardens stretching across the horizon, farms with varies spices together with a mild summer and pleasant winter make Idukki a favoured tourist destination in Kerala. Idukki has a geographical area of 5,14,962 ha, which is 12.9 % of Kerala. The district has 3.7 % of Kerala's population. About 50% of its area is Reserved Forests. About 66% of the electric power of the State is generated here.

Fig. 1


## History and revenue division

The Idukki district was formed on January 26, 1972 by carving out of Devikulam, Peerumedu and Udumbanchola taluks from the esrstwhile Kottayam district and Thodupuzha taluk from the esrstwhile Eranakulam district. It

measures 115 km, south to north and 67 km, east to west with 5019 sq. km in area. The district is divided into four revenue taluks viz., Devikulam (1774.2 sq. km), Peerumedu (1286.4 sq. km), Udumbanchola (1071.4 sq. km) and Thodupuzha ((973.3 sq. km), 64 revenue villages, and eight developmental blocks, 51 panchayats and one municipality. The eight developmental blocks are Elamdesom, Thodupuzha, Devikulam, Adimali, Idukki, Nedumkandom, Kattappana, and Azhutha. Thodupuzha is the only municipality in Idukki district. There is one MP constituency and five Assembly constituencies (Thodupuzha, Idukki, Devikulam, Udumbanchola, and Peerumedu). The district map with boundaries is presented in Fig 2. The names of the Blocks and Panchayats are given in the Table 1.

Table 1: Names of the Block Panchayats and Panchayats in Idukki District

| **Block Panchayats** | **Grama Panchayats** |
|---|---|
| Devikulam | Marayoor, Kanthalloor, Vattavada, Munnar, Mankulam, Chinnakkanal, Santhanpara |
| Adimali | Pallivasal, Mannamkandam, Vellathooval, Byson valley, Konnathady |
| Elamdesom | Vannappuram, Kodikulam, Karimannoor, Udumbannoor, Alakode, Velliamattom, Kudayathoor |
| Thodupuzha | Kumaramangalam, Manakkad, Purappuzha, Karimkunnam, Edavetty, Muttom |
| Nedumkandam | Rajakumary, Tajakkad, Senapathy, **Udumbanchola**, Nedumkandam, Pampadumpara, Karunapuram |
| Idukki | Kanjikuzhy, Vazhathoppu, Kamakshy, Arakkulam, Vathykudy, Mariapuram |
| Kattappana | Erattayar, Chakkupallam, Kattappana, Kanchiyar, Upputhara, Ayyappankoil, Vandanmedu |
| Azhutha | Elappara, Koddayar, Peruvanthanam, **Peerumedu**, Vandiperiyar, Kukily |

**Climate, Topography, Forest and Water bodies**

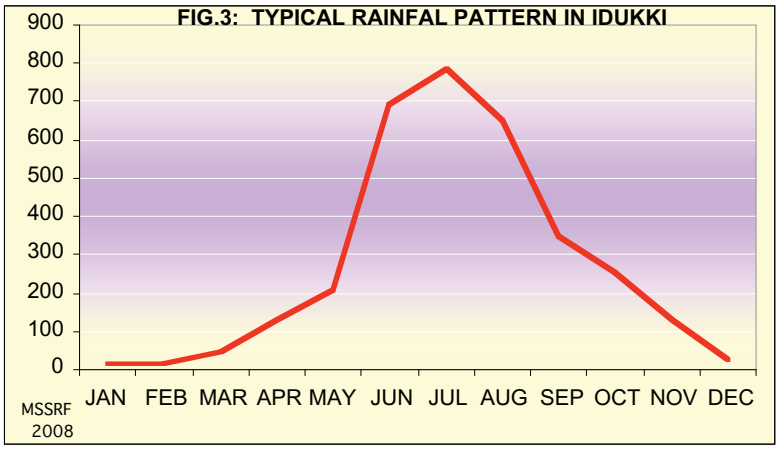
The topographic classification of land in Idukki district is given in Table 2. The high ranges vary in altitude from 600 m to more than 1600 m ft above MSL. This diverse topography and associated climate promote diverse flora and fauna. Except a little area of midland in the western region of Thodupuzha taluk, all areas of this and remaining three taluks are entirely either in upland or high range regions. Almost 96 % of the total area of the district comes under the high land covered by rugged mountain ranges, hills and deep valleys. About 52 % of area in the district, which is about 260907 ha, is claimed to be under forest. Different types of forests seen in the district are (1) evergreen/Semi-evergreen forests, (2) moist deciduous forests, (3) dry

deciduous forests, (4) mountain sub-tropical/temperate forests, (5) grasslands, and (7) forest plantations.

Table 2. Land pattern of Idukki district

| Altitude (M S L) | Land pattern | % land area |
|---|---|---|
| 20m - 100m | Midland | 4.5 |
| 100m – 300m | Mid – upland | 7.5 |
| 300m – 600m | Upland | 12.1 |
| 600m – 1200m | Western Ghat High Range | 48.3 |
| 1200m - Above | Top Western Ghat High Range | 24 |

Climate varies with altitude, land pattern and forest coverage. Moderate climate prevails in the midland area with temperature varying between 21_C to 30_C and having minimum seasonal variation. The eastern parts of the district located in the highland have a comparatively cold climate with temperature varying between -1_ C to 25_ C. The average rainfall is 3500 mm with variation from 2500 to 4500 mm and rarely going up to 7000 cm. The eastern and northeastern parts of the district, lying in the eastern side of the Western Ghats, are in a rain shadow region receiving only up to 1500 cm rainfall. The area comprising Marayur, Kanthalloor, Vattavada and Thalayar fall in this region.




The three most important rivers of the district are Periyar, Thodupuzhayar and Thalayar. River Pamba also originates from the district. The three fresh water lakes of the district are Devikulam, Eravikulam and Elaveezha Poonchira. Total area covered by water bodies is 13130 ha.

**Flora and Fauna**

The valuable trees growing in the forests are teak, rosewood, deodars, sandal etc. All kinds of wild animals with the exception of lions abound in the forests of Idukki. The

grasslands of Peerumedu are a haven of carnivores like the tiger and the leopard. Bison, wild bear, languor and monkeys are a few other common denizens of the jungle. The Thar (striped goat) seen in Marayur region and Rajamala is exclusive to the region. There is also good bird diversity. Unfortunately, over the years, there had been severe loss to the plant and the animal life due to mindless deforestation, indiscriminate felling of trees, encroachment and poaching. The large scale plantation of Eucalyptus in denuded forest land and hilly terrain by the Forest Department and private individuals is further aggravating the ecological crisis of the region. The district has the Idukki Wildlife Sanctuary near Thodupuzha and Chinnar Wildlife Sanctuary and near Munnar there is the Eravikulam National Park.

**Socio-demographic profile**

The socio-demographic data of Idukki, according to 2001 census, are provided in Table 3. Development of the district as the important plantation or spices hub of Kerala is achieved by the hard working farmers who made settlement and started cultivation from the early days under conditions of untold hardships. While the district has many

Table 3: Comparative data of population in Idukki district

| **Particulars** | **2001 census** |
|---|---|
| Total Population (in lakhs) | 11.29 |
| Density / sq.km. | 259 |
| Sex Ratio / 1000 males | 993 |
| Total house holds (in lakhs) | 2.65 |
| Tribal families (house holds) | 11516 |
| Scheduled caste (in lakhs) | 1.59 |
| Scheduled tribe (in lakhs) | 0.51 |
| Literacy Rate, % | Male 92.3; Female 85.0 |
| Total Workers (in lakhs) | 3.89 |
| Agricultural labourers (in lakhs) | 1.32 |
| Marginal workers (in lakhs) | 1.16 |
| Cultivators | 1,03,596 |
| Small & marginal farmers | 1,01,862 |
| Average holding size, ha | 1.01 |
| Per capita availability of the land, ha | 0.24 |
| Per capita income, Rs. | 21,297 |
| BPL Households (in lakh) | 1.17 |

huge estate owners, the vast majority of farmers are small and marginal earning their livelihood exclusively from agriculture, which in major part of the district is based on one or very few plantation crops.

Idukki district has the second largest population of scheduled castes and tribes in Kerala. The 50,973 tribal population of the district is living in 283 settlements across all taluks, with Devikulam taluk having highest density (Fig. 4). Most of the tribes are living in acutely remote hilly tracts and in the deep interiors of thickly growing forests. *Mannans, Mala Arayans, Urali, Muthuvans, Hill Pulaya, Paliyan and Ulladan* are the different groups of tribals in the district. All these tribes are not aborigines and many of them are agriculturists. The *Muthuvans* of Marayoor, Kanthaloor and Vattavada panchayats speak Tamil dialects. Most of the Harijans work as agricultural labourers in the tea and cardamom estates. Ayyappancoil and Pampadumpara of Udumbanchola taluk, Kumali of Peerumedu taluk, Kuttampuzha, Mannamkandam and Marayur of Devikulam taluk, Vannappuram, Vazhathope and Velliyamattom of Thodupuzha taluk are the concentrations of Harijans.

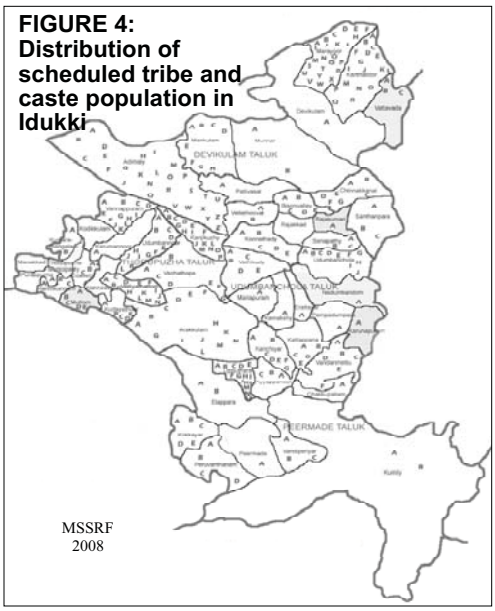



**FIGURE 4: Distribution of scheduled tribe and caste population in Idukki**

# 5. THE STUDY TEAM

The M.S.SWAMINATHAN RESEARCH FOUNDATION (MSSRF) has undertaken this study under the overall guidance of Prof. M.S. Swaminathan, Chairman, MSSRF and Hon. Member of Parliament (*Rajya Sabha*). The study team consisted of the following:

- Dr. S. Bala Ravi – Team Leader – Former Assistant Director General (IPR), Indian Council for Agricultural Research and currently Advisor, MSSRF
- Dr. K.U.K. Nampoothiri – Team Member –Director, Community Agro-biodiversity Center (MSSRF), Kalpetta, and former Director, Central Plantation Crops Research Institute (ICAR), Kasaragod.

The study was supported by Dr T.K. Hrideek, Research Associate, MSSRF and Dr. M. Manjula Menon, Research Associate, MSSRF.

# 6. EXECUTIVE SUMMARY

Idukki district is known for its enchanting scenic beauty, pleasant weather, aromatic spices and sprawling tea gardens. Rugged mountains, undulating hills, valleys and forests occupy about 97 % of the total area of the district. About 51 % of the area is under forest, predominantly evergreen. The economy of Idukki is almost exclusively agricultural. Gross cropped area is close to 2.99 lakh ha. The unique terrain and agro-climatic conditions of the district are suited to grow plantation and spices crops. Over 90 % area is rain-fed. The district has largest area under various spices, notably small cardamom. Idukki is therefore called the 'Spices District' of India. Major crops grown here in order of economic importance are rubber, vegetables, tubers, plantains, coffee, tea, coconut, cocoa, and other spices such as ginger, turmeric, nutmeg, garlic, etc. The net sown area is 2.14 lakh ha and there are 2.11 lakh farm holdings. The average holding size is 1.01 ha and about 95 % of holdings are below 2 ha in size and only 0.3% of the holdings own more than 10 ha. Animal husbandry, particularly dairying is practiced in integration with crop husbandry. This is an important source of additional income. Animal population is 2. 65 lakh and 94.5% of them are milk producing. About 10 % of farm revenue of the district is earned from animal sector, wherein milk contributes 90 % share of this income. In addition to cattle, goat and poultry have important role in income generation. Nearly 10 % of the population is engaged as workers in plantations.

The farm crisis in Idukki originated from different causes and assumed explosive stage with many farmer suicides over last few years. Three important reasons behind the farmer distress are the very high cost of production of major plantation and spices crops, high volatility of commodity prices with prices dipping below cost of production, and huge escalation in farmers' debt. The accumulated burden of this distress over years exacerbated with continuous drought and downpour years shattered the economic backbone of many farmers with small and medium sized holdings. The economic decline and continuous neglect of plantation crops made these crops more vulnerable to pests and diseases with appalling decline in productivity. With the increase in the prices of farm inputs and labour wages, a return to normal agriculture appeared impossible to many. The productivity decline compounded the distress from price fall and escalated cost of production. Many farmers chose to commit suicide to escape from the state of helplessness and burden of farm debt. While the district

administration states that there were only 103 suicides during 2001 to 2007, the District Cooperative Bank gave data on 473 suicides of its farmer members between 1998 and 2007. While one would normally expect that the farmers who had committed suicide might have had a huge loan liability, it is astounding to realize that the average loan liabilities of Idukki suicide victims ranged between Rs 10,210 and 19,630. It appears that beyond loans, the hopeless state of agriculture might have driven them to the extreme act. For those who chose to stay put, the cascade effect of the farm crisis rendered them incapable repaying the loan liabilities. They are also incapable to make any fresh investments and to have a good harvest. Their livelihoods stand continuously deprived and threatened. The socio-political issues governing the land right of farmers in some parts of the district added new dimension to their agony and distress.

**Agricultural loan liability:** Two major formal streams of agricultural credit in Idukki district are the scheduled commercial banks (SCBs) and the agricultural cooperative banks (ACBs). The Commission made an effort to collect agricultural loan transactions in SCBs and ACBs during last 10 years with separate data on small farmers. The local NABARD official and the District Cooperative Bank (DCB) offered good support. It took long time to get incomplete data from SCBs, despite efforts made by the lead bank, the Union Bank of India. Among the SCBs, data were available only from Union Bank of India, South Indian Bank, Indian Oversees Bank, State Bank of India, and Bank of Baroda for the period 2003 to 2007. Major categories of loan disbursed are crop and term loans. Other loans of very small size are cattle loan and agri-business loan. On 31 March 2007, total outstanding crop loan principal was Rs 95.5 crores, while the outstanding interest of this loan was Rs 36.6 crores, which is more than one-third of the principal. Total outstanding loan from ACBs on 31 March 2007 was Rs 210.4 crores and 63 % of which was crop loan. The over all-outstanding loan on this date from the five SCBs was Rs 419.5 crores. Nearly 85 % of it was crop loans, 10 % term loans, 4 % cattle loan and 0.5 % agri-business loan. Nearly 84 % of this loan in 2007 was availed by small farmers. The estimated total agricultural loan outstanding from ACBs and SCBs on 31 March 2007 is Rs 630.0 crores, about 85 % of which was availed by small farmers.

**Tracing other factors of farm distress:** The intensity of impact created by adverse market prices, increased cost of production and aberrant agro-climatic factors varied with crops. Certain district-specific factors imposed restrictions on choice of the crops.

For example, in the Cardamom Hill Reserve (CHR) forest area farmers are allowed to grow only small cardamom, while in the region demarcated as tea plantations, none other than tea could be grown. Elsewhere, other plantation crops took predominance in the cropping pattern of farmers. Thus the role of each of these crops and crop combinations to the farm distress has to be discussed separately.

**Cardamom:** Small cardamom, *Elettaria cardamom,* native of this region is a prominent spice crop of Idukki. This district contributes more than 70 % to the cardamom production in India. Currently cardamom occupies about 33,000 ha in a region called CHR forest area spread across Devikulam, Udumbanchola and Peerumedu taluks at altitudes between 600 and 1200 m above MSL. Present average yield is around 300 kg/ha. Twenty years back the average yield was below 50 kg/ha and the cardamom area was 64,000 ha. There are about 25,000 cardamom farmers, majority of them owning small or medium holdings. During last 35 years, cardamom production and productivity increased by 15-fold, while area decreased by 40 %. The yield scaled above 75 kg only after 1991. This change was largely achieved with the arrival of few high yielding varieties, particularly 'Njallani', and intensification of production. Shri. Joseph Sebastin and his family, developed the variety, 'Njallani' and this is estimated to have been contributing, on an average, Rs 100 crores a year to the agricultural income of the district.

While the high yielding varieties opened new opportunity to increase yield many-fold, the new production management also demanded far higher plant nutrients and many-fold higher application of fungicides and pesticides. Many farmers applied far higher nutrients than the recommended dose of 150N: 75P: 300K kg/ha, often not in balanced manner, taking advantage of the nutrient responsiveness of new varieties. Increased nutrient supply led to increased vulnerability to pests and diseases, which triggered increased applications of fungicides and pesticides in large quantities. The recommended 8 rounds of soil and plant applications of fungicides and pesticides an year were frequently ignored to go up to 15 rounds. Such intensified production practices and excessive use of plant protection chemicals over the last 15 years have set in adverse impact on the ecology, production cost, soil health and above all sustainability of production. There is also notable impact of this intensification on the forest cover and canopy of the CHR area. The tree density is reduced and the canopy cut down up to 25%. When the cardamom yield moved to unprecedented 600 kg/ha or even above one ton/ha, the productive life of clump declined by almost one-third. This

demanded more frequent replanting, more soil work, more soil erosion and lesser sustainability.

It was in this background the crop suffered two consecutive drought and a heavy rainfall together with heavy price fall. The price fall made farmers incapable of annual investment, which demanded Rs 75,000-1,50,000/ha. Lack of such investment plummeted the yield and made the crop more vulnerable to stress. Low yield and low price made the livelihood distressful and encouraged mounting debt. Many gardens were damaged and the farmers left incapable of undertaking replanting. Without assistance, these farmers cannot be taken back to their income generating strength. In view of their shattered economy, it is important that during replanting stage these farmers have to be compensated for their annual income at least during the first year.

Ever increasing cost of production together with low price is an important source of farm distress in cardamom. Different estimates show the cost of production ranging from Rs 75,000/ha to two-fold higher. With variable yield under varied managements, the estimated production cost of every kg capsule ranges between Rs 150 and 300. At such huge cost of production undertaken even by small farmers, using bank loans to the tune of Rs 50,000/ha, any adverse fall in prices or crop loss on any count do hit the farmer severely. When such adversities persist or recur for two or more years continuously, it may not only crush the economic backbone of farmers but also entrap them in huge debt. This is what had happened to cardamom farmers during 2003 to 2007 in Idukki with steep price fall and recurring adverse weather, droughts during two years and heavy rainfall in one year. To add to the vagaries, the input prices also increased. The prices of copper fungicide, which is an important input for cardamom, increased almost three-fold during the last four years. Together the labour cost is rising and timely availability of labour is becoming difficult. Even small farmers require hired labour for certain operations. While the price of one kg of cardamom in 1976 was sufficient to pay for 22 man days, it shrunk to just four man days in 2006. While mechanization is not easy in the terrain where the crop is grown and may be possible only for certain operations, selective mechanization is a contemporary imperative for mitigating labour shortage.

Under the increasing unsustainable approaches in cardamom farming, there is a widespread desire among farmers of the district to turn organic farming. While the emphasis to turn the whole district organic is louder, the cardamom farmers and their

associations are less enthusiastic about this idea. They do recognize the merit of organic farming. However, they consider that organic farming with current available technology may not provide economic yield and income. However all welcome the need for moving away from high intensity chemical farming to 'green farming' with less dependence on chemical inputs and more use of organic inputs and integrated pest and disease management. There is also need for fine tuning this technology on location-specific manner. Opportunity is now ripe for promoting organic inputs like *Psuedomonas, Trichoderma*, VAM, bio-pesticides like entomopathogenic nematodes (EPN), vermicompost and vermi-wash and to evolve and enforce quality standards for them to check spurious trade. This calls for establishment of a well equipped laboratory to extend service to farmers on input quality testing and soil test services. Local production of these inputs offers a great opportunity for additional income generation by *Kudumbasrees, Ayalkkoottoms,* other self help groups (SHGs) and farmers' clubs.

Post-harvest processing is an important requirement to fetch good prices for the produce. Idukki cardamom is reputed for its capsule size and green colour. Harvesting at precise time and following specific curing process using fuel wood, electricity, diesel or LPG and grading the dried capsules are essential to achieve the reputed green quality. Sun drying leads to poor quality and low price. Drying 1 kg cardamom needs 4 kg fuel wood. Use of firewood for curing over years has led to serious depletion of trees in CHR forest. This together with forest loss elsewhere is triggering serious climate change in the region. While the district generates more than 60 % of the power in the State, the electricity supply in the district is poor and the Kerala State Electricity Board (KSEB) is levying industrial tariff on farmers using electricity for cardamom curing at household level. Make note that the same KSEB supplies power at agricultural tariff for dewatering in Kuttanad. While 95 % of the farmers curing cardamom are small holders, the rationale of levying industrial tariff is amazing. It appears the environmental cost of denying power at affordable rate and pushing farmers to fuel wood is not appreciated. The income difference KSEB makes at these two rates is negligible. KSEB also perhaps does not realize that with decline in forest and depletion of rainfall, it will cease to generate power. There is a shared interest for KSEB, farmers and all in protecting the forest. Supply of power at agricultural tariff to all farmers may wean away farmers from the fuel wood for processing. This may also help them in increasing their competitiveness with the cost reduction in curing. The KSEB may therefore revert from this unfair and discriminatory classification of power

use by the Idukki farmers and provide power at agricultural tariff for processing of all agricultural produces at household level by small farmers and their groups.

Cardamom marketing conducted under APMC Act is through a process of auction at designated locations. Farmers and traders participating in auction have to be registered under this Act by the Spices Board of India. This had created and promoted farmer unfriendly practices such as exclusion of several farmers from the market, compelling these excluded farmers to sell their produce to middlemen, and formation of trade cartels to deny fair price to farmers. While the recent introduction of Cardamom growers ID card and e-auction are steps in the forward direction, farmers are still not out side the clutches of few traders who do and undo the domestic cardamom pricing. I this context, the move to establish a Spices park in Idduki as a common world class infrastructure for cleaning, processing, steam sterilization, packaging, quality testing, warehousing on a 'user fee' is welcome. It is important to underscore that such facility will not be directly accessible to the vast majority of small producers, but only to big traders. To rescue small producers from middlemen requires locally accessible common facility for curing, grading and short-term safe warehousing. Linking such warehousing with bank with facility to receive partial cost may help many cash starved farmers for holding their stock and realizing better price. Creation of such facility, its group management by farmers and its eventual networking with Spices park in hub and spoke model would help small farmers to realize the benefit of the Spices park. This may also empower producers to maintain good hygiene and quality standards and product consistency with traceability, which are mandatory for the modern competitive trade.

To insulate farmers from recurrence of distress due to uneconomic price, it is important to establish Cardamom Price Stabilization Fund (CPSF), which is an improvement over the Price Stabilization Fund Trust (PSFT) introduced in 2003 by the Central government. The WTO Commission for Kerala headed by Prof. Swaminathan had also recommended the need for price stabilization fund. In the CPSF, an economic price band (EPB) is determined around the cost of production and as the market prices go below the EPB, the farmer is compensated to receive economic price and as the market prices go above the EPB, the farmer is made to contribute a small share of the high price to the CPSF so that the fund is maintained by the farmers, for their own secured welfare.

**Black pepper:** With reported area of 84,219 ha under black pepper, it occupies the largest area in the district. Area under pepper had been increasing according to official statistics. Pepper is grown virtually in every farm holding or homestead garden, except those in higher ranges and hence is deeply associated with the income and livelihoods of vast majority of farmers. Pepper is estimated to contribute about 20 % of agricultural income of the district. It is mostly an intercrop and a pure crop in un-estimated small area in Rajakumari, Rajakkad, Adimali and Vazhathopu Panchayats. It is a common intercrop with coffee and tea. Most commonly used standards are dadaps (*Erythrina sp*.) and silver oak (*Grevelia sp*) apart from common trees like mango, Jackfruit tree, etc. Pepper produced in Idukki has better quality. Compared with other districts of Kerala pepper productivity in Idukki is higher, although way behind the world average. The agro-climatic condition of Idukki is suited for increasing the yield.

However, during the last 5-6 years, pepper cultivation and income from this crop had been seriously affected with many major problems. These problems continuously impacting on the income of farmers, particularly the small and tribal farmers have major share on their economic distress like in the case of cardamom. The problems are: (1) decline in yield due to widespread incidences of slow and quick wilts and other biotic pressures, (2) low yield from the carry over effects of unfavourable agro-climatic conditions and poor management of gardens in the recent past, (3) decline in price since 2001, and (4) increasing cost of production and lack of profitability. Since 2001 with concurrent fall in prices and increase in cost of production, the profitability from the crop is lost. Under this economic equation, farmers, particularly small farmers were not able to make fresh investment on the crop for its normal management. With the low rainfall spell for two years since 2003 the crop was seriously affected with diseases like slow and quick wilts. There was heavy loss of crop in areas severely affected by the drought and diseases. Farmers who had invested early years by taking crop loan failed to recover income and repay the loan due to yield loss and price fall. Over the years this liability had been enlarging. When the farm distress due to pepper cultivation is so wide spread, the official statistics on pepper received wider cynicism from farmers. The DoA officials also concurred on the substantial damage that had happened to large pepper area justifying the demand for replanting and rejuvenation for restoration of income and livelihood of small and tribal farmers.

Redress of above said problems essentially constitute the primary strategy for addressing farm distress contributed by pepper. Revival of pepper productivity requires at least two major initiatives covering gardens badly affected with priority to small and tribal farmers. These are undertaking replanting whole or part of the gardens where vines have become senile or had been irreversibly affected by diseases or continuous neglect and launching rejuvenation process to nurse back healthy gardens to higher yield. Often the same garden may require both these treatments. Varieties widely grown in the district are local land races such as Karimunda, Neelamundi, Kuthiravally, Narayakodi, and Chagannoran. All of them are susceptible to major diseases. While few high yielding varieties, some of them with better tolerance to diseases, are evolved, farmers are not able to get the quality planting material of these varieties. Replanting gives an opportunity to plant high yielding varieties of vines.

When comes to planting material, the district had been facing acute shortage for quality planting material. The need for identification of high yielding varieties appropriate to each region and their mother plants, large scale multiplication of runners under scientific management for providing foundation stock and mass scale production of rooted cuttings assume high importance. The three research institutions recommending pepper variety for the district speaks differently as they work in isolation. While the CRS, Pampadumpara (KAU) recommends Panniyur 5, the ICRI recommends Panniyur 4, (it excluded Panniyur 5 from the study) and IISR recommends its releases, Sakthi, Thevam and Malabar Excel (it did not evaluate Panniyur 4 or 5) discussed. There is no interaction among these institutions when they make such recommendations. The farmers are also not involved in participatory manner. When varieties are identified, it is desirable to raise the rooted cuttings locally by involving trained farmers and SHGs of farmwomen under expert supervision, guidance and certification of seedlings. Effectively soil treatment against soil borne pests/pathogens and judicious use of organic and other inputs become important. Replanting and rejuvenation also offers opportunity to make a change to either total organic farming or green farming with use of organic inputs, IPM and need based chemical use. This, in turn, may generate a huge opportunity for local production and supply or organic inputs by farmers, their SHGs and other agencies. Their continuous training, credit support and technical guidance are important for promoting stringent

certification standards. The employment and income generation potential of these activities to local farmers and groups on continuing basis is significant.

Despite being a major crop of the district and affecting the economy of farmers to significant scale, pepper has no organized marketing facility. Hence, the majority small farmers have no way but the middlemen for marketing. Some of them lack facility for drying and for grading the dried pepper. Some are under pressure to dispose the harvest in green state. For enabling these farmers to take the benefit of processing and value addition and to hold the stock for some time till prices turn favourable, it is important to establish community facilities for post harvest processing, grading and short term warehousing. Warehouse-bank linkage may help small farmers who are in need of cash by pledging the processed stock deposited in the warehouse. The large volume of the processed and graded or value added produce warehoused by many small farmers might also collectively help them by commanding better price than selling in piece meal. Farmers may get full benefit of such facilities, when these are managed well with minimal overheads under their cooperatives or associations or even SHGs. Like in the case of cardamom, these local processing facilities may be networked with the forthcoming Spices Park. The GOK may examine the pros and cons of taking pepper marketing under APMC Act and establishing Pepper Price Stabilization Trust Fund as a solution to redress the distress caused by huge price variations.

Unfortunately, the role of research on pepper production in the district is virtually negligible. While the KAU and IISR have developed many varieties and had been claiming that some of these varieties are suited to Idukki, they are not getting popular among farmers. Idukki may require different varieties in different agro-climatic regions. The inability of these institutes to work with fair coordination and in participation with farmers is making many of their technologies not moving down to farms. Like in the case of cardamom, farmers' varieties are making their presence than the public research varieties. Farmer's varieties such as 'Appachan molaku' and Kumbakal are popular in certain pockets. The CRS, Pampadumpara mandated with location specific research and technology transfer on cardamom and pepper has no major programme on production of pepper planting material of varieties recommended by it. Rather the Centre is giving priority to the multiplication of rose and other flowering plants!

**Rubber:** Rubber occupies about 38,844 ha area in the district and contributes one of the highest shares (26%) to the agricultural income. The area under rubber is increasing largely due to attractive price, availability of cost effective technologies, better extension services being provided by the Rubber Board of India (RBI) and financial support available under different development schemes. It appears the production increase is not commensurate with area increase indicating that the new area being brought under in high altitudes is possibly less productive. From the representations received by this Commission it is clear that rubber, as a crop has no role in the economic distress of farmers. The RBI model on excellence in research, technology transfer, integration between technology development and transfer, decentralization of development schemes and better ratio between field staff and farmers being serviced is worthy of study and adoption by other commodity Boards. Natural rubber, because of its heat tolerance, will continue to receive importance in national and international trade and hence rubber should continue to receive strong research and marketing support. With this in view and in recognition of the notable contribution of the RRI, a special research grant is recommended to strengthen its research and infrastructure.

**Vegetables and fruits:** Idukki district produces substantial amount of vegetables. This is possibly the only district in the State producing cool season vegetables. These include potato, carrot, cabbage, cauliflower, French and butter beans, tomato and chilly grown at high altitudes in four Panchayats under Devikulam taluk. It also produces a few tropical vegetables like bitter gourd and cowpea in large scale and French bean and tubers in small scale. The cool season fruits cultivable in the district are orange, apple, passion fruit, strawberry, cherry, guava, tree-tomato, kiwi, mangosteen, egg fruit, peach, and gooseberry. The vegetables contribute 7.2 % of the total agricultural income of the district. On this basis, these are ranked fourth among agricultural crops. Banana and plantains, which are other major fruits grown here are not included here. Vegetable production statistics of the district is incomplete and fragmentary. According to figures the area under vegetables was 3189 ha during 2005-06. It is reported that more than 1600 ha is grown with cool season vegetables mainly in Vattavada, Kanthalloor, Marayur and Munnar Panchayats.

Tropical vegetables are grown fairly under intensive practices at planes and low elevations, while the cool season vegetables are grown largely by traditional and low management methods under many constraints. The cool season vegetable growing

region lies in a rain shadow region receiving less than 1300 mm rainfall in the eastern side of the Western Ghats. The region is economically backward with poor road, no irrigation, technology servicing, marketing or storage facility, apart from social amenities like bank, schools, hospitals, drinking water and other essential services. Many crops are raised during only one growing season. Augmenting irrigation facility through check dams, soil conservation, improving roads, creating market linkages and go down facilities, strengthening technology servicing for quality seeds, package of practices, inputs and credits are measures badly required to promote production of cool season vegetables and fruits and for enhancing the employment and income of the poor tribal people behind these crops. With such strengthening the vegetable production capacity of the district can be substantially enhanced and thus promote the self-reliance of the State in vegetables.

This cool season vegetable and fruit growing region receives no or minimal services from departments like agriculture, animal husbandry, Kerala Agricultural University and other development agencies of the State. The region is surrounded by forest and therefore Forest Department has important role in promoting the livelihood activities of the people. In the absence of support from these departments, the people are heavily depending on the private moneylenders and input suppliers from neighbouring Tamil Nadu. In that process the entire produce is moved to Tamil Nadu. When the region has such potential and the state of production system is in such neglect, it is surprising that the State Horticultural Mission has not placed the deserving focus to this region. There is urgency to invest funds from the SMH for promoting infrastructure, production, marketing, cold storaging, value addition and capacity building as well as for strengthening the services from other development departments including a very supportive attitude from the Forest department. There is desirability in establishing a horticulture research unit of KAU in this region to address the research and quality planting material needs of the region. Agricultural development of this region may not go without building essential services like schooling, healthcare, drinking water supply, etc.

Marketing of vegetables demands very special attention due to their perishability and inaccessibility of the region where it is produced. The initiatives being taken by the VFPCK and KADS in small measure need to be strengthened and replicated to

eliminate middleman and to ensure better price to producers. VFPCK is found functioning without adequate funding, while SHM is failing to identify the problems and provide priority support to the agencies capable of building farmers' market.

**Banana and plantains:** Banana and plantains are grown virtually in every farm holdings, particularly the small and medium, either as an inter- or pure or backyard crop. It is a common source of income to small holding in particular. More than 5000 ha area is under this crop, with 65 % of area under plantains. Banana and plantains contribute about 2.8 % of the total agricultural income of Idukki district. Banana cultivation is largely undertaken by converting rice fields and the area has increased by 46% during seven years from 2000. The yield of banana and plantain is, however, decreasing over these years. The most widely and commercially grown banana variety is 'Nedran'. Traditional varieties like Njalipoovan, Palayankodan, Red poovan and Kadali and improved variety like Robusta are the common plantain varieties. A new high yielding variety of Nendran called 'Quintal Nendran' innovated by a farmer in Adimali is a popular banana variety. Unfortunately this innovative farmer has fallen a victim of his innovation under certain unsavory situations. GoK may examine this and a fair deal done to promote farmer innovators.

Major issues associated with banana and plantain cultivation are regulation of environmental pollution caused by heavy application of the pesticide (furadan) to banana, promotion of farmers' markets in all regions/Panchayats to ensure fair marketing and modification of the insurance coverage of banana/plantain to receive higher compensation. There is increasing awareness on the environmental impact from application of pesticide. Organic banana cultivation with premium price for organic banana is emerging. For example, farmers' market of KADS offers premium prices to organic products and also promotes organic cultivation. The intervention of VFPCK with '*Swasraya Karshaka* Market' offers fair price to these produces. But the coverage being provided by VFPCK is a fraction of total farmers and produce generated. Support has to be given under the SHM to expand the current coverage. Currently banana and plantain are covered under crop insurance with a premium of Rs 2.50 per plant and compensation of Rs 50. The demand of farmers to raise the compensation to Rs 100 is justified and is to be met.

**Tapioca and other tubers:** Tapioca, elephant foot yam and *Dioscorea* are main tuber crops of Idukki district. All tubers excluding sweet potato together occupy about 3.2 % of the cropped area and contribute 7.9 % of the total agricultural income. The yield of tapioca, which is the principal tuber crop is the second highest across districts of the State. However, the area under tapioca has been substantially declining over years, largely due to replacement with rubber. No tuber crop-specific grievance was heard from farmers. The potential of tapioca in rearing silk worms need to be pursued by the Indian Silk Board to assess the economic feasibility.

**Coffee:** Coffee occupies only a small area of about 10870 ha in the district between 120 and 1650 m elevations above MSL and it contributes 2.5 % of the agricultural income of Idukki district. Major regions growing coffee are Vandiperiyar, Vazhavana and Adimali. The rainfall pattern of Idukki is not well suited to coffee with irregular blossom and fruit setting showers and heavy rain during rest of the stages. The district has predominance of small coffee growers and they constitute 93% of the coffee growing holdings with 59% of total area. Nearly 85 % area is grown under *Robusta* coffee, which has average yield of 627 kg/ha. Area under coffee has been declining during the last seven years with similar trend on production and yield. This together with increasing cost of production has been making coffee-based livelihood for small growers a difficult option. In this context coffee prices and marketing assume importance. Coffee marketing is unregulated and most of the small farmers sell their produce through middlemen. With the lack of facility to these farmers for drying, pulping, and warehousing, the exploitation they face during marketing is very high. There is need to build three coffee warehouses at selected locations in Vandiperiyar, Vazhavana and Adimali with free of cost land provided by the Panchayat or the State government.

It is expected that Idukki may get its due share from the recent provision of Rs 310 crores for replanting senile gardens under the 11$^{th}$ Plan. The CBI currently offers financial support to the tune of 20-25% on production enhancing and value addition programmes such as sprinkler irrigation, pulping facility, drying yards, water storage facility, etc. Many small farmers in Idukki are not able to use this support due to their inability to put the remaining 75-80% of the investment. Hence there is need to enhance this assistance to 50 % of the actual cost with ceiling on Rs. 50,000/holding.

Since 1995 coffee marketing is unregulated. Under the existing coffee market, the traders are well networked and equipped to store and process, while the producers, particularly the small farmers, are not. There is no coffee auction platform. The price stabilization fund trust (PSFT) established for coffee growers has not received encouraging response from farmers. There is need to modify this PSFT scheme by linking with economic price line based on cost of production. The online platform for spot trading of the commodity in collaboration with the National Commodity and Derivatives Exchange Ltd (NCDEX) is viewed with an apprehension that it is a prelude to coffee futures. All such decisions having major economic impact on coffee farmers have to be made farmer participatory, with capacity building to farmers.

**Tea:** Tea is linked with history of agriculture in the district. It currently occupies about 23702 ha, produces 40063 t of leaves at an average yield of 1690 kg/ha. Tea plantations are situated above 750 m in Devikulam and Peerumedu taluks, with 26 % area between 1500 and 2000 m, while 8 % area above 2000m. Idukki has about 4956 tea gardens, out of which small growers (garden size below 10.1 ha) own 4887 gardens with area of 3910 ha. There are 69 larger gardens with area above 100 ha and occupying about 82 % of area and contributing to 93 % of production. As a large share of tea produced in the region is exported, the production has to be competitive in quality and cost. While the tea produced may pass quality-wise, the crisis of tea production in Idukki arises from high cost of production and low productivity arising from aging bushes, which in 86 % of the gardens have crossed 70 years. According to United Planters Association of South India (UPASI), production cost of Idukki tea is 158 % higher than that of Vietnam. There is growing mismatch between tea prices and labour wages including social welfare cost. The 50% agricultural tax being levied on tea by the GoK, which is the highest in the country, also affects the tea plantations. Thus about 20 estates have closed throwing the livelihoods of workers in jeopardy. Some policy changes to support tea production and trade are required from the GoK.

The state of tea economy has placed the future of tea industry in catch 22 position. The industry is incapable of making any long term developmental investments, while without such investments it cannot come out its present impasse. Replanting senile gardens with good quality and high yielding clones should receive high priority. However, the industry is incapacitated even to use the 25% subsidy being offered by the Tea Board of India (TBI) for replanting. To make a change, this planting subsidy

has to be enhanced to 75 % for small planters and to 50 % for the rest. For plantations brought under the Plantations Labour Act, 1951 an additional pro rata subsidy component on the labour wages of the re-planted area till the new clones reach the plucking stage is to be given. The desirability of creating a special purpose fund through an amendment in the Plantations Labour Act to share the social costs on labourers between the employer and the Central/State Government may also be seriously examined.

For marketing tea, public auction is the most popular mode. Kochi is the only auction center in Kerala. There is increasing interest among producers shift to e-auction for better price realization and discouraging trade cartels. There is also exploitation of small tea growers by the big estates, which purchases the leaves from small farmers. Under the pretext of quality and other reasons, the buyer dictates the prices. For example, the current rate for tealeaves vary from Rs 7.5-9.75/kg. The TBI has to periodically fix a minimum quality linked price for leaves to prevent exploitation of small producers. It may also promote cooperatives of small tea producers with infrastructure for quality assessment of fresh leaves and good practices by the tea estates to prevent exploitation of small growers.

The inflexibility of the Kerala Land Reforms Act, 1963 to allow livelihood based crop diversification is bothering tea growers. There is a felt need to revisit this Act when tea does not offer an exclusive opportunity for the livelihood, particularly the small producers and the tea plantation workers. Hence, the GoK may consider allowing 5 % of the tea garden area or a maximum of 500 ha, which ever is less in a given plantation, to exclusively promote dairying, fodder grass cultivation, kitchen garden and floriculture with emphasis to use this relaxation for the livelihood of the deprived.

**Coconut:** Coconut occupies 24,343 ha in Idukki district and contributes 1.1 % of the annual agricultural income of the district. Most of the area is in the planes, in Thodupuzha taluk and in Kokkayar Panchayat. Although coconut is not suited to elevations above 500 m, it is being planted at higher elevations, where the yield is very low. The average yield ranges from 20 to 50 nuts/palm during unfavourable and favourable years, respectively. In most part, coconut is severely affected by root (wilt) disease. With decreasing profit from the crop, its area is decreasing with slow take over by the rubber at lower elevations. The crop requires a major intervention for replanting and rejuvenation for yield and income restoration. The severely wilt affected

and senile trees which have lost the economic yield potential have to be replanted with healthy seedling and the poorly managed trees are to well managed to push their yield above the economic threshold. These programmes have to be linked with the ongoing schemes of Special Mission on Coconut administered by the Coconut Development Board. It is desirable that planting material wherever possible may be selected from the region and nursery is raised in participation with trained farmers and SHGs of farmwomen. Similarly, income and employment to farmers and farmwomen may be promoted by supporting value addition activities on coconut, such as virgin oil production and tender coconut marketing, etc. It is important that coconut promotional activities are confined to regions of the district below 500 m altitude.

**Other Crops:** Other crops each occupying smaller area and contributing a very small share to the agricultural income of Idukki district are rice, cocoa, arecanut, ginger, garlic, nutmeg and cashew nut. Rice cultivation is confined to 1215 ha predominantly in the planes of Thodupuzha taluk. Its contribution to the agricultural economy of the district is about 0.3 % and during the last 7 years rice area had declined by 65 %. Major impact of this shrinkage of rice area would be on the milk and meat production programmes of the district.

Cocoa is cultivated in about 4900 ha in the planes and lower elevations of the district, mostly as an intercrop. The area under cocoa and yield over the last 7 years has been growing, which is largely due to favourable prices.

Sugarcane is grown as rain-fed in small area around Marayur at high altitude. Although the official data available on this crop also appears questionable, the reported yield of 8 t cane/ha is far below the economic threshold. The crop is under continuous decline in area and production. Whole harvest is crushed locally to produce jaggery. However, the dismally low cane and juice yield leads to a very high cost of production to jaggery, rendering it less competitive. This has brought serious economic problem to sugarcane farmers. A special effort to introduce locally adapted high yielding varieties with the help of Sugarcane Breeding Institute, Coimbatore, training farmers on modern methods of cultivation and appropriate package of practices to boost the yield at least up to 30-35 t/ha, and processing is important to turn sugarcane cultivation economically viable. Technical assistance of the DoA or the KAU may be ensured for improving cultivation and processing. Marketing Marayur jaggery with proper packaging and labeling through networked outlets like ‘Triveni’ shops may help

in realizing niche prices to farmers. The potential of this jaggery for securing geographical indication may also be examined.

Ginger, a minor spices crop of Idukki is rapidly losing its ground. During last 7 years, ginger area had decreased from 1711 ha to 900 ha with 60% decline in production and 20 % in yield. The high cost of production and low prices have made ginger cultivation unattractive in the district. Things being so, the State Horticulture Mission proposes to invest Rs 1.7 crore for improving ginger production in Idukki is incomprehensible. Such investment without addressing and remedying the causes that had led ginger cultivation uneconomical is imprudent. This fund should have better used in other sectors like vegetables and fruits with better benefit to farmers.

Other minor spices each occupying areas less than 1000 ha in the district are nutmeg, turmeric, cloves, tamarind, garlic and vanilla.

**Animal husbandry:** Idukki has a natural advantage for livestock rearing with favourable agro-climatic conditions and availability of land for grazing and fodder production. Livestock wealth of Idukki contributes significantly to the agricultural economy of the district. The total animal population of the district is 516691, comprising 118374 cattle, 2541 buffaloes 121104 goats, 12765 pigs and 261907 poultry. The share of animal husbandry to the agricultural economy of the district is 10.8 % with 84% contributions from milk, 12 % from meat and 4 % from egg. About 40,000 farm families are reported to cattle rearing for income generation. However, the animal stock has declined since 2003, over all by 25%, cattle by 29%, buffaloes by 42% and poultry by 54% and increase of goat by 43 %. The reasons for this decline should serve as an eye opener to the concerned and an opportunity to address them.

It is reported that the indigenous non-descript (ND) cattle of the district has milk yield of 2.0-2.5 lit/head/day. Hence, more than four decades age, a first cattle improvement programme called the Indo-Swiss Project (ISP) was initiated in Idukki. The vision behind the ISP was to transform Idukki, particularly the Peermedu region, in to a '*milk shed'* of Kerala through cross breeding of local cattle with highly productive exotic breeds like Brown Swiss (BS), Jersey, and Holstein Fraser (HF), which have milk yield above 30 lit/day/head. ISP also aimed at strengthening the fodder resources of the region by introducing and popularizing appropriate fodder grass species. During the course of this project, its management moved from Department of Animal Husbandry (DAH) to newly created Kerala Livestock Development Board (KLDB). Internal

breeding within DAH continued and two more organizations were born. These are Dairy Development Department (DDD) and Kerala Cooperative Milk Marketing Federation (MILMA) with bifurcated mandates.

The ISP delivered a new composite and multipurpose breed called '*Sunandini*' derived from a complex and non-pedigreed introgression of Jersey, HF and American SB on initial cross derivative of local ND cattle and BS possessing 62.5% blood of BS. The claimed gains are first calving of '*Sunandini*' is brought to 31 months, its calving interval reduced to13.6 months and milk yield increased on an average to 7.8 to 11.3 lit/head/day. However, the current average milk yield of cattle in Idukki is about 6.5 lit/head/day. The yield expected under the 'milk shed' vision was far higher. The DDD considers that notwithstanding the '*Sunanadini*', the district is lacking high yielding breeds. Nonetheless inferior semen extracted from '*Sunanadini*' bulls maintained by KLDB and outsourced from farmers is being used for artificial insemination.

A comparison of milk yield and production from cross-bred (CB) cattle in Idukki with that of Trivandrum over 20 years would reveal that ISP did not specially benefit the Idukki in any manner despite its natural advantage to dairying. Trivandrum district outstripped Idukki both in production and yield. More over, while both the districts have almost equal number of CB cattle, ND cattle is far more in Idukki, suggesting that the ISP failed to cross breed many ND cattle in Idukki than in Trivandrum. Thus, on milk production, milk yield and coverage of cross breeding of ND cattle, the ISP project has not succeeded in Idukki. This study team came across many complaints from farmers on the non-availability of fodder during summer months and non-availability of fodder grasses planting material. No database is available on the area cultivated by fodder grass in the district. The district is reported to be 65% deficit in fodder grass. The decline in paddy cultivation also makes paddy straw rare and dear. According to KLDC Annual Report, it had sold 4.33 lakh rooted slips of Hybrid Napier to DDD in 2005-06. But, the Idukki district suffers acute fodder grass shortage. Neither the veterinary research under the Kerala Agricultural University seems to have identified or developed any fodder grass suited to the Idukki region. The half built Veterinary college campus at Kolahalamedu has left abandoned. These developments have major bearing on future efforts to turn Idukki a dairying hub of Kerala.

According to DAH, the important reasons for poor milk production in the district are high cost of production arising from high cost of balanced feed, animal care products and medicines, shortage of good quality fodder, low productivity of animals, and

occurrence of diseases like mastitis. The DDD adds three more reasons, the non-availability of high yielding breeds, difficulties in marketing and low return from dairying. That means over 40 years, the efforts to build a strong foundation to turn Idukki as the milk district did not materialize and need to start again from nothing. Unfortunately the existing promotion policies are not conducive to dairying. There is no quality feed supply at reasonable prices, there is no fair price for the milk, there is no programme to produce enough fodder, and there is no effective health service and support system. When these are facilitated the innovative and hard working farmers of Idukki on their own, would take the district to lead position in milk and meat production. Farmers do not look for subsidies and freebies, they only want an enabling environment, technology service and policy support. With out the latter any subsidy is also not going to change any farther.

Milk price is a major factor hindering dairying. Farmers demonstrated that a liter of mineral water is costlier than a liter of milk they sell. The principal buyer is the DDD. There seems to be a forced nexus between politically determined consumer price and farmer price, which does not take in to consideration the cost of production and income for livelihood of a dairy farmer. Such uneconomic milk price is not neutralized with supply of quality feed and fodder at fair price and easy access to quality medical care of animals. This kind of pricing and promotional policy is central to the dairying debacle in Idukki district, notwithstanding the lack of high milk producing stocks. The recommendations provided herein may help revival of dairying in Idukki, if only the policies constraining dairying are rectified to promote this enterprise either as a specialized or integrated activity. Idukki district with its natural potential for dairying and hard working and innovative farmers offers uncommon opportunity in the State to enhance farmer income from an integration of crop and animal husbandry. While certain regions suited for specific crops may not allow integrated dairying, other regions are suited for dairying and mixed farming.

Important policy interventions required in the district for promoting milk and meat production are; (1) ensuring production cost based price to farmers, (2) establishment of feed production units in private/public sector and ensuring feed at competitive cost, (3) promotion of fodder grass and silage production for round the year supply of quality roughage, (4) supply of value added paddy straw or other roughages from regions where these is available at cost effective price, (5) abolition of institutions in the milk procurement and marketing chain which are blocking fair price to farmers, (6)

establishment of farmers' cooperatives on the Gujarat Cooperative Milk Marketing Federation model, (7) use of locally adapted high performance milk/meat producing breeds with farmer participatory selection for cyclic improvement, (8) regular training, capacity building and extension of services to farmers on animal management, disease control and monitoring and hygienic milk production, and (9) facilitation of insurance of animals.

With the above points in view and based on proposals received from the DAH and DDD following recommendations are made. (1) Enhancement of milk production by promoting scientific feeding of animals in lactation and providing hands on training to farmers on the importance of balanced feeding and systematic healthcare for increasing milk yield and income and on the cost-benefit advantages of better management of high yielding animals in milk. (2) Supporting healthy female calf rearing for shortening their duration to conception, their further genetic upgrading, enhancing their production and achieving higher income generation to tribal and BPL farmers and other small farmers, including plantation workers. (3) Supporting rearing of male calf for promotion of beef production. (4) Management of mastitis for promoting milk yield of should deserve high priority in Idukki in view of the ubiquitous nature of this disease. (5) Introduction of high yielding but locally adapted cows to bring in new genetic variability having enhanced milk production potential for crossing over yield stagnation in dairying. (6) Promotion of goat farming using improved stocks to support small and tribal farmers and plantation workers in economic distress. (7) Promotion of high yielding and quality fodder providing species to ensure adequate availability of green or dry fodder rounds the year. (8) Supporting group insurance of all eligible cattle and buffaloes in milk.

**Agricultural marketing:** The market and prices are important factors contributing to the economic distress of Idukki farmers. The district with its hilly terrain, high ranges, poor communication system and transport infrastructure poses major challenge to marketing agricultural produces, crops and animal. This provides a favourable field for play of middlemen, denial of fair price and wide fluctuations in day-to-day prices. The situation denies bargaining power to farmers and they are forced to make distress sale. There are different marketing systems, depending on the crop and the binding market law or system. For example, cardamom marketing is bound to APMC Act and

milk marketing is largely influenced by government controlled milk cooperatives. There are also farmers' markets being promoted by the Vegetable and Fruit Promotion Council, Keralam (VFPCK) and the Kerala Agricultural Development Society (KADS). The marketing laws provide only a framework but not price safeguard. Certain laws are not farmer friendly. APMC law does not allow farmer to quote a price. It also does not prevent trade cartels. In this context, the recent initiatives from SBI to introduce e-auction and issue identity cards to all cardamom producers are a welcome step. The proposals to establish 'Flavourit Spice Trading Ltd' as a public company for making market intervention when prices fall and a Spices Park for creating new markets for spices and their value added products, when administered in farmer friendly manner are expected to help them. Government-farmer cooperation by establishing a cardamom price stabilization fund trust (CPSFT) may also safeguard farmers in perpetuity from the adverse impact of uneconomic price.

In the case of coffee and tea, there is need to modify this PSFT scheme to make it more small farmer friendly and modify it like the CPSFT mentioned above to make it sensitive to the changing cost of production and economic price limit decided for each crop. The proposal of launching an online platform for spot trading of coffee in collaboration with the National Commodity and Derivatives Exchange Ltd (NCDEX) is viewed with an apprehension that it is a prelude to coffee futures. In the case of tea need for additional auction center outside Kochi and introduction of e-auction is favoured. The need for the TBI to ensure a minimum quality linked price for leaves to prevent exploitation of small producers by tea factories is felt.

Black pepper undergoes considerable price variation on many counts. It is a market controlled totally by middlemen and commission agents. Small farmers lacking processing and grading capacity are exploited to the hilt. There is mechanism in place to protect the price and a huge number of small farmers are put to distress by price fluctuations. Idukki experience provides a lesson on the impact of low prices on crop health and productivity, apart from livelihood of small farmers. There is a need to create a price stabilization system for pepper. The recommended community processing, value addition and warehousing facility is expected to help farmers in realizing better of the available prices.

The 'Farmers' Open Market' being modeled by the KADS and the 'Swasraya Karshaka Market' being devised by the VFPCK are worth promoting by the GoK. The SHM needs to place more resources on marketing and market infrastructure building. Building agricultural market in Idukki requires many other support infrastructures. The government and local bodies have to extend full cooperation and support to these efforts. Training and capacity building of farmers, linking SHGs in processing and value addition, developing market intelligence and networking with major regional markets are components of the farmer friendly market system.

**Conservation farming:** The hilly and mountainous terrain, denuding vegetation, increasing agricultural activities and high rainfall are accelerating soil erosion and landslides. The process is further enhanced by mono-cropping, indiscriminate deforestation, unregulated grazing and lack of proper management of soil and water resources. All these are increasing the fragility of the whole region in ecological and economic sense. More than 80% of the soil in the district is prone to severe erosion hazards. Height of water column in open wells is declining at alarming rate. Increasing scarcity of water, receding water table and intensified digging and deepening of wells together with nuclear family formation are contributing to unsustainable water mining for domestic and agricultural uses. The environmental deterioration caused by loss of vegetation and topsoil and declining water table need to be checked with multiple urgent measures. Soil conservation, re-vegetation and water storage measures at appropriate locations using check dams are imperative. Re-plantation of forest and CHR area with multi-species flora is also part of this scheme.

The Soil Conservation Department (SCD), Government of Kerala had been implementing soil and water conservation measures in Idukki district since 1973. From 1995 to 2007 NABARD had sectioned 44 schemes in the district in 13 tranches. Other supports had come from the Western Ghat Development Scheme (WGDPS) and National Watershed Development Project for Rain fed Areas (NWDPRA). Since 1973, SCD had treated 43,500 ha in the district. According to NABARD, the SCD could spend only 51 % of the Rs 10 crores provided in three tranches during 2002-2007. The SCD has been following a departmental approach for project implementation with out peoples' participation and transparency. As soil conservation is largely community asset building, it is important to associate local Panchayat, farmers and community organizations for project identification and implementation with transparency. Similarly,

involvement of SCD is also important when Panchayats or NGOs using funding from NWDPRA, WGDPS or National Rural Employment Generation Program (NREGP) implement such projects.

This Commission underscores the importance of soil conservation measures in the CHR area and major pepper growing tracts and the need for undertaking this work on contiguous area basis with water shed based approach, participation of local farmers and concerned Panchayats. The work has to be located on priority basis only within mentioned areas classified under 'moderate to severe', 'moderate – rock outcrops' and 'severe – sea rock outcrops' by the Kerala Land Use Board, using Panchayat or Block as the unit and totally excluding the area already treated. The areas dominated by small and tribal farmers may also receive priority. The total recommended area for treatment is 40,000 ha in a project timeframe of 10 years. The DSC may use its internal resources for survey, identification and detailed study of watersheds, conducting PRA exercise and documentation, etc.

The different conservation measures recommended, including check dams are discussed in the report. In the case of roof water harvesting, support is specially provided for tribal, small or BPL farmers and other farmers. A local committee may oversee the project work in each Panchayat. The special funds currently available from NABARD and other projects may be sub vented to the recommended fund.

**Tribal development:** They need special attention for capacity building and training on various agricultural practices, value addition, processing and fair marketing. The tribal households are given prioritized attention in almost all recommendations related to crop and animal husbandry, other development schemes and protection measures against wild animal damage.

**Idukki weather, its change and impact on farm economy:** The Mountains, hills, streams, waterfalls and the large biodiversity together offer an enchanting scenic view in most part of the district. It has a salubrious weather with pleasant maximum and minimum temperatures, round the year. This district receives the highest rainfall (3506 mm) in Kerala. This unique weather of the district, particularly in the high ranges, has made it a major tourist destination in the State and suited to high value plantation and spice crops such as cardamom, pepper and tea and temperate vegetables and fruits. This is the only district of the State with largest forest cover. However, during the course of this study, the Commission came across repeated comments from many

farmers on the changing rainfall and other weather in the district and its impact on important crops. Hence we accessed weather data of variable period available from six locations spread across the district - the Kannandevan Plantations in Munnar (73 years), the UPASI, Vandiperiyar (31 years), Cardamom Research Station, Pampadumpara (50 years), Indian Cardamom Research Institute, Mayiladumpara (21 years), Kerala State Electricity Board, Idukki (27 years) and State Agricultural Farm, Arikkuzha (22 years) and analysed in accordance with the rules of World Meteorological Organization. Parameters analysed are mean, standard deviation, coefficient of variation (CV) and linear trend analysis based on three years moving average of annual mean values. Results from the three principal locations having more than 30 years data were used to draw main conclusions.

The rainfall is found decreasing in all over during the period of study. The 73 years data from Munnar revealed very clear and steep downward trend in the total rainfall. Further analysis of rainfall during South West (SWM) and North East (NEM) Monsoons showed that much of the decrease in total rainfall is accountable to SWM, while change in rainfall during NEM is also variable across locations.

The total number of rainy days (TRD) was found shifting over years in all locations. TRD is found increasing both in Pampadumpara and Vandiperiyar and this shift was not similar during SMW and NEM. While TRD during NEM have increased at Pampadumpara and Vandiperiyar, this was decreasing in Mayiladumpara during SWM.

Available temperature data showed that the maximum and minimum temperatures in all the three major locations were changing. Interestingly, while there was a rise in maximum temperature the minimum temperature was decreasing. The increase more than $2^0$ C in maximum temperature at Pampadumpara during last 29 years is a major change. The rate of decrease in minimum temperature is slightly lower, but very significant.

The above conclusions on the weather of Idukki district over the last 31-73 years from three principal locations and other three locations unambiguously point to the serious dimensions of weather change and associated emerging threats. The declining rainfall, particularly during SWM, and the increasing temperature are bound to have very serious impact on agriculture and its sustainability in Idukki. The increasing maximum temperature and decreasing minimum temperature sent ominous signals on the future

of this beautiful natural abode. More over, these changes will impact seriously on the ecology of the district and surrounding region, which may feed back on further aggravation of the changes. The predictable and unpredictable chain action being triggered by the changing pattern of monsoon and temperature is bound to have cascading effects on the people, their livelihood, biodiversity and everything that makes the district unique, rich and beautiful. It is already being manifested in the declining water table, increasing shortage of water during summer period and frequent incidence of drought like situations.

The ecological implications of population pressure, continuous encroachments and changes made in the land use pattern, including the vast CHR area, have now reached to an irreversible stage. The loss of natural forests and the depletion of CHR forests are substantially contributing to the weather changes being witnessed today. In the mean time, the natural fertility and productivity of the region is declining, soil erosion has increased to unprecedented magnitude, environmental pollution is on the rise, incidences of pests and diseases are increasing, water table is declining, and loss of flora and fauna are happening silently and continuously. The spreading *Eucalyptus* cultivation is extracting the last drop of water from the soil column. The snow balling ecological destruction and weather change being witnessed have potential to threaten depletion and eventual death of the river Periyar.

Unless the root causes of rising adverse weather change are directly addressed on a very systematic master plan for restoration of Idukki ecology and following agricultural practices not endangering or challenging natural forces, the weather change of Idukki may continue unabated with outcome, which is very obvious. Such master plan should regulate all kinds of development plans including further migrations and other manifestations of anthropogenic pressure. Massive reforestation, balanced management of forest and forest canopy in CHR area, water and soil conservation for replenishing declining water table, regulated water mining and banning cultivation of *Eucalyptus* are other important measures to be taken on priority. It should not be forgotten that a good ecology is the primary requisite for sustainable good agriculture and the associated livelihood. It is time to save Idukki and further delay may relapse to an irrecoverable state.

**Package funding and implementation:** A total of Rest 1126 crores excluding the funds required for waiving of loans, which may come close to Rs 600 crore is recommended with a frame work for programme implementation under ‘Idukki Aiswarya Saminthi’ chaired by the Hon’ble Chief Minister of Kerala.

# 7. RECOMMENDATIONS

**Task 1: Common infrastructure and service facility and capacity building**

**1.1. Establishment of a centralized analytical facility:** The district consumes significant amount of agricultural chemicals. Farmers complained that there is considerable spurious trade in the chemical and organic inputs. There is also not adequate soil analysis service facility in the district. Hence there is a long felt need for a central laboratory facility to extend analytical services on the soil, micronutrients, chemical inputs (particularly fungicides and pesticides) and marketed organic inputs. Farmers wanted that this facility be established at Kattappana, which is a central point of the district and also well connected. The local Panchayat or the State Government may provide required land for this institution at convenient location. The three agencies identified to manage this facility are Department of Agriculture, Kerala Agricultural University and Soil Survey Department. Farmers are not enthusiastic about the DoA managing this laboratory, as it is a party to distributing inferior inputs. It is recommended a state of the art analytical facility to cater the needs of farmers of the district may be established at Kattappana and managed by an appropriate public organization to meet the long felt needs of farmers. Its maintenance after first five years may be taken over by the GoK. GoK may also pool up the soil analysis facility available under ICRI, Department of Agriculture, KAU, and KVK and extend the service free of charge to all small holders and tribal farmers for first five years and later at 50% of the cost.

**1.2. Establish and maintain soil health cards for all farm holdings:** Sustainable farming requires continuous maintenance and monitoring of soil health. This demands short interval soil analysis (once in 2-3 years) with medium interval (once in 8-10 years) analysis for micronutrients and application of manures and fertilizers (organic/inorganic) in accordance with the evolving crop-soil dynamics. A permanent record of soil health is very important for improving and monitoring the soil health. Hence establishment of a system of soil health card (SHC is a mini book) is recommended for every farm holding. All soil related data of the farm are to be recorded on real time basis in this card. Each household may be charged a token cost of Rs 5 towards this card. The DoA may coordinate the issue of this card and its

maintenance by the farmers. Support is recommended to establish this facility and required training.

**1.3. Establish 'smart card' to each farm holding:** Smart card offers opportunity for a farmer to avail virtually a 'single window' service. The card with identification and digitalized eligibility information is a very convenient and hassle free system to provide multi-channel support to farmers. Whether it is subsidized input, bank loan, marketing license, what ever be, the information provided in the smart card will help farmer for easy access to these services with out much administrative hassles and harassment. Introduction of smart card requires computerized servicing by all service providers and this may involve cost and time. However, considering the cropping pattern, Idukki district appears to be a region suitable for launching this innovation. Therefore financial assistance to introduce smart card based service to all farmers is recommended.

**1.4. Training and capacity building to farmers and groups:** The different packages recommended here require great deal of training and capacity building to farmers, members of SHGs of farm women including *Kudumbasree, Ayalkkoottom*, etc and those established by the NGOs and other agencies. Activities like production of certified quality planting material of cardamom, pepper, coconut, etc, production of different organic farming inputs with required quality, management of various processing and value addition activities, warehousing facility, healthy maintenance of cattle, its scientific feeding, management of mastitis, etc require excellent capacity building and better understanding of the programme. Some of these trainings are integrated into the concerned schemes, while some others are not. This recommendation pertains to all those training components for which specific funding is not provided in the different packages. These trainings may be conducted under the leadership of concerned implementing agencies. An example to follow is the Mini Self Help Groups being promoted by the Coffee Board of India for raising and supplying quality seedlings of advanced varieties used for vacancy filling in the planters' fields. The different Commodity Boards also should come forward to support and train SHGs under their different programmes.

**Task 2: Strengthening forest cover and ecological security**

**2.1. Discourage and stop Eucalyptus plantation:** Cultivation and spread of Eucalyptus play a very harmful role to the deteriorating ecology of Idukki. There is

great urgency to prevent/ban fresh *Eucalyptus* plantation and its coppice crop and switching over to other environment friendly biomass producing species such as subabul (*Leucaena leucocephala*), bamboo, reeds, canes, etc. Support to meet 50% of the cost of seeds and other planting materials of such eco-friendly species is recommended. It is envisaged to cover 20,000 ha at a cost of Rs 1000/ha. The resources may also be linked with the National Mission on Bamboo.

**2.2. Greening the growing rain shadow region:** An expanding rain shadow region in the north-eastern part of the district near to the Tamil Nadu boundary has potential to cast omnious spell on the weather and environment of the region. Strengthening the tree cover of this region by immediate plantig of the region with suitable mix of tree species in an area of 6,000 ha encompassing the rain shadow region to mitigate its spread is recommended. The cost of generating planting material and undertaking the plantation within three years is provided.

**2.3. Conducting study on the causes and spread of the rain shadow region:** The area where reported rain shadow region exists and said to be enlarging is east of the tall high ranges in the Devikulam taluk where the tallest Anamudi mountains exist. It was not clear during this study whether the cause of rain shadow region and its reported spread is natural or anthopogenic. The report of the spread of the region also needs to be scientifically established along with the rate of spread and causal factors. With this view a detailed study of the region is recommended by experts from KFRI, CWRDM, meteorology department and forest department for scientific unravelling of the fact within two years and to suggest measures for immediate and medium term mitigation. The GoK may follow up the study with effective integrated measures to counter the ecological change, in addition to what is recommended above.

**2.4. Re-foresting the CHR area:** The decreasing forest cover and canopy in CHR forests is a matter of high ecological concern. To ensure sustainable cardamom production, it is important to increase the density of forest with chosen tree species and regulate lopping of tree canopy. Some species are listed in the body of this report. The supervisory role of this has to be vested with the Forest department as Revenue department has no capacity for such regulation. Above all, farmers have to follow a suitable code of conduct on tree density and canopy. The recommendation is to undertake with the participation of farmers in CHR area tree planting using appropriate tree species for restoring optimum tree density and to preserve at least 50 % of tree

canopy. Support is recommended to generate seedlings of chosen species and their free distribution among cardamom gardens with depleted tree density in 15,000 ha. The ongoing programme of the GoK may be integrated with this and action expedited.

**2.5. Undertake tree planting in tea and coffee plantations**: While growing shade trees is a common practice in tea and coffee plantations, many large plantations in the in Peermedu, Udubanchola and Devikulam belt and in Ayyappancovil, Adimaly, Erumeli, Neriyamangalam, Munnar, Devikulam and Mankulam areas are without adequate tree population. Planting and maintaining a desirable tree density using preferred species is important from ecological point of view. Hence, undertaking of required tree plantation in these regions on priority basis is recommended. The GoK may develop a policy in the matter and promote this practice. The DoF may raise the saplings of selected species and distribute free of cost to small farmers (2 ha and below) and at 50% cost to other planters and in no case the cost of sapling may exceed Rest 50/100 sapling.

**2.6. Conduct studies on watershed and soil management within forest areas:** Soil erosion and landslides within forest area have a serious impact on the water retention, conservation of wild biodiversity and forest ecology. Forest department may undertake appropriate studies on mitigative measures. Financial support is recommended for these studies by the Forest department. The department may also take steps to build a few chack dams within the forest areas as indicated elsewhere under the recommendations.

**2.7. Permission to use reservoir water for livelihood of farmers:** Farmers, predominatly tribal farmers, bordering several reservoirs in the district are not able to take a second crop due to non-availability of water while water is plenty in the adjoining reservoirs. The irrigation with little water drawn from these reservoirs will make a huge difference in their income generation capacity and livelihoods. Hence, it is recommended that to promote the livelihood and income of farmers residing and practising agriculture as main livelihood within a band of 1000 m from the banks of all reservoirs may be allowed to draw water from the reservoir exclusively for agricultural purpose by using a pump (not exceeding 5 HP). The government of Kerala is requested to effect required policy change to facilitate this. We further recommend infrastructure support to these farming communities to install irrigation pumps.

**2.8. Erection of solar fencing to protect life and livelihood of tribals in resettlements:** Several tribal resettlements are located in wild animal corridors (eg. Melekkudy and Thazhekkudy of Kundala and settlements in Kanthalloor, Vattavada, etc). The necessity of building about 40-50 km long solar fences to protect such settlements has been recognised by this Commission. It is hence recommended that the above mentioned settlements and other similar ones be protected with solar fencing measuring up to 40-50 km costing Rs one lakh/km.

**2.9. Promotion of pisciculture in reservoirs:** Idukki has several reservoirs and other water bodies. These reservoirs offer great opportunity for inland fishery not only to increase fish production substqantially, but also generate employment and income to local communities including the tribals inhabiting the bordering areas. This has the potential to be a highly profitable venture with cooperation and coordination among departments of Forests, Irrigation, Fishery and KSEB with the involvement of local communities. It is recommended to create such coordination, undertake studies on the existing fish and crab population and crab fattening, examine scope for culture fishing native and introduced high yielding species such as Tilapia and common European carp together with ranching and other catch enhancement methods. Financial support for this research-cum-fish culture programme including ranching of identified fresh water species and acquisition of five small boats for the purpose is recommended. However, this fund should be considered only if there is interdepartmental agreement to use the water body for fishing and such fishing help the economic development of local communities

**2.10. Capacity enhancement of tribal and other communities on use of forest:** The recent legislation on 'The Scheduled Tribe and Other traditional Forest Dwellers (Recognition of forest rights) Act, 2006' enacted by the Government of India recognises and vests the forest rights and occupation in forest land in forest dwelling Scheduled Tribes and other traditional forest dwellers who have been residing for generations in such forests. This act acceedes right of ownership, access to collect, use and dispose of minor forest produce (MFP) which was being traditionally collected. The rights also encompass rights in fish and other products of water bodies, grazing and access to seasonal forest resources. Several tribal hamlets in the district are placed within or bordering the forest and they have to be trained on their rights as conferred by the recent laws and also for sustainable use of forest resources, modern methods of animal rearing, crop production and value addition. This training is

important to make their livelihood and forest sustainable and may include improved techniques of sustainable collection/extraction, processing, storage, and marketting.

**Task 3: Promotion of agri-produce marketing**

**3.1. Market reforms for cardamom:** Make the recently introduced e-auction more beneficial to farmers by facilitating to realize optimal prices with least opportunity for cartelized control of market. Ensure that either by registration or through ID cards all farmers growing cardamom are covered, irrespective of whether it is grown as inter or mono crop. The 'Flavourit Spice Trading Ltd' may be activated for regular entry in the e-auction to safeguard the domestic price line to help farmers.

**3.2. Marketing of black pepper:** Black pepper market is left unregulated and is outside the APMC Act. As long as it stays so, it will be difficult to establish a price stabilization system because a sustainable price stabilization system demands pay off from the government during price fall and reciprocation from farmers during price booms. Such system becomes un-enforceable when the commodity stays out of APMC Act. Kerala being the major producer of black pepper, the State government may examine pros and cons of bringing pepper within the purview of APMC Act and feasibility of establishing a Pepper Price Stabilization Fund (PPSF).

**3.3. Marketing fruits and vegetables:** Idukki district has different replicable models on marketing agricultural produce, particularly fruits and vegetables with minimal exploitation from middlemen. Two agencies came to the attention of this Commission are the State sponsored VFPCK and farmer group initiated KADS. While the efforts being made by the VFPCK are laudable, its impact is minimal, largely due to its fund limitations and consequent incapacity in establishing appropriate market infrastructure. According to the State Horticultural Mission plan for Idukki district available to this Commission, Rs 55 lakhs is found provided to establish 11 markets, 10 of then in Hills. This fund should be allocated to VFPCK together with an additional fund of Rs 5.0 crores from SHM for establishing market yards with good facility on own land. It is important that the government/ Panchayats may make the land available for establishing the markets at points convenient to farmers. Another Rs 18 lakhs provided for one refrigerated van and sorting and grading unit may also be provided to the VFPCK. When this funding of Rs 5.18 crores is allocated to VFPCK from the SHM,

a matching grant of Rs 2. 59 crores is recommended under this package to the VFPCK for agricultural market development in all Panchayats of Idukki district.

**Task 4. Providing road connectivity to strengthen market linkage**

**4.1. Linking remote villages with agricultural markets:** The terrain of the district makes many villages inaccessible, despite the fact that Kerala has overall better rural road connectivity. In road connectivity and in power supply, this district remains backward. Lack of this important communication facility is seriously hampering the agriculturists, many of them tribal, by preventing their access to technology, inputs and agricultural credit. It also seriously hampers their agricultural produce marketing and forces them to get continuously exploited by the middlemen and private moneylenders. Road connectivity is a primary requisite for the communities to claim a share of development programmes being implemented by the State and Central governments. Therefore, creating motorable road connectivity to all remote villages deserves high priority for addressing the economic distress of a section of the farming community isolated in remote areas of the district. The financial assistance recommended is only a token as road building in this region is very costly. This aspect needs to be further and totally attended by the State and Central governments over a period in immediate future. There is also a suggestion to create a rail link between Kochi and Madurai through Munnar to give boost to the Idukki economy including hill tourism. The governments of Kerala and Tamil Nadu may consider this suggestion and approach the Center for an economic viability survey of this proposal.

**Task 5: Conservation farming for sustainable agriculture**

**5.1. Soil conservation measures:** The total recommended area for soil conservation treatment by multiple approaches like stone pitched contour bund together with soil binding bio-bund (including fodder grass), contour trenching, moisture conservation pits, loose boulder and functional check dams (also to serve enhancing irrigation), and need based retaining wall is 40,000 ha under pepper (excluding plane region) and cardamom in a project timeframe of 10 years considering the slow delivery system of DSC. The areas dominated by small and tribal farmers within the indicated region may be given priority. An average rate of Rs 20,000/ ha is recommended. The project work in each Panchayat may be decided and overseen by a local committee consisting two representatives of local Panchayat, two nominees of farmers including one

representative of a local Farmers' Association, and one locally available subject matter expert. The work may be integrated with ongoing projects within the defined region supported by NWDPRA or WGDPS. The National Rural Employment Guarantee Program (NREGP) in each Panchayat may be dovetailed to the conservation work. The special funds currently available from NABARD and other projects may be subvented to the recommended fund.

**5.2.** Support is recommended for 2000 units of roof water harvesting with prescribed upper limit for the support to each household. In the case of tribal, small or BPL farmers, the support is 75% of the cost, which is limited to Rs. 15,000/unit, while for rest of the farmers the support is 50% of the cost and limited to Rs.10, 000/unit. It is important that the household will be using the water for economic activities like kitchen gardening/vegetable cultivation, As mentioned under recommendation above, a local committee consisting of two representatives of local Panchayat, two nominees of farmers including representative of one local Farmers' Association, and one locally available subject matter expert may determine the households for RWH and oversee the work.

**5.3 Water conservation by check dams:** In many areas of the district water shortage is increasing and water table is declining. This together with decreasing rainfall is foretelling serious ecological disaster to the district. Together with soil and water conservation within each water-shed of arable and forest areas, high priority has to be given to recharge water table and to make water available for agricultural activities during summer. Building of several checkdams at selected locations within cultivated and forest aeas fringing agricultural lands is recommended. This may be jointly done by the Departments of Soil Conservation, Agriculture and Forest keeping the ecological interest and interest of agriculture at the foremost. The location of such checkdams may be decided together with the partnering farming community and concerned Panchayats. It will be desirable that management of checkdams is done by a committee headed by farmer representative and comprising of officials of forest, soil conservation and agricultural departments, and Panchayat representatives.

**Task 6: One time special research support on plantation crops**

**6.1. Strengthening research on plantation crops:** GOI has in the past advocated special one-time research grant to important institutions to strengthen research.

Earlier recipients of such grant were PAU, IISc, MPKV, etc. Research on plantation crops managed by commodity boards have been starving for funds and this had over years affected their input to this important sector. An exception is the rubber research under Rubber Board of India. A special grant of Rs 100 crores is recommended to promote research undertaken by rubber, cardamom, tea and coffee research institutions and pepper and other crops research under KAU. The share of funding recommended is Rs 30 crores to RBI in recognition of its excellence in research, Rs 20 crores each to Cardamom, Coffee and Tea Research institutions of respective Boards to strengthen their research and Rs 10 crores to KAU to strengthen its research on pepper, fruits and vegetables and fodder grasses in Idukki district. (see Recommendations 7. 9 to 11 and 8.5).

**Task 7: Relief to the distress of cardamom farmers**

7.1. **Replanting senile gardens:** Productivity of cardamom in the many gardens of small and tribal farmers is very low and this makes their economic situation highly vulnerable to debt trap. Decreased productivity is largely due to senility of garden, their inability to undertake replanting and also due to poor management. Replanting these gardens would improve yield and enhance their income. Therefore, it is recommended to extend financial support for replanting senile and uneconomic gardens owned by small and medium farmers, covering about 40 % of the total area. These small and medium farmers should be cultivating 4 ha or less area and having either legal ownership or legal lease right or possession right during the preceding 10 years. The area estimated for replanting is 2680 ha every year for five years. Funding is to be provided to cover re-planting cost @ Rs 20,000/ha excluding cost of planting material and income compensation to farm family @ Rs 15,000/ha/year for first year of re-planting, with total cost of Rs 35,000/ha. For the purpose of financial support farmers may be grouped in to three. Group I may include tribal, scheduled caste farm families and small farmers classified as BPL. They shall receive 90 % financial support for re-planting. Tribal farmers from all cardamom growing taluks may be included. Group II may comprise small farm families owning two ha or less area but not classified as BPL. They shall receive 50% financial support. Group III may include all other farm families owning holding of the size between above 2 ha and up to 4 ha. They may receive 25 % financial support for the replanting. Every year 1072 ha of Group I farmers, 804 ha each of Group II and Group III farmers may be covered at the recommended norms of financial assistance.

Under the XI Plan Rs 7.5 crore is provided to the ISB. After adjusting this fund, rest of the recommended fund may be given as part of this special package with approval to implement the programme as recommended here.

**7.2. Production and supply of quality planting material:** Lack of supply of quality planting material and the importance of using them for fresh planting is emphasized. The replanting recommended above has to be supported with production and supply of quality planting material of farmer preferred high yielding varieties. To meet this support is recommended for production of adequate quality planting material of approved high yielding varieties of cardamom involving progressive farmers and farmers' SHGs. Estimate of planting material cost for the replanting 2680 ha/year is made @ 1000 planting units/ha and @ Rs 22/planting unit, which includes Rs 2/unit as the nursery charge. Involvement of self help groups and expert farmers trained in quality planting unit production is suggested to generate local employment and income generation. Local bank may be linked to finance the nursery with funds allowed under the financial support. The supply of planting material is provided as part of the package for the replanting (Recommendation 7.1) at Rs 20/unit with 90%, 50 % and 25 % financial assistance eligible to the respective three groups of farmers.

**7.3. Support to farmers in mitigating high cost of production:** Costs on inputs, particularly on the plant protection chemicals, is a major component of the escalating production cost and thereby a critical factor influencing the profitability when the biotic stresses are high and prices are low. During the last few years, the prices of copper sulphate and copper fungicides have increased more than three-folds. This has been contributing to the economic distress arising from the adverse terms of trade in cardamom. In view of this, partial financial assistance to countervail the high price of copper sulphate or copper fungicides is recommended. This is expected to regenerate the cardamom gardens of small farmers, which have become sick and low yielding due to poor plant protection measures. This support is suggested for three years to each selected garden and the programme may run for five years and cover 24,750 ha under cardamom. While implementing, the area selected for replanting on a particular year under Recommendation 7.1 may be excluded. Cost is computed for three groups of farmers as mentioned above in the ratio of 30:40:30 and copper sulphate @10 kg/ha/year and at price of Rs160/kg.

**7.4. Promotion of 'green farming' for sustainable cardamom production:** The environmental impact arising from intensive production using heavy chemical inputs is the major cause making the cardamom production increasingly unsustainable, both in terms of soil fertility and forest canopy. While immediate switch over to organic farming is not an economically viable option, immediate shift to 'green farming' with lesser use of toxic pesticides and increased stress on IPM practices with *Trichoderma*, *Metarrihizium, Psuedomonas*, neem cake and oil, EPN, predators and yellow sticky trap together with decreased use of chemical fertilizers and increased application of vermicompost is recommended for wider adoption. With a view to turn the farmers away from chemical intensive farming to 'green farming' and eventually to organic farming, financial support is recommended to promote 'green farming' in 15,000 ha of cardamom area spread across A and B zones during five years. It is also suggested that all IPM inputs may be produced in the district by involving well-trained local SHGs and innovative farmers. The required technical backstopping, culture supply, supervision and quality certification may be provided by the ICRI, IISR and KAU. Each selected holding belonging to the three groups of farmers mentioned under Recommendation 2.1 in the proportion 2:2:1 may be supported for three years. Under the XI Plan funding for the ISB, an amount of Rs 3 Crore is provided for vermicompost production. This may be integrated into this recommendation and the balance recommended fund provided under this special package with approval to implement the programme as recommended here.

**7.5. Promoting value addition and better price realization:** Many cardamom farmers owning/cultivating in small and medium holdings lack infrastructure and capacity to process and grade the capsules before marketing. This denies them realization of the prevailing market price. In addition, the economic predilection of many of these farmers deprives them capacity to hold the stock until the day of favourable market prices. There is no infrastructure and support system to assist these groups of farmers in value addition and to facilitate short-term storage. Hence, there is need to establish a chain of warehousing facilities along with common facility for value addition and grading cardamom to help the tribal, small and medium size farmers for realizing better income from their harvest. Establishment of seven community cardamom warehousing-cum-value addition units spread across the cardamom growing region of the district is recommended. The location of these units, each having capacity to store 5000 t, is to be chosen by the stakeholder farmers, ISB and Panchayats. The concerned local Panchayats or the government may provide the

required land free of cost. Each of these warehouses may be linked with one nearest bank to extend credit to needy farmers when they deposit the processed produce in the warehouse for holding the stock for better price realization. These units may be eventually linked to the spices park in hub and spokes model. Local SHGs or farmers' associations or cooperatives may be entrusted to manage this facility on sustainable basis as common facility to assist tribal and small/marginal farmers.

An amount of Rs 1.5 crore approved for ISB under XI Plan for improved cardamom curing devices may be integrated into this proposal.

**7.6. Mechanizing cardamom cultivation:** One time assistance for introducing limited mechanization in cardamom cultivation was requested by farmers in view of decreasing labour availability and increasing cost of production on labour head. Although widespread mechanization may be difficult, considering the terrain and forest tree density of the CHR area, limited mechanization for certain operation appears feasible and this may help in minimising cost of production. Hence, introduction of suitable machinery for operations like weeding and pit making on trial basis is recommended with suggestion to train local youths in the operation and maintenance of these machineries. It is important to ensure that the model of machinery chosen is to be suited to the area and does not affect the forest cover. Full financial support to procure 20 pit making machines and 40 weeder units is recommended. These machineries may be distributed across different Panchayats in the CHR area and placed either under the control of SBI or concerned Panchayat or association of cardamom farmers with full freedom for access to them by all farmers on a uniformly applied tariff and other regulations.

**7.7. Establishment of cardamom price stabilization fund (CPSF)**: Source of major distress to farmers is the shocks from high volatility in prices, which often go down and stay below or around the cost of production. To the farmers of CHR area who exclusively depend on cardamom for their income, such price fluctuations affect the fragile economy of small farmers in hard manner, which leads to default in loan repayment and accumulation of debt burden and consequent multi-faceted problems. The National Commission on Farmers' recommended to provide adequate price protection to farmers, particularly when there is fall in the international prices of specific commodity or its import at prices lower than domestic producer prices, through establishing a price stabilization system. Recently the Government of India introduced

a price stabilization fund trust (PSFT) to assist tea, coffee and rubber growers. PSFT is found not popular among farmers. We recommend establishment of cardamom price stabilization fund (CPSF) to provide permanent protection against the extreme price volatility and threats to the livelihood security of cardamom farmers. A 20-year term, zero interest loan of Rs 250 crores is recommended for establishing the CPSF. Details are explained in the body of this report. Also consider establishing a Commodity Price Stabilization Fund for all major plantation and spices crops with initial grant of Rs 1000 crores.

**7.8. Trade benefits to farmers from geographical indication:** Idukki cardamom enjoys historically recognised trade preference and preferential price. Over historical period this cardamom in the trade parlour is being held to have originated from Alleppy and hence gained a reputation as 'Alleppy cardamom'. The initiative to secure a geographical indication for this cardamom under the name 'Alleppy Green' would benefit the traders rather than the Idukki farmers, who have been traditionally producing the reputed quality cardamom. The name 'Alleppy cardamom' represents the cardamom originating from a trade hub, but not the region of production, where the specific agro-ecological factors and method of harvesting and processing contributes to the reputed quality of green cardamom. Alleppy cannot legitimately claim for any processing done over there contributing to the specific reputed quality. The traceability of 'Alleppy cardamom' does not go beyond Alleppy to the production region. Therefore, such GI nomenclature may only benefit the traders, allowing them to blend cardamom of specific trading quality produced from all over the South rather than the cardamom farmers of Idukki, who are indeed the traditional custodians of the reputed green cardamom quality. Hence, it would be appropriate to get the GI title changed to 'Alleppy (Idukki CHR) Green' with produce traceability to Idukki. Such GI title alone would help the cardamom farmers of Idukki to access the economic benefit accruing from this GI.

**7.9. Strengthening research and technology transfer at ICRI:** The ICRI may restore all surrendered posts, create two additional posts on social sciences disciplines, create a new technology transfer unit for effective coordination with development wing, and fill up all vacancies of scientific, technical and administrative posts to gear up its research efforts. It may deploy additional scientific and technical personnel for strengthening research programme on crop improvement, screening of germplasm for yield, quality, biotic and abiotic responses within 5-10 years, crop

management, data analysis and management, large scale multiplication and supply of farmer preferred high yielding varieties. Concurrently, research on high priority is to be strengthened on developing high yielding varieties suited to moderate management and possessing resistance/ tolerance to major diseases and pests, development and farmer participated standardization of cost-effective organic formulations for cardamom, determining and promulgating quality standards of different organic inputs, establishing a permanent organic farming block with few improved varieties at ICRI farm, organizing farmer-participatory evaluation of promising varieties and important agro-techniques and development of labour saving machinery for cardamom production. While the recent revision of salary of scientific and technical staff of ICRI is a step towards attracting and retaining talent, much need to be done to make their remuneration and career advance prospects on par with those of ICAR and SAU. This may be done during the forthcoming Central Pay revision to improve research output and quality.

**7. 10. Strengthening research infrastructure at ICRI:** Subject to the compliance of recommendations in para 7.9, support for strengthening research infrastructure at ICRI is recommended. The infrastructure may include a new laboratory block, strengthening pesticide residue and agri-input quality analysis center, green/glass house for screening germplasm and advanced breeding lines for diseases & pests under artificial epiphytotic conditions and farmers' training hostel with facilities. The ICRI may deposit a set of final database on germplasm with the National Bureau of Plant Genetic Resources, which is the national nodal agency on plant genetic resources. It may evolve and maintain permanent institutional mechanism for periodic interactions between the scientists of ICRI, IISR and CRS and the development staff of SBI and DoA and determining training needs of farmers on sustainable production, ecological issues, value addition and marketing. SBI may make scientific ranks in equivalence with the ICAR system and remuneration and career opportunities in accordance with flexible complementation system (see also Recommendation 6.1).

**7.11. Toning up research with increased institutional autonomy and accountability:** The ICRI and CRS should have its own Research Management Committee. The RMC chaired by the head of the research center shall have members drawn from subject matter experts and research management experts (all from outside the organization) two or three progressive farmers from its mandated region including those recognized for their innovation and two representative of SBI or KAU as the

case may be. The RMC should be vested with authority to determine research priority, advice, guide and evaluate the research out puts and inviting the attention of SBI/KAU authority on the administrative issues hampering research progress.

7.8. Award to innovative farmer for outstanding contribution: An award of Rs 10 lakhs is recommended to Joseph Sebastian, the farmer breeder of 'Njallani Green' variety, which brought through a yield revolution in cardamom. It is estimated that additional annual income to the national exchequer brought by the increased yield due to high yielding varieties, predominantly contributed by the Njallani variety, is to the tune of Rs 150 crores, on an average. We recommend grant of similar awards to all other innovative farmer breeders who have contributed varieties of high yielding varieties of high value crops, on achieving its coverage over 10,000 ha.

**Task 8: Distress relief to the pepper farmers**

**8.1. Promotion of large scale scientific re planting of sick and low-yielding pepper gardens:** Pepper contributes to the income of almost every farmer, particularly the poor. This proposal seeks to bring back much of the sick and low yielding pepper gardens, largely owned by tribal and small farmers, to healthy and productive state to support income and assured livelihood of these farmers. Proposal includes undertaking of re-planting in 15 % of total area, which is 12,500 ha. Replanting has to go along with appropriate soil sanitation to check soil-borne pests and diseases. Out of this proposed area of replanting, 70 % (8750 ha) is reserved to tribal and small farmers with priority to BPL small farmers (Group I) and 30 % (3750 ha) of the area to farmers owning above 2 ha and below 4 ha (Group II). The scheme provides support for initial planting and for its management during three years with stress on soil health restoration. Soil sanitation and manuring will be done with farmyard manure (5 kg/vine), neem cake (500g/vine) and vermicompost treated with *Trichoderma/ Psuedomonas*. Costing is done for production of poly-bagged and certified twin rooted cuttings and its supply @ 1000 sets/ha (Rs 6000/ha), cost of soil amendment and health restoration (Rs 11,000/ha/year) and planting @ Rs 20,000/ha. Financial assistance is provided @ 90 % of total cost for Group I farmers and @ 50 % of total cost for Group II farmers Planting will be done with quality certified rooted cuttings of recommended variety. Nursery is managed locally with support through banks by research institutions, trained SHGs and progressive farmers. A committee chaired by a scientist from a local research institution, an official of DoA and a

representative of local Panchayat may certify the planting material. Planting is to be completed in 5 years. However assistance for manuring of re-planted gardens may continue for two years following the planting, thus taking 7 years for conclusion of the project. Farmers may apply the recommended quantity of farmyard manure on their own.

**8.2. Promotion of organic farming and rejuvenation of pepper gardens:** This is to remedy the widespread decline in the health of pepper gardens and improve their productivity. Continuous neglect of pepper gardens under financial stress, particularly by the resource poor farmers had severely compromised the health and productivity of pepper. This proposal is to cover 25% of the area under pepper in the district, which works out to 21,000 ha. It is pointed out that this area is not included in the re-planting scheme and is classified as 'does not demand replanting during next 10 years'. Like in Recommendation 3.1, 70 % and 30 % of area are reserved for Group I and Group II farmers, respectively. The package includes supply of quality organic inputs such as neem cake @ 1000kg/ha, local production and supply of locally effective strains of *Trichoderma,* vesicular arbiscular mycorhiza (VAM) and *Pseudomonas* and vermicompost. While farmers themselves may arrange and apply farmyard manure at the recommended rate, production of bio-agents is to be organized in the existing government or non-government institutions having capacity for the same and by contracting SHGs together with required training for technical and managerial empowerment and linkage with banking institutions. Training aspect is dealt separately. Financial assistance is @ 90 % to Group I farmers and 50 % to Group II farmers. Costing is done @ Rs 16,000/ha/year for 21,000 ha for three years.

**8.3. Establishment of pepper nursery for certified planting material production:** Implementation of the schemes outlined above demands large-scale production of quality certified planting material of recommended varieties. It is desirable that runners from local mother vines/gardens are selected and used with all precautions to prevent spread of plant and soil borne pathogens/pests. Competent local NGOs and SHGs may be enlisted and trained for production of rooted cuttings in addition to the support of local research institutions for planting material production. The support of latter may be used for training and supply of foundation stock of planting material. A committee chaired by a scientist including an official from DoA and representative of local Panchayat may certify the rooted cuttings produced before its supply.

**8.4. Promotion of value addition and better price realization:** Value addition of pepper and short-term warehousing facility will help small and tribal farmers in realizing better price. At present no facility is accessible to these farmers either for value addition like proper drying, grading or even blanching. Therefore, the proposal is to establish 15-20 community facilities for value addition and warehousing of pepper in major pepper growing regions of Idukki. These are to be distributed in such a manner as to provide one facility for every two nearest Panchayats, which together shall have above 3500 ha under pepper. Each of them may have facility for warehousing 500-1000 t of pepper, drying facility to handle about 500 kg at a time and for grading. Five among them may be provided with extra facility for production of white pepper (through retting process). The facility in each warehouse may also include 10 pepper threshing machines, which may be hired out to needy farmers. Each of these warehouses may be linked to the proposed Spices Park in hub and spoke model. The land for establishment of these facilities at convenient spots may be provided free of cost either by the concerned Panchayat or Municipality or the State government. Like in the case of cardamom warehousing, pepper warehousing may be linked to local banks to extend part of the cost as loan to farmers on warehousing of dried and graded pepper. Each of these units may be managed and maintained by local farmers' cooperatives or association of pepper farmers or SHGs ensuring services to all needy farmers at collectively determined service charge.

**8.5. Strengthening research infrastructure at CRS, Pampadumpara:** CRS, Pampadumpara is required to play an effective lead role in location-specific technology servicing in the Idukki district on all crop sectors, in particular the black pepper. The Center is reported to have 10 sanctioned scientific positions, while only one scientist is in position as of now, who is the head of the Center. As the primary step to enable the Center to discharge its regional responsibilities, the KAU authorities are required to fill up all sanctioned scientific and technical positions immediately, retain this staff and prioritize the research on crops, which significantly influence the livelihoods of local farmers, particularly the small and tribal. The additional support being recommended for strengthening infrastructure and research of this Center may be given only after filling up all vacant scientific and technical positions and prioritizing its research as suggested. The additional fund is provided for strengthening infrastructure and research on following areas: (1) Short listing the most suitable improved pepper varieties, including superior farmers' varieties suited to the district, organizing farmer participatory trial of these varieties and joint identification of superior varieties for each

agro-climatic region of the district, (2) Organizing supply of foundation planting material of selected varieties, training nursery units for production of quality planting material and certification of all planting material distributed to farmers, (3) Developing integrated organic farming protocol for pepper along with integrated pest and disease management, farmer participatory demonstrations of the developed organic farming method and capacity building to farmers on this method, (4) Identification of variants within *Erithrina* sp, or alternate tree species which are tolerant/resistant to the gall wasp and suitable for use as pepper standard, (5) Real time coordination with ICRI, other KAU centres and IISR on all production and value addition technologies developed for major crops of the district, (6) building appropriate infrastructure to meet these research needs, such as poly house, water harvesting structure in the research farm, and capacity building of farmers, SHGs, etc. (see Recommendation 6.1).

**Task 9: Promotion of rubber research**

**9.1. Intensification of rubber research on intractable issues:** Achievements of rubber research stands out as a model for other plantation crops to emulate. Despite major achievement in latex yield and quality enhancement, yield loss due to diseases remains an outstanding issue for research. This is particularly so in the case of tapping panel drying, leaf fall and pink diseases. Special financial support is recommended in appreciation of excellence in research and technology transfer achieved by the RBI and for intensification of research on few important factors constraining realizable yield (see Recommendation 6.1).

**Task 10: Promotion of vegetable and fruit production and income generation**

**10.1. Strengthening support to vegetable and fruit production and income generation to small/tribal farmers:** It is guestimated, with fair reliability, that about 4500 to 5000 ha area in the district is grown with cool season and tropical vegetables. It is the only district having such vast area under cool season vegetables in Kerala. Technical and administrative support for production, processing and marketing of this vegetable is either lacking or very disappointing. The recommendation to provide 80% of the funds required for strengthening infrastructure for production of cool season vegetables and fruits in Vattavada, Kanthalloor and Marayur Panchayats with supply of quality vegetable seeds and planting material of fruit trees (using technology available in KAU and IISR, Bangalore) streamlining input supply including promotion

of organic inputs, arrangement of bank loans with establishment of a bank branch in these Panchayats to support vegetable production, marketing to realize fair price and capacity building of farmers and farm women under State Horticultural Mission. The 20 % of the estimated Rs 1.5 crore is recommended under this package. With identification of suitable improved varieties of all vegetables from local or introduced seeds, farmer participatory approach with capacity building may be followed for regular seed production and supply. Similar promotional work including seed production is to be taken up for the tropical vegetable production in Panchayats having such potential. Keeping farmers' interest to the fore, public and private seed supply systems may also be encouraged.

**10.2. Establishment of cold storage facility to promote fruit and vegetable production:** Support for construction of two modular cold storage facilities with 40 t capacity at Vattavada and 30 t capacity at Kanthalloor for short term storage of vegetables and fruits is recommended to prevent distress sale of fruits and vegetables by farmers. The required land at suitable location may be provided free of cost by the respective Panchayats or GoK. Despite this being a very critical requirement to ensure fair price to the farmers of this backward region, this is found to be not included in the State Horticultural Mission (SHM). The SHM may include this recommendation in its programme and provide 50 % of the cost. Additional 50% is recommended. The VFPCK may be entrusted to provide required technical back up to the local vegetable/fruit farmers and Panchayat for establishing and operating the storage facility and its linkages with market. Similarly, a cold storage built by the DoA in Munnar is being left with out commissioning and using to benefit farmers. The DoA may ensure commissioning of this cold storage within six months at its cost and transfer the functional facility to the VFPCK for operation to benefit fruit and vegetable farmers of the region.

**10.3. Cold storage facility at Thodupuzha under KADS:** A fourth cold storage facility of 40 t capacity is recommended at Thodupuzha for short term storage of fruits and vegetables. This facility may be built and operated by the KADS to benefit the fruit and vegetable farmers of the region.

**10.4. Augmenting irrigation to promote production of cool season vegetables:** The cool season vegetable growing Vattavada-Kanthalloor belt is lying virtually in the rain shadow Devikulam taluk. Due to water shortage cultivation is restricted to one

season with very little area growing two seasons. Crop intensification, improved productivity and assured production would be possible with little investment on irrigation infrastructure. The impact of such investment on the poor tribal people here will be phenomenal. However, most of the watersheds in the Vattavada-Kanthalloor belt either fall within the adjoining forest area or the water has to be carried through the forest area. Hence, support and cooperation of Forest Department is essential to harness water from the streams and run off during monsoon (see section on 'Vegetables and Fruits' in the main body of Report). It is recommended that vegetable and fruit cultivation in this region is assisted by building seven check dams at selected points together with required water conveyance system to deliver water to vegetable and fruit growers of the region. The SHM fund may be made available to provide 50 % grant for buying drip irrigation system for orchards. Maintenance of irrigation system may be done by a joint committee of farmers, Panchayat and Forest Department under the guidance of district Collector. The maintenance cost of the irrigation system may be borne by the minor irrigation department. Full financial assistance for this work is recommended.

**10.5. Promote value addition of vegetables and fruits through the SHGs of farm women:** Cool season fruits and vegetables produced at Vattavada, two at Kanthalloor and tropical vegetables produced in and around Thodupuzha region offers opportunity for value addition and thereby employment and income generation. SHGs of farmwomen could be trained and supported with infrastructure to marketing. This would help farmers to get fair price during normal and glut seasons. Support is recommended for establishing seven such SHGs, one each at Vattavada and Kanthalloor, two at Thodupuzha under KADS and three under VFPCK at other locations, their training, infrastructure, etc.

**10.6. Promotion of vegetable marketing:** The two initiatives for promotion of agricultural produce marketing and in particular fruits and vegetables, by minimizing the role of middlemen are being taken by the KADS and VFPCK. Although the present coverage of these two organizations is small, they deserve to be encouraged to replicate such marketing system in different parts of the district, particularly the inaccessible regions like Vattavada and Kanthalloor. This requires organizing farmers, building their capacity, networking markets, providing production advisories and market intelligence, etc. Equitable financial support to undertake these activities for replication of farmers' markets is recommended to VFPCK, KADS and DoA.

**10.7. Strengthening communication system including roads in Vattavada-Kanthalloor region:** The Vattavada-Kanthalloor region bordering the Tamil Nadu has very poor communication system and other infrastructural facility such as public health, banking, marketing, education, etc. While some of these basic amenities are to be provided by the State government on its own, support is recommended for strengthening road system. Better road may spur up creation of staying facility at this region and open up new opportunity for farm tourism in this picturesque region endowed with pleasant weather during most part of the year. The road will promote economic growth of the region in more than one way.

**10.8. Establishment of a regional cool season vegetable and fruit research center:** To meet the huge technology gap in the cultivation, processing and marketing of the cool season vegetables and fruits in the Vattavada-Kanthalloor belt, establishment of a regional cool season vegetable and fruit research center in this region under the KAU is a felt need. The state government may provide the required –20-30 ha area to establish this Center at a location convenient to the stakeholder farmers. Required financial support to establish this center is recommended under 6.1.

**10.9. Insurance to banana and plantains:** Among the fruits and vegetables grown in Idukki district, banana and plantains are most vulnerable to natural calamities and loss of individual plants/bunch could inflict significant loss to a small farmer. This crop is currently under insurance cover with premium of Rs 2.50 per plant and committed compensation of Rs 50/ bunch. Farmers have a justifiable demand to raise the compensation to at least Rs 100/bunch. Such enhanced compensation may also enhance the premium. However, it is presumed that when more farmers are brought under insurance scheme, the premium may substantially go down. It is recommended that required facilitation to farmers to insure banana and plantains be extended under compensation offer of Rs 100/plant and financial support under this package be provided to meet 50% of the insurance premium for a period of three years and that when this scheme is in place banana/plantain are to be excluded from eligibility for compensation under natural calamity.

**Task 11: Relief to the coffee farmers' distress**

**11.1. Replanting senile coffee gardens:** About 30 % of coffee planted area in the district, coming around 3200 ha is with senile or low yielding plantations which requires replanting for enhancing productivity and income. Sufficient fund has been provided to

the Coffee Board of India for undertaking replanting during the 11th Plan. Devolution of required fund to undertake replanting in Idukki district is recommended. Coffee farmers growing pepper as intercrop may be brought under the different schemes recommended on pepper under this package.

**11.2. Building infrastructure to increase profitability of coffee:** The Coffee Board of India currently offer financial support to small holders to the tune of 20-25% of the total cost on infrastructure related to production enhancement and value addition, such as fixing sprinkler irrigation, installing pulping facility, drying yards, water storage facility, etc. The small and tribal growers are unable to access this assistance as they have to put forth an unaffordable share to install the facility, notwithstanding the fact that sprinkler irrigation, pulping facility, drying yards, water storage facility, etc may substantially help in enhancing their income generating capacity. In view of the financial stress of these farmers in Idukki district, it is recommended that the grant component of the support may be enhanced to 60% of the actual cost or Rs. 50,000/holding, which ever is less. The additional fund over and above the allowed one by the CBI is provided in this package.

**11.3. Warehousing facility for small coffee growers:** Apart from lack of facility to process coffee berries, the small farmers are unable to hold their stock for reasonable time beyond the harvest season to realize better prices. While support to pulping machines and drying yards may strengthen their capacity for processing the harvest, lack of warehousing is preventing them to retain produce beyond harvest period when the prices are low. This apart, most of these farmers are cash starved and need money soon after harvest. Hence, mere warehousing may not be interesting to them unless it is linked with a banking system, which on deposition of the processed produce in the warehouse may pay a part of the estimated price. To facilitate such support to small and tribal coffee farmers, it is recommended to build three coffee warehouses at selected locations in Vandiperiyar, Vazhavana and Adimali with land provided by the local Panchayat or the State government. These warehouses may be linked with a nearest bank and managed by either coffee growers' association or SHGs of coffee farmers on small farmer friendly terms.

**11.4. Promotion of coffee research:**

It is necessary to strengthen research especially to evolve pest and disease resistant high yielding varieties as well as value addition and product diversification. Special

funding is recommended under Recommendation 6.1.

**Task 12: Relief to the distress of tea farmers:**

**12.1. Promotion of replanting the senile and low-yielding plantations:** Tea production is now seriously sick and incapable to make any long-term investments such as factory modernization, undertaking replanting, etc despite the Tea Board of India (TBI) providing 25% subsidy on the replanting cost. Tea industry is in a vicious circle of over aged plantations, low productivity, high cost of production, low price and economic deadlock for replacing old bushes with high yielding plants. Many gardens, particularly the small tea growers (area below 25 ha) are unable to avail the currently offered replanting subsidy because it is so less and the share of 75 % investment they have to make for replanting does not command much economic sense in view of the low price and increasing cost of production. Under these circumstances, resorting to bank loan for replanting by the small growers is highly risky. However, replanting is the only long term solution to increase productivity and safeguard the livelihood of small tea planters. Hence, enhanced subsidy is essential to encourage small planters to undertake replanting. The large planters have an additional problem due to the need for retention of full labour force with full wages and other social benefits as prescribed under Plantations Labour Act, 1951, although the period between replanting and attainment of new bushes to plucking stage does not require the usual labour quota. Hence there is justification in their demand for a *pro rata* subsidy on the wages of additionally retained labour corresponding to the re-planted area. In view of this, it is recommended that the replanting subsidy component may be enhanced to 75 % of the actual replanting cost in the case of small farmers (owning up to 25 ha) and to 50 % for those plantations with area exceeding 20 ha. In addition, for plantations covered under the PLA, actual labour subsidy within permissible limit is recommended. Small farmers may be allowed options to augment their income by crop diversification, dairying, etc.

**12.2. Promotion of quality improvement:** Tea tasters conventionally determine tea quality. The human subjectivity inherent in this method can now be eliminated with the development of E-nose, which is an indigenously innovated tea quality monitoring instrument by the CDAC. This instrument is reported to have capacity to sense all relevant volatile compounds of tea, determining its quality, and reliably predict ‘Tea Taster-like’ scores with better reproducibility. For factory level promotion of tea quality

supply of this instrument at 50 % subsidy is recommended. With such quality evaluation, tea processors should be able to discern the quality of tealeaves supplied by small garden owners and accordingly pay premium prices to such supply and promote quality culture among them.

**12.3. Livelihood options to plantation workers for alternate income generation:** A number of tea gardens still stay closed and in a few more they are not completely paid due to the financial crisis these gardens are undergoing. Dairying and goat rearing could offer opportunities for income generation to the families of these workers. Another opportunity seen by this study is kitchen gardening to improve the family nutrition and income generation. However, both these require availability of at least 5 cents of cultivable land to each family within the estate at locations convenient to them either for growing fodder grass/ trees or maintaining the vegetable garden. This is linked with another proposal in this report to allow at least 5 % of the tea garden area for such purposes including floriculture.

**12.4. Promotion of tea research:** The need for high yielding clones with leaf quality stands unfulfilled. There is long felt need to strengthen research on tea to meet the diverse adaptive needs of growing conditions and to enhance the competitiveness of Indian tea. A special one-time research grant is recommended. (see Recommendation 6.1).

**Task 13: Restoration of coconut cultivation for enhanced income generation**

**13.1. Rejuvenation of sick and very low-yielding palms:** Coconut cultivation is widely practiced by small and tribal farmers in planes and mid-hills of the district and it offers an additional income to many families. However, over years, due to wide spread incidence of root (wilt) disease and continuous neglect, the yield of these palms has significantly declined. Today Idukki and Wayanad districts have the lowest productivity. While one of the reasons contributing to the low productivity in these districts is its cultivation at higher altitudes, the major reasons for the low productivity in the planes and mid-altitudes are the damages by diseases and pests and old age of palms. While the DoA has proposed a huge percentage of palms for replanting, this study recommends replanting of about 20 % of palms in planes and hills excluding palms in gardens above 500 m altitude. Although the area estimated is 5000 ha, the actual coverage will be far larger in this area as only few palms in every hectare may be replanted. The project shall give priority to small and tribal farmers and exclude

farm families owning more than 4 ha area. This replanting should be integrated in to the ongoing programme of replanting being undertaken under Technology Mission on Coconut by the Coconut Development Board in the district. The programme may cover 5000 ha area in the delimited region during five years @ 1000 ha/year. The required planting material, as much as possible, may be sourced from the mother palms identified from disease-affected areas of the region and nursery raised in participation with trained farmers and SHGs of farmwomen. Seed nuts may be introduced from elsewhere only when it is not locally available in adequate number. The financial support include for production and distribution of quality seedlings, compensation for removal of senile/sick palms and cost of re-planting.

**13.2. Support to enhance productivity of low yielding gardens:** Increasing productivity of existing healthy palms is an important requirement to enhance family income of small and tribal farmers. The economic strength of these farmers does not allow annual investment for scientific management of the coconut gardens and this over a period had brought down the productivity in many ways. Recommended application of manure, fertilizers, prophylactic and protective plant protection measures is to be followed for productivity restoration and maintenance of palm health. This programme may be implemented in about 20 % area under coconut (5000 ha) for five years and each selected garden may be provided assistance for two continuous years. The estimated cost is Rs 18,000/ha/year and 80 % of this cost is recommended for two years in 5000 ha. The gardens identified for replanting may be excluded from this programme and it may be integrated with the ongoing productivity enhancement programme being undertaken under Technology Mission on Coconut by the Coconut Development Board in the district.

**13.3. Income generation from value addition of produces from coconut:** Group activity by the SHGs of farm women, agricultural labourers and rural youth for developing value added products like virgin oil, coconut chips, culinary items, coir fiber products, etc and their marketing may add value to the spare time of these women and youth and generate additional income. Marketing tender coconut in and outside the district could be another income generating activity. Support to these activities through banks with interest free working capital, 50 % subsidy for the essential infrastructure (excluding vehicle of any kind) and required training by competent institutions is recommended.

**Task 14: Animal husbandry / diary farming**

**14.1. Ksheera Vardhini scheme:** This is proposed to increase milk yield and production and thereby enhancing the income of dairy farmers. The scheme envisages recruitment of 21500 lactating cows and buffaloes with average yield not below 4 lit/day (on the basis of monthly production and as evidenced from the supply of milk to the milk cooperative collection center). These animals are selected from all across the district by a committee comprising one each official from DAH and DDD and a representative of concerned Panchayat. Only one head of cow or she-buffalo from each farm holding will be brought under this scheme. For the purpose of determining the feed ration supply during two years, these animals are classified into two groups. Animals producing between 4 and 6 lit milk/day are placed in Group I and those producing above 6 lit/day are placed in Group II. During selection of these cattle preference may be given to the animals, which come to lactation from the female calf scheme. Selected animals are fed with production ration during lactation and maintenance ration during dry period, with modification of feed ration depending on the monthly milk delivery. For the purpose of budgeting, it is assumed that recruited animals are equal in both groups. The farmers may procure recommended feed on their own using the feed loan paid through the local bank, which is interest free. The DAH is made responsible for training farmers owning selected cattle, regular supervision of feeding, quality healthcare support and effective implementation. Required funding may be provided to the DAH. After two years of supported feeding, DAH shall also ensure that quality feed is accessible in the market for farmers continuing with scientific feeding (see the feed production scheme recommended herein). The concerned department (DAH/DDD) shall also ensure the animals selected under this project are getting adequate forage (For this the programme may be linked with the forage production scheme recommended in this report).

**14.2. Scheme on female calf rearing:** The justification for this scheme is explained in the main body of this report. The scheme proposes to identify and recruit 18,000 female calves, whose mother cows had, on an average, yielded at least 4 lit milk/day. Six thousand calves of age not exceeding 6 months are to be recruited a year and scientifically fed under good health care for two years, by which time they are expected to cross puberty. These calves are to be inseminated with quality semen of identified breed for genetic upgrading. The health care may include periodic de-worming, prophylactic vaccinations and other health checks. The feed cost on each

calf for two years will be paid as interest free loan to farmers from local banks. The farm families selected for this programme are to be grouped in to two. Group I may include tribal farmers, plantation workers, BPL and small farmers, who will receive 50 % of the calf rearing quota with 75 % financial assistance. Group II will include rest of the farmers owning holding size not exceeding 4 ha. Group II may be allotted the remaining 50 % of calves and may receive 50% financial assistance on feed. Only one calf will be recruited from each a farm holding. All participant farmers are to be given one day training by the DAH on the project, methodologies and the credit arrangement from bank. The DAH shall be responsible for calf selection, total healthcare support, effective project monitoring and certification of calf on its attainment of puberty, artificial insemination and conception. Wherever the calf has not reached puberty within 24 months from date of recruitment or sold before completion of scheme period, owner farmer of such calves will be responsible to pay back the disbursed feed loan principal. It also means the DAH has to take enough care in the selection and monitoring of the calves. When these animals reach lactation they may be inducted under the 'Ksheera Vardhini' scheme. The Calves also be given recommended fodder ration by creating inter-linkage with the recommended fodder production scheme.

**14.3. Scheme on male calf rearing:** This scheme for promotion of good quality beef production and income generation to farmers proposes recruitment of 15000 heifers/he buffaloes of 2-6 month age @ 5000 units every year for three years. The milk yield of their mother animal shall not be a constraint for their selection. Otherwise their selection, feeding, healthcare, training to farmers, etc and conditions on feed cost paid through bank shall be in accordance with the scheme on female calf rearing. At the end of the project farmers are free to sell the animal at market rate.

**14.4. Mastitis management:** Mastitis is highly prevalent in Idukki district and is the single largest cause of productivity decline and inferior milk quality. This scheme is to promote mastitis management with hygienic cattle shed, awareness and training to dairy farmers and to supply them with mastitis kits. Financial assistance is proposed for 10,000 new or renovated cattle sheds at 20 % of cost limited to Rs 6000/structure. Support would also be made available for supply of mastitis kit @ Rs 75/kit for 22000 cows/buffaloes for 2 yrs. The DAH is to be provided fund to organize awareness and training to farmers covered by this scheme.

**14.5. Introduction of high yielding cows and bulls to promote milk production and breed upgrading: T**he Indo-Swiss project on breed upgrading having failed in enhancing milk productivity to an economic threshold level, there is a dire need look

for alternate route to genetic improvement and enhanced milk production. As the existing stocks are not suitable for bringing this change, introduction of locally adapted high yielding breeds with capability to yield in Idukki is necessary to promote commercial milk production. Hence introduction of 1900 cows and 100 bulls of selected high yielding breeds across five years and their distribution across the district to progressive dairy farmers identified with total transparency are recommended. The suggested breeds are Sindhi, Sahiwal and Holstein Freisher. The estimated landing cost of an animal is Rs 35,000. Financial support to the extent of 75% of estimated cost is recommended. The bulls maintained by the DAH may be used for semen production, cross breeding as well as for maintenance of desired breeds. The DAH is to be supported to meet the training cost of these farmers and towards meeting the healthcare needs of these animals and data collection on their performance.

**14.6. Promotion of goat farming for income generation by the poor:** Goat farming is increasingly becoming popular in Idukki due to increasing demand for meat and the suitability of the region for goat husbandry. The proposal is to provide a unit of five goats (one male and four females) of Malabari or Malabari x Boyer derivative or equivalently superior breed known for rapid body weight gain, to each of 12,000 families who are either BPL, small holders, tribal or plantation workers (tea estates in duress). Financial assistance will be 60 % and rest to be provided as interest free loan from local bank, re-payable within two years.

**14.7. Assistance to establishment of cattle feed production unit:** Quality feed supply at reasonable price is important to promote milk production in Idukki district. To facilitate this establishment of one cattle feed production unit, in private or public sector with installed capacity to produce 300-500 t feed/day is recommended. This unit may be located in Thodupuzha or very near in Ernakulam district near railhead. Support is recommended to meet 25% cost of setting up a feed production unit. The State government may provide free land at suggested location to establish the unit and allowing tax relief during the initial 5-7 years.

**14. 8. Promotion of fodder grass and azolla production:** All the above mentioned milk and meat production enhancement and income generation programmes require round the year production and supply of fresh fodder apart from quality feed. Lack of adequate availability of green or dry fodder round the year is already a major constraint limiting milk and meat production in the district. Hence, promotional programmes for production of quality fodder and their silaging deserve priority in the

scheme of things. The components for such scheme may involve identification of appropriate annual and perennial fodder species, azolla raising, production and supply of their quality propagating material at concessional rate (80% cost reduction), promotion of production and capacity building on silaging to meet the demand during summer months. This scheme has to be closely linked with other dairy development programmes indicated. Financial assistance is recommended to meet 80% cost of the planting material (seeds/slips) required for 800 ha every year for 3 years and azolla production (in areas with sufficient water round the year) in 3300 mini units, each of 30 $m^3$ size, during three years. (For more details consult text in the body of the report).

**14.9. Group insurance of Idukki district cattle:** With different schemes promoting animal husbandry under various schemes involving small, marginal and tribal farmers, insurance of these animals assumes importance to safeguard against associated economic risk to these farmers. Hence group insurance is recommended for about 40,000 milch cattle and buffaloes yielding more than 3 lit/day and which have not completed more than five lactations. The assistance estimated at gross rate is Rs 600/ head of cattle. However, in case the premium per head of cattle exceeds this, the pro rata balance contribution may be realized from concerned farmers.

**Task 15: Promotion of sugarcane and silk production**

**15.1. Promotion of Marayur jaggery and Kanthalloor lemon grass oil:** While Marayur jaggery has its own reputation for its quality, it has very low competitiveness due to extremely low productivity of cane. Two major important actions are recommended on sugarcane. First and foremost is improvement in productivity with introduction of suitable high yielding variety(ies) from Sugarcane Breeding Institute, Coimbatore. Identification of one or two most suitable varieties based on 10-20 farmer participatory evaluation trials under the guidance of DoA for two to three years and its popularization will go a long way in redeeming the situation. It is important that the new variety and its package of practices should enhance the yield to at least 35-40t/ha. Second is measures to obtain better jaggery recovery, making jaggery in new attractive moulds suitable for convenient packaging, labeling and marketing through outlets like ‘Maveli’ store networks. Assistance provided is Rs 20 lakhs. In the case of lemon grass oil, which is largely produced by small and tribal farmers, introduction of new varieties from Odakkali Research Center, its farmer participatory evaluation, improving productivity and oil extraction efficiency are recommended. Two community-operated high efficiency extraction units are recommended for improved oil extraction

and quality. These may be established and operated by the cooperatives of lemon grass cultivating farmers. Assistance provided for lemon grass production and oil extraction is Rs 10 lakhs.

**15.2. Support to mulberry silk production activity:** community may be community engaged in the silk cocoon production may be organized in to maximum of 25 groups and each group provided with rearing sheds, required rearing equipments with rotary montage. Five stifling chambers and a cottage basin reeling unit may be provided as common facility. Required financial assistance is recommended.

**Task 16: Immediate relief on farm loan liabilities**

**16.1. Waive off loan liabilities of farmers owning up to 4 ha:** The most important cause contributing to the farmers' distress in the Idukki district is their high indebtedness, which had accumulated beyond their repaying capacity. This had arisen due to the recurring natural calamities of one kind or another and depressed market prices of produces, in particular, during the last six years and high cost involved in the production of most of these produces. The only way to redress this distress and revive the agriculture of these farmers, particularly those with small and medium holdings, is by waiving off the loan liabilities, which they had accumulated in all financial institutions, such as agricultural cooperative banks and scheduled commercial and private banks, as an one time measure. Hence, it is recommended that the principal and interest in the case of crop loans and the whole interest and principal up to Rs 1 lakh in the case of term loans be waived off in the case of all farmers who cultivate up to 10 acres (4 ha) land, which is either owned or leased with or without lease deed. The recommended cut off date for waive off is 31 March 2008.

**16.2. Reward farmers making prompt loan repayment:** This Commission underscores that such waiving off should be extremely rare action and to be resorted to only under extremely distressful situations like in the present case. It is also important to ensure that such an action should not jeopardize the functioning of agricultural credit institutions. Although such loan waive off will be benefiting majority of farmers who are compelled to default the repayments, it is important to ensure that those few farmers who had been making prompt repayment of loan even under extremely distressed state are not demoralized and made to regret for being prompt. Therefore, along with such waive off, the farmers who had been prompt in repayment should be recognized and rewarded. Hence farmers who had been prompt in

repayment of crop loan and interest are recommended for receiving crop loan at a lowest interest of 4%. This reward may be extended to all farmers with holdings of 4 ha or less and had repaid the loan either totally or partially as per the schedule as on 31 December 2007. This concessional interest may be allowed for four years for those who had been repaying the total loan liability and for two years for those who had repaid at least 50% of the due loan. The State government may absorb the cost of disbursing loan at 4 %.

**17. Financial support and programme implementation:** The implementation of programmes recommended here may involve all commodity Boards, various departments of government of Kerala. This calls for greater coordination among agencies responsible for implementation, including financial institutions. To achieve this coordination and monitoring a high powered committee called Idikki Aiswarya Samithi chaired by the Hon'ble Chief Minister of Kerala and represented by the senior most government officials from government of Kerala and Chair persons of the Commodity Committees is recommended. The programmes may be implemented and overseen by Idukki Karma Samithi chaired by the Chief Secretary, GoK. The funding support for all programmes except the loan waive off, which is will be implemented by the GoI, is Rest 1126 crores.

# 8. POLICY INTERVENTIONS

During this study, we came across a number if issues, which are interlinked with the current policies of the government, mostly the State government. Solution to these problems cannot be found without making appropriate amends to the policy. The issues and the policy amends required are discussed below:

**1. Legal entitlement on land in CHR area:** While a large part of the CHR area is either legally owned through *pattayams* or by lease system (see Box 2), farmers in some area do not have any of these records on the land, which they had been possessing and cultivating for several years. These farmers, due to lack of land documents are being deprived access to credit from formal lending institutions and are also excluded from all State and Central government development programmes on agriculture. Thus they are being marginalized and left out. More over, the recent actions on unauthorized occupations and constructions in the district have driven them to great uncertainty and fear. Many of them are small and marginal farmers. The recommendation is either to authorize their land right or issue a certificate on their land possession to enable them availing loans and developmental opportunities flowing in the district.

**2. Supply of power for agricultural produce processing at high rate:** Statistics clearly show that 95 % of farmers in the district are small and marginal and this is the case also with cardamom farmers. Those in CHR area can cultivate nothing other than cardamom. Drying of cardamom and pepper before marketing is an essential post-harvest step and not an industrial processing step. Traditionally farmers are using fuel wood for drying cardamom. A huge majority still uses firewood. Four kg of dried wood is required to dry 1 kg capsule. The current production of 7,900 t of cardamom in Idukki requires 31,600 t of firewood. Annual use of such huge amount of firewood has taken a heavy toll of the CHR forest, driving the ecological state of the area to explosive stage with impact visible in the local climate (see Section on Idukki weather, its change and impact on farm economy and livelihoods). In the long term interest of the region and the State this should be arrested soon and firmly. State has to promote use of electricity instead of fuel wood. Although the district generates more than 60 %

of the power in the State, it is not given a due share of the power in quality and quantity. For some strange reason the Kerala State Electricity Board (KSEB) levies industrial tariff on the power used for drying of cardamom. This study found most of the dryers used by small and medium farmers are operated by motors of 2-5 HP, a capacity much lower than what is normally used in lift irrigation. The high power tariff adds Rs 8 to the cost of production of every kg of cardamom. When high cost of production of Indian cardamom is pushing it out of the international market, the tariff policy of KSEB is only making the things worse. Enough to say the KSEB policy to levy industrial tariff on the power used for drying cardamom or pepper by small and medium farmers or their groups is not only unfair but entails a huge environmental cost by pushing farmers away from power to fire wood. It is unfair to the farmers of a district, which contributes more than 60 % of the power generated in the State. Therefore, in all fairness to the Idukki farmers, in the interest of safeguarding the forestry of the region, which is also important for power generation in the long run, the power tariff on produce processing (cardamom, pepper and coffee) taken up by small and medium farmers or their groups may be levied only at the agricultural tariff level.

**3. Restricted diversification in tea gardens:** Tea gardens, as per the Kerala Land Reforms Act, 1963 are excluded from any crop diversification. The distress in tea gardens is affecting the plantation workers more than the management. This study, on realizing the economic distress of workers in 9 closed tea gardens or in 11 gardens making only partial payment of wages, recognized the need for alternate income generation opportunities for these people to manage a dignified life. Two recommendations made are to involve them in cattle or goat rearing and managing kitchen garden, wherever possible. These activities demand 5-10 cents additional land area under the control of the family, preferably near their settlements. Many of the big tea gardens have unplanted area, part of which could be used for alternate income generation and to neutralise the economic loss being suffered from the tea. With this view, it is recommended that tea plantations with area exceeding 100 ha may be allowed to use 5 % of total area or a maximum of 500 ha, which ever is lowest, to use for animal rearing, vegetable cultivation and floriculture, on condition that each family of workers settled within the plantation area and interested to do animal rearing or vegetable cultivation is provided with a maximum of 10 cents for this purpose. The planters may also be allowed to do either of the mentioned alternate activity with strict compliance to a code of conduct.

**4. Allow water from reservoir for livelihoods:** Many of the tribal resettlements are located on the boundaries of reservoirs in Idukki. They are often sand witched between forest and the reservoir. They are provided with 1-4 acres of land and agriculture is the only major income generation activity to them. Most of these lands are not cultivated more than one season for want of irrigation water. Although water is available in plenty in the neighbourhood reservoir, the regulations do not allow use of this water for agriculture. If only use of this water is allowed, they must have made two to three crops a year instead of one. This will offer them more self-employment, income and better livelihood. This may make a major difference in their life, although the water drawn may be very insignificant. Hence it is recommended that the policy preventing access to reservoir water by the community habitating the border areas of reservoirs may be reviewed and those living or practicing farming within a bandwidth of 1000 m from the reservoirs may be allowed to draw water by using pumps having maximum of 5 HP motor exclusively for their home use and agriculture.

**5. Regulating unsustainable mining of water:** Studies have revealed the water table in many parts of the district, particularly the densely populated and intensively cultivated areas, is declining and the rainfall is decreasing over all. The change to nuclear families also is contributing to intensified water mining by digging more wells and deepening them. The numbers of wells have increased significantly. More and more bore wells are also being established. Well digging at inappropriate locations in the valleys is also disrupting the clay substratum and causing shortage of water for paddy cultivation. There is no policy in place to regulate water mining for domestic, agricultural and industrial uses. The water mining in Idukki has become unsustainable and there is dire need and urgency to put in place a policy/regulation on mining underground water and promoting conservation of run off water and water harvesting systems at household and farm levels.

**6. Promotion of tea planting in the tea and coffee plantations:** It is common to grow shade trees in tea and coffee gardens. However, in many tea and coffee plantations found in the Peermedu, Udubanchola and Devikulam belt as well in Ayyappancovil, Adimaly, Erumeli, Neriyamangalam, Munnar and Mankulam regions there are no adequate tree coverage. Planting appropriate species of trees in the gardens of these regions are important for strengthening the ecological security of the

whole region. Hence, all plantations should be brought under a policy framework to maintain adequate density of trees with annual ecology penalty levied on gardens not complying with this requirement.

**7. Local taxation of tea:** According to UPASI every Rupee spent for producing tea in South India, 46 paise is on cultivation cost, 22 paise is on processing cost, 15 paise is on social cost, 9 paise is on overhead and 8 paise is general cost. In addition to this cost, various states are levying different rates of agricultural tax on tea. For example, this tax is nil in Tamil Nadu, 35 % in Assam and Karnataka and 50% in Kerala. Under the present state of tea production and trade, the tax being levied by the GoK is very repressive and tea trade is pleading for some concession on this tax tariff. GoK is requested to re-examine the issue and revise the tax rate to promote tea trade in the State.

**8. Incentive to feed production:** Production and supply of quality cattle feed at competitive rate is a basic requirement for promoting milk production in the State. Feed production in Kerala is far inadequate to meet the demand and therefore all kinds of feed are supplied to farmers without quality control. Idukki has natural endowment for promoting milk and meat production. Several initiatives costing over Rs 90 crores are recommended in this report. Without availability of quality feed at affordable rate these schemes may not become sustainable. Hence promotion of feed production in private or public sector is a strategic need. The GoK is requested to provide a congenial and helpful policy to promote feed production by providing suitable site for the feed factory and other infrastructure back up including tax holiday to the unit for few initial years. The benefit of this will be much larger to the State in the long term.

**9. Consideration to include pepper trade under the APMC Act:** The distress to farmers from price depression of pepper is very large and widespread. Hence the State government may like to examine the pros and cons of inclusion of pepper marketing under the APMC Act, keeping farmers interest in front. One advantage of APMC Act is that marketing under this may allow price protection under Pepper Price Stabilization Trust Fund in the pattern recommended for cardamom. GoK may also examine whether such arrangement also may also be put in place by alternate institutional framework.

**10. Prevention of Eucalyptus farming in Idukki district:** It is discussed and concluded in this report that large-scale cultivation of *Eucalyptus* is an invitation to faster environmental disaster in idukki and the entire region. Hence, there is urgency to prevent/ban fresh *Eucalyptus* plantation and its coppice crop and switching over to other environment friendly biomass producing species such as subabul, bamboo, reeds, canes, etc together with good harvesting practices depending on the local ecosystem. A policy decision on the matter and its expeditious implementation is in the largesr interest of the district and the whole region.

**11. Import policy on black pepper:** Like in the case of many agricultural commodities the cost of production of pepper in India is one of the highest in comparison with that in Vietnam or Indonesia. Hence, a protective tariff structure is imperative to safeguard the interest of domestic producers. Current applied import tariff of black pepper is 70 %. It is understood import of some quantity is allowed at lower tariff. In any case, even at the existing tariff, considerable pepper from SE Asia is allowed to enter the country for blending and re-export. India pepper has a long reputation for quality and this is being compromised and diluted by the re-export of blended pepper. More than that the import is depressing the domestic price and causing hardship to farmers. Hence the Union Ministry of commerce and industry may consider upward revision of applied tariff to 80 or 90 %, as the case may be, and prevent blending of Indian pepper with imported pepper for re-export. This will help our pepper farmers.

**12. Illegal cardamom trade across porous borders:** Guatemala is a major producer of small and large cardamom and it produces at half the Indian cost of production. Thus, Guatemala is successful in establishing a competitive presence in international trade and virtually pushing out India from international market. Therefore, the only market Indian cardamom currently has is the domestic market. More than 95% of production is marketed within. The current level applied tariff on cardamom is to some extent successful in checking cardamom import. However, considerable Guatemalan cardamom is illegally entering India through its border with Nepal and Bangladesh. This is significantly influencing in depressing domestic prices of cardamom. Hence, the Union government may take appropriate measures to totally prevent illegal entry of cardamom to through these borders.

# 9. COMPOSITE FINANCIAL SUMMARY

**(Rs Crores)**

| Task No | Details of Task | Budget |
|---|---|---|
| **1. Common infrastructure** | **Common infrastructure and service facility and capacity building** | |
| 1.1 | Establishment of new centralized and state of the art analytical facility at Kattappana to extend analytical service to farmers on soil, micronutrients, chemical inputs (particularly fungicides and pesticides), residues and commercially marketed organic inputs. The cost of establishment, equipping and managing for five years is recommended. Cost excludes establishment charges of staff. (see Recommendation 1.1). | **3.00** |
| 1.2 | Establish and maintain soil health cards for all farm holdings of Idukki district within a period of five years on a token cost of Rs.5/ farm holding. Regularly extend services like soil analysis once in two/three years and recommend crop based manurial schedule. (see Recommendation 1.2). | **1.00** |
| 1.3 | Establish 'smart card' to each farm holding to render the cardholder to access all agro-services, such as inputs, loan, other financial and material assistance under development programmes from government and for providing crop-specific identity (eg. Cardamom growers' ID card) to farmers associated with all developmental and financial institutions (see Recommendation 1.3). | **5.00** |
| 1.4 | Training and capacity building of farmers and members of SHGs including Kudumbasree, Ayalkkoottom, etc and those established by the NGOs and other agencies involving them on various developmental activities such as production of certified quality planting material of cardamom, pepper, coconut, etc, production of different inputs for organic farming, management of various processing and value addition activities, warehousing facility, etc. These may be conducted by the concerned implementing agencies. This support excludes those programmes under this package where fund for training is separately provided. ((see Recommendation 1.4). | **0.80** |
| | **Sub Total** | **9.80** |
| **2. Ecological security** | **Strengthening forest cover for ecological security of Idukki and adjoining districts** | |
| 2.1 | Prevent/ban fresh *Eucalyptus* plantation and its coppice crop and change over to other environment friendly biomass producing species such as subabul (*Leucaena leucocephala*), bamboo, reeds, canes, etc. Support to meet 50% of the cost of seeds and other planting | **2.00** |

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| | material of such species is recommended.covering 20,000 ha @ Rs 1000/ha. (see Recommendation 2.1) | |
| 2.2 | Countering the spreading rain shadow region of Idukki by undertaking production of planting material comprising suitable mix of tree species and establishing a green belt in the region covering an area 6,000 ha within three years (see Recommendation 2.2) | **0.95** |
| 2.3 | Undertaking scientific studies on the causes of existence and spread of the the rain shadow region and recommending appropriate practical and cost effective methods for its mitigation, in addition to the greening process recommended by this report. The team may include experts from KFRI, CWRDM and Departments of Meteriology and Forest. | **0.20** |
| 2.4 | Re-foresting the CHR area with chosen tree species to increase the tree density in cardamom gardens to maintain a density at the desirable level. Support is recommended to generate seedlings and their free supply in 15,000 ha in selected gardens of CHR area. Farmers should also follow a code of conduct by restricting tree lopping to retain at least 50 % of the canopy. (see Recommendation 2.4). | **0.50** |
| 2.5 | Promote tree planting in the tea and coffee plantation belt in Peermedu, Udumbanchola and Devikulam taluks and in Ayyappancovil, Adimaly, Erumeli, Munnar, Devikulam, Neriyamangalam and Mankulam areas. Supply of saplings of chosen species free of cost to small farmers (2 ha and below) and at 50% cost to other planters is recommended (see Recommendation 2.5). | **0.15** |
| 2.6 | Support for organising studies on watershed and soil management within forest areas where such studies are urgently required to reverse the erosion, land slide, conservation of biodiversity and environmental degradation. Financial support for check dams is provided under Recommendation 5.3.. | **0.25** |
| 2.7 | GoK to grand approval for using reservoir water by communities farming in the border area within a bandwidth of 1000 m. Support is recommended for installation of pumpsets not exceeding 5 HP, power connection and other irrigation infrastructure. | **0.75** |
| 2.8 | Erection of solar fencing to protect life and livelihoods of tribals in resettlements. Recommended Erection of 40-50 km long solar fencing in different tribal settlement areas such as Kundala (mele and keezhe kudy), Kanthalloor (discontinuous locations), Vattavada, and other tribal colonies, constantly threatened by wild elephants. | **0.50** |
| 2.9 | Promotion of pisci culture in reservoirs- Include establishing interdepartmental coordination on this proposal, conducting studies on the native fish population, assessing potential to culture fishing of selected freshwater species by ranching and other catch enhancement methods. Support is for studies, organising ranching, and acquisition of five small boats for promotion of fish culture in five major reservoirs. (see | **1.40** |

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| | Recommendation 2.9). | |
| 2.10 | Capacity enhancement of tribal communities on use of forest resources and recent legislations on accessing non-timber forest products, etc. (see Recommendation 2.10). | **0.10** |
| | **Sub Total** | **6.80** |
| **3. Marketing** | **Promotion of rural marketing** | |
| 3. 3 | For promoting group marketing of vegetables and fruits and other agricultural commodities and for realizing fair price by farmers, it is proposed to strengthen the initiatives on rural market infrastructure and networking being taken up by the VFPCK in the district. It is recommended that the SHM may allocate Rs 5.18 crores to VFPCK for establishing permanent market yards and other infrastructure. When this is done, a matching grant (50%) is recommended under this package to VFPCK (see Recommendation 3.3). | **2.59[c]** |
| | **Sub Total** | **2.59[c]** |
| **4. Rural roads** | **Creating rural connectivity for better technology and input services and agricultural marketing** | |
| 4.1 | Creating rural road connectivity with remote villages to promote agricultural marketing and improve technology and input servicing .To be undertaken with NREGP and other Bharat Nirman programmes. (see Recommendation 4.1) | **250.00** |
| | **Sub Total** | **250.00** |
| **5.Conservation farming** | **Conservation farming for strengthening sustainable agriculture** | |
| 5.1 | Special financial assistance is recommended to treat 40,000 ha of area under pepper and cardamom for soil conservation by multiple approaches at average rate of Rs 20,000 per ha in a 10 year timeframe. Within the recommended region, the areas dominated by small and tribal farmers may receive priority. (see Recommendation 5.1) | **80.00** |
| 5.2 | Recommendation to establish 2000 units of roof water harvesting with a prescribed upper limit for the support to each household. In the case of tribal, small or BPL farmers, the support is 75% of the cost limited to Rs. 15,000/unit, and it is 50% of the cost limited to Rs.10,000 for rest of the farmers. (see Recommendation 5.2) | **2.50** |
| 5.3 | Water conservation is important to check ecological degradation of the district. Building twenty four check dams at strategic points in hilly regions (in arable and **forest lands**) for promoting water conservation and water use for crop productivity and income generation, with priority on vegetable, pepper and cardamom, is recommended. These are in addition to the seven check | **10.00** |

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| | dams recommended for Vattavada and Kanthalloor under Recommendation 9.4. (see Recommendation 5.3). | |
| | **Sub Total** | **92.50** |
| **6. Research** | **One time special grant to strengthen research on plantation and spices crops** | |
| 6.1 | Supporting major research institutions of the country with one-time research grant is a laudable initiative of GOI and institutions like PAU, IISc, MPKV, and some Universities have received this grant in the past. Research on plantation crops under Commodity Boards has made significant contributions to agricultural and export income of the country. In recognition of this, the GoI has recently agreed to implement the S&T pay package and career advancement policy with flexible complementation to the R&D institutions under these Boards. These research institutions are to be given one time infrastructure strengthening fund to upgrade research capacity to meet the rising challenges from global export competition. Therefore, a special one-time research infrastructure grant of Rs 100 crores is recommended to promote research on rubber, coffee, cardamom, pepper and tea. The Rubber Board of India is rewarded with major share in recognition of its excellence on research. (see Recommendations 6.9 to 11, 7.5 and 5.1). | **100.00** |
| | **Sub Total** | **100.00** |
| **7. Cardamom** | **Addressing distress due to cardamom cultivation** | |
| 7.1. | Extension of financial support for replanting senile and uneconomic gardens, covering 40 % of the total area and owned by small and medium farmers (land title holders, lessees with ancestral lease or at least 10 years cultivation history on same land even without title right) who has 4 ha or below farm area, which is either fully or partly planted with cardamom, @ 2680 ha/year for five years. (see details under Recommendation 2.1). Under XI plan, ISB is provided with Rs 7.5 Crore and this fund may be included in this proposal. (see Recommendation 6.1) | **27.50** |
| 7.2. | Support production of quality planting material of approved high yielding varieties of cardamom involving progrssive farmers and farmers' SHGs to meet the replanting demand mentioned above for five years @ 2.68 lakhs planting unit/year (see details under Recommendation 6.2) | **17.25** |
| 7.3. | Extent financial support to countervail the high price of copper fungicides to regenerate the gardens of small farmers which faced set back in proper management due to the financial crisis of these farmers. The support has to be extended for three years in each farm with the | **10.85** |

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| | programme running for five years in 24,750 ha area under cardamom, excluding the area selected for replanting. (see details under Recommendation 7.3) | |
| 7.4. | Promotion of sustainable cardamom production by shift to 'green farming' following use of with IPM components such as *Trichoderma*, *Metarrihizium, Psuedomonas*, neem cake and oil, EPN, predators and yellow sticky trap in conjunction with vermicompost and decreased intensive use of toxic pesticides with a view to move to organic cardamom production. An amount of Rs 3 crore is provided for vermicompost production under the XI Plan project of ISB may be integrated here. (see Recommendation 7.4) | **27.50** |
| 7.5. | Setting up seven community cardamom warehousing centers, each of 5000 t storage capacity and each with curing and grading facilities. (see Recommendation 2.5) An amount of Rs 1.5 crore approved for ISB under XI Plan for improved cardamom curing devices may be integrated into this proposal. (see Recommendation 7.5) | **3.50** |
| 7.6. | Mechanization of cardamom cultivation with weeding and pit making machines and training youth in operation and maintenance of machinery. (see Recommendation 7.6) | **0.20** |
| 7.7. | A 20-year term, zero interest loan for establishing cardamom price stabilization fund. (see Recommendation 7.7). | **250.00[d]** |
| 7.9. | Award Rs 10 lakhs to Joseph Sebastian, the farmer breeder of 'Njallani Green' variety, which through its increased yield had been contributing, on an average, Rs 12000 crores to the national exchaquer every year since over last 15 years. Grant similar awards to all innovative farmer breeders who have contributed varieties, which individually exceeds 10,000 ha in coverage. (see Recommendation 7.9) | **0.10** |
| | **Sub Total** | **336.90*** |
| **8. Pepper** | **Addressing distress due to pepper cultivation** | |
| 8.1 | Securing stability in the livelihood of small farmers by promoting re-plantation of their sick and low yielding pepper gardens using healthy planting material of improved varieties together with measures to sanitize the soil by bio-control methods. The programme to cover 12,500 ha pepper gardens over a period of five years @ 2500 ha/ year. (see Recommendation 8. 1). | **29.00** |
| 8.2 | Promotion of organic farming to rejuvenate the standing pepper gardens of small and tribal farmers in 21,000 ha (25% of the total area) to increase and stabilize their income by improving productivity of treated gardens. (see Recommendation 8. 2). | **79.00** |
| 8.3 | Establishment of pepper nursery for large scale | |

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| | production and supply of certified planting material as per Recommendation 8. 3. | **3.50** |
| 8.4 | Establishing 15-20 community facilities for pepper value addition and warehousing in major pepper growing regions of Idukki as per Recommendation 8. 4. | **6.60** |
| 8.5 | Strengthening research and infrastructure facility at CRS, Pampadumpara as per Recommendation 8.5. (Also see 6.1) | |
| | **Sub total** | **118.10** |
| **9. Rubber** | **Reward for excellence in rubber research** | |
| 9.1 | In appreciation of excellence in research and technology transfer achieved by the RBI and for intensification of research on few important factors constraining realizable yield, a one time special research grant is recommended (see Recommendation 6.1 and section 9.1 herein) | |
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| **10. Vegetables & fruits** | **Promotion of vegetable and fruit cultivation for income generation of tribal and poor farmers** | |
| 10.1 | Strengthening the infrastructure for production of cool season vegetables and fruits in Vattavada, Kanthalloor and Marayur Panchayats under State Horticultural Mission as per the Recommendation 10.1. 20 % of the estimated cost of Rs. 1.5 crore is recommended under this package. | **0.30** |
| 10.2 | Support construction of two modular cold storage facility of 40 t capacity at Vattavada and 30 t capacity at Kanthalloor for short term storage of vegetables and fruits and commission the cold storage already constructed at Munnar as per Recommendation 10.2. Support recommended is 50 % of cost, with the remaining to be met from SHM fund. | **1.50** |
| 10.3 | Support construction of one modular cold storage facility of 40 t capacity at Thodupuzha under KADS for short term storage of vegetables and fruits as per Recommendation 10.3. | **1.50** |
| 10.4 | Augmenting irrigation to promote production of cool season vegetables in Vattavada-Kanthalloor region by building seven check dams and required irrigation system to deliver water to vegetable and fruit growers with 50 % support to be provided under SHM for drip irrigation (see Recommendations 10.4 and also 5.3). | **3.50** |
| 10.5 | Promote 7 value addition units of vegetables and fruits through the SHGs of farmwomen–one each at Vattavada and Kanthalloor, two at Thodupuzha and three at other locations as per Recommendation 10.5. | **0.70** |
| 10.6 | Promotion of vegetable marketing, organizing and capacity building of farmers, publications, etc by KADS, VFPCK and DoA as per Recommendation 10. 6. | **0.18** |
| 10.7 | Strengthening communication system including roads in | |

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| | Vattavada-Kanthalloor region as per Recommendation 10.7. | **10.00** |
| 10.8 | Establishment of a regional cool season vegetable and fruit research center (see recommendation 6.1) | |
| 10.9 | Support for insurance of banana/plantain with enhanced compensation of Rs 100/plant / as per Recommendation 10. 9. | **0.60** |
| | **Sub Total** | **18.28** |
| **11. Coffee** | **Promotion of income generation to small Coffee growers** | |
| 11.1 | Replanting of senile or low yielding plantations in about 30 % of area, coming around 3200 ha with financial assistance provided under the 11$^{th}$ Plan for this purpose as per Recommendation 11.1. | **0.00** |
| 11.2 | Additional support to build production infrastructure to promote productivity of coffee over and above the grant of 20-25% of the total cost being provided by the Coffee Board of India (see Recommendation 11.2) | **5.00** |
| 11.3 | Establishment of bank linked warehousing facility for small coffee growers as per Recommendation 11.3. | **0.65** |
| 11.4 | Promotion of coffee research and transfer of technology to Idukki farmers (see section 6.1). | |
| | **Sub Total** | **5.65** |
| **12. Tea** | **Addressing the distress of small tea planters and tea plantation workers** | |
| 12.1 | Replanting the senile and low yielding plantations, particularly the small planters (see Recommendation 12.1). | **30.00** |
| 12.2 | Promotion of quality improvement with 50 % cost subsidy on E-nose instrument (see Recommendation 12.2). | **0.50** |
| 12.3 | For promoting the livelihoods of tea plantation workers, particularly those belonging to the gardens under closure or in financial crisis and hence receiving partial wages and other eligible benefits. Alternate income generation, models are suggested especially under Animal husbandry. Financial provision for this is included under respective programmes. (see Recommendation 12.3). | **0.00** |
| 12.4 | Promotion of tea research and transfer of technology to Idukki farmers (see section 6.1). | |
| | **Sub Total** | **30.50** |
| **13. Coconut** | **Enhancing income generation from Coconut** | |
| 13.1 | Rejuvenation of coconut gardens including replanting, wherever necessary, is recommended in areas below an altitude of 500 m from MSL. Replating of aged and low yielding sick palms in about 5000 ha area @ 1000 ha/year for five years is recommended. The financial support for replanting is @ Rs 96,000/ha, which is 80 % of total cost. (see Recommendation 13.1). | **48.00** |
| 13.2 | Support to enhance productivity of low yielding gardens | |

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| | in 5000 ha area in five years for increasing productivity of existing healthy palms (see Recommendation 13.2). | **14.50** |
| 13.3 | Promoting household or self help groups (SHGs) activity for value adding of coconut-based products such as virgin oil and marketing of tender coconut for income generation (see Recommendation 13.3). | **0.80** |
| | **Sub Total** | **63.30** |
| **14. Animal husbandry** | **Promoting animal husbandry for integrated income generation and strengthening organic farming base** | |
| 14.1 | Ksheera Vardhini aims to achieve immediate increase in milk yield and production. Milking cows are selected above a benchmark in productivity, maintained under scientific feeding for three years to optimize milk productivity. Seeks to recruit 21500 milking cows and buffaloes over five years, ensure their healthcare and to provide need-based training to farmers. (see Recommendation 14.1) | **34.00** |
| 14.2 | Support for recruiting 18,000 calves (6000 each year for three years) between 2-6 month age and growing them under scientific feeding with regular healthcare for a period of two years, till they reach puberty and conceive with artificial insemination. Training and health care component are provided to the DAH and the feed cost to be disbursed as interest free loan to selected farmers from local banks. | **17.25** |
| 14.3 | The recommendation is for recruiting 5000 heifers of 2-6 month age every year for three years for promoting production of good quality beef and income generation to farmers and to support the heifers with feed and healthcare as mentioned under the scheme for female calves.. | **12.05** |
| 14.4 | Mastitis management at wider scale is recommended with components like supply of mastitis kits, awareness and training to dairy farmers and support to construct hygienic cattle shed. Financial assistance is recommended for 10,000 new or renovated cattle sheds at 20 % of cost limited to Rs 6000/structure, supply of mastitis kit for 22,000 cows/buffaloes for 2 yrs @ Rs 75/kit and funding DAH to organize awareness and training to farmers. | **6.50** |
| 14.5 | Promotion of commercial dairying through introduction of locally adapted high yielding breeds and to concurrently make breed upgradation of locally available high yielding cattle. The scheme may introduce 1900 cows and 100 bulls of selected high yielding breeds (milk yield between 25-30 lit/day) over five years at estimated landing cost of Rs 35,000/head, in partnership with progressive dairy farmers who may meet 25 % of the cost. Cost of training to farmers, healthcare of these animals and data | **5.50** |

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| | collection on the performance of these animals is recommended to the DAH. (see Recommendation 14.5) | |
| 14.6 | The scheme for promotion of goat farming for income generation offers to provide a unit of improved breed of goats consisting one male and four females to each of the 12,000 families of BPL, small and tribal farmers and tea estate workers in distress with 40 % of cost borne by the recipient farmers, which will be provided as interest free loan from local bank and re-payable within two years. (see Recommendation 14. 6). | **10.95** |
| 14.7 | Assistance to establish one cattle feed production unit in or near Idukki district with an installed capacity of 300-500 t/day. Support is recommended to meet 25% cost setting up a feed production unit as grant under this package and the State government extending free land and tax relief to the unit for the initial 5-7 years. | **0.50** |
| 14.8 | Promotion of forage/fodder grass and fodder tree cultivation in private and public land to meet the demand for green forage or silage and azolla production in areas with round the year water availability are recommended. Financial assistance is to meet 80% cost of the planting material (seeds/slips) to cover 800 ha every year for 3 years and azolla production in 3300 mini units, each of 30 $m^3$ size, during three years is recommended (see Recommendation 14.8) | **2.00** |
| 14.9 | Group insurance for about 40,000 milch cattle and buffaloes yielding more than 3 lit/day and has not completed more than five lactations. The financial assistance estimated at the gross rate is Rs 600/head of cattle with pro rata balance contribution, if any, shared by the concerned farmer. (see Recommendation 14.9). | **2.40** |
| | **Sub Total** | **91. 15** |
| **15. Other issues** | **Reviving sugarcane cultivation and livelihood from silk production** | |
| 15.1 | Support to improved production of Marayur jaggery and lemon grass oil in Kanthalloor Assistance on sugarcane cultivation, training farmers, improved jaggery production and marketing is Rs 20 lakhs. Similarly Rs 10 lakhs is recommended for lemon grass production and extraction. (see Recommendation 15.1). | **0.30** |
| 15.2 | Providing rearing sheds, need-based rearing equipments with rotary montage and stifling chambers (five in number) and a cottage basin reeling unit as common facility for the families organized in to a maximum of 25 groups (see Recommendation 15.2). | **0.10** |
| | **Sub Total** | **0.40** |
| **16. Farm debt** | **Immediate relief to debt burden** | |
| 16.1. | The GoI has already announced its decision to waive off loan liabilities of farmers in all institutional financial | |

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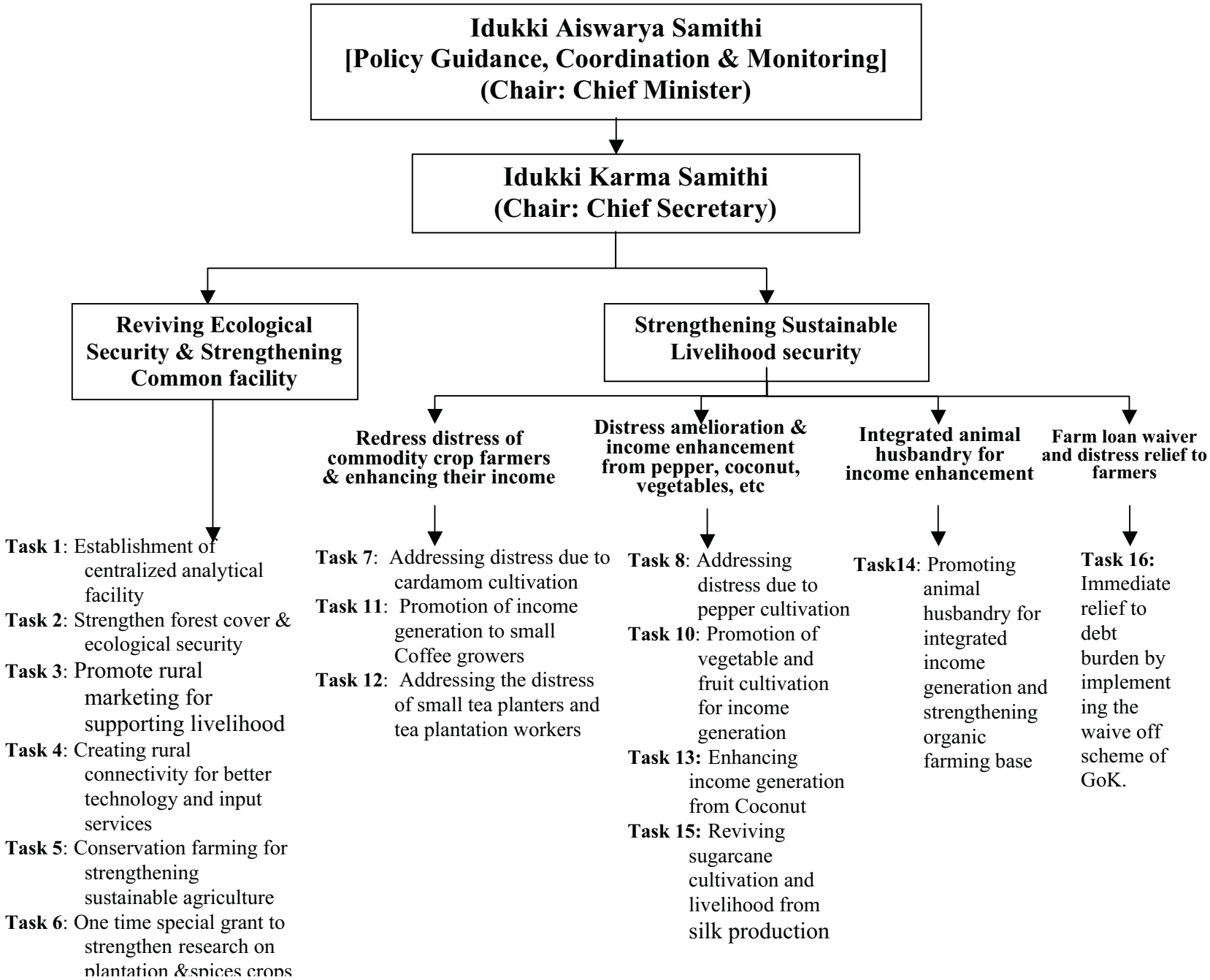
| | systems (cooperative banks and scheduled commercial and private banks) with principal and interests. This is expected to give full relief to 85-90% of farmers and partial relief to remaining farmers of the district. (see Recommendation 16.1). | **600.00[a]** |
| 16.2. | As a reward to farmers who had been prompt in repaying the loan even under period of farm distress in Idukki, extend them crop loan at 4 % interest for four years and two years for those who had totally paid back the loan and those who had paid 50% or more of the loan liability on a decided cut off date, respectively. (see Recommendation 16.2 for details). | **150.00[b]** |
| | **Sub total** | **750.00 [ab]** |
| | **Grand Total** | **1876.00** |
| | **Recommended Provision as per this package** | **1126.00** |

a- Estimated Rs. 600 crores as per GOI loan waiver package (Union Budget-2008-09)
b- The GoK may ensure the recommended interest remission from its resources
c- Conditional funding subject to fund sharing from SHM
d- Funding on long & interest free loan basis.

# 10. FRAMEWORK FOR IMPLEMENTATION

Implementation and monitoring of the recommendations and programmes for mitigation of farm distress and revival of ecological health in Idukki assumes higher importance to ensure that the financial resources are effectively and efficiently utilized to deliver the programmes and infrastructure recommended herein. The compartmentalization of different major crops under different Commodity Boards controlled by the Union Government and equally strong compartmentalized functioning of all concerned departments under the Government of Kerala demands greater coordination and harmonization in effectively translating the programmes into actions to benefit the target communities. Hence a well-coordinated orchestration of all implementing agencies is very essential for Revitalization of Idukki. It is recommended that the implementation set up with statutory back up may have a two-tier administrative structure (see the flow chart on page 82). The **'Idukki Aiswarya Samithi'** (IAS) chaired by the Chief Minister, may provide required policy guidance and monitoring of task implementation. The second tier set up is **'Idukki Karma Samithi'** (IKS) chaired by the Chief Secretary, which may leverage all concerned Commodity Boards and government institutions under single command line for task implementation in right sequence and good coordination. It is desirable to create special purpose vehicle with statutory status for task implementation under the guidance of IAS and IKS. The recommendations are classified under tasks with indicative task-wise budget. The 'IKS' may also include men and women of distinction in public life, representatives of farmers associations, and major media institutions. IAS and IKS shall ensure transparency in the business, accountability and work delivery on time frame without cost over run.


Idukki Aiswarya Samithi
[Policy Guidance, Coordination & Monitoring]
(Chair: Chief Minister)
Idukki Karma Samithi
(Chair: Chief Secretary)
Reviving Ecological Security & Strengthening Common facility
Strengthening Sustainable Livelihood security
Redress distress of commodity crop farmers & enhancing their income
Distress amelioration & income enhancement from pepper, coconut, vegetables, etc
Integrated animal husbandry for income enhancement
Farm loan waiver and distress relief to farmers
Task 1: Establishment of centralized analytical facility
Task 2: Strengthen forest cover & ecological security
Task 3: Promote rural marketing for supporting livelihood
Task 4: Creating rural connectivity for better technology and input services
Task 5: Conservation farming for strengthening sustainable agriculture
Task 6: One time special grant to strengthen research on plantation &spices crops
Task 7: Addressing distress due to cardamom cultivation
Task 11: Promotion of income generation to small Coffee growers
Task 12: Addressing the distress of small tea planters and tea plantation workers
Task 8: Addressing distress due to pepper cultivation
Task 10: Promotion of vegetable and fruit cultivation for income generation
Task 13: Enhancing income generation from Coconut
Task 15: Reviving sugarcane cultivation and livelihood from silk production
Task14: Promoting animal husbandry for integrated income generation and strengthening organic farming base
Task 16: Immediate relief to debt burden by implement ing the waive off scheme of GoK.

# 11

# STRENGTHENING LIVELIHOOD SECURITY

## 11.1. AGRICULTURE

The economy of Idukki is predominantly agricultural. Gross cropped area is 2,98,662 ha. The unique terrain, soil and agro-climatic conditions of the district are most suitable for growing plantation crops. The soils include hill and forest soil possessing loamy texture with variable clay and gravel content between 10% and 50%. With hardly 9 % of area under irrigation, virtually the entire plantation crops such as tea, coffee, rubber, coconut, cardamom, pepper, ginger, etc are grown under rain-fed conditions. Tropical and cool season vegetables, banana and plantains and paddy share the irrigated area. The district is notable for cultivation of largest area under various spices, particularly small cardamom, and contribution of large shares of these produces. For this reason Idukki is called the 'Spices District' of India. Recently, stress also is being given to floriculture, olericulture, medicinal plants, etc., under the 'Horticulture Technology Mission'. The 2,14,363 ha net sown area in the district is shared by about 2,11,174 holdings, small and large. The average holding size is 1.01 ha, which is the highest in the state. According to the statistics available, nearly 95 % of the holdings are marginal and small owning less than 2 ha area, while about 4 % of the holding own 2 to 4 ha land, 1 % of the holding own 4 to10 ha land and 0.3% of the holdings own more than 10 ha (Table 4). The small and marginal farmers constituting 95 % of total holdings share about 60 % of the total cultivated area, while the remaining area is shared by holding categories owning 2 ha and above, including large plantations.

Table 4: Land holding pattern of the Idukki district

| Holding size | Number of holdings | | Area, ha | |
|---|---|---|---|---|
| | Holdings | Percentage | Area | Percentage |
| Up to 1 ha | 169,822 | 80.4 | 41,708 | 34 |
| Between 1 and 1.99 ha | 30,283 | 14.3 | 31,820 | 26 |
| Between 2 and 3.99 ha | 8430 | 4.0 | 49,665 | 40 |
| Between 4 and 9.99 ha | 2094 | 1.0 | NA | |
| Above 10 ha | 545 | 0.3 | NA | |
| Total | 2,11,174 | 100.0 | 1,23,193 | 100 |

Source: Economics & Statistics Department, Government of Kerala

Plantation and spice crops such as cardamom, rubber, pepper, tea and coffee occupy major part of the sown area. Other spice crops cultivated in the district are ginger, turmeric, nutmeg, cloves, vanilla, cumin, garlic, star anise, tamarind and green chilly.

Area and production of important plantation and annual crops during 2005-06 are presented in Table 5.

Animal husbandry, particularly dairying is an important source of income. This is largely practiced in integration with crop husbandry. The district has 2,64,540 animals and 94.5% among them are milch and the rest draught animals. Goat and poultry are also important income generating activities. Plantation workers in tea and coffee estates constitute about 10 % of the population.

Table 5: Statistics on important crops of Idukki district (2005-06)

| Crop | Area (ha) | Production (t) | Productivity | % Area |
|---|---|---|---|---|
| Pepper | 84,219 | 52063 | 618 | 33.2 |
| Rubber | 38,844 | 56330 | 1450 | 15.3 |
| Cardamom | 32,846 | 9076 | 276 | 12.9 |
| Coconut | 24,343 | 90 nuts | 3697 (m. nuts) | 9.6 |
| Tea | 23,702 | 40063 | 1690 | 9.3 |
| Coffee | 10,870 | 6820 | 627 | 4.3 |
| Tapioca | 6,608 | 205293 | 31067 | 2.6 |
| Cocoa | 4,908 | 3051 | 622 | 1.9 |
| Arecanut | 4,009 | 4669 nuts | 1165 (m nuts) | 1.6 |
| Mango | 3,203 | 21524 | 6720 | 1.3 |
| Vegetables | 3,189 | NA | NA | 1.3 |
| Paddy | 2,932 | 7500 | 2558 | 1.2 |
| Banana | 1,828 | 13883 | 7595 | 0.7 |
| Pineapple | 1,626 | 13318 | 8191 | 0.6 |
| Cashew | 1,197 | 746 | 623 | 0.5 |
| Nutmeg | 976 | 251 | 257 | 0.4 |
| Ginger | 900 | 3103 | 3448 | 0.4 |
| Sugarcane | 760 | 5160 | 6789 | 0.3 |
| Turmeric | 381 | 787 | 2066 | 0.2 |
| Cloves | 376 | 24 | 64 | 0.2 |
| Tamarind | 381 | 660 | 1732 | 0.2 |
| Garlic | 5764 | 1105 | 17000 | 2.3 |
| Total | 2,53,862 | | | |

All major crops widely cultivated by all types farm holdings are either of high value, perennial in habit or both. Planting and annual management of these crops involves very high cost. More over as these crops are managed under rain-fed conditions, there are frequent economic set back to farmers due to crop losses arising from weather aberrations and associated biotic factors. Much more distress is caused by high fluctuations in market prices, which often fall below the cost of production. Many of the small farmers lack the economic strength to recover from such set backs because the

economic stake involved is very huge. Two or three consecutive years of unfavourable weather or market prices may inflict irrecoverable economic setback to them. As most of the annual cultivation cost cannot be met without credit from formal or informal sectors, indebtedness is very common among Idukki farmers. This vulnerability is enhanced by certain agro-ecological factors and monoculture of high value crops.

A close examination of the area under important crops during the decade ending 2006-07 shows that among the major crops, area under pepper had increased suddenly by 20 % from in 2004-05 and registered a decadal increase of 46%. Similarly, during this period area under pineapple had increased by 74 %, banana by 46%, and arecanut by 14 %. Important crops whose area had declined during this period are tapioca by 20 %, rice by 14 %, ginger by 51%, garlic by 74%, and sugarcane by 61%.

The estimated annual agricultural revenue generated in the district by major crops and animal husbandry based on 2005-06 production and commodity price is Rs. 1780 crores. This estimate does not include revenue from many minor crops and agricultural by-products. The share of animal husbandry to the total revenue is about 10.8%. During 2005-06, three major crops, namely, rubber, cardamom and pepper contributed 63 % of the farm revenue in the district (Fig. 5). Share of tea and coffee was only 4 %. The relative economic primacy of rubber, pepper and cardamom and their individual share to the total farm economy of the district may periodically change, depending on their pricing. While share of milk production to the farm economy of the district is 9.1 %, its share within the animal husbandry sector is 84 %. The role of egg and meat production to the district economy is very small.

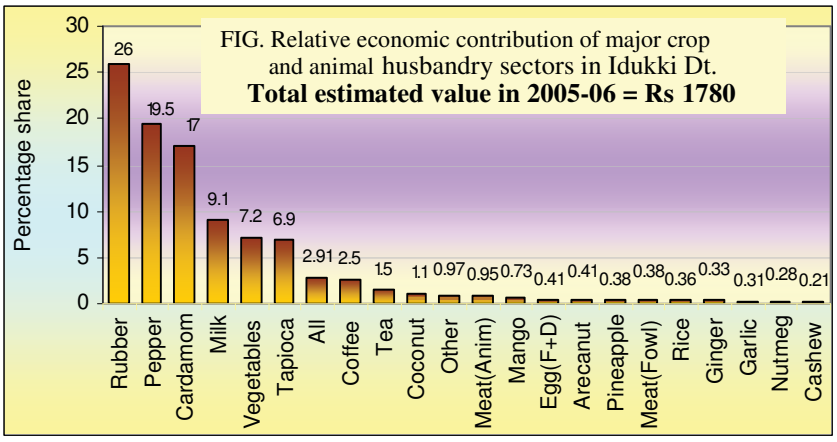



FIG. Relative economic contribution of major crop and animal husbandry sectors in Idukki Dt.
**Total estimated value in 2005-06 = Rs 1780**

### 11.1.1. Causes of farm crisis in Idukki

The current farm crisis in Idukki arises from the convergence of different causes over last few years. Three important reasons we wish to mention here. First, the low and

highly volatile farm gate prices for major commodities like cardamom, pepper, coffee and tea, which are produced at high cost, and consequent escalation in the indebtedness of farmers, particularly those with small and medium holdings, to a level beyond their repaying capacity. Second, the serious set back being caused by the price fall to the management of crop leading to poor crop health and low productivity, particularly pepper and cardamom, which was further compounded by the continuous occurrence of uncommon drought spells during 2002-05 followed by heavy cyclonic rain during 2006-07. Third, ever increasing cost of production, which is disconnected with the produce price, particularly for inputs like fungicides and labour wages. The immediate impact of accumulated debt was non-availability of further credit for the regular management of the crop and resulting decline in crop health and yield. The cascading consequences of these causes over the last few years virtually denied adequate income from agriculture to the farm families, sapped their strength to repay the overdue credit liabilities, and debilitated future income potential from poorly managed plantation crops, while the loan liability was accumulating with the threat of legal recovery proceedings and eventual loss of the only source of family livelihood, the farm land.

Farming in Idukki has another unique problem adding to the farmers' distress. Some of the farmers, particularly the cardamom growers, have no legal right on the land they and their predecessors were cultivating for years. Lack of such legal right either as ownership or lease right over the land had been denying them institutional credit and benefit from various governmental programmes. It was also discouraging investment on soil conservation and improvement with resultant deterioration of this productive asset. Non-access to institutional credit is also driving these farmers to moneylenders and paying higher interest to move faster into debt trap. What ever be the market price, marketing agricultural produces for that price is a very difficult problem for many farmers due the unfriendly terrain, poor communication facility, particularly the rural roads, and the exploitation by the middlemen.

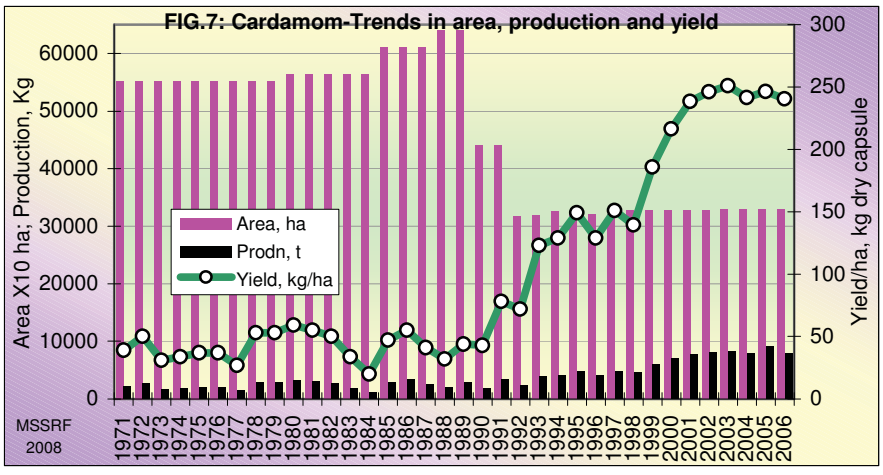
At the bottom of the crisis is the price fall below the economic threshold and the absence of a safety net to compensate the farmer at the threshold price. This adverse situation with price decline in almost all major crops over the years has been creating spiraling indebtedness of farmers, particularly the small and marginal, and associated distress leading to many suicides. According to the official estimate of the District Collectorate, there were 103 suicides during 2001 to 2007, for which year-wise data

was not available. However, the District Cooperative Bank, Idukki reported year wise farm suicide data from 1998 to 2007, which counted to 473 suicides. This is discussed later.

## 11.1.2. CARDAMOM

The cardamom grown in Idukki falls under the category "small cardamom", *Elettaria cardamom,* which is a crop native to the region where this species along with related species were growing in wild state. The region within Idukki district, where cardamom was growing in wild state and found ideal for its cultivation is called Cardamom Hill Reserve (CHR) forest. The CHR forest, according to governmental proclamation made in 1897 is spread across hills with altitude between 600 and 1200 m above MSL in the present day Devikulam, Udumbanchola and Peerumedu taluks (Box 1). The area, according to historical records, is believed to have 344 sq miles (87,335 ha). However, over a period of time, due to different reasons, the cultivation of cardamom had shrunk to the present 33,000 ha (Fig. 7). The status of CHR forest and its area is currently under litigation at the Supreme Court of India (Box 2).


FIG. 7

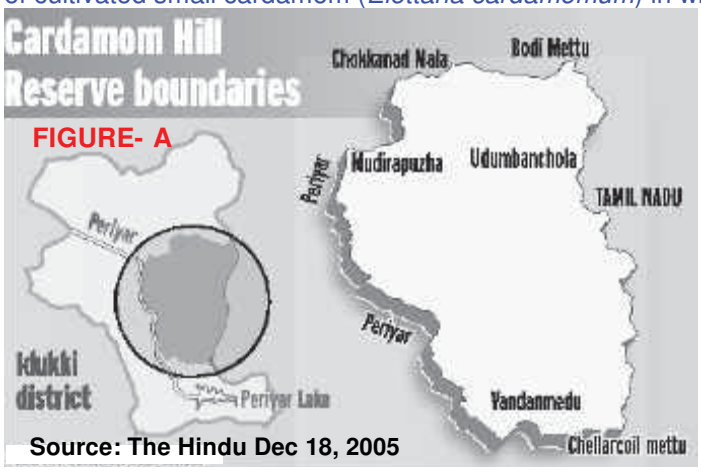



The CHR forest is known for ideal agro-ecology for cardamom cultivation with evergreen forest cover and well distributed high rainfall. Cardamom is very sensitive to moisture and light stresses and requires cool and shady evergreen forest environment for better performance. Some

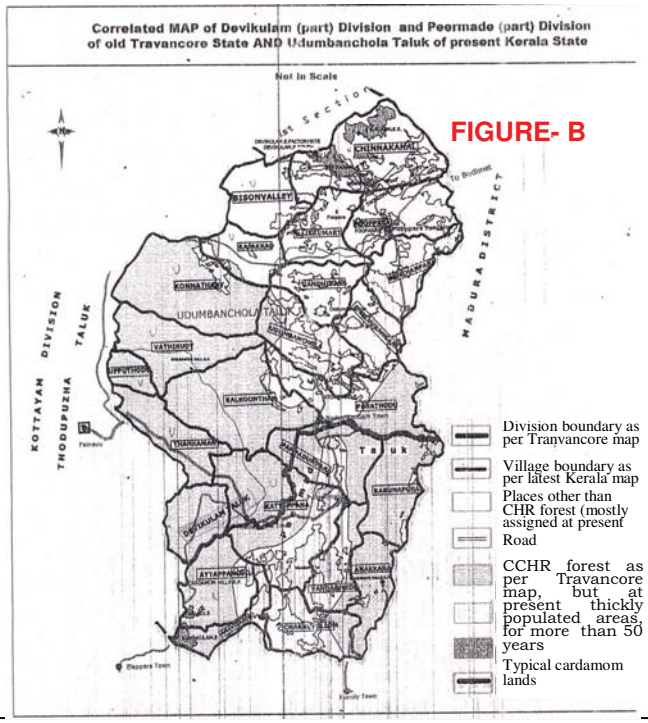
parts of the CHR forest offer highest average cardamom yield. Conservation of forest cover is important for sustained cultivation and yield of cardamom. Keeping the sustainability of cardamom cultivation in mind, the erstwhile

**BOX 1 Cardamom Hill Reserve (CHR) area**

Cardamom Hill Reserve (CHR) is part of the Idukki evergreen forest known for the natural occurrence of cultivated small cardamom (*Elettaria cardamomum*) in wild sate. Harvest of cardamom from wild state was a source of income to the erstwhile kingdom of Travancore. For enhancing this income, a royal proclamation was made on 24 August 1897 by the Kingdom of Travancore for concurrent increase of cardamom production and protection of the CHR forest along with the cardamom diversity. This proclamation indicated the area of CHR forest as 15,720 acres (6364 ha). It also clearly defined the four boundaries of CHR area as follows: "North - from Bodimettoo, along the path to Thondi Malai thence a line drawn to Kummikal, Kuppukard, Vellakal Malai and Chokanad Malai; West- Chokonad Malai to junction of Muthirapuzha with the Periyanur River, following up the Periyanur River to Ponmudi Malai; East-the British Frontier from Chellakoilmettoo to Bodimettoo and South - from Ponmudi Malai to Cotta Malai drawn so as to include all the cardamom gardens in the Wundenmettoo Range thence to Chellacoilmettoo on the British Frontier" (see **Figure A**). Subsequent surveys revealed the area within these boundaries is 334 square miles (87,335 ha or 2,15,721 acres). This was also acknowledged in subsequent government documents like the Travancore Forest Manuals of 1917 and 1947 and an executive order of the Government of Kerala in 1958. However, an official view now being taken reverts back to 6364 ha and that it is not reserve forest area, but Revenue *poramboke* land. The official map of CHR area provided by the Revenue administration of Idukki district is presented in **Fig. B**. As per the National Forest Policy, 1988 mountainous regions need at least 66 % forest cover and the plains, 20 %. The environmental cost of one ha of forestland is estimated to be a huge Rs.1.3 crores




Source: The Hindu Dec 18, 2005




Travancore government framed special rules in 1935 for leasing out the CHR forest area. These rules prescribed that nothing except cardamom should be grown on the leased land and that the tree canopy should be maintained, failing which, the land would revert to the Government. However, over last many years the state of the play has substantially changed. In some cardamom growing areas, it is intercropped with

pepper, coffee and/or cocoa. Today there are about 25,000 cardamom farmers with small, medium and large holdings. This region accounts for about 70 % cardamom production in the country.

During the last 50 years, cardamom cultivation was progressively intensified from a state of harvest from wild to marginal management of the crop. Farmers gained enormous skill in selecting and creating superior varieties from the locally available germplasm. Although cardamom research was started in 1956, none of the research-released varieties is popular among Idukki farmers. There is considerable variation within the cardamom germplasm, which farmers skillfully use to develop superior varieties. The Indian Cardamom Research Institute (ICRI) in Myladumpara has 800 germplasm accessions. The variation within cardamom is categorised in to three types mainly on panicle nature. These are the 'Malabar' type with prostrate panicle, 'Vazhukka' type with semi-erect panicle and 'Mysore' type with erect panicle. Malabar and Vazhukka types are popular in Idukki.

**BOX- 2:Cardamom cultivation in CHR forest**

Following the proclamation of the CHR forest for promotion of cardamom cultivation, the Travancore government in 1935 framed the Cardamom Rules for leasing out the CHR area for cardamom cultivation. These rules insisted that nothing except cardamom should be grown on the leased land and that the tree canopy should be maintained, failing which, the land would revert to the Government. Conservation of soil and forest overgrowth are important. The CHR area was assigned for cardamom cultivation to private persons including tribal people on registry and on lease. The assignment of reserve forest on registry for cardamom cultivation was discontinued in 1942 and the assignment on lease continued. Over the period several governmental interventions had happened on lease renewal, rehabilitation of migrants and grant of land titles. Considerable encroachments also had happened in the area over the years. It is reported that the forest area in the CHR has reduced to 25 % of what existed 50 years ago. However, this region today accounts for about 70 % small cardamom production in the country.

According to one assessment, out of the 87,000 ha, about 10,000 ha are on lease to plantation owners; 8,000 ha are under old Cardamom *pattayams* (*chembu pattayam*) and Land Assignment pattayams (*kuthakappattam*); and about 1,300 hectares fall in the Mathikettan National Park. About 20,363 ha encroached in this area prior to 1977 was regularized in 1993 with the approval from the Union Ministry of Environment and Forests. The Cardamom Lease Rules were re-framed in 1960 under the Kerala Land Assignment Act. The Cardamom *pattayams* and Land Assignment *pattayams* confer absolute right for growing cardamom over the areas in their possession. The *kuthakappattam* is now fixed at Rs.5,000/ha for 20 years. Since last few years, the lease is not being renewed although the lessees continue to cultivate the land. Lack of lease or title documents is causing a number of problems to farmers.

The administration of CHR area over years had been shifting between Forest Department and Revenue Department, often with duel control. At present, the whole CHR area, except the Mathikettan shola national park and a few small stretches elsewhere under the control of Forest Department, is under the Revenue Department. These interdepartmental shifts had promoted encroachments, large-scale destruction of trees and land conversion. These are resulting in altered rainfall pattern (see section of Idukki weather) increased flash floods and landslides in Idukki and heavy siltation in the Idukki dam.

On the basis of soil productivity and other favourable factors governing cardamom yield, the CHR area is divided into three zones, A, B and C. Zone A falling partly within the Peerumedu and Udumbanchola taluks constituting approximately 34 % of cardamom area in the district has highest productivity (Table 6). Largest area (nearly 43 %) falls under Zone B in Udumbanchola taluk, Yields in the larger part of the area is close to that of zone A and it is lower in areas adjoining Zone C. Zones A and B are the most fertile evergreen forest patch most suitable for cardamom. With the loss of forest in substantial area under zone B, crop diversification had been done. Area under zone C is notable for low forest cover and low yield. Small farmers who exclusively depend on cardamom face more economic stress in this region.

Table 6: Zonation of CHR area in Idukki district

| Zone | Villages falling under the zone* | Approx. area as % of total and average zonal yield |
|---|---|---|
| A | Peerumedu Taluk excluding Kokkayar and Peruvanthanam villages; Chakkupallam, Ayyappankovil and Vandanmedu villages of Udumbanchola taluk; | Area: 34%<br>Yield: 450/ha |
| B | Chathurangapara, Rajakkad, Santhanpara, Pampadumpara, Parathodu, and Udumbanchola villages of Udumbanchola taluk; | Area: 43%<br>Yield: 300/ha |
| C | Rest of the cardamom growing area in Idukki | Area: 23%<br>Yield: 200/ha |

* Based on Economics of cardamom cultivation of small growers, Report of Administrative Staff College of India, Hyderabad, 1988.

**Research**

There are three major research institutions having research mandate on cardamom and two on pepper. These are the Indian Cardamom Research Institute (ICRI), Myladumpara under the Indian Spices Board (the Union Ministry of Commerce and Industry), the Indian Institute of Spices Research (IISR) under the Indian Council of Agricultural Research, and the Cardamom Research Station (CRS), Pampadumpara under the Kerala Agricultural University. Among these, CRS was established in 1956 and IISR in 1976 and ICRI in 1978. On an overall assessment, this study considers that the research contributions of these institutions over the years in enhancing productivity of two economically most important crops, cardamom and pepper, and income to the farmers of the district are disappointing.

Three major factors, which have contributed to the cardamom productivity, are improved variety, mother plant selection and rapid clonal propagation and agro-techniques for production optimization. The role of all the three institutions in

developing acceptable variety and assisting farmers with propagating material is marginal. While IISR could not identify any variety suited to the region, two varieties each were identified from germplasm and released for Idukki region by CRS and ICRI. CRS varieties are PV 1 and PV 2, and ICRI varieties are ICRI- 1, ICRI 2 and ICRI 6. Fourth variety, ICRI 5 was derived from hybridization. None of these varieties could gain acceptance among farmers. A most favourable estimate would put the coverage of research institution bred varieties only in 2-3 % of the total area. According to ICRI, three hybrids, MHC-IO, MHC-13 and MHC-18 with yielding ability of one ton/ha are in the pipeline.

While research institutions were failing, the farmers have come out with number of good varieties. Some of the popular and recent varieties selected by farmers are 'Vander cardamom', 'PNS Vaigai', 'Panikkulangara' series 1 and 2, 'Elarani' series 1 to 3, 'Kalarikkal white', 'Valley green gold', 'Palakkudi', 'Njallani', Pulikkal Elam, Ayamkudy, Sivanivas series 1 and 2, Chruparambil, and Akshaya. Out of these farmers' varieties, 'Njallani' variety developed by Shri. Sebastin Joseph has become highly popular and its coverage is estimated to be around 70% of the area (Box 3). Another innovative cardamom farmer, Shri. Kalarickal K.J.Baby, author of 'Kalarikkal white' and recipient of the National Innovation Foundation recognition, disclosed to this Commission that he has developed a new variety called 'Kalarickal Extra Bold', which has capsule size of 8 mm and yield potential of 2.7 t/ha. More than 95 % of area is covered by different farmers' varieties. Notwithstanding this, the contributions of research institutions in developing farmer variety-specific recommendations including optimal package of practices and assessment of these varieties for disease and pest vulnerabilities are limited. All these have placed these research institutions at low esteem among cardamom farmers.

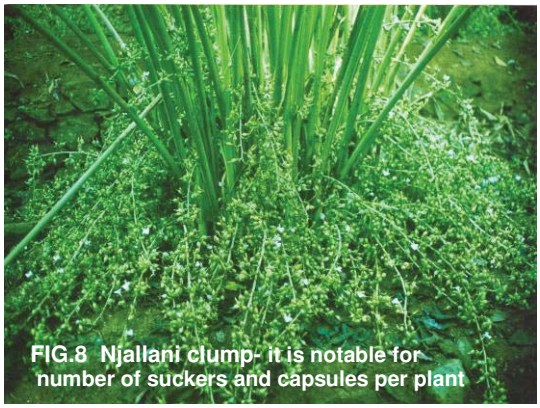


FIG.8 Njallani clump- it is notable for number of suckers and capsules per plant

**'Njallani'- a wonder variety:** 'Njallani' is reported to have been identified in 1986 (Box 3). It started spreading locally by clonal propagation rather slowly during early stages and rapidly later. Currently this is the ruling variety in Idukki. While the earlier varieties were yielding 200-300kg/ha, 'Njallani' yields 600-800kg/ha with proven potential yield of 1900kg/ha (Fig.8). This variety has excellent response to fertilizers and other yield promoting management practices. Prior

to the 1990s the average yield of cardamom in Idukki was less than 100 kg/ha (Fig 7). During the next three years, it rose close to 110 kg/ha at an annual growth rate of 2.7 %. The annual growth rate of yield during the next five years rose at 8% and at 11.7%

**Box 3: 'Njallani'- A celebration of farmer breeder**

**Mr. Sebastian Joseph is a small farmer with formal schooling up to fourth standard. He with the help of his son Rejimon, who had studied up to Plus Two, developed a new cardamom variety called 'Njallani'. 'Njallani' revolutionised the small cardamom cultivation in India, particularly in Idukki district, in production management and productivity. The innovation behind 'Njallani' is the selection skill of farmer. The journey to 'Njallani' was started with the selection of four cardamom clones from local varieties having well sized capsules. These plants were intercrossed with the help of honeybees. From the resultant seedling progeny, four clones producing larger number of bigger capsules were selected. One, most superior among them was finally selected in 1986. 'Njallani' celebrates the ancestral family name of Sebastian. The new variety produces more than double the quantity of capsules from a clump compared to the other varieties. Sebastian also noted that 'Njallani' has prolific suckering. Hence he found advantageous to use suckers for propagation instead of using seedlings. Sucker planting led to early fruiting from second year, while seedling propagation takes more than two years for fruiting.**

**'Njallani' belongs to 'vazhukka type' with high yield potential and rare ability to respond to better agronomic management. It spread like wild fire to occupy more than 70 % of the cardamom area in Idukki in about a decade and lesser percentage of area in other cardamom growing regions. The spreading started from the early 90s appears to have reached the peak by 2002-03. The increase in the cardamom yield and production in Idukki district as well as in Kerala could largely be attributed to this variety. On assumption that influence of Njallini on yield and production had become perceptible only from 1995-96 and subsequent 75 % of production difference from the base period prior to 1995-96 is contributed by this variety, its revenue contribution to the State at the rate of about Rs 150 crores during last 15 years.**

**For this huge contribution unparalleled in the modern history of agriculture, Shri Sebastin Joseph deserves to be honored with an appropriate national civilian award.**

during subsequent five years, ending 2004-05. The principal variety contributing to this yield increase was 'Njallani' and there appears to have a fair relationship between its spread and yield growth rate. 'Njallani' may deserve major share of the credit for the four-fold increase in cardamom production in Idukki district with out significant change in area during the period 1992-93 to 2005-06 (Fig. 7).

'Palakkudi' and 'PNS Vaigai', are other two popular varieties, far behind 'Njallani' in coverage. For its phenomenal strength in yield and profit, 'Njallani' is also called as the 'Green Gold'. Developing a variety superior to 'Njallani' or other popular farmers' varieties is a major scientific challenge today. While 'Njallani' is an outstanding and widely acclaimed variety for its prolific suckering, flowering, high yield and bold green capsules under remarkable input responsiveness, its weakness lies in susceptibility to all major fungal diseases and insect pests. Major diseases afflicting cardamom in Idukki are capsule rot (*azhukal*) caused by *Phytophthora*, rhizome (clump) rot caused by *Pythium* and *Rhizoctonia*, *Fusarium* capsule rot and leaf blight caused by

*Phytophthora meadii* and *Colletotrichum*. Most of these diseases coinciding with monsoon period take a heavy toll of the crop with yield loss exceeding 60%. Major insect pests in Idukki are cardamom thrips, shoot and capsule borer and root grub. The revenue loss could be severe, particularly by thrips, to the extent of 80%. Added to these, nematodes, particularly the golden nematode, also contribute to crop loss. Vulnerability of a high yielding variety to these major pests and diseases and the extent of economic loss they can inflict demand substantive use of fungicides and pesticides as prophylactic and control applications. While up to 8 rounds of foliar dustings, sprays and soil applications of fungicides and pesticides a year id recommended farmers practice up to 15 rounds. This has caused deep imprint on the local ecology and escalation in cost of production, particularly with the recent three-fold increase in the cost of copper-based fungicides. The increasing imbalance in the application of chemical fertilizers and organic manure also significantly increases the propensity of high yielding varieties to diseases and pests.

The recommended fertilizer dose for cardamom in Idukki is NPK 150:75:300 kg/ha either as soil application or partly as soil and foliar spray. Organic manure recommended is 750 kg neem cake or 10,000 kg farmyard manure/compost/vermi-compost/ha. The input responsiveness of 'Njallani' encourages heavy and imbalanced chemical fertilization without recommended organic manure. This is seriously affecting the sustainability of cardamom cultivation in Idukki on three major counts. First, these practices deteriorate soil health and fertility. The forest soil of CHR area has substantially deteriorated under continuous application of imbalanced chemical fertilizers and unchecked use of pesticides. The CN ratio of this once rich forest soil is declining, the soil pH over last 15 years had declined from 5.5 to 4.4 and intensified soil activities like soil trenching and frequent re-plantation have been heavily promoting erosion of topsoil. Second, the intensified production management is promoting the incidences of diseases and pests. This warrants application of more and more fungicides and pesticides, contributing to soil health damage and environment pollution. Third, the changing CHR forest density and canopy cover is threatening the sustainability of cardamom cultivation. Good forest density and canopy are essential to provide ideal microclimate to cardamom. However, under high input management of pest/disease susceptible variety biotic pressure could get enhanced under the microclimate created by forest canopy and humidity. Cultivation of such varieties is found promoting heavy lopping of trees to the extent of 25 %. Scientific study has

shown that 50 % shade is optimum for cardamom production. Such lopping also affects the soil with depleted leaf fall and increased erosion.

Another important characteristic of 'Njallani' variety as reported by farmers is that it starts production from 18$^{th}$ month under high management and reaches to peak yield on third year and continues with alternate peak yielding till seventh year, requiring re-plantation in eighth year. This re-plantation cycle of Njallani is shorter than other varieties, which offer economic yield up to 10-12 years. More frequent replanting requirement of a variety contributes to increased soil erosion. It appears the intensified yield extraction is the cause for early fatigue seen in 'Njallani'. Research had shown that moderate management of 'Njallani' leads to about 30 % reduction in yield and extension of economic lifespan to 10-12 years. An important benefit of frequent replanting from healthy mother clones is that the incidence of *Katte* disease had decreased.

Clonal propagation is a relatively slow process in cardamom with multiplication rate of 100/year. Hence, whenever there is a new variety or a major re-plantation process, acute shortage of quality planting material is experienced. Use of unhealthy planting material seriously compromises the sustainability of cardamom production and its economic viability. The support system available under the present research system is vastly inadequate and it, more often, is non-functional. For example, the CRS during last 15 years had produced and distributed only 6137 planting units of PV 1 and 5094 units of PV 2. On the other hand, in five years it has distributed about 15,000 rose buddings! This is a case of misplaced priority of a regional research set up with primary mandate on cardamom and pepper. Except ICRI and the SBI, other research institutions offer no support to farmer-preferred variety, when such variety is not a product of the concerned institution. With such institutional paralysis on planting material production, the need for building capacity and establishing farmer participatory movements for certified planting material production and supply assumes high priority for strengthening the sustainability of cardamom production in Idukki.

Research on crop production and protection management methods has brought out region specific recommendations to some extent. Recommendations are in place on agro-techniques such as mother plant selection, sowing, raising secondary and polybag nurseries, rapid clonal propagation, spacing, method of planting, mulching, weeding, trashing, manuring, earthing up, drainage, judicious irrigation, plant

protection measures, crop activity calendar, post harvest processing, etc. ICRI has developed and recommended control measures for shoot fly, thrips and nematode infestations. An economic schedule of soil cum foliar application of fertilizers formulated is claimed to save fertilizer cost. Integrated disease management involving soil amendment, fungicidal control, bio-control with *Trichoderma* or *Metarrihizium* (particularly for *Azhukkal* disease) are developed for the control of fungal diseases. For the management of pests, bio-agents and botanicals like neem oil, antagonistic fungi, predators and yellow stick traps were developed as part of the integrated pest management. Ongoing research places stress on integrated nutrient and water management using bio-fertilizers and organic inputs. While all the three institutes are working independently on this aspect, it would be desirable that their recommendations are harmonized on location-specific basis before release. As expected there is significant gap between researchers' recommendations and farmers' practices. There are also farmer innovations in crop management to achieve better and cost-effective results. Unfortunately, researchers' nether recognize these innovations nor conduct study for their validation and integration in to the official recommendations.

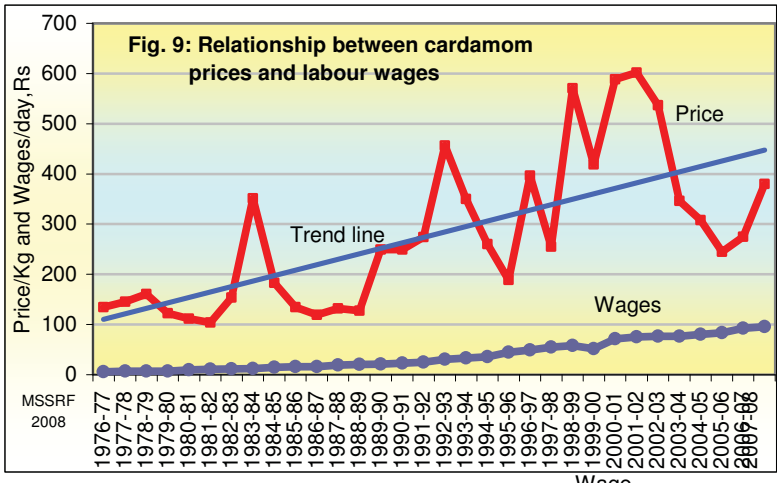
**Sustainable cardamom production:** All points discussed above lead to the urgency for discouraging exploitative cardamom production practices in Idukki and for promoting sustainable and profitable production practices. The major elements of such sustainable production practices should be:

- Promotion of optimal crop production practices with restricted use of fertilizer and other agro-chemicals within a threshold level that is standardized to secure an optimal economic yield, irrespective of the potential of a variety to yield more under higher input use;
- Promotion of green agriculture combining recommended application of organic manure including vermi-compost along with organic recycling and need based chemical fertilization and integrated pest and disease management by using varieties possessing genetic resistance/tolerance to major diseases and pests, bio-agents like *Trichoderma* and VAM, bio-pesticides and vermi-wash;
- Conservation of CHR evergreen forest at optimal shade tree density and regulation of canopy level at 50 - 60%, depending on the direction of hill slope and by undertaking fresh tree planting with chosen species;
- Intensified farmer participatory research for evolving region-specific best varieties, ensuring avoidance of variety monoculture, and best crop management practices;

- Promotion of farmer evolved varieties on merit by research institutions to engage these varieties at early stage in variety evaluation trials and for developing variety specific best management practices and also to provide institutional support for their rapid propagation through production and supply of quality planting material;
- Promotion of practices for soil conservation including contour conservation treatments in regions highly and moderately vulnerable to erosion;

**Economics of cardamom production:** Good crop production practices are important for the sustainability of cardamom production and associated forest ecosystem. Limiting production to an optimized economic threshold yield in different CHR zones cannot be achieved and sustained without ensuring fair price and its stability. This demands an assured minimum floor price for cardamom as well as a code of conduct to limit input use and productivity within the thresholds determined for A, B and C zones, irrespective of the state of market price. From the discussions this Commission had with progressive cardamom farmers and farmers' associations, it emerged that at the current cost of production a net income of Rs. 25,000 - 40,000/ha is satisfactory.

Highly divergent estimates were provided to this Commission on the cost of production of cardamom. According to the CRS, Pampadumpara, the cost of producing 500kg dry capsule is Rs 74,876. The Cardamom Growers' Association (CGA) makes the highest estimate of Rs 2,22,661 to produce 740 kg dry cardamom. The SBI estimate is Rs 130,400 for 670 kg yield. The cost of production of one kilogram dry capsules accordingly varies between Rs 150 to 301 (Table 7). The estimate of cost of production made by this Commission, on the basis of field study, discussions and analysis, is Rs 1,12,635 for 475 kg dry capsules or Rs 237/kg. Major share of cost of production is as labour charges (67 %) and input cost (25 %). Many farmers reported that labour charges had increased disproportionately and this together with rise in input cost had escalated the cost of production. The relationship between cardamom price and labour wages for 32 years from 1976-77 presented in Figure 9 validates the point made by farmers. While



the price of one kg cardamom in 1976-77 was sufficient to pay for 22 man days, it reduced to four man days in 2006-07, although the cardamom price between these periods increased by 3-fold. However, more than the cost, the current problem, which is becoming more acute is the shortage of labour, particularly during peak and critical phases of crop management. Hence there is need for mechanization of farm operations, wherever this is possible. Support for such mechanization is recommended. These machineries may be placed under the control of either SBI or local Panchayat or association of cardamom farmers with freedom for access to all farmers on a uniformly applied tariff.

Table 7: Cost of cultivation of cardamom/ha* estimated by different agencies

| No | Details operation | KAU | CGA | SBI | MSS Com |
|---|---|---|---|---|---|
| 1 | Cost of weeding, thrashing cleaning, mulching (2 rounds), earthing and forking | 16,440 | 24,898 | | 13,650 |
| 2 | Cost of fertilizer, manure and application (fertilizer in 2 splits) | 27,132 | 27,009 | | 23,150 |
| 3 | Cost of pesticide/ fungicide and application (7-12 rounds spraying and 2-4 rounds drenching) | 13,389 | 59,851 | | 16,951 |
| 4 | Shade regulation | 10,920 | 3,260 | | 7,875 |
| 5 | Cost of irrigation (4 rounds) | 3,480 | 9,584 | | 4,200 |
| 6 | Cost of harvesting | 27,405 | 44,460 | | 32,550 |
| 7 | Cost of curing/ polishing/ grading | 4,560 | 26,676 | | 3,150 |
| 8 | Miscellaneous + land lease charge | 3,564 | 26,923 | | 1,300 |
| 9 | Bank interest @7 & 12 % on cultivation cost | NA | NA | | 9,809 |
| 10 | Total cost | 74,876 | 2,22,661 | 1,30,400 | 1,12,635 |
| 11 | Yield / ha, dry capsule, kg | 500 | 740 | 670 | 475 |
| 12 | Cost of production/kg, Rs | 150 | 301 | 195 | 237 |
| | Total no of man days engaged | 816 | 926 | NA | 720 |

* The cost pertains to average annual cost of one crop cycle
Abbreviations used: KAU = CRS, Pampadumpara, CGA = Cardamom Growers' Association; SBI = Spices Board of India; MSS Com = M.S.Swaminathan Commission.; NA= not available.

On the basis of above assessment on cost of production made by this Commission, a floor price of Rs 300/kg at the current cost of production would ensure a livelihood income (net profit) of Rs 30,000/ha at yield of 475-500 kg/ha. This profit margin may decrease or increase depending on the yield and variable cost of production in different CHR zones.

Areas requiring future research are post-harvest technology, ecological impact of current farming practices on CHR, strengthening sustainability of cardamom cultivation, medicinal properties of cardamom, socio-economical studies and impact of ecotourism.

**Promotion of organic farming**: Notwithstanding a widespread desire among farmers of the district to turn the district organic, the cardamom farmers and their associations are less enthusiastic about this idea. While they do recognize the merit of organic farming, they strongly consider that under the present available technology regime organic farming may not provide economic yield and income. Most of them, in CHR area, exclusively depend on cardamom for livelihood and therefore not immediately ready to switch over to totally organic. They, however, desire to follow '**green farming**' which has more organic components in production practices with concurrent reduction in the use of agro-chemicals, however allowing need-based use of the latter. Inputs like *Psuedomonas, Trichoderma*, VAM, bio-pesticides like entomopathogenic nematodes (EPN), vermi-compost and vermi-wash are having increasing demand and traders are exploiting this to pass on spurious products. Farmers complained that spurious organic inputs are being distributed even through the Department of Agriculture.

In the absence of a regulatory regime on the quality of these inputs and its enforcement, trade in organic inputs has become a lucrative business. There is no public or private facility to analyse these products. As farmers spend nearly 25% of production cost on different inputs, there is urgency to set quality standards for all marketed inputs with enforcement of adequate labeling, providing analytical facility to detect spurious products and statutory provisions to hand over exemplary penalty to offenders. This may be the first step to make the district organic. Large scale capacity building at community level to promote household and group based production of quality organic inputs, involving women farmer groups such as *Kudumbasrees, Ayalkkoottoms,* other self help groups (SHGs) and farmers' clubs and supporting these groups with infrastructure, capital and quality certification facility would put cardamom production eventually on organic track, with partial change over immediately. This deserves priority action as a component for strengthening economical and ecological sustainability of cardamom production.

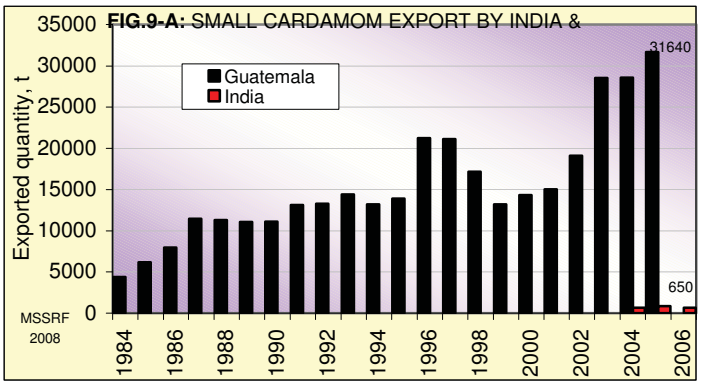
**Post-harvest processing:** One important post-harvest processing practiced by many farmers at farm level is the drying of cardamom capsules. Cardamom is harvested almost once in a fortnight stretching across eight months. As the dried capsules retaining green colour fetches higher prices, harvesting at right stage and proper post harvest processing are important. This involves curing (drying) the harvested capsules within 24-36 hours. Immersion of freshly harvested capsules for short time in an anti-

oxidant solution is also resorted to augment its green colour. Curing is done at 45-55$^{o}$ C for variable period, depending on the drying system. Drying brings the moisture content of freshly harvested capsule from 70-80 % down to 11-12 %. Sun drying leads to poor quality and low price. Hence artificial drying is important and this is being done with wood, electricity, diesel or LPG. Dried capsules are graded for their boldness by passing through sieves with mesh sizes of 8 mm, 7.5 mm, 7 mm and 6 mm.

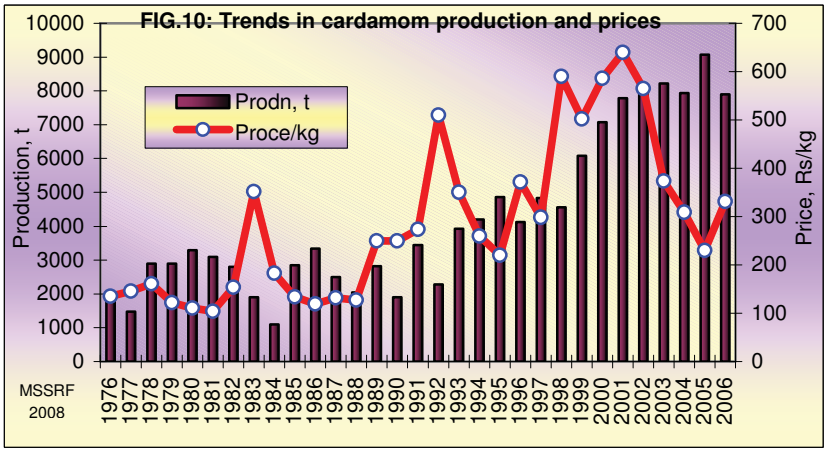
About 4 kg fuel wood is required to dry 1 kg of cardamom and this causes huge demand for firewood leading to conversion of forest trees to firewood. Firewood based drying has been a major cause for the tree loss in the CHR forest. Despite this huge environmental degradation, the policy of the Kerala State Electricity Board (KSEB) to supply power for curing cardamom at farm level at industrial tariff is dismaying. To say the least, this is a consumption classification totally insensitive to the environmental interest of the region, which contributes more than 60 % of the power generated in the State. More over, nearly 95 % of the farmers who are drying cardamom at household level are the poor. A full appreciation of the huge environmental cost of allowing firewood based drying and that vast majority of farmers own small and medium holdings, would demand revision of present tariff policy to provide power supply for drying cardamom by these farmers and their groups at agricultural tariff. Electrical drying may also offer better quality and increased income to these farmers. At the current industrial tariff the cost of drying 1 kg cardamom works out to Rs 6-7. This unfair to the farmers of Idukki, the district which generates much of the electricity in the State, while power for dewatering by all farmers in Kuttanad is given at agricultural tariff. Hence, the State government and KSEB have to correct this unfair and discriminatory classification of power use for cardamom drying and similar processing of primary produce at farm holding level either alone or in group.

**Unique quality of Idukki cardamom and quality mark:** Small cardamom being held as the ‘Queen of Spices’ had historically attracted the global market interest. For a long time Indian cardamom enjoyed the patronage of global market, although the small or large cardamoms are being produced in 11 other countries. Over the recent years India had suffered major set back in its export with the entry of Guatemala in global market to supply cardamom at cheaper prices (Fig.9-A). While the basic farm gate price of Indian cardamom (based on cost of production) is around Rs 300/kg, Guatemala is able to sell at about 110/kg in international market. The only advantage India now has the superior quality of its cardamom. The quality of ‘Alleppy Green’

cardamom has set a widely recognized high benchmark for cardamom quality. The advantage of this quality may hopefully be consolidated with the expected grant of Geographical Indications (GI) to the 'Alleppy Green'. As Alleppy region does not produce cardamom, it is merely a historically identified trade point of Idukki cardamom; it would be appropriate to get the GI under the title 'Idukki CHR (Alleppy) Green'. Such GI title alone would allow traceability linked economic advantage of Idukki cardamom quality to these farmers or else the traders may misuse the GI by blending cardamom produced from all over the South. Notwithstanding the decline in export, it is important to safeguard the reputation of Idukki cardamom for its quality by good practices by farmers and researchers and promotional programmes by the policy makers. The inability of many small farmers have satisfactory infrastructure for proper drying and grading of cardamom and their consequent failure in maintaining quality for their produce is not only denying them optimum price, but also expose them to the exploitation by the trade. Therefore, empowering them with this infrastructure and skill is important to facilitate a better deal for them in produce trading.




Currently about 95 % of cardamom is traded domestically. The domestic market is also substantially influenced by the legal and illegal entry of Guatemalan cardamom. Domestic market is notable for wild variations in prices (Fig.10). The data on annual production and prices seem to suggest no clear relationship between them. Hence, price appears to be dictated more by other extraneous elements. This may include variations in export and import and domestic demand or the market manipulations being made by the cardamom trade cartel. The Spices Board of India had taken a number of initiatives to secure better price to producers by establishing auction centers and reforms in auctioning method



under the Agricultural Produce Marketing Committee Act. Registration of cardamom growers, issue of identity cards to authentic small and big cardamom growers, and recent introduction of e-auction are some of these measures.

While the system of registration of farmers qualifying them for participation in the auction excluded small farmers, a new arrangement to facilitate the participation of the latter is introduced by the SBI. This registration is being issued by the Department of Revenue. The cardamom growers' identity card now being issued by the SBI and having validity for three years allows the cardholder to move the produce to auction centres and also for its other movements in the vicinity of production and storage with out harassment from the tax officials. However the present terms of trade offer less space and advantage to small farmers and they are left to the mercy of middlemen. Their rescue from middlemen requires group formation among small farmers to gain power of scale on the produce volume, providing support for processing and storage facility and creating financial space to increase their stock holding power are important to. More information on marketing and establishment of Cardamom Price Stabilization Fund Trust (CPSFT) are provided in later section on 'Agricultural Marketing'.

**Spice Park:** This is a project being developed and implemented by the SBI. This is kind of a micro-SEZ for promoting exclusively spices value addition, trade and export with public-private participation. The vision is to make this park as an important global spices processing hub and to achieve an export target of US $ 10 billion in ten years. In the Idukki district the 'Spices Park' is aiming to establish in an area of 30-40 ha made available free of cost by the government of Kerala. It may include common world class infrastructure, which is accessible on a 'user fee', for cleaning, processing, steam sterilization, packaging, quality testing, warehousing and training together with other support services like water, power, communication, banks, customs, etc. The part space is also available for individual entrepreneurs engaged in spice processing or its value added product manufacturing aimed at promoting export.

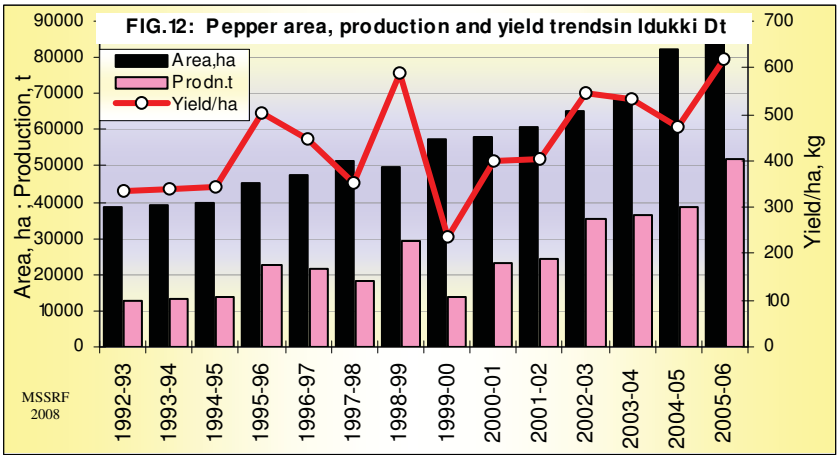
A centralized processing and trading unit like this may always offer advantages in having state of the art facility for processing, maintaining traceability, high hygiene and quality standards and product consistency, all important for the modern competitive trade. However, how far such single centralized facility would help the small farmers scattered across the district with their small harvest in bypassing the middlemen and

taking advantage of the value addition facility is doubtful. They may truly benefit, if such facility is designed in hub and spoke model with many mini one-stage value addition, grading and warehousing facilities spread across with connectivity to the central facility, so that farmers may avail the mini-unit facility in their neighborhoods. At the central facility all sophisticated secondary or tertiary value addition as well as packaging, labeling, quality testing, etc may be performed. Hence, it is recommended that village level processing and grading units may be established with bank credit linked warehousing facilities for major spices.

### 11.1.3. BLACK PEPPER

Black pepper is grown (Fig. 11) in about 84,219 ha in the district. This crop has deep association with the income and livelihood of virtually every farm holding or homestead gardens, except those in very high elevations, where the crop is not grown. Majority of the area under pepper are smallholdings. In vast areas pepper is intercropped. In an un-estimated small area falling principally in Rajakumari, Rajakkad, Adimali and Vazhathopu Panchayats, it is grown as pure crop. These Panchayats constitute the heartland of pepper in Idukki. Black pepper is commonly grown on standards like dadaps (*Erythrina sp.*) and silver oak (*Grevelia sp*). Other trees used are mango and Jackfruit tree. Pepper-coffee and pepper-tea are common plantation intercrops. The only risk in some of these intercrops is that whenever pesticides are applied on the other intercrop, it gets deposited on pepper berries leading to residual toxicity.

Fig.11: A pepper garden- note the vine with slow wilt

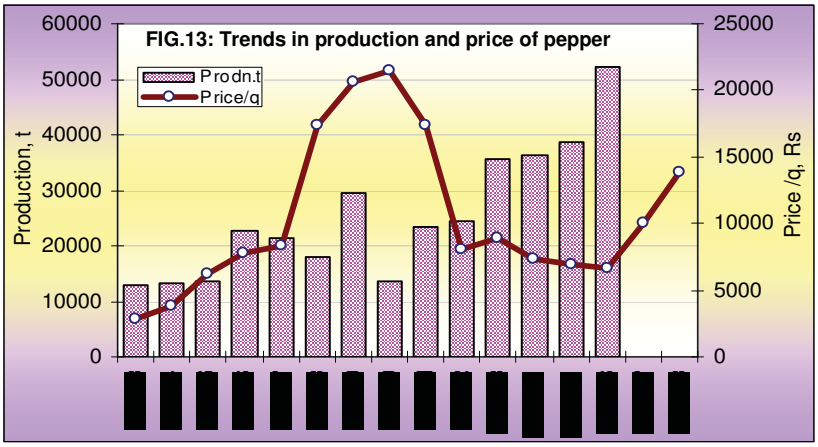



According to the official statistics, the crop has been gaining popularity over years and its acreage is reported to have increased from 38531 ha in 1992 to 84,219 ha in 2007 (Fig. 12). Pepper contributes to about 20 % of agricultural income generated by the district (Fig 5). It is grown by small, marginal and tribal farmers and contributes significantly to their income and livelihood.

Some of the major problems concerning the crop and associated income generation are mentioned below:

**Low and erratic productivity:** Pepper produced in Idukki has better quality. Although the average productivity of pepper in the district is higher than elsewhere in Kerala, it is far behind the world average. More ever, Idukki has much more potential for enhancing the pepper yield due to the congenial agro-climatic conditions available here. Pepper gardens yielding above one tonne/ha are not uncommon here. Major reasons holding back productivity of pepper are non-availability of quality planting material of high yielding varieties, poor awareness on the management of major biotic stresses like quick wilt (foot rot) caused by *Phytophthora capsici* and stunted disease caused by virus, slow wilt (or slow decline, Fig. 11) caused by the nematodes (*Radopholus similis* and *Meloidogyne incognita*), and pollu beetle and scale insects. These together with fluctuations in the distribution of rain are causing wide variations in yield across years (Fig. 12). A new threat to pepper cultivation in Idukki is the gall wasp (*Quadrastichus erythrinae)*, which damages the widely used pepper standard, Erythrina. Improved high yielding varieties although are available, their planting material is in acute shortage. Hence, majority of the gardens have local land races such as Karimunda, which is the most popular, Neelamundi, Kuthiravally, Narayakodi and Chagannoran.

**Price fluctuation:** Price of pepper was very attractive during 1997 and subsequent three years. This was followed by a deep decline from 2003 with rise from 2006-07 (Fig. 13). When prices across years are compared, the price fall during 2001-05 was not the lowest. But what is important is that the cost of production had been rising progressively over years rendering the recent price fall going below the cost of production. This has been a major cause of severe economic distress to pepper producers, which immediately impacted on their ability to invest in the crop and better upkeep of gardens. Continuous failure in proper



maintenance of the gardens led to widespread infestation of vines with slow and quick wilts and serious set back to the productivity. Thus substantial area under pepper was damaged requiring replanting and rejuvenation to restore the pepper based income generation and livelihood of small and tribal farmers. This set back in pepper production has widely affected the economy of many farm families with increased agricultural debt. In this context many farmers criticized and ridiculed the Department of Agriculture on the official figures on pepper area, production and yield during 2005-06 and 2006-07 and some even challenged these data.

As pepper is largely exported, its domestic price is heavily influenced by the international prices. Domestic prices higher than international prices also attract import pressure from external markets even at the current import tariff of 70 %. While Indian pepper had been traditionally commanding special reputation for its quality in international markets, recent attempts to blend Indian pepper with low priced pepper imported from elsewhere is also causing adverse impact on the price. Farmers wanted to prevent import of pepper and to stop trade practices on blending of imported pepper.

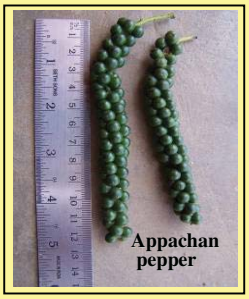
**Lack of fair market to farmers:** There is no organized marketing facility for pepper and hence farmers, especially the small farmers, are compelled to sell the produce to middlemen. Many small farmers dispose their harvest in green state or without grading the dried pepper. Facilities for post harvest processing, grading and short term warehousing accessible to small and tribal farmers may substantially help them in realizing better price. Linkage of such warehousing facility with bank credit may help small farmers to receive some part of the price as credit as soon as it is deposited. The produce may be processed, graded and warehoused till sold on favourable price and the farmer is given the additional due payment of the price, after adjusting the credit availed. This would prevent farmer from making distress sale of the harvest to the middlemen, encourage value addition and/or grading of the produce to realize better price and facilitate sale at optimal price. For the bank, the produce warehoused may serve as the security for advancing a good percentage of the price and recover the same when the stock is sold within short period. The large volume of the warehoused produce, which is also processed and graded or value added, may command better price than selling in piece meal. Management of such processing and storage facility by farmers' cooperatives or associations with minimal overheads and banks offering credit also at no overheads may deliver highest benefits to farmers.

**Shortage of quality planting material:** Because the huge annual demand for quality planting material of pepper is not adequately met by the development agencies, many farmers use inferior planting material. A large proportion of the small and tribal farmers are unable to access the planting material distributed by the development agencies. There was all round criticism of the quality of the planting material being supplied and the wrong season these agencies choose for the supply. Officials of the Department of Agriculture agreed that the sourcing of planting material from nurseries outside the district and the bureaucratic reasons for delayed supply are affecting the pepper re-plantation with quality planting material. They also admitted the shortage of planting material and desirability of generating planting material within the district with community participation.

Like in cardamom, farmers have developed novel varieties of pepper, 'Appachan molaku' and Kumbakal are two farmers' varieties of pepper (Box 4). The KAU and IISR have developed and released about 16 pepper varieties/hybrids. However, vast majority of the pepper gardens in the district are growing local varieties such as Karimunda, Neelamundi, Kuthiravally, Narayakodi, Chagannoran, etc. The KAU have developed many varieties under the Panniyur series. Panniyur 1 is a popular variety, but not suited under the forest shade conditions. The CRS, Pampadumpara of KAU recommends Panniyur 3 and 5 for the district. The evaluations conducted show that Panniyur 5 is superior to other available varieties. Based on research station trials using Panniyur 2, Panniyur 3, Panniyur 4, Sreekara, and Subhakara and KS 88, ICRI recommends Panniyur 4 as the best suited variety to Idukki. According to the IISR, its releases, Sakthi and Thevam having tolerance to quick wilt, and the hybrid Malabar Excel are suited to higher altitude of Idukki district. Interestingly, the comparative yield evaluations conducted by the ICRI the IISR do not include Panniyur 5. Thus the three research institutions have different conclusions on the varieties suited to Idukki. The CRS, Pampadumpara, which has the mandate on location-specific research on pepper, also has not yet evaluated the IISR varieties in Idukki.

**Box 4: Farmer's varieties in pepper**

**Idukki is notable for innovations by farmers in the selection and development of varieties of commercial and plant-ation crops. Very popular farmers varieties are available in cardamom, pepper, Nedran banana, vegetables, etc. In the case of pepper two popular farmer's varieties came to the notice during this study are the Appachan black pepper and the Kumbakal.**


Appachan pepper

The lack of coordination and dialogue among these institutions was earlier mentioned and this needs to be abolished. The CRS mandated to conduct location specific research and to conduct technology transfer has no programme for production of pepper planting material of Panniyur 5, while its current priority on the multiplication of rose and other flowering plants was also mentioned. The research report of this station states that until 2007 it had distributed only 6149 rooted cuttings of pepper. Another agency promoting distribution of quality pepper planting material is the Directorate of Arecanut and Spices. It is a funding agency facilitating sourcing of quality nuclear vine from research institutions and their multiplication and supply through the State Department of Agriculture and the SBI.

The right choice of varieties for the region is not receiving importance or priority during distribution of planting material by the development agencies. They operate under a target driven programme, where number seems to be more important than quality and suitability. Panniyur 1, which is proved unsuitable in canopy-covered area is being commonly included for distribution by the development agencies. The State Department of Agriculture is claimed to have distributed about 14.1 million rooted pepper cuttings during 2002 to 2006. Farmers not only questioned this figure, but also observed that much of what was distributed failed to survive as it was supplied during post-rainy season. It is an irony that the district faces acute shortage for the quality planting material of the right variety despite the presence of different research and development institutions having specific mandate for improving and promoting pepper cultivation. A well-coordinated effort is required to produce disease free planting material along with nematode free soil. A massive programme to generate adequate quantity of runners from chosen varieties and production of certified rooted cuttings under fool-proof soil hygienic conditions is most important for re-generation of sick pepper gardens in Idukki. This has to go hand in hand with appropriate soil treatment (including solarization) to render the soil in the poly bag holding the rooted cutting free from soil-borne pathogens (particularly nematode).

Here solarization of soil together with organic method of treatment on a standardized schedule has merit over application of highly toxic pesticides like thimet. Such programmes have to go hand in hand with awareness generation to farmers on the important role of soil health in sustainable pepper production. It is estimated that 15% of the total area demands re-planting and about 25% of the area have to be brought

under soil health improvement programme to reverse the continuing economic distress being experienced by the pepper farmers.

**Green farming:** Soil health both in terms of nutrient balance and freedom from pathogenic organisms is important to enhance and sustain pepper productivity. Idukki soils are generally low in potash and its availability in good measure is important for productivity. So is the case with micronutrients. Green farming, unlike organic farming, apart from using organic inputs such as farm yard manure, vermicompost and bio-control agents also uses need based supplementary application of chemical fertilizers and plant protection chemicals to meet balanced nutrition of macro- and micro-nutrients to support sustainable high productivity. Management method for getting rid of soil borne pathogens causing major decline in yield and slow death of vine includes regular application of neem cake and bio-control agents like *Trichoderma, Pseudomonas,* and VAM together with need based application of Bordeaux mixture. For the reasons that these treatments on regular basis are very costly and not possible for the small and marginal farmers in their present economic state and that these treatments are very essential to save the pepper gardens and the livelihoods of dependent farmers, support is recommended for at least three years as a component of the package on pepper. The farmers who are keen to move to organic production may also use this pathway for the transition. When pepper and cardamom being grown in more than one lakh hectares turn organic may generate huge demand for vermicompost and bio-control agents such as *Trichoderma, Pseudomonas,* VAM, entomopathogenic nematodes (EPN), *Azospirillum,* etc. It offers equally large opportunity for local production of these inputs by SHGs and other institutions. In this context, linking identified SHGs with such programmes, building their capacity and empowering them with required infrastructure to facilitate production of required bio-control agents of prescribed quality for all crops of each region would offer multiple benefits of employment and income generation to farm families. Wherever organic farming is followed, group approach may help in circumventing or minimizing the high cost on organic certification also.

**Value addition:** Drying, cleaning and grading are operations essential to fetch better prices to producers. These are often not carried out by small and tribal farmers due to financial pressure for quick transaction. Many also do not have the facility, particularly for grading. There is scope for further value addition such as blanching, conversion to white pepper and dehydrated green pepper and extraction of oil or oleoresins. While

the upcoming Spices Park may address these issues on commercial basis, this is unlikely to directly help small and tribal farmers for value adding their harvest and realization of higher price. Hence, primarily with a purpose to serve these groups of farmers, it is recommended that common processing, value addition and warehousing facilities may be established in each Panchayat. These facilities could be operated by pepper farmers' cooperatives or SHGs, who may levy a non-exploitative and self-supporting service charge in a manner, which would encourage farmers using this facility. The local Panchayat may help for the maintenance of these facilities.

**State of research institutions in Idukki on cardamom and pepper**

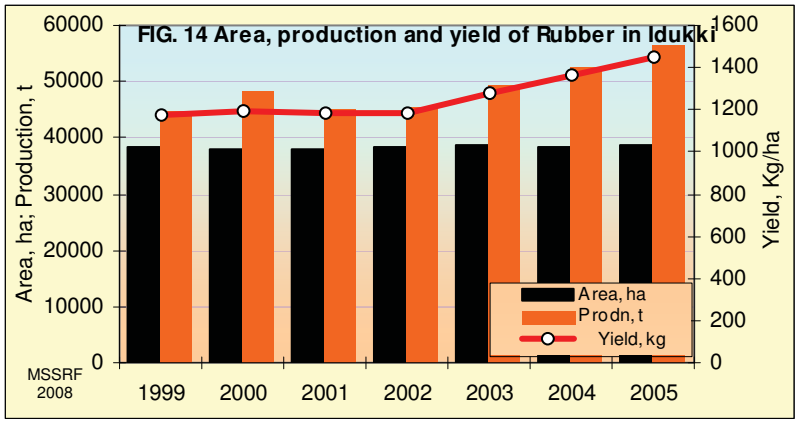
The ICRI was established with mandate to undertake research on small and large cardamoms. With respect to Idukki, where the institute is located, small cardamom is the most important crop. ICRI is reported to have had 60 sanctioned scientific positions in the 1990s. While the current sanctioned strength of scientific personnel is 37, only 12 are in position thanks to the current institutional recruitment policy. It is understood that the administration neither approves new posts nor allows filling up of vacated positions. More over, about 10 positions in the disciplines of plant breeding, agronomy, technology transfer and plant physiology were forced to surrender. Similarly, the posts of technical assistants were also made to surrender and few are remaining vacant. While the actual scientific and technical staff strength has been substantially pruned, the institute is burdened with additional responsibility to conduct research on new crops such as vanilla, ginger, turmeric, clove, nutmeg, *Garcinia*, tamarind, curry leaf and other nearly a dozen herbal spices. Assessment of technologies generated by the institute for farmer acceptance shows that agro-techniques are satisfactory, while the output on development of varieties having high yield and biotic resistance/tolerance is far inadequate, as mentioned earlier. This shortcoming is claimed to have been remedied, at least partially, with the development of three pipeline hybrids, MHC-IO, MHC-13 and MHC-18. These varieties are yet to reach farmers and get tested for their acceptability. The inter-phase between the institute and the development wing is also not strong. Many farmers complained about the technical inadequacy of field staff in providing solutions to the problems faced by the crop.

The CRS under KAU established to evolve locally suited agro-techniques for spices including pepper and new varieties of cardamom, is in a state more distressed than

the farmers of the district. It has 10 sanctioned scientific posts and 46.4 ha farm area. Against this, only one scientist, who heads the center, is in place. The present staff position is one scientist, 4 farm personnel, 2 laboratory assistants, 5 administrative staff, and 17 farm workers. The center seems to have set aside the work on cardamom and pepper, except conducting few All India Coordinated project trails on these crops, and is diverting its limited human resource to the floriculture, which is supported by the State Horticulture Mission (SHM). While there is huge demand in the district for the quality planting material of black pepper there is no effort at CRS to address the planting material shortage and replace local varieties with high yielding material suited to the region. Interestingly, SHM has a component for production of about 10 lakh rooted cutting of black pepper. Instead of choosing CRS for production of pepper planting material under the SHM to meet the need of this major pepper-producing district, the center is being used for production of rose and other floriculture planting material! The KAU authorities have to make sure that the CRS is re-positioned to its initial mandate with emphasis on black pepper.

### 11.1.4. RUBBER

Although rubber occupies an area of 38,844 ha, it is the crop contributing highest to the agricultural income of the district. With 26 % of the agricultural income of the district coming from this crop, it is currently far ahead of pepper and cardamom in this respect. It is gaining popularity among farmers on reasons of attractive price, availability of cost effective technologies and financial support and notably better extension services from the Rubber Board of India (RBI). Rubber is extensively cultivated Peruvamthanam and Kokkayar Panchayats of Peerumedu taluk and Muttom, Arakulam, Vannappuram, Kodikulam, Velliyamattom, Alakode and Karikode Panchayats of Thodupuzha taluk. It is also spreading to the areas like Kattappana, Murikkassary and Adimali. Few farmers cultivate rubber along with cardamom and pepper. The rubber in Idukki offers 100-120 tapping days annually. During the seven years between 1999 and 2005, the area under rubber increased only by 1.7 %, while



the production during this period increased by 26 % (Fig.14). The yield was rising during this period at an average annual rate of 4 %.

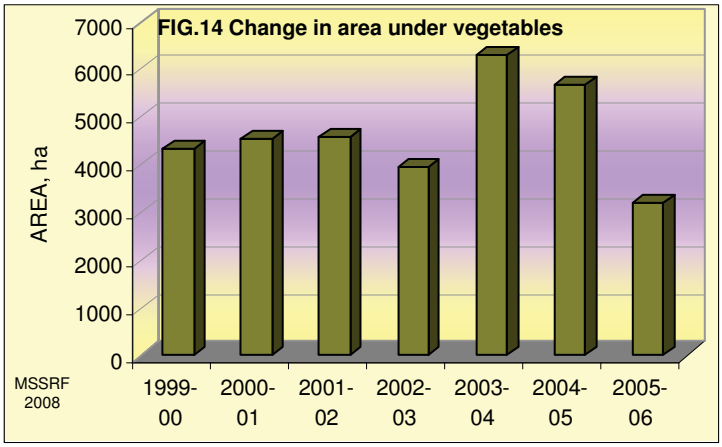
It is important to mention that during the several interactions this Commission had with farmers of the district not a single complaint on rubber cultivation and price was received. This also did not come as an issue in any of the many memoranda received by this Commission. The lack of distress among rubber farmers appears to be due to the system of research and development established by the RBI, which could be rated as the most effective among equivalent Boards on other plantation or spices crops, and the favourable price for the produce. The critical factor behind this effectiveness of RBI appears to be the superior varieties and other production technologies developed by the research wing and an equally effective development wing, which maintains a well-coordinated link between the research wing and farmers. The functioning of the RBI offers lesson for other commodity Boards in organizing their research and development and closely integrating both of these wings for serving farmers. The research at the Rubber Research Institute of India (RRII) has given India the lead position in rubber productivity. The variety RRII 105 released in 1980 is still the ruling variety and it currently commands coverage above 85% of the area under rubber. It is reported that the new varieties belonging to 400 series released recently have the potential to out yield RRII 105 by 20 %. Recently released RRII-414 has already become popular with farmers of Idukki. A notable feature of rubber cultivation is that unlike in other plantation crops, rubber farmers get to know about the latest technologies and they there is hardly any gap between technology development and adoption. This is a testimony to the credible research output of the RRII. The recommendations of the research wing are well integrated with the development programmes. For example, the eligibility of farmer to subsidies provided by the development wing of the RBI is linked with the compliance in necessarily following the package of practices recommended by the research wing of the Board. Another reason for the efficiency of the RBI is the organization of the development wing with one Field Officer for almost every 3-4 village or 700-1000 files (a file refers to a case or individual farmer linked development activity assisted by the Board). The Field Officers maintains first hand knowledge on every farmer under their jurisdiction all farmers wishing to take the support of the Board are assisted when they comply with the guidelines of the Board. The Field Officers directly disburse all the benefits to farmers including subsidies. This commendable combination of research excellence and farmer-centric development approach together with fairly good price for the rubber

during last few years have placed rubber cultivation a notch above other plantation crops. This possibly contributed to absence of grievances in the district on rubber cultivation and marketing related issues. Nevertheless, rubber cultivation is troubled by the occurrence of tapping panel drying, leaf fall and pink disease, which have no effective control measures.

Natural rubber, because of its heat tolerance, will continue to gain its importance in national and international trade. Therefore, rubber should continue to receive strong research and marketing support. In addition the RRI deserves recognition with special research fund to reward the excellent work done for promoting the natural rubber production in the country. The success of RRI may be emulated by the research systems under other commodity Boards.

### 11.1.5. VEGETABLES AND FRUITS

Idukki district produces substantial amount of vegetables and possibly is the only district producing cool season vegetables in Kerala. More than its current level of production of diverse vegetables adapted to tropical and cool season conditions, the district holds great promise for expansion of its production and to take the state on the road to self sufficiency in vegetables. This sector in Idukki has vast potential to generate employment and income generation to large number of people in the production chain. Despite all these, the vegetable area in the district, on the basis of data provided by the Department of Economics and Statistics, Kerala, tend to show a declining trend (Fig. 14). With respect to vegetables, the Department of Economics and Statistics, Kerala has no data other than the area. It is not known whether or not the decline in area is influencing production. However, vegetables contributing about 7.2 % of the total agricultural income of the district and in this respect rank fourth among agricultural crops (Fig.5). The unit area-wise income from vegetables is far higher than that from any other crops in Idukki including cardamom, rubber and pepper. For example, the



entire revenue being generated from Cardamom in 32850 ha can be realized from vegetables grown in 7550 ha.

During 2005-06 the area under vegetables in Idukki was 3189 ha. Principal tropical vegetables produced in Idukki are few. These are predominantly bitter gourd and cowpea and to lesser extent French bean and tubers (elephant foot yam, dioscorea and colocasia). Banana and plantains are dealt separately. Major Panchayats producing tropical vegetables are Vathikkudy, Konnathady, Kamakshi, Adimaly, Mankulam, Erattayar, Rajakkad, Rajakumari, Udumbannoor, Peruvanthanam, Kattappana, etc. Important cool season vegetables are grown in more than 1600 ha spread across four Panchayats, namely, Vattavada, Kanthalloor, Marayur and Munnar. There are around 2230 farmers in Vattavada cultivating about 1200 ha. These vegetables include potato, French bean, butter bean, carrot, cabbage, tomato and chilly. This region, particularly Kanthalloor, also produces fruits such as orange, apple, passion fruit, strawberry, cherry, guava, tree-tomato, kiwi, mangosteen, egg fruit, peach, gooseberry (amla), etc. Major part of area growing garlic also falls under Kanthalloor Panchayat. These four Panchayats suited to cool season vegetables have high potential to enhance production of fruits and vegetables.

While tropical vegetables are grown by intensive practices, the cool season vegetables are grown largely by traditional methods. However, chemical fertilizers and pesticides are part of the production methodology practiced for both groups of vegetables. The region growing cool season vegetables lies in the eastern side of the Western Ghats, which is a rain shadow region receiving less than 1300 mm rainfall. The region is also economically backward with poor infrastructure. Water shortage is a major constraint and it restricts cultivation to one growing season of 3-4 months in large tract. Only potato, carrot and cabbage are grown during two seasons in some places. Augmenting water through conservation measures and building few check dams with conveyance may help yield and production enhancement and thereby the income of the very poor communities subsisting mainly on vegetable cultivation.

Despite substantial production of cool season vegetables in the Vattavada-Kanthalloor belt, the region is notable for high poverty and underdevelopment. There is no communication system including roads, no regular banking service, no satisfactory services from departments like agriculture, animal husbandry and Kerala Agricultural

University and other development agencies of the State. Due to this, the local farmers, who speak both Tamil and Malayalam, are heavily depended on agricultural services and market from Tamil Nadu. They access seeds, other inputs and credit from traders in Tamil Nadu on contract to sell the vegetables only to them. Such contracts are being misused to exploit these people for long years. It is understood that the vegetables purchased at low prices from this region are transported to Tamil Nadu and then re-transported to Kerala at prices many-fold higher. The Government of Kerala and concerned departments have to give highest priority to promote production of vegetables in this region, strengthen the local infrastructure and create market linkage to prevent exploitation and enhancing the income generation of these poor farmers. Infrastructure and service supports like roads, irrigation and soil conservation, banking facility, quality seed supply, need based agro-technology, market networking, warehousing, cold storage, capacity building and value addition have to receive highest priority. The GoK may address the backwardness of this region in schooling, healthcare, drinking water supply and other essential services.

During colonial days, Pazhathottam ward of Vattavada was famous for the cultivation of exotic fruits such as plums, cherries, passion fruit, egg fruit, strawberries, apples, Rubutan, custard apple, etc. Although production of these fruits has drastically declined, the potential of this region to produce these fruit tress and others such as oranges, peaches, avocado, mangosteen, strawberry, litchi, annona, lovi lovi, kiwi, etc remains. None of these fruit trees have been scientifically studied for their variability in this location, selected for better yield or quality attributes and for production of quality planting material. This together with improvement of cool season vegetables and their quality seed production is an area that should be receiving urgent attention of Kerala Agricultural University. It is desirable that the GoK may establish a horticulture research center at this region with R & D focus on cool season vegetables and fruits.

Unfortunately the State Horticulture Mission has bypassed the potential of fruit production in this area. The repeated efforts of this Commission team to meet the SHM official and to get the work plan of Idukki did not succeed, despite repeated efforts. However, the information the Commission is having on the SHM activity in Idukki is sourced from the Principal Agricultural Officer, Idukki, which looked like a draft plan with many gaps. It is noted that Rs 112.5 lakhs is provided to cool season

vegetables under ‘establishment of new gardens’ in 1500 ha. It is not clear why this fund should be deployed to open cultivation in additional 1500 ha, when the existing area under vegetables has many constraints for increasing production and securing fair market. While it mentions about the seed production of bitter gourd and cowpea, there is no programme to provide quality seeds of the cool season vegetables to growers. Similarly, the SHM does not address many other important issues concerned with promotion of vegetable production and income enhancement to the poor farming families.

Needless to stress that quality seed is the most important constraint in vegetable production and profitability. Major source of seed supply are private traders in Kerala and Tamil Nadu and local markets. Quality seeds of many vegetables are in acute short supply. It is estimated that public sector seed production in Kerala is merely less than 20% of the estimated 142 t of vegetable seeds required annually. The supply to this from KAU, VFPCK, farms of Agriculture Department and National Seeds Corporation is very meager. Hence farmer participatory quality seed production of chosen high yielding and locally adapted varieties of important vegetables under required isolation norms and appropriate agro climatic conditions and seasons should receive high priority under the SHM. Wherever improved varieties are suited to the region, their breeder or foundation seed may be sourced from research institutions like KAU, Indian Institute of Horticultural Research and Tamil Nadu Agricultural University for production of certified seeds. The SHM may take the assistance of Horticulture wing of the DoA, the KAU and the VFPCK for organizing farmer SHGs, training and supporting them for production of quality vegetable seeds-both tropical and cool season vegetables and fruits.

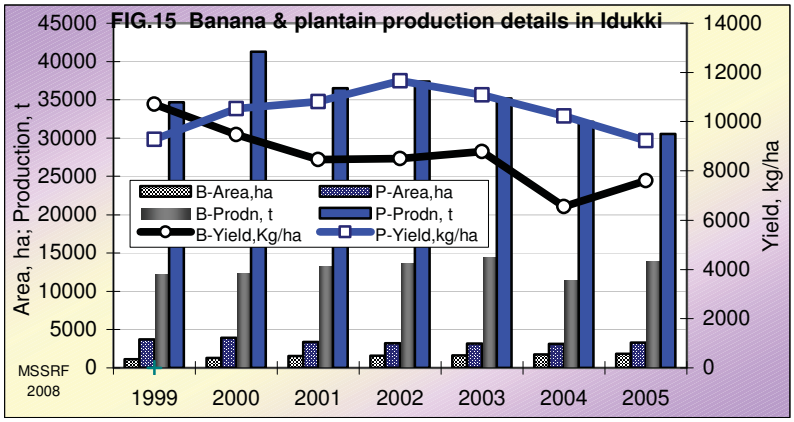
Augmenting irrigation water to increase cropping intensity is another important requirement for promoting cool season vegetable production. As almost all watersheds adjoining the Vattavada-Kanthalloor belt is with the Forest Department, cooperation of this department has to be obtained to build few check dams together with water conveying system. Another priority is on marketing and ensuring fair price to the farmers. This aspect is discussed in detail under “Agricultural Marketing’. One immediate option to the SHM to offer better marketing is to support VFPCK with necessary infrastructure funding. Creation of cold storage facility at Vattavada and

Kanthalloor is important to prevent distress sale of fruits and vegetables by farmers due to very poor communication facility in these regions. The action plan of SHM does not appear placing any priority to these important issues bothering the fruit and vegetables farmers of this backward region.

The Development of the Vattavada-Kanthalloor region with satisfactory communication system and other basic amenities to the local communities may open new opportunity to exploit the picturesque scenery and pleasant weather of the region and for promoting farm tourism.

### 11.1.6. BANANA AND PLANTAINS

Banana and plantains are grown virtually in every farm holdings, particularly the small and medium, either as an inter- or pure or backyard crop. It is a major source of income to poor families, in particular. The area under banana and plantains during 2005-06 was 1828 ha and 3311 ha, respectively. Their respective contributions to the total agricultural income of Idukki district are 0.82 % and 2.1 %. The area under banana has been increasing over years, almost to the tune of 46% during 1999-00 to 2005-06; while the area under plantain has remained almost steady during this period (Fig.15). The data further reveal that the yields of banana and plantain are decreasing over these years. The most widely and commercially grown banana variety is 'Nedran'. Njalipoovan, Robusta, Palayankodan, Red poovan and Kadali are the popular plantain varieties. The increasing area under banana and its decreasing yield indicate that farmers are encouraged to grow Nedran because of a favourable price and better profitability. Nedran banana always offer better profitability and this has encouraged large scale conversion of wet/paddy lands. Under this economic context, the claim being made by the VFPCK that its intervention since last three years through organizing few banana farmers and establishing of 'Swasraya Karshaka Market' had resulted in realization of higher prices deserves a re-check.



Commercial cultivation of Nendran demands intensive application of fertilizers and pesticides, particularly forate (furadan) against stem borer and nematodes, at substantial environmental cost. The increasing awareness among farmers on the environmental toxicity from intensive chemical-based farming is causing shift to organic production of banana and plantains. It is also encouraging that certain markets like that of Kerala Agricultural Development Society (KADS) are offering higher price for organic produces. A new banana variety called 'quintal Nendran' notable for high yield has been identified by a farmer of Idukki district (Box 5).

**BOX 5: 'Quintal Nendran' and misfortune of an innovative farmer**

**A farmer, Shri. C.M. Gopi in Mannamkandam village of Adimali in Idukki district has evolved a new high yielding farmers' variety of Nedran named 'Quintal Nendran'. As the name indicates, this variety is claimed to have ability to produce heavier bunches weighing 40-50 kg in comparison with the traditional Nedran variety, which on average produces bunches of 20-25 kg. 'Quintal Nendran' has become popular in different parts of Kerala. It appears Kerala Agricultural University has not conducted any study on this variety to establish its yield superiority and to identify regions suitable for the variety.**

**Shri. Gopi is an innovative and progressive farmer. He had been honoured in 1995 with "Karshaka Tilak' and in 1996 with 'Udhyan Pandit' awards. It appears the innovation he made in banana brought him misfortune. It is gathered that after Shri. Gopi developed the new Nedran variety, a Minister of Agriculture, GoK encouraged him to establish a tissue culture laboratory for rapid propagation of the new variety. According to Shri. Gopi the tissue culture laboratory established by him costs Rs 30 lakhs and in the process he lost not only his agricultural livelihood, but also burdened him with a heavy debt. On the intervention of another Minister of Agriculture, the tissue culture facility was taken over in 2004 by the VFPCK for five years on a contract, which agreed to settle loan liability of Gopi and also pay him royalty on every seedling. The VFPCK failed and Gopi's loan liability enlarged. He became virtually ruined, while many farmers made profits with his innovation.**

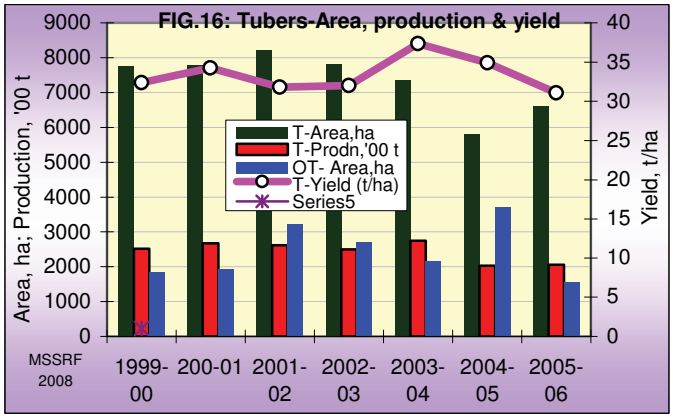
**The GoK may urgently examine this whole matter with an independently enquiry and offer adequate economic rehabilitation of this innovative farmer, who is driven to the brim of his life.**

As these plants are vulnerable to damages from winds, heavy rain and drought and such damage even to a single plant may inflict considerable loss to the farmer, insurance against these risks is important to safeguard farmers' income from banana cultivation. VFPCK is facilitating such insurance only to farmers who are the registered members. These members at present constitute a microscopic portion of farmers growing banana and plantain in the district. The current level of insurance premium is Rs 2.50 per plant and pays a compensation of Rs 50. According to farmers the compensation is so low and it has to be at least Rs 100. When more farmers and area is brought under insurance, the premium may

substantially go down. It is recommended that farmers may be facilitated to insure their banana and plantains for risks against crop damage by winds, heavy rain or drought and for payment of compensation @ Rs 100/plant and 50% of the insurance premium be met from this package for a period of three years. When such scheme is in place banana/plantain may be excluded from eligibility for compensation under natural calamity.

### 11.1.7. TAPIOCA AND OTHER TUBERS

Tapioca and other tubers, mainly elephant foot yam and dioscorea but excluding sweet potato, occupy about 3.2 % of the cultivated area in the district and contribute 7.9 % of the total agricultural income. Tapioca yield in Idukki is the second highest in the State, only after Wayanad. Despite this high yield and its stability over years, area under this crop is declining (Fig. 16). The area decrease under tapioca decreased by 20 % during 1999-00 to 2005-06. Tapioca follows ginger in major decline of planted area in the district during the recent past. However, in the case of other tubers no significant area decline is noted during the corresponding period. It appears tapioca area is giving way to the expanding more profitable rubber. This Commission did not receive any major grievance related to tapioca and other tubers from farmers. There are new opportunities for cultivation of nutritionally superior tuber crops with the help of the Central Tuber Crops Research Institute, Thiruananthapuram.

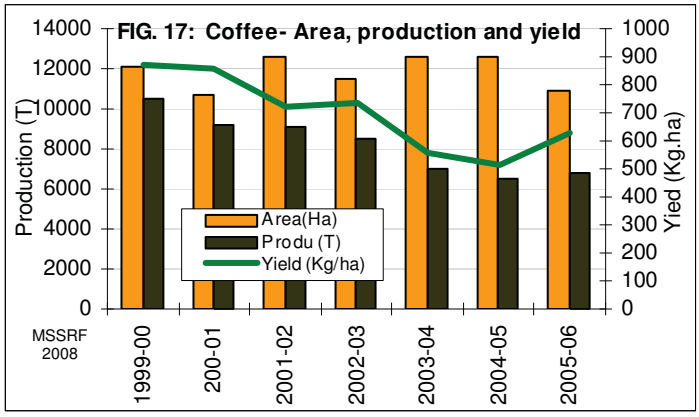



A report on the possibility of rearing silkworm on the tapioca leaves came to the notice of this study. However, detailed information on the quality of silk and economics of the opportunity were not available. The Indian Silk board is requested to examine the option and explore how far this could be used to generate additional employment and income to the people.

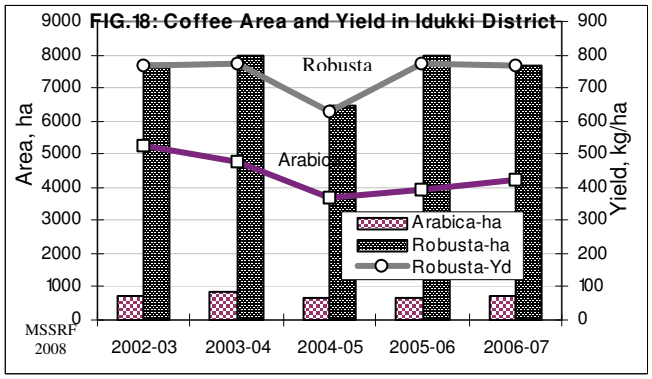
### 11.1.8. COFFEE

Coffee cultivation contributes to 2.5 % of the agricultural income in Idukki district and in

this respect enjoys 8th position between different crop and animal sectors of the district. Coffee occupies only about 10870 ha area in the district and is confined within elevations ranging from 120 m to 1650 m above MSL. The rainfall pattern of Idukki is not highly suitable for coffee. There is problem of insufficient and erratic rainfall during the critical periods of coffee blossom and fruit setting and excess rains during other stages, including harvest and drying. However, Idukki shares 14.8 % of coffee area and 28 % of the coffee holdings of Kerala. The district is notable for predominance of small coffee farms. While the Coffee Board of India (CBI) classification of coffee holding groups area below 10 ha as small, the average coffee holding size in Idukki is 0.74 ha. Among the 17014 coffee growing holdings in the district, 93% is small owning less than 2 ha and they share 59% of total area. The coffee area in the district is spread across Vandiperiyar zone (41%), Vazhavana zone (35%) and Adimali zone (24%). *Robusta* coffee is predominantly grown (85 % area) and occasionally tree coffee species is also grown. Production during 2006-07 was 6820 t at an average yield of 627 kg/ha. During the last seven years, areas under coffee shows sign of decline together with significant fall in production and yield (Fig.17). Vazhavana has maximum *arabica* area, while largest *robusta* area is in Vandiperiyar. On an average, *arabica* coffee in Idukki district yielded about 58 % yield of the *robusta* coffee (Fig 18).




Widely grown *robusta* selections in the district are peredina, S 274, C x R, S 795, SLN 5B, SLN 7-3, SLN 8 and SLN 9. Cauvery and BBTC are commonly grown *arabica* coffee. The CBI is distributing the planting material of new varieties. This Commission did not come across major grievance from coffee growers either on the availability of planting material or on such other issues hindering coffee production. However, with regard to coffee marketing, the



need for supporting small farmers with warehousing facility and strengthening their stock holding capacity was brought before this Commission. In the absence of warehousing facility accessible to farmers, they are facing exploitation by the traders who have warehousing facility in different regions. In view of this, it is recommended to build three coffee warehouses at selected locations in Vandiperiyar, Vazhavana and Adimali with land provided by the Panchayat or the State government.

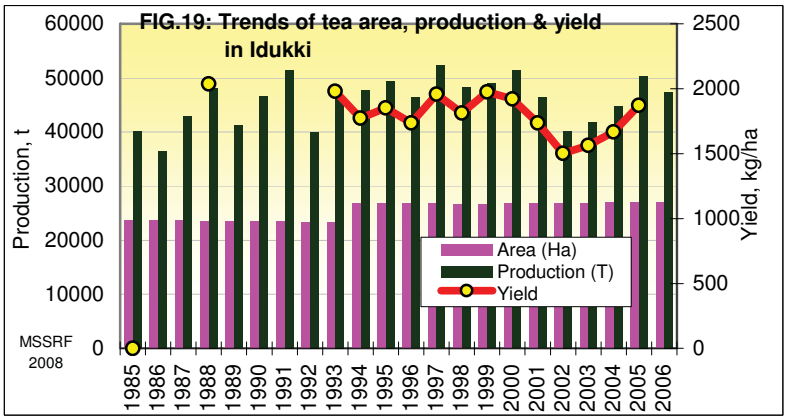
Recently under the 11th Plan, government of India has provided Rs 310 crores for replanting senile gardens across States. This is expected to benefit the coffee growers of idukki also. The CBI currently offer financial support to the tune of 20-25% on production enhancing and value addition programmes such as sprinkler irrigation, pulping facility, drying yards, water storage facility, etc. to small holders. For many small farmers such level of financial assistance is not helpful for making major infrastructure investment. Hence there is need to enhance this assistance to 50 % of the actual cost or Rs. 50,000/holding, which ever is less. Recommendation to this effect is made.

CBI had been supporting coffee farmers during times of distress. During 2003-04 and 2004-05, which were the years of extreme distress to coffee growers due to deep decline in prices, it had come forward to waive off all outstanding loans - principal and interest- disbursed by it. According to the Board, the total amount waived off amount across India was Rs 23.08 crores covering 7925 loan accounts. Similarly, the Government of India had also declared a three year moratorium period for paying interest on Special Coffee Term Loans extended by the banks with one-third of the rescheduled interest waived off. Since 2004-05 CBI has been operating an 'Interest Subsidy Scheme' to subsidize interest on the loans taken by farmers from scheduled commercial banks to the extent of up to 5% in the case of small growers and 3% in the case of large growers. The benefit extended under this scheme during the last three years to coffee farmers of Kerala is about Rs 6.4 crores. Coffee farmers of Idukki district received all these benefits. All these might have contributed to the relative ease in the economic stress noticed among coffee farmers of the district. Coffee marketing is discussed under 'Agricultural marketing'.

**11.1.9. TEA**

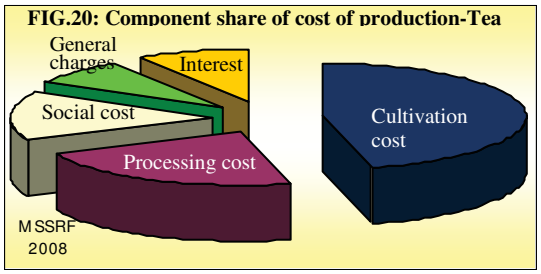
Tea is one of the early plantation crops in Idukki and it currently occupies about 23702

ha, produces 40063 t of leaves at an average yield of 1690 kg/ha (Fig 19). It contributes 1.5 % to the agricultural income of Idukki district. Most of the tea plantations are situated in elevations above 750 m. About 66 % of area lies between 750 and 1500 m, 26 % area between 1500 and 2000 m and 8 % area above 2000m. This area, largely located in Devikulam and Peerumedu taluks is endowed with natural advantages of elevation, climate and soil. Tea growing area is divided into four major zones, namely Vandiperiyar zone (21% area), Peermadu zone (7%), Elappara zone (19%) and High range or Munnar zone (53%). Tea area over recent years has remained constant with senile bushes.

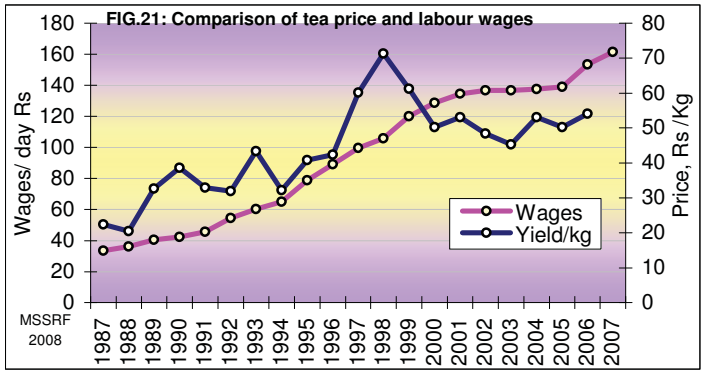



Under the Tea Board Act, growers owning below 25 acres (10.12 ha) are classified as small growers, who in Idukki constitute 7%. Idukki has about 4956 tea gardens, out of which small growers own 4887 gardens with area of 3910 ha. Most striking feature of the small tea growers are their unorganized operation and productivity less than the district average. There are 69 larger gardens with area above 100 ha, which occupy about 82 % of area and contributing to 93 % of production. Compared to tea from North India, larger share of South Indian tea is exported. Hence, tea production has to be competitive with that elsewhere in the world. Crisis of Indian tea production arises from its high cost of production and low productivity arising from aging bushes, which in 86 % of the gardens have crossed 70 years.

**Factors causing crisis in tea sector:** According to United Planters Association of South India (UPASI), the production cost of tea in South India is Rs 54/kg while the same in Vietnam is Rs 34.23. In every Rupee spent on production, 46 paise is cultivation cost, 22 paise is processing cost, 15 paise is social cost, 8 paise is general cost and 9 paise is overhead (Fig.20). A comparison of tea prices and labour wages including social welfare cost shows the trend is



increasingly unfavourable for tea producers after 1998 (Fig. 21). In addition to the neck breaking cost of production, Kerala is levying 50% agricultural tax on tea, which is the highest level of taxation among all States. While Tamil Nadu had abolished this tax, the other highest tax is 35 % levied by Assam and Karnataka. More over, the policy on tea import is rubbing salt over the injuries of the domestic tea sector. In 2006, 11960 t, which is equal to 25 % of domestic production was imported. All these have precipitated and aggravated the crisis in tea sector, which is most intense in Kerala. This has led to the closure of about 20 estates, out of which 11 have re-opened since then. However, at least 8 of them are not able to pay wages to employees beyond basic pay.




Tea production is now seriously sick with incapacity to make any long term developmental investments, factory modernization, undertaking replanting, etc despite provision of 25% subsidy on the cost by the Tea Board of India (TBI). All these are resulting in decline of tea production and tea-dependent employment and income generation.

Major intervention is required from Central and state governments to correct policies forcing Indian tea production non-competitive and declining. Incentives are required to enhance the income of small growers by promoting enhanced production of quality tea and diversification of holdings with other crops and dairying. Together with policy intervention, extensive replanting of aged plantations with high yielding and high quality clones are essential to take tea production in Idukki back to healthy state. The subsidy component has to be enhanced to 75 % for small farmers and 50 % of the re-plantation cost for plantations at or above 20 ha. In addition, pro rata subsidy is to be given on the labour wages of the re-planted area till the new clones reach the plucking stage in all plantations covered under the Plantation Labour Act. For this a special purpose fund may be created with an amendment in the Plantations Labour Act, 1951 to share the social costs on labourers between the employer and the Central/State Government.

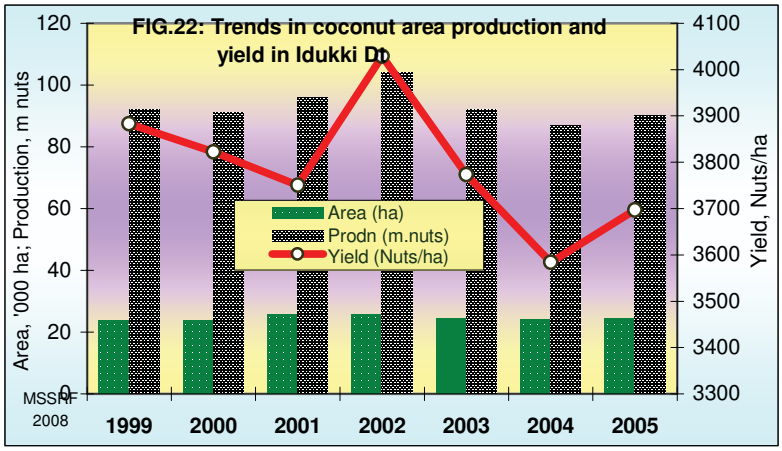
Another issue bothering tea growers is the inflexibility enforced by the Kerala Land Reforms Act, 1963 to exclude tea gardens for any crop diversification, particularly when the tea production is not profitable due to depressed global price. On the basis of many proposals on this issue came before this Commission, a careful study was undertaken. While the regulations under KLR Act are important, it is recommended that Government of Kerala may allow an one time and strictly enforced flexibility to allow 5 % of the tea garden area, not exceeding 500 ha in a plantation, to exclusively promote dairying, fodder grass cultivation, kitchen garden not exceeding 200 - 400 $m^2$/ family and floriculture. In such cases the plantation labourers residing within estates be given priority in dairying and kitchen gardening to enhance their income and nutrition.

Quality enhancement and enforcement on tea is important for trade promotion with geographical indication and geographical logos, as is being built for Nilagiri or Assam tea. It is important to ensure that these labels and logos are accessible to all producing the specified quality of tea within the reasonably defined geographical area. Conventionally tea tasters determine the tea quality. The subjectivity inherent in this method can now be eliminated with the use of E-nose, an indigenously developed tea quality-monitoring instrument by the CDAC. This instrument has capacity to sense volatile compounds of tea and reliably predict 'Tea Taster-like' scores with better accuracy. Tea Board may offer 50 % subsidy on this instrument with a scheme to strengthen quality value added tea production in Idukki.

### 11.1.10. COCONUT

Coconut occupies 24,343 ha in Idukki district and contributes to about 1.1 % of the annual agricultural income of the district. Although coconut is not suited to elevations above 500 m, it is being planted at higher elevations either as a garden or homestead crop. In these regions yield is very low and often uneconomical. The average yield ranges from 20 to 50 nuts/palm during unfavourable and favourable years, respectively. More coconut plantations are in Thodupuzha taluk and in Kokkayar Panchayat. Coconut is severely affected by root (wilt) disease in the planes and low elevated regions, which are the areas most suited for the crop in the district. While the area under coconut went on increasing during 1999 to 2002 at 3 % annual growth rate, it is found declining at 2 % annual rate thereafter (Fig. 22). It appears the area under coconut in the plane and lower elevations is giving way to rubber. The crop requires a

major intervention for its rejuvenation for yield and income enhancement. The severely wilt affected and senile trees which have lost the economic yield potential have to be replaced with healthy planting material and the remaining trees are to be managed better for pushing their yield above the economic threshold. The management practices should include adequate manuring and timely control of leaf rot and bud rot diseases and pests like rhinoceros beetle and red palm weevil. It is desirable that planting material wherever possible be selected from the region and nursery raised in participation with trained farmers and SHGs of farmwomen. Introduction of seed nuts may be resorted to only when locally selected mother palms in disease-affected areas are not meeting the annual demands for seed nuts. Household based group activity could be promoted for value addition of coconut, such as virgin oil production and tender coconut marketing for increased income generation. Advice and support of Coconut Development Board may be taken in this regard. It is important that coconut promotional activities are confined to regions of the district below 500 m altitude The recommendations under this package is over and above the support being provided by the Coconut Development Board.

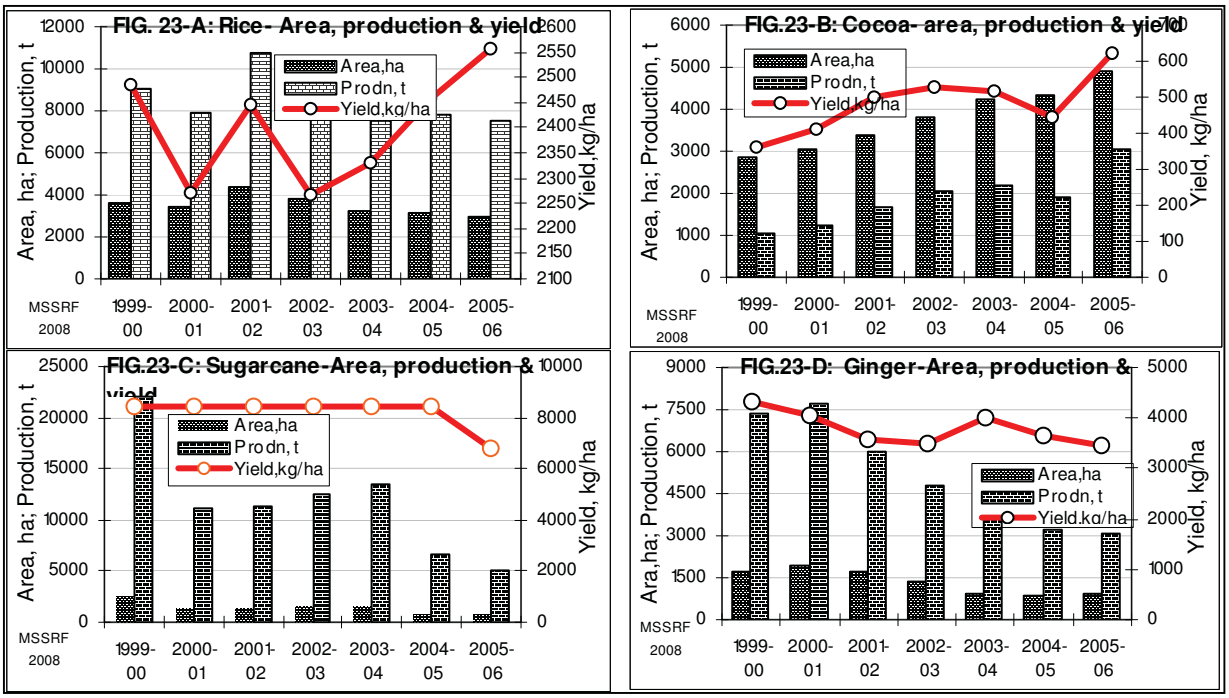



## 11.1.11. OTHER CROPS

Other crops, which occupy smaller area and contribute a small fraction to the agricultural income of Idukki district, are rice, cocoa, arecanut, ginger, garlic, nutmeg and cashew nut. Rice area in 2007 according to Department of Agriculture is 1215 ha, largely confining to the plane region of Thodupuzha taluk. Its contribution to the agricultural economy of the district is about 0.3 %. Over the last 8 years since 1999-00, the rice area had declined by 65 % (Fig.23A). Although the Idukki district has the lowest area under rice, compared with other districts of the State, the shrinkage of rice area may impact the proposal to expand milk and meat production in the district. Hence, there is importance for conserving area under rice by economic incentives and policies to protect the wetland ecology. Profitable price to paddy is the best sustainable incentive.

Cocoa is another minor crop grown in about 4900 ha in the planes and lower elevations of the district. It is grown as an intercrop. The area under cocoa over the last 8 years from 1999-00 has been growing at annual average rate of 10%. The yield also had been increasing during this period (Fig.23-B). The increased area, yield and production have been due to favourable price.

Sugarcane is being grown as a highly localized crop in small area in and around Marayur at high altitude. The crop is grown largely as rain fed in low and up lands with limited irrigation by few farmers. It appears the official yield data available is not dependable. In any case the yield is very low, around 8 t cane/ha, which is far below the economic threshold. This adverse equation has been causing continuous decline in area and production (Fig.23-C). The variety being grown also produces very thin stem with low juice recovery. All the harvest is crushed locally to produce jaggery. Marayur jaggery is reported to have special quality to claim niche status. However, the dismally low yield of cane and juice recovery makes the cost of production of jaggery




very high and far less competitive. Hence, sugarcane farmers are facing serious economic problem. A special effort to introduce locally adapted high yielding varieties with the help of Sugarcane Breeding Institute, Coimbatore, training farmers on modern methods of cultivation and processing and application of appropriate package of practices to boost the yield at least up to 30-35 t/ha is important to make sugarcane cultivation economically viable. As long as this is not achieved any short-term support given to these farmers will not be sustainable. It appears farmers are not getting any technical assistance from either the Department of Agriculture or the KAU to improve

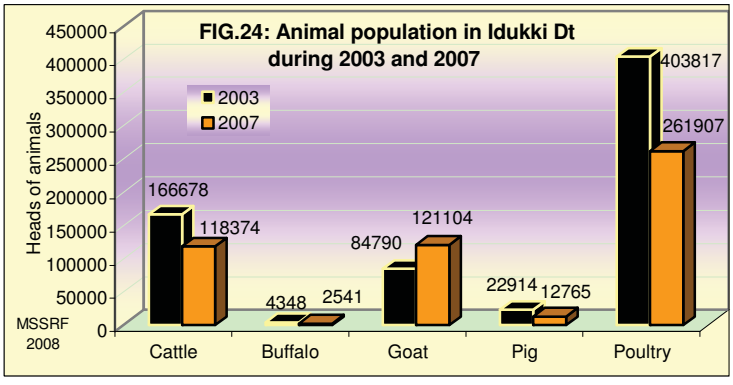
the cultivation. Marketing Marayur jaggery with proper packaging and labeling through outlets like 'Triveni' shops, which are networked through out the State may help in realizing niche prices to farmers. Having such niche market established, geographical indication may be secured for this jaggery to make this product exclusive to the region.

In Idukki ginger is one of the minor spices grown. During 1999-00, the area under ginger was 1711 ha and the production 7369 t. The area in 2005-06 decreased almost by half to 900 ha. Concurrent production decline was close to 60%, while that of yield was 20 % (Fig.23-D). The high cost of production and low prices have been making ginger cultivation unattractive in the district. It is notable that the State Horticulture Mission in Idukki is making about Rs 1.7 crore investment on ginger production without apparently addressing or remedying the causes, which have led ginger cultivation uneconomical. Such investment on a crop losing grounds on economic reasons may bring no sustainable outcome and benefit to ginger farmers.

Other minor spices each occupying areas less than 1000 ha in the district are nutmeg, turmeric, cloves, tamarind, garlic and vanilla.

## 11.2. ANIMAL HUSBANDRY

Animal husbandry is a major subsidiary livelihood activity of many farmers. Livestock wealth has significant contribution to the agricultural economy of the district. As per the latest survey in 2007, the total animal population of the district is 516691, comprising 118374 cattle, 2541 buffaloes 121104 goats, 12765 pigs and 261907 poultry (Fig.24). There is a negligible number of sheep. The share of animal husbandry to the agricultural economy of the district is 10.8 % with 84% contributions from milk, 12 % from meat and 4 % from egg (Fig. 5). About 40,000 families in the district are reported to be engaged in cattle rearing. The data on animal stock census conducted during 2003 and 2007 is showing about 25% decline in the total animal heads from 682547 to 516691. Major groups of animals declined during four-year period are cattle (29%), buffaloes (42%) and poultry (54%). The population of goat is



found increasing by almost 43 % during this period. This trend clearly indicates decreasing importance to the production of milk and egg. It is not sure whether increasing goats indicate an increasing stress on meat for local need. This overall change in Idukki, which is widely recognized for its high suitability for dairy farming, is indeed alarming. This decline in cattle and poultry in Idukki when the demand for these produces is increasing in Kerala and when the State is becoming increasingly deficit for them is indeed very strange. There is possibly no other region in the State more suited than Idukki district for economic dairy farming with the availability of large permanent pasture land for free grazing of cattle, potential for fodder production and largest area under forestlands. The reasons for declining animal husbandry should lie behind the state policy on animal husbandry and its programmes and priorities. This is discussed later.

### 11.2.1. IDUKKI-THE 'MILK SHED' OF KERALA: THE VISION AND ACTION

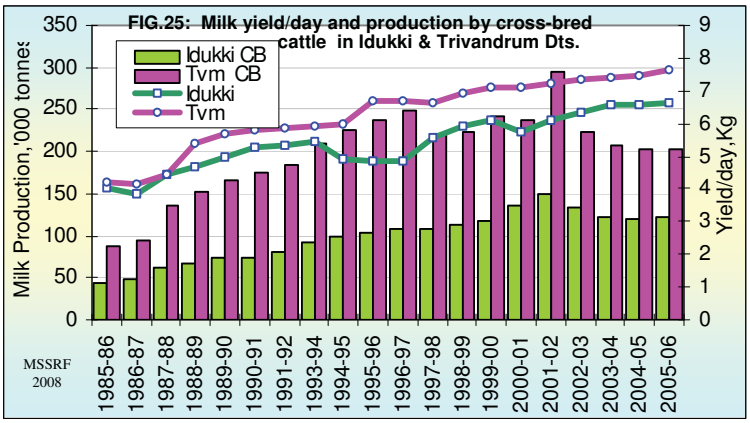
It was in Idukki the first Indo-Swiss Project (ISP) on cattle improvement initiated more than four decades ago. The district wise data on milk production prior to the project is not available with the Animal Husbandry Department. It is, however, understood that average milk yield of local cows in the region was about 2.0-2.5 lit/head/day. The vision behind the ISP was to transform Idukki, particularly the Peerumedu region, in to a '*milk shed'* of Kerala through cross breeding of local non-descript cattle with highly productive exotic breeds like Brown Swiss (BS), Jersey, and Holstein Fraser (HF), which have milk yield above 30 lit/day/head. The project also aimed at strengthening the fodder resources of the region by introducing and popularizing appropriate fodder grass species. The project started in 1963 appears to have passed on all along without an independent review to assess how far it realized the vision.

ISP started under Department of Animal Husbandry (DAH) was separated from DAH in 1971 and named as Kerala Livestock Development and Milk Marketing Board. In 1975, it was bifurcated into Kerala Livestock Development Board (KLDB) with mandate on livestock breeding and Kerala Cooperative Milk Marketing Federation (MILMA) with milk collection, processing and marketing as its mandate. There is a fourth department called Dairy Development Department with mandate on fodder grass development, distribution of milch cows, development, marketing and training and control on over 3500 milk procurement societies. All these departments are privy to overall changes happening on the animal-rearing scenario in Idulki district. During

this period more departments were born from the DAH with out meeting the mission on cattle breeding. The new composite and multipurpose breed called '*Sunandini*' was derived from cross between local non-descript (ND) cattle with exotic breeds with initial 62.5% genetic contribution from BS. This hybrid was subsequently allowed to have variable introgressions from Jersey, HF and American SB without selection in the female side. These derivatives are now broadly termed as 'cross-bred' cattle.

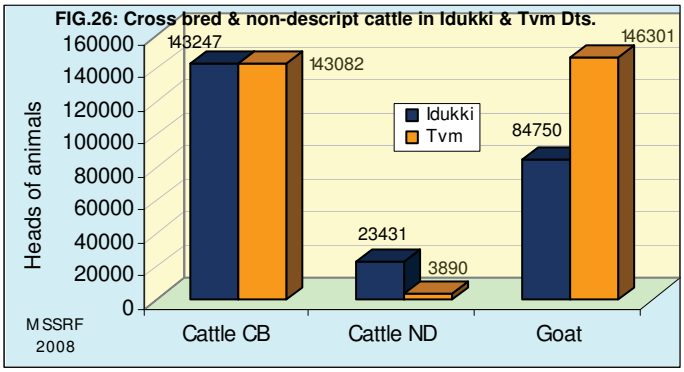
According to KLDB, the average age for first calving of '*Sunandini'* is 31 months and its calving interval is 13.6 months. At Mattupatti research farm 'Sunanadini' is reported to have yielded on an average 7.8 to 11.3 lit/head/day across five lactations with coefficient of variation between 8.1 % and 47 %. However, the current average milk yield of cattle in Idukki is about 6.5 lit/head/day. The yield envisioned under the 'milk shed' vision was far higher. The Dairy Development Department (DDD) holds the view that notwithstanding the 'Sunanadini', the district is lacking high yielding breeds. A look back at the failure of ISP in matching the vision may find the reasons in the lapses in selection concurrent with insemination of the improved stock distributed among farmers and the inappropriate choice of superior breeding stock. The first reason arose from separation of breeding programme from DAH and lack of coordination between DAH, which has the contact with cattle farmers and the KLDB, which produces and supplies the semen. Currently, the KLDB has become a corporate entity to produce and market inferior semen (largely from 'Sunanadini' bulls maintained by KLDB and outsourced from farmers) and planting material of few fodder plants, with no customised commitment to serve Idukki or Kerala farmers.

### 11.2.2. DRYING 'MILK SHED' AND VANISHING CATTLE




The cattle upgradation and milk production data from Idukki and other districts of Kerala may show how far the vision of turning Idukki the 'milk shed' of Kerala has materialized. The primary reason for choosing Idukki to locate the ISP was that it provides suitable weather to husband crossbreds of Jersey, BS and HF and the district has vast area to promote dairying unlike other districts. When one takes the milk production statistics of Kerala over 20 years (DAH, 2006), one notes that

Trivandrum and Palakkad are leading milk-producing districts. A comparison of milk production and milk yield from the cross-bred (CB) cattle over 20 years in Trivandrum and Idukki districts is made to bring out whether the location of ISP in Idukki had specially benefited the district, also considering its natural advantage to dairying. This comparison is presented in Figure 25. Trivandrum district outstripped Idukki both in production and yield. Moving further one may examine whether the number and composition of the cattle population in Idukki had changed more favourable than in other districts of Kerala. Such a comparison is again presented in Figure 26. It shows despite high milk production, Trivandrum district has far lower total cattle population than in Idukki and both the districts have almost equal number of CB cattle. What is more interesting is that Trivandrum district has far less ND cattle than the Idukki district and it suggests that the cross breeding programme has not touched far many ND cattle in Idukki. Thus, on three counts, on milk production, milk yield and genetic upgrading of ND cattle, the ISP project has not achieved any special impact in Idukki. According to 2007 cattle census the cattle are deserting this drying 'milk shed'. These developments are matters of very serious concern to all interested in building a thriving dairy business in Idukki district to take advantage of its unique natural endowment for grazing, fodder grass production and dairying with CB cattle.



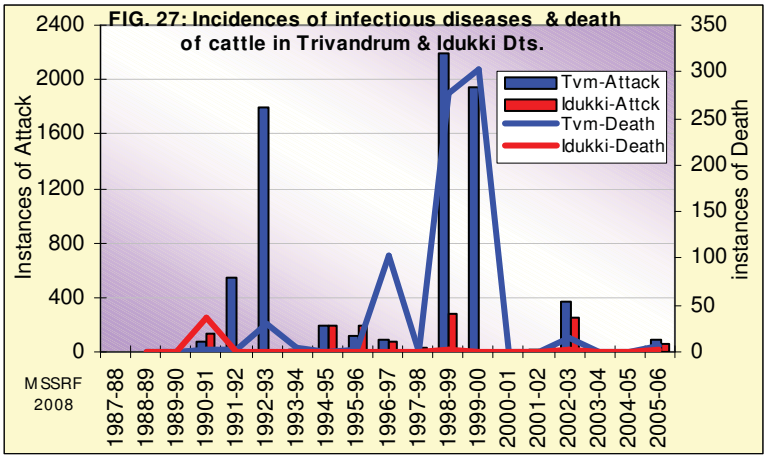

### 11.2.3. CATTLE DEVELOPMENT SANS FODDER DEVELOPMENT

The set back in achieving milk production has its natural reflection on the second goal of the ISP, that is strengthening the fodder resources of the region. This study team came across complaints from many farmers on the non-availability of fodder during summer months and lack of planting material of fodder grasses. During field studies, this Commission came to know that two fodder grasses, Congo Signal and Hybrid Napier (Co 3), introduced by the ISP are popular among farmers, although these are grown sparsely. The district is reported to be 65% deficit in fodder grass. Neither any department dealing with animal science (there are four of them) nor the State Department of Economics and Statistics have data on the area cultivated by fodder grass in the district. According to KLDC Annual Report of 2005-06, 99% of the 10.2 t of Congo signal seed produced was sold out side Kerala and 95% of the 4.33 lakh rooted slips of Hybrid Napier multiplied was sold to DDD, Kerala. But, the Idukki district suffers

acute fodder grass shortage. This study did also not come across that the Veterinary research institutions under the Kerala Agricultural University had identified or developed fodder grass suited to the Idukki region. In this context, it would be relevant to refer the dismal fate of a Veterinary college campus built half way and left abandoned at the Kolahalamedu in Peerumedu taluk.

### 11.2.4. INSEMINATE AND FORGET

Undoubtedly artificial insemination is the first, but not the only step to genetic improvement of cattle. What ISP had been doing religiously is production of frozen semen of '*Sunandini'* and exotic bulls, which now is to the tune of 3 million doses and supply two-third of this semen to the 2922 artificial insemination centers across Kerala. Again, Idukki is one of the few districts with lowest intake of this frozen semen produced at Mattupetti. From the insemination onwards, the domain changes to DAH. The immediate progeny from using '*Sunandini'* semen on ND cattle may not have substantial rise in milk yield, and the yield up to 6 lit/head/day may be reached only with repeated insemination over two or three generations. There is no follow up on the inseminated cattle, its progeny and for the second cycle on insemination and so on and so forth. There is no coordination between KLDC and DAH on breed upgrading. For this semen production KLDC uses un-pedigreed heifers procured from farmers due to shortage of pedigreed '*Sunandini'* bulls in its Mattupetti farm.




Another reason discouraging investment on high yielding high cost cattle and moving upward from low productivity is the rising incidences of infectious and contagious diseases, particularly with the introgression of exotic blood in the locally adapted ND cattle. A comparison of the data on the incidences of infectious diseases and resulting death of cattle in Idukki and Trivandrum districts shows that such events were far lesser in Idukki (Fig. 27). Therefore, a fair conclusion may be that animal diseases, although prevalent, could not be a reason discouraging growth of dairying in Idukki district, particularly with CB cattle.

### 11.2.5. THE PATHWAY FOR PROMOTING DAIRING IN IDUKKI

Having reached the inescapable conclusion that the ISP did not have any special impact on dairying in Idukki in any manner different from what it has been claimed to have done to other districts of Kerala, it is important to understand what is holding back Idukki from becoming the 'milk shed' of Kerala, despite the most congenial conditions available for cattle rearing. According to DAH, the important reasons for the poor performance in milk production in the district are high cost of production due to high cost of balanced feed, animal care products and medicines, shortage of good quality fodder, low productivity of animals, and occurrence of diseases like mastitis. The DDD adds additional reasons like non-availability of high yielding breeds, difficulties in marketing and low return from dairying as reasons for the poor response from farmers to dairying.

While it is obvious that high cost of production and uneconomic price of milk to the producer are central to the dairying debacle in Idukki district, other factors such as low animal productivity, high feed and medical care cost, lack of quality green fodder round the year, frequent occurrence of diseases like mastitis and foot and mouth disease and lack of competitive market are negatively impinching on the dairy farm economics. The socio-economic factors adding to the dairy decline are the breakdown of joint/composite families, shift in cropping pattern (decline in rice area), and high labour cost. But these factors are common across Kerala. A dairy promotion policy to optimize producer profitability and to minimize production cost by leveraging the natural endowment of Idukki district for sustainable increase in milk and meat production and improvement of farmers' income appears lacking.

### 11.2.6. MILK IS CHEAPER THAN WATER!

Current demand for milk in Kerala, according to the Director of Animal Husbandry, is 85 lakh lit/day, the State is deficit for 30% of the demand and this is being met by import from neighboring States. According to dairy farmers of Idukki, current cost of production of a liter of milk comes to between Rs 11 and 12 and unless farmers get a price of Rs 14, dairying cannot support livelihood in Idukki at the current productivity and production cost. At one of the farmers' meetings organized by this Commission a dairy farmer presented two bottles before Prof. M.S. Swaminathan to drive home that branded mineral water is sold at price higher than a liter of milk (Fig. 27A).

It is found that the public sector milk procuring, processing and marketing agencies like DDD and MILMA pays only Rs.11.85 to 12.25/lit of milk having 4.1% fat and 8.5 % SNF content. Idukki district is producing about 1. 5 lakh lit/day. Out of this, 1.01 lakh is being procured by cooperative milk societies of the DDD. A comparison of these prices is made with that of Tamil Nadu, which supplies substantial milk to Kerala on daily basis. AVIN procures milk with 4.5 % fat and 8.5 % SNF at Rs 14/lit and sells at Rs 20/lit at a margin of 42 %. The DDD had conceded in a document that the price being offered by it to milk producers of Idukki is less than the local market prices. It had even approached this Commission to seek funding for increasing procurement price by Rs 0.50/lit and to buy milk cans and whole lot of infrastructure, movable and immovable. These government agencies are marketing milk at the price of Rs 17/lit, making a margin of 42% of the original cost. This is despite the government is providing full financial support for infrastructure and staff and some contingency fund to these agencies. It appears the consumer price of milk is fixed with government intervention from a populist consideration. In the process the dairy farmer is made the final shock absorber of the inefficiency of the public agencies procuring and trading milk and a populist consumer biased price policy. The dairy farmers may not get fair deal as long as inefficient monopolistic public milk procurement and marketing systems are foisted up on them. As long as such framework and policy exist, no temporary relief offered would help in reviving the dairy business. A revamp of the whole framework and replacing it with a dairy farmer-centric pricing policy alone would turn Idukki into a ‘milk shed’ of Kerala.

**FIG.27A: Farmer displaying milk which is fetching price lower than water**

### 11.2.7. NEED AN INTEGRATED APPROACH

Commercial milk production with high yielding cattle requires supply of balanced feed and green fodder at reasonable price. All concerned governmental agencies agree that costs of feed, medical care and management are rising disproportionate to the produce price. While the green fodder is not available, the dry fodder is getting increasingly scarce and costly due to heavy decline in rice cultivation. The Director of DAH stated that while daily requirement of manufactured cattle feed in Kerala is 3500 t, the local production in public and private sectors is only 1500 t. The deficit feed is imported from neighboring States. Due to high demand and low supply, feed prices shoots up and spurious feed supply takes the toll of dairy farmers in the absence of

strict regulatory measures. Sustainable dairy promotion may not be possible in Kerala without making the State near self sufficient in feed by establishing additional feed production capacity and enforcing feed quality regulation. The institutions responsible for fodder/forage grass production have to account for their continuous failures and a time bound strategy needs to be put in action to generate green fodder round the year. The present farmer exploitative marketing system functioning under the guise of cooperative societies dictated by the dairy bureaucracy has to be restyled into farmer centered milk marketing system following the Gujarat Cooperative Milk Marketing Federation model. In a state where cost of production of every farm commodity is high, consumers have to be conditioned to pay more to safeguard production and the livelihood of the producer. Alternatively, the government must come forward to subsidise either the producer or the consumer. There is no other short cut to promote farm production and self-reliance.

There is a fairly good infrastructure and manpower for animal health care and effective management of epidemics. The infrastructure includes 40 veterinary institutions, 3 veterinary polyclinics, one each mobile veterinary hospital, clinical laboratory, veterinary dispensary and district poultry farm, 2 mobile farm aid units and 30 veterinary hospitals. There are also 86 centers with artificial insemination facility. Veterinary service under the DAH is there at every Panchayat. Notwithstanding these, farmers have to incur expenditures of different kinds for getting the services of veterinary expert. The DDD has 150 primary dairy co-operative societies supporting milk production and procurement. Four departments or Boards control these infrastructures with overlapping mandates and with very little or no horizontal coordination.

### 11.2.8. CURRENT ACTIVITY ON DAIRY PROMOTION

On the basis of the information provided to this Commission by the DAH and DDD, their current developmental activities appear very marginal. The DAH is conducting awareness programmes, seminars and exhibitions on better breeding practices, minimising inter-calving period, increasing productivity, controlling of mastitis, rabies and other diseases, calf care management and clinical service for infertility. The main activity of DDD is organising primary dairy co-operative societies to support milk production and it claims that the dairy co-operative society, on an average, collects 809 lit of milk/day. With multiplicity of departments and Boards, the animal husbandry sector appears to be starving for funds, which is seriously constraining promotion of

milk, meat and egg production in the district. DAH and DDD came with Rs 677 crore for expanding their institutional activities and free distribution of animals and feeds. These proposals, reflecting their truncated and overlapping operational domain showed duplications and lacked in holistic approach in integrating dairy production as a sustainable opportunity for income generation. The DAH argues that no more the dairy sector is tied to concepts like one cow one family of yester years and production units should have 10 or more animals. The DDD, on the other hand, recommends units having 2 milch cows, each producing 30 lit/day (Box 7).

**Box 6: Free distribution of cows-A case study**

A case of fee distribution of cows to farmers for promoting milk production and income generation offers lesson on developmental strategies woven around free supply of production assets to individuals. At Pooppara there is a resettlement colony of Mannan tribe with 47 families. In 2003 all these families were given a ND cow free of cost by the DAH. Each family has only 1-acre land, which they use primarily to cultivate tapioca, with little pepper and plantains. They do not have adequate space to grow fodder crop or irrigation facility for intensified cultivation of any crop. The area also do not receive high rainfall common elsewhere in Idukki. Accordig to the farmers they did not receive any support for growing fodder crop. The cows distributed had milk yield around 2-3 lit/day. Eventually within two years, half of these families found that they cannot maintain the cow for different reasons and disposed it off. When the team visited the settlement, about 50% of the families were retaining the cows. They showed great eagerness to get fodder grasses suited to their land and growing conditions. Some among them are enthusiastic to have high yielding cows and willing to receive such cows even if they have to pay a part of the cost. It is important that such schemes when envisaged should have a mechanism to create a feeling of ownership.

Idukki district offers uncommon opportunity in the State to enhance the income of farmers from an integration of crop and animal husbandry. While certain regions are specially suited for specific crops, other regions are suited for dairying and mixed farming. The district has the advantage of natural potential for dairying and hard working farmers, who have proven their innovative strength. What is needed is fair producer price and removal of systems, which deny the fair price, such as exploitative private trade cartels or farmer unfriendly public institutions. This demands shedding of substantial policy content. Without this, all effort to enhance animal production to strengthen sustainable income to farmers may remain patchwork and short-term solutions. Important policy interventions required in the district for promoting milk and meat production are; (1) ensuring production cost based price to farmers, (2) establishment of feed production units in private/public sector and ensuring feed at competitive cost, (3) promotion of fodder grass and silage production for round the year supply of quality roughage, (4) supply of value added paddy straw or other roughages from regions where these is available at cost effective price, (5) abolition of institutions in the milk procurement and marketing chain which are denying fair price to farmers, (6) establishment of farmers' cooperatives on the Gujarat

Cooperative Milk Marketing Federation model, (7) use of locally adapted high performance milk/meat producing breeds with farmer participatory selection for cyclic improvement, (8) regular training, capacity building and extension of services to farmers on animal management, disease control and monitoring and hygienic milk production, and (9) facilitation of insurance of animals.

Some of the proposals received from the DAH and DDD are mentioned below with recommendations on them separately dealt under section 'Recommendations'.

(1) Enhancement of milk production by promoting scientific feeding of animals in lactation would provide good training to farmers and hands on experience on the importance of balanced feeding for increasing milk yield and income together with the cost-benefit aspects of better management of milch animals. The scheme is called 'Ksheera vardhini'. The economic loss from poor feeding is not only lower the yield, but also increased inter-calving interval. This programme will go hand in hand with intensive training to farmers on the importance of regular feeding, determination of daily ration and its components and regular healthcare management. The scheme may cover 21500 cows and buffaloes spread across the district over a period of five years, with preference given to the animals covered under the female calf-rearing scheme. Only one head of cow or she-buffalo from each a farm holding will be brought under this scheme. The farmers may procure recommended feed with the feed loan paid through the local bank in four annual installments, on the basis of registration of the animal under the scheme, pass book showing milk delivery to the MCS and certification on the eligibility to draw the feed loan installment. The DAH is to be provided with funds for organising required training to farmers in the programme and to extend regular quality healthcare services to all registered animals. It shall also be made accountable for achieving the impact expected from this scheme.

(2) Supporting healthy female calf rearing for shortening their duration to conception, for their further genetic upgrading, for enhancing their production and for achieving higher income generation to tribal and BPL farmers and other small farmers, including plantation workers. According to DDD there are 40,000 families rearing cattle in Idukki. DAH estimates that nearly 12,000 calves are born every year in Idukki and majority of them reach puberty only after 3-4 years due to poor feeding and health care. The economic loss from such delayed puberty is sought to be remedied by proper caring of these calves to attain conception after about 2 years. These calves

could be used as stocks for genetic enhancement under appropriate insemination schedule.

(3) Supporting rearing of male calf for promotion of beef production. This is to cover 5000 heifers every year for three years for promoting production of good quality beef and income generation to farmers. Details of this scheme are similar to the one on female calf rearing except heifer selection is not on the basis of mother cow milk yield and that the families included under the female calf scheme or 'Ksheera vardhini' will not be chosen for this scheme. In case the farmer included in the scheme is disposing off the heifer before completion of project, the liability to repay the disbursed principal of feed loan shall lie with him/her. At the end of the project farmers are free to sell the animal at free market rate.

(4) Management of mastitis for promoting milk yield of should deserve high priority in Idukki in view of the ubiquitous nature of this disease. Mastitis is the single largest cause of productivity decline and decreased milk quality. It is estimated to cause loss of about 95 kilo lit of milk in the district every year. The disease could be easily managed with hygienic cattle shed, awareness generation to dairy farmers and training on the use of mastitis kit. Mastitis test could now be performed at a nominal cost of Rs 0.25. According to the Director, DAH the mastitis kit is now available at Rs 75/unit. Many farmers are not aware of the harm this disease could do and the simple precautions, which can control the disease. Hence it is important to train them on the disease, precautionary measures and disease management along with empowering them for the same. This scheme, with required support for two years, seeks to promote hygienic cattle shed, awareness and training to dairy farmers and supply them with mastitis kits.

(5) Introduction of high yielding and locally adapted cows to bring in new genetic variability for enhanced milk production potential to tide over the yield stagnation in dairying. Having the KLDC efforts not succeeded in raising the milk yield to economically viable level of 15 lit or above/day, there no alternative other than introduction of high yielding stock. According to Shri P.J Joseph, MLA, an expert dairy farmer, farm visionary and former Minister of Kerala, the high yielding breeds suited to Idukki are Sindhi, Sahiwal, Holstein Freisher, etc, which may yield between 20-30 lit/day. However, the DAH has no data on the adaptability of these breeds in the area

and their yield sustainability. While introduction of such animal is a worthy proposal, there is also inherent risk in the large-scale introduction of new breeds in the absence of supportive data on their adaptability, yield stability, etc. Hence there desirability for restrictive introduction of 1900 cows and 100 bulls of selected high yielding breeds (milk production between 25 and 30 lit/day) across five years and their distribution all across the district to progressive dairy farmers identified with total transparency. The cows introduced should not have crossed second lactation and the bulls their mid-age. The farmers identified should be willing to maintain these animals on recommended level of management and under insurance for at least four years or three lactations. The estimated landing cost of an animal is Rs 35,000. Financial support is limited to 75% of estimated cost. The bulls may be retained by the DAH for semen production and cross breeding. The DAH is to be supported to meet the training cost of these farmers and towards meeting the healthcare needs of these animals and data collection on the performance of at least 100 cows of each breed spread across.

(6) Goat farming is increasingly becoming popular in Idukki due to rising demand for meat and the suitability of the region for goat husbandry, particularly by the small and tribal farmers and plantation workers in economic distress. This can substantially assist these groups of farmers who have very little resource for rearing cattle. Stall-feeding is also feasible under situations when the holding has either very small or the family is landless. The proposal is to provide a unit of five Malabari or Malabarica cross (Malabari x Boyer) goats, one male and four females, to each of 12,000 families identified from the BPL or small (owning 2 ha or less) or tribal or tea estate worker. Financial assistance will be 60 % and rest will be provided as interest free loan from local bank, re-payable within two years and pledging the goats as the security.

(7) Lack of adequate availability of green or dry fodder round the year is one major constraint limiting milk and meat production in the district. As majority of farmers are small ad medium, they do not have area for exclusive production of forage grasses. Hence, high yielding and quality fodder providing species, which could be grown as intercrops or on field bunds or along contour bunds or fodder trees are important. Government and local Panchayats may also facilitate growing these grasses/trees by SHGs on suitable *poramboke* or revenue or grazing lands leased out on short-term basis. Apart from identified multi-cut grass species such as Congo signal (*Brach aria ruziziensis*), Co-3 or KKLM-1 Hybrid Napier (*Pennisetum typhoides x P. purpureum*) and Guinea grass (*Panicum maximum*), perennial fodder trees, which could be grown

among plantation crops should be promoted. Azolla production is possible in areas with sufficient water round the year and good shade. Support for azolla production may be linked with dairy farmers, who have been provided with improved breed stock and others involved in 'Kheeravardhini' scheme. Important component of this scheme is production and supply of quality propagating material to all interested dairy farmers at 50% cost of the planting material (seeds/slips) to cover 800 ha every year for 3 years and azolla production in 3300 mini units, each of 30 $m^3$ size, during three years.

(8) Considering the economic status of farmers being inducted to dairying and the risk involved in the rearing of cattle, insurance of animals is important. Group insurance is proposed for about 40,000 milking cattle and buffaloes yielding more than 3 lit/day and has not completed more than five lactations. Financial assistance is proposed for 5 year insurance of animals at or before first lactation, 4 year insurance to animals in second lactation, 3 year insurance to animals in third lactation and 2 year insurance for the rest of lactating animals and those whose number of lactation is unknown. With the massive animal husbandry programme involving virtually every cattle, the level of risk during five years is expected to be low for an insurance company. Hence, assistance is estimated at gross rate of Rs 600/head of cattle with pro rata balance contribution, if any, to be shared by concerned farmers.

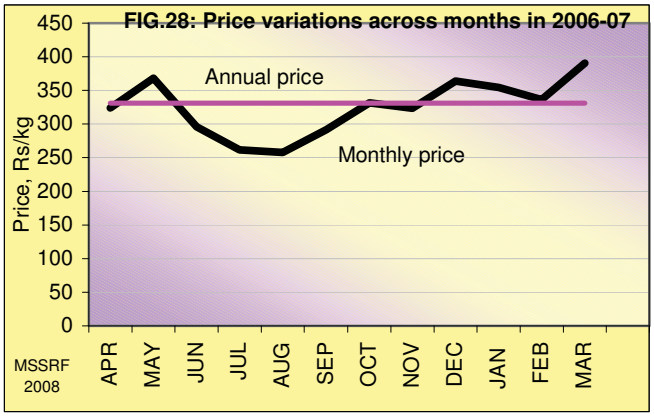
### 11.3. AGRICULTURAL MARKETING

Idukki with its hilly terrain, high ranges, poor communication system and transport infrastructure poses major challenge to the marketing of all agricultural produces of plant and animal origin. Lack of market, over play of middlemen, denial of fair price, and wide fluctuations in day-to-day prices are the common experience of farmers. The situation denies bargaining power to farmers and they are often forced to make distress sale, while the same produce is sold to consumers at far higher prices. The market contributes a significant share to the economic distress of Idukki farmers. There are different marketing systems in place, depending on the crop and the market law binding on the produce. For example, the Agricultural Produce Marketing Committee Act (APMC) precludes farmer (producer) to sell cardamom directly to the consumer or a trader without having APMC license. The involvement of government agencies in marketing, as is in the case of milk, also does not make a change to the exploitation. This unfavourable production and market economics in combination with

vagaries of weather is killing all sectors of agriculture in Idukki with profound impact on the livelihood of large section of farmers. Hence, appropriate marketing systems to ensure fair price to farm produces have important implication in minimizing farm distress.

**Cardamom:** Cardamom can be placed for sale only at designated APMC auction centers with only APMC licensed traders participating in the transaction. The Spices Board of India is the competent authority to grant APMC registration to cardamom traders. At an APMC auction center, farmers are price takers and not entitled to quote a price. This leads to collusion among traders to operate like a cartel and to deny fair price to farmer. Farmers have no way to assess what might be the price on a day he/she takes the produce to the market. They are practically forced to accept the offer in open auction. Forced because it is always not economical to pull out the price from market, transport to and fro for second auction. Thus, a cartel of traders dictates the price every time. In this context, the recently introduced email auction system is expected to give little hope to farmers. In this system, auction is completely computerized and confidential so that trader may not be able to operate as a cartel.

With respect to prices, the auction is totally unregulated. In few years had gone below the production cost causing huge distress to farmers (Fig. 10). There is huge variation across each auction with in a month and year (Fig. 28). In the case of farmers, only the registered farmers are eligible to participate in the auction. This system excluded many farmers, particularly the small. To remedy this, the SBI is now issuing cardamom growers' identity card with three years' validity. This ID is meant only for the purpose of participation in the auction as well as to serve as a legal permit to transport the produce locally without harassment from tax officials. However, many small farmers trade their produce to middlemen, who in turn take it the auction center. Many of them lack infrastructure and capacity to process and grade the capsules and thus forego substantial price benefit. They also have no or less capacity to hold the stock till the period of favourable prices



because of their financial predicament. To facilitate better income realization by these farmers, local warehousing facilities together with common value addition and grading facility is proposed. The land at suitable location for these warehouses may be provided by the local Panchayats or the government. These centers may be later linked to the spices park as spokes and hub. Such warehouses may be also linked with local banks to credit farmers when they deposit their processed produce. Local SHGs or farmers' associations may be entrusted to manage this facility as a common facility center to small farmers.

It still remains that the most serious problem bothering farmers is the price instability (Fig 10). Prices below Rs 300/kg at current production cost deny livelihood income. It may also inflict loss to farmers and cripple their fragile economy and livelihood. This had happened during 2004-06, with prices plunging below Rs 300/kg. A protection to cardamom farmers against price fall below a price line built from five year moving average of cost of production is critical to safeguard farmers from the vagaries of price instability. In line with the recommendations made by the Commission on WTO concerns in Kerala Agriculture chaired by Prof. M.S. Swaminathan (Box 7) and National Farmers' Commission, we recommend establishment of a **cardamom price stabilization fund** (CPSF), which may serve to cushion and stabilize price volatility shocks and to ensure livelihood security to cardamom farmers. The cost of cultivation may be regularly monitored by an institutional mechanism comprising the SBI, the SAU and cardamom farmers associations. This Commission finds that the current cost of production is Rs 237/kg and a price between Rs 300-360/kg is economical.

**Box- 7: Price Stabilization Fund**

The desirability of establishing a commodity **Price Stabilization Fund** for plantation crops, particularly for rubber, coffee, cardamom, pepper and tea, was recommended in 2003 by the Commission on WTO concerns in Kerala Agriculture chaired by Prof. M.S. Swaminathan (Building sustainable agricultural trade security system for Kerala). This recommendation suggested to raise part of the fund from the trade and industry in crops such as rubber, and allocation of a portion of purchase tax or surcharge to the fund by the State government.

During the same year, the government of India came forward with Price Stabilization Fund Trust (PSFT) introduced in April 2003 by the Government of India to assist tea, coffee and rubber growers. The PSFT has a corpus fund of Rs 500 crores, which is being kept in a public account of the Government of India.

While building the CPSF, there is a lesson to be learnt from price stabilization fund trust (PSFT) introduced in April 2003 by the Government of India (Box 7). Intervention from this fund is allowed on a price spectrum band in the range of plus or minus 20% based on a 7 year moving average of international prices.

When the domestic price falls below the lower band, then the year is treated as "distress year". In a distress year the PSFT would deposit Rs.1000/- in the S/B account of the grower. Similarly, when the domestic prices rise above the upper band the same would be treated as a "boom year" and grower would have to contribute Rs.1000/- in his PSF-S/B account. Thus every year an inflow of Rs.1000/- would be credited to the account of grower and at the end of 10 years the grower could withdraw the balance amount, including Government's contribution and interest earnings. There had been very little response from farmers to this scheme.

The limitation of the PSFT is that it is built around a 7 year moving average of international prices, rather than the domestic cost of production. In the case of cardamom as 60 % of production is from Idukki district alone an economic price band (EPB) for determination of 'distress year' and 'boom year' could be made on the five year moving average of cost of production per kg. The EPB includes the cost production and a minimal profit to sustain the livelihood of farmers. The CPSF should ensure a price to farmers within the economic price band, whenever the domestic market prices fall below the bottom line of the determined economic price band. For example, when the cost of production is estimated at Rs 237/kg, the bottom line of EPB may be around Rs 300 (Rs 237 + 60), which would allow a net livelihood income of Rs 30,000/ha/year. Apart from EPB, one may have to decide a threshold price line, which marks the 'boom year'. The cost of cultivation may always have a variation and this could be used to determine the EPB bandwidth. For example, the Cardamom Growers' Association determined the cost of production at Rs 301/kg. Hence, as an illustration, the EPB may be fixed at Rs 300-360.

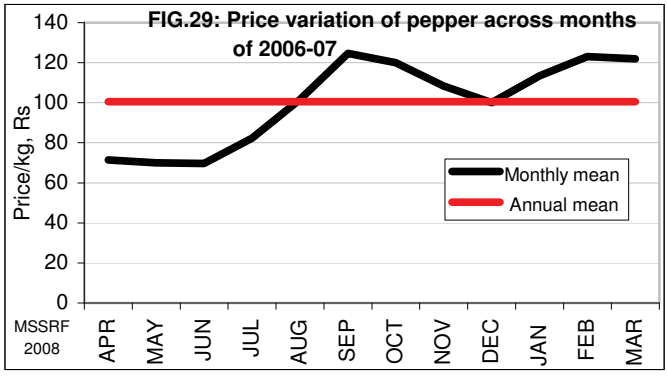
Another important principle of CPSF is that while all registered or ID card holding farmers who receive support from the trust during 'distress years' are bound to contribute to the trust during 'boom years'. The price support during distress years shall be available only to those who contribute to the CPSF during boom years. In the case of small farmers, who do not sell at the auction center directly, but only through the middlemen, the middlemen have to compulsorily contribute to the CPSF so that the small farmers are protected automatically. The contribution during 'boom years' may be fixed some thing like Rs. 20/kg when ruling price is between Rs 360-450 and Rs 30/kg when price rules between Rs 451-550 and Rs 40/kg when ruling price exceeds Rs 551/kg. This contribution shall eventually build a permanent CPSF having around Rs 500-600 crores. When the fund in CPSF reaches to this size, the

contribution could be temporarily suspended from subsequent crop year. The cycle of withdrawal from CPSF during period of low price and contribution during period of high price may continue. The CPSF may be initiated with an interest free long-term loan of Rs 250 crores from the government of India. Crop insurance could also be linked to the CPSF.

Recently, the SBI has registered a public company called 'Flavourit Spice Trading Ltd' (FSTL) with a view to procure cardamom, value add and develop products and market under the 'Flavourit' brand within and outside country. The processing is proposed to be placed at the Spices Park with linkage to the auction center. FSTL proposes to enter the auction centers to ensure that farmers are getting the minimum eligible price for the produce and to use its procurement strength to regulate auction prices and to neutralize trade cartels. The foreign markets where FSTL proposes to launch its brand are the international spices marketing hubs like Metro, Aldi, Lidil (Germany), Rimi, Seven Eleven (Scandinavia), Wal Mart (US), Sanabury (UK).

**Coffee:** Since 1995 coffee marketing is unregulated and left to farmers under a free marketing system. Under the existing coffee market, the traders are well networked and equipped to store and process the stock, while the producers, particularly the small farmers, are not. There is no coffee auction platform established by the Coffee Board of India (CBI). The price stabilization fund trust (PSFT) established for coffee growers does not protect them by ensuring an economic price line (EPL) linked with cost of production. Hence majority of farmers are not joining the PSFT. So far only 2165 farmers have joined from Kerala. The PSFT member farmers are protected by an insurance scheme, which assures a sum Rs 25000. There is need to modify this PSFT scheme more small farmer friendly and to ensure an EPL like the CPSF mentioned above. It is understood that CBI is planning to launch an online platform for spot trading of the commodity by March 2008 in collaboration with the National Commodity and Derivatives Exchange Ltd (NCDEX), an online multi-commodity exchange. This seems to with an eye to take coffee trade to coffee futures, which is received with considerable apprehensions by farmers. All such decisions having major economic impact on coffee farmers have to be made farmer participatory, with capacity building to farmers, if necessary.

**Tea:** Traditionally practiced trading modes are sale by auction, or by mutual treaty or by forward sale through selling or buying agents. Blending, packaging and retailing are other processes associated with trade. Of these public auctions is the most popular mode. Kerala has only one auction center, which is in Kochi. There is increasing interest among producers shift to e-auction to realize better price and to discourage monopoly and exploitation by the trade cartels. All small farmers sell their leaves to the nearest big estates who have processing facility. There is also considerable exploitation at this level under the guise of quality and other pretexts to force the sale on a price dictated by the buyer. For example, the current rate for tealeaves vary from Rs 7.5-9.75/kg. The Tea Board of India has to fix a minimum quality linked price for leaves to prevent exploitation of small producers. It may also promote small tea producers cooperatives with infrastructure for quality assessment of fresh leaves and good practices by the tea estates to prevent exploitation of small growers.




**Black pepper:** Black pepper, another high value produce, also has no regulated market or it is in free market. The producers, who are predominantly small farmers, are totally unorganized, while the traders operating at local, regional and national levels are well organized and knit. The local vendors mop up most of the produce at village level, either dry or green, graded or bulked. More over, these sales are mostly done during harvest season when the prices invariably are lower. Availability of common processing and drying facility, warehousing facility and a system for immediate payment of price at least partially through bank or cooperatives in lieu of the stock deposited with warehouse may help better price recovery to these farmers. Usually, knowledge on the prices at major commodity trading markets through newspapers helps farmers taking decision on the marketing of their produce. There is need to promote organized pepper marketing and facilitating better price realization to pepper farmers. The price fluctuates vary widely across month of a given year (Fig.29) and this brings out the importance of holding capacity to sell at favourable time. The marketing strength of all small farmers has to be increased with cooperatives and support facilities like warehousing, processing and grading infrastructure at local level together with credit

against the warehoused stock. It is hence proposed to establish four value addition-cum-warehousing facility for pepper farmers in major production areas such as Rajakat, Rajakumari, Vazhathop, Adimali and Thodupuzha, each having 5,000 tonnes capacity. The value addition facility will include drying, blanching, grading and white pepper production. These facilities may be networked with the proposed Spices Park. Warehouses may be linked to local financial institutions like commercial banks or cooperative banks to offer advance equivalent to 70-75% of the estimated sale to enhance the holding capacity of small farmers for realizing better price. This should be operated as a common facility accessible to all and managed by association of pepper farmers or similar cooperatives. However, the quality of pepper warehoused, especially in respect of moisture content and percentage of foreign particles has to be stipulated. They have the responsibility to effectively maintain all facilities and replace whenever required on self-supporting basis. Towards this end, the management may levy a reasonable service charge from farmers using the facility and services. The State government may consider inclusion of pepper in APMC act or create an institutional framework in private/public/cooperative sectors to streamline pepper trade and facilitate a Pepper Price Stabilization Trust Fund in the pattern recommended for cardamom.

While the above marketing systems are crop-specific and the domestic prices of these commodities are largely influenced by the international prices, the market of many other commodities like vegetables, bananas, etc are influenced by the local factors. In this context an innovative initiative by a group of farmers under the banner Kerala Agricultural Development Society (KADS) is worth mentioning. Another recent government initiative is the Vegetable and Fruit Promotion Council, Keralam. These two initiatives are explained for their merits and strength in facilitating fair price to different produces of Idukki farmers.

**Kerala Agricultural Development Society (KADS)**

KADS is a voluntary organization of farmers registered in 2001 under the Charitable Society Act, 1955 of Kerala. The mission of KADS is securing fair price to farm produces by avoiding middlemen, promotion of quality organic produce production, and assistance in sustainable management of natural resources through awareness campaign, promotion and practicing of eco-friendly agriculture. It currently has membership of 1242. KADS facilitates marketing through ‘farmer’s open market’ and organic agriculture through assisting in organic certification in collaboration with

INDOCERT, which is a certification agency. About 1000 farmers formed into 54 groups are in $C_1$, $C_2$ and $C_3$ stages of organic certification in about 1800 ha. Production and marketing are promoted on spices like nutmeg, cardamom, pepper, cloves, vanilla, ginger, other spices and condiments, and other crops like cocoa, vegetables, tapioca and other tubers, coconut, arecanut, banana, rubber, coffee ornamental and medicinal plants, planting materials, seeds and seedlings, and dairy products, meat of goat rabbit and poultry, eggs, etc. and inputs like vermicompost, bio-pesticides and value added products. KADS with farmers' participation also facilitates collection, transporting and storage of various produces. It also encourages women's participation in kitchen garden and marketing traditional dishes and popularizing cooking methods through '*Grameena Bhakshanashala'* (village food stall).

'Farmers' Open Market' (FOM) sells farm produces directly to the customers realizing fair price to farmers. The FOM is essentially open only to those who are registered farmers. KADS officials claim that FOM facilitates to realize at least 15-20% higher price than the selling price in alternate market. In addition, KADS offers 30% extra price on 'organic' produce, the market for which is increasing. In 2008 KADS is planning to introduce its own logo and label for the organic produces. The organic produces includes Nendran banana, different varieties of plantain, vegetables, paddy, milled rice, cocoa, coconut, and tender coconut.

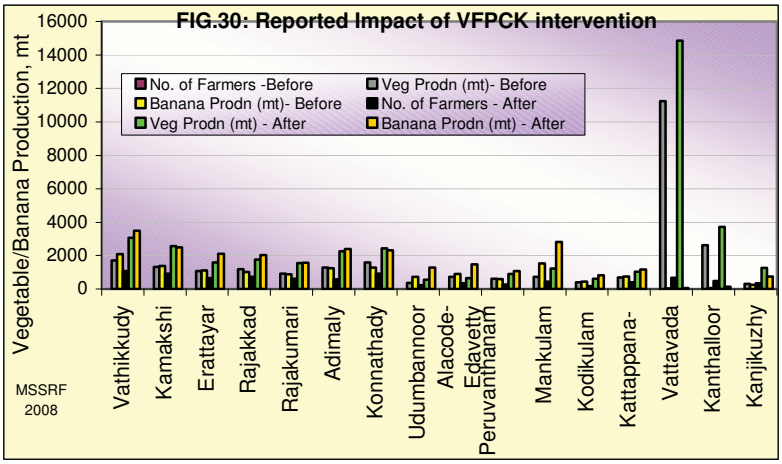
The 'FOM' has three sections. First is 'Daily sale center' (DSC), where farmers sell perishable commodities directly to the customers. Distress sale of any perishable produce is prevented. Second is 'Bulk produce auction center' (BPAC), where farmers auction off their produce to traders in bulk on prices decided by farmers. Third is 'Produce exchange Center' (PEC), where farmers exchange farm produces and planting materials. KADS has good short-term storage space for handling excess commodities. There is a sale counter for natural and eco-friendly farm produces, 'The Prakruthi'. The 'Karshika Vipanana Sangham' organized at Panchayat is linked to the Market and it helps farmers in collecting and transporting produces to the market at nominal service fee. The head load workers' union, which extorts wages for loading and unloading in the market area, is excluded from the KADS operational area. It also promotes capacity building of women SHGs in value addition and marketing. According to the market officials, the average monthly sale turn over in open market comes to Rs.7 lakhs and it is increasing over period. KADS also has entered into a 5-

year contract with a Swiss company for annual supply of 4000 t of processed organic cocoa bean/year, and this fetches 40% higher price to producers.

KADS is supported by an internet facility, which assists farmers with day-to-day and continuous trading details from various markets. Day to day trade details of the FOM are also up-linked with the help of Virtual University of KAU and Techno Park, Trivandrum. The capacity building to member farmers in collaboration with different public institutions includes supply of information on new agricultural techniques, improved varieties and other new innovations and quality planting materials as well as distribution of layer chicks, rabbits, fish fingerlings, goats, etc. The social security programme of KADS to its members includes group insurance with annual premium of Rs 100 and bringing their children under the schemes such as Janashree Bima Yojana and Shiksha Sahayog Yojana. KADS is acquiring its own market site and building infrastructure to promote farmers cause.

**Vegetable and Fruit Promotion Council, Keralam (VFPCK)**

This is an organisation constituted by Government of Kerala under Indian Companies Act, 1956 to develop and sustain the income generation from fruit and vegetable cultivation in the state. Its mission is organizing farmers under SHGs, encouraging these SHGs for large-scale production of certain vegetables and fruits and facilitating them for group marketing of produce in 'Swasraya Karshaka Market' (SKM) for realizing higher prices. It promotes participatory approaches and environment friendly practices and in some cases production of quality seeds by farmers.




VFPCK has organized many SHGs in about 16 Panchayats in the district (Fig. 30). These SHGs are facilitated to access the government subsidy on crops being chosen, crop loan to groups from commercial banks and leasing out land for production by landless or small farmers. Earlier VFPCK used to remit 2 % interest on the loan taken by the SHGs. These fruits and vegetables chosen for large-scale production are few of those locally adapted and having

demand. Most common tropical vegetables cultivated are bitter gourd, cowpea, banana, yams, etc. One important claimed element of marketing is elimination of middlemen. However, local or outside traders are the buyers. Local farmers like a cooperative of registered members manage the SKM established under the guidance of VFPCK. These markets are newly established on land leased out from private individuals or Panchayats. Currently, there are 16 SKMs in as many Panchayats in Idukki (Fig. 30). However, most of these markets are at logistically inconvenient locations and on land leased on short term. Farmers, who are registered and non-registered members are eligible to sell their produce in the SKM.

FIG.31: A view of SKM in Thankamani

The method followed for sale is the principal reason for better realization of price. Large volume of each produce reaches the market. Each vegetable or fruit arrived on a day is graded and each farmer consignment is lumped in one of these grades (Fig. 31). Sale of the produce in each grade is auctioned in bulk with the base price of bidding decided by the SKM committee on the basis of price in major market that day in Ernakulam. Because each produce are marketed in large volume, wholesale traders are attracted to join the bidding. Whenever, the auction fail to get a good price of the day, the stock is moved to markets away for realizing higher price. This possibility discourages any kind of cartel approach by the traders during the auction.

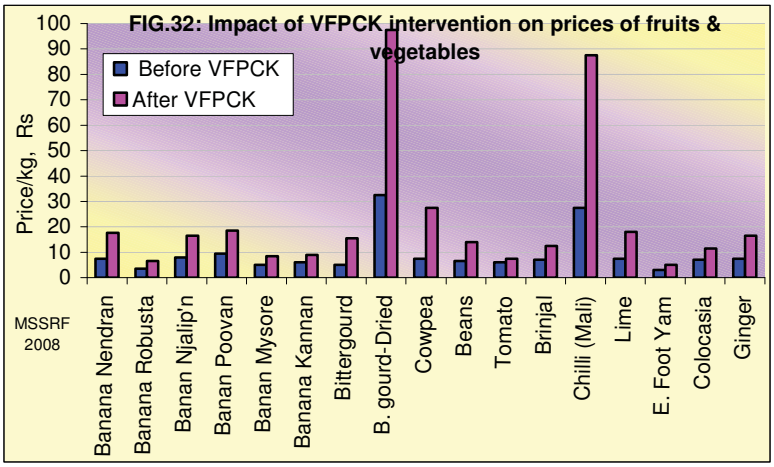



FIG.32: Impact of VFPCK intervention on prices of fruits & vegetables

The VFPCK facilitates each SKM with market information from its Market Information Center. It also builds capacity to the farmers on accounting, computerized record keeping and post harvest handling. Through such marketing, VFPCK claims that farmers are getting price higher than what they may get otherwise without the SKM and it is almost double in many produces (Fig. 32). The SKM are

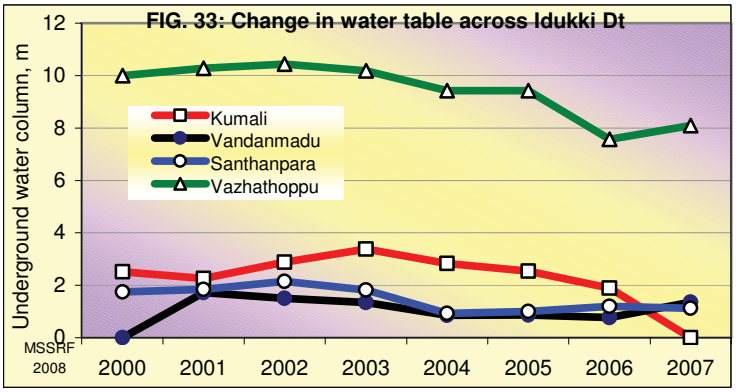
levies 5 % of the price money as service charge from all farmers selling their produce in this market. This is used to pay the lease charges and other services required to run the market, which include few staff. The profit skimmed from 5 % levy is divided among the registered members. The VFPCK also facilitates insurance of banana at a premium of Rs 2.50/plant with one-fifth contribution made by it. According to VFPCK it is closely monitoring the performance of all SKMs on well-defined criteria with a view to support better performing units with permanent land and building.

**Jaggery:** Poor marketing opportunity for Marayur jaggery and consequent low income to the sugarcane farmers of Marayur were brought before this Commission by the farmers and the local MLA. Sugarcane production in Marayur is about 5160 t at 6.8 t/ha, which is very low and uneconomic yield. The whole harvest is used for jaggery production, which is about 1400-1600 t/year. Due to extremely low productivity and high cost of production, Marayur jaggery is unable to compete with jaggery from elsewhere. Hence, one way to market this jaggery is to invoke its uniqueness in quality and niche value to claim a premium price. Production of this jaggery in suitable attractive moulds and marketing it with appropriate packaging and labeling through the 'Triveni' chain of shops at niche price may help farmers. Yield increase is important to sustain this produce.

## 11.4. CONSERVATION FARMING

In Idukki district 95% of land comes under high land. The hilly and mountainous terrain with moderate to steep slopes, denuding vegetation, increasing agricultural activities and high rainfall are accelerating soil erosion and landslides. The process is further enhanced by mono-cropping, indiscriminate deforestation, unregulated grazing and lack of proper management of soil and water resources. The runoff assumes very high velocity during the two main monsoons. All these are increasing the fragility of the whole region in ecological and economic sense. The soils are largely clayey, with or without gravel mix, and loamy. More than 80% of the soil in the district is classified under the series K 36 and K 38, both of which are prone to severe erosion hazards. Frequent and repeated occurrence of floods, land slides and land slips had caused massive sedimentation in the low laying paddy fields to render their automatic conversion to garden lands. The huge cumulative economic and ecological loss being caused over years by soil erosion is neither estimated nor appreciated.

Along with the loss of topsoil and vegetative cover, water scarcity is increasing due to decreased water table recharging and increased run off, leading to further soil loss. Height of water column in open wells at several locations is declining at alarming rate (Fig. 33). Increasing scarcity of water, receding water table and intensified digging and deepening of wells together with nuclear family formation are contributing to unsustainable water mining for domestic and agricultural uses. The numbers of wells have increased significantly. Unregulated well digging at inappropriate locations in the valleys is disrupting the clay substratum and causing shortage of water for paddy cultivation. The environmental deterioration caused by loss of vegetation, topsoil and declining water table need to be checked with multiple measures on urgency basis. Soil conservation, re-vegetation and water storage measures at appropriate locations using check dams are some such measures. Re-plantation of forest and CHR area with multi -species flora is discussed elsewhere.




The importance of check dams to impound run off, promote *in situ* moisture conservation by enhancing infiltration, reactivation of springs and consequent ecological regeneration is well known. In recognition of this, the Soil Conservation Department (SCD), Government of Kerala had been implementing soil and water conservation measures in Idukki district since 1973. From 1995 to 2007 NABARD had sectioned 44 schemes in the district in 13 tranches. In addition, special programmes such as Western Ghat Development Scheme (WGDPS) and National Watershed Development Project for Rain fed Areas (NWDPRA) are also undertaking conservation activities in the district from Eighth Five Year Plan. It is stated by the SCD that since 1973, it had treated 43500 ha in Idukki district with scientific soil and water conservation measures expending Rs 27.0 crores. According to NABARD, the SCD could spend only 51 % of the Rs 10 crores provided in three tranches during 2002-2007. Inescapable conclusion is that notwithstanding the urgency of the work and availability of projects and funding, the SCD is failing continuously in delivery. A perusal of the completed and undergoing projects shows that all works were taken up in haphazard and piecemeal manner without continuity, co-ordination across

implementing agencies and impact assessment. It is important such works are independently assessed. Despite this the SCD has presented a very ambitious project before this Commission. The past failures of the SCD is a major disincentive to this Commission in recommending substantial funding support for this important area of work, which is assuming highest priority under the emerging environmental degradation of the district.

The problem with the SCD is that they follow a departmental approach to the project implementation with out peoples' participation, which is important for such programmes. Involvement of local Panchayat, farmers, non-governmental organizations may make the project more objective, transparent and useful. Similarly, when such projects are implemented either by Panchayats or NGOs using funding from NWDPRA, WGDPS or National Rural Employment Generation Program (NREGP), involvement of SCD is also important. The present functioning style of SCD appears to be inflexible for such integrated working.

This Commission underscores the importance of soil conservation measures in the CHR area and major pepper growing tracts and the need for undertaking this work on contiguous area with water shed based approach, participation of local farmers and concerned Panchayats. The work has to be located on priority basis only within areas growing predominantly pepper and cardamom and classified under 'moderate to severe', 'moderate – rock outcrops' and 'severe – sea rock outcrops' by the Kerala Land Use Board, using Panchayat or Block as the unit and totally excluding the area already treated. The areas dominated by small and tribal farmers may also receive priority. The total recommended area for treatment is 40,000 ha in a project timeframe of 10 years considering the slow delivery system of DSC. An average rate of Rs 20,000 ha is recommended. The DSC may use its internal resources for survey, identification and detailed study of watersheds, conducting PRA exercise and documentation, what ever that be. The funding recommended here is to be used exclusively for the different treatment activities mentioned hereunder for the area broadly indicated.

The different conservation measures recommended are (1) stone pitched contour bund in conjunction with soil binding bio-bund (including fodder grass), (2) contour trenching, (3) moisture conservation pits, (4) loose boulder and functional check dams (also to serve enhancing irrigation), (5) essential need based retaining wall, (6) roof

water harvesting and (7) organising required one or two day training to farmers/community members on the importance of conservation and continuous maintenance of conservation structures. In the case of roof water harvesting, the funding is with 75 % support for tribal, small or BPL farmers (limiting unit support to Rs. 15,000) and 50% support for other farmers (limiting unit support to Rs.10, 000). Total of 2000 RWH units is recommended. A local committee consisting two representatives of local Panchayat, two nominees of farmers including representative of one local Farmers' Association, and one locally available subject matter expert may oversee the project work in each Panchayat. The special funds currently available from NABARD and other projects may be sub vented to the recommended fund.

### 11.5. SERICULTURE

A small community of people comprising 350 families is engaged in silk cocoon production for their livelihood. About 5 t of cocoon is produced and this is marketed in Teni of Tamil Nadu. The SERIFED provides the technical training and assistance. While the silkworm used is reported to be of good quality, the cocoon fetches only low price of Rs 100/kg due to quality problem. It is identified the lack of grading is the reason for low price. The farmers also do not get the price promptly from the traders. Thus due to low volume of production and quality, the hapless producers are being exploited by the traders. There are two reeling units and one weaving unit. It appears these units are not put to use for value adding the cocoon and earning better income. The special problems of the farmers may be taken to the attention of the Silk Board and necessary training, capacity building for quality cocoon production and creation of facility for processing and fair marketing of processed silk. The Silk Board may also examine the possibility of using tapioca for sericulture and expanding the cocoon production to other areas of Idukki after assessing the techno-economic feasibility.

The community may be organized in to maximum of 25 groups and each group provided with rearing sheds, required rearing equipments with rotary montage. Five stifling chambers and a cottage basin reeling unit may be provided as common facility.

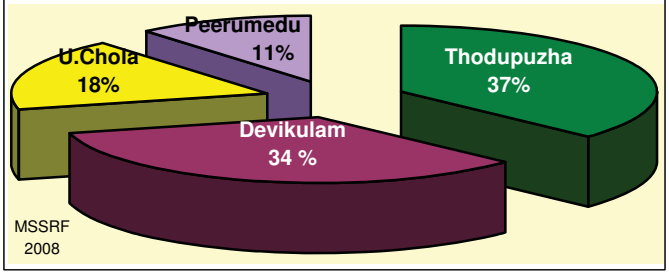
### 11.6. TRIBAL DEVELOPMENT

Idukki has the second largest population of Scheduled Tribes and Scheduled Caste

people. While most of the tribal clusters are settled or re-settled in far-flung areas with in forest or similarly not easily accessible places, almost all of them are provided with 1-5 acres of cultivable land (Fig. 34). Maximum households are settled in Thodupuzha taluk. Other taluks in order of households are Devikulam, Udumbanchola and Peerumedu taluks (Fig. 35). Nomadic tribes are rare. Tribal groups highly vary in their achievement in education, economic status, participation in mainstream life and other social parameters. However, all of them are relatively backward. A separate Tribal Welfare Department does exist for focused socio-economic development of these communities. A few tribal denominations have less knowledge in settled agriculture and other livelihood options. Out of the 16282 t ribal households, 11600 families depend on agriculture for their livelihoods. Principal crops being grown by these communities are rubber, pepper, cardamom, vegetables, and coffee. Some of them also rear cattle and goats. There was a general complaint from members of these communities that most of the agricultural development schemes skip them. They also are failing in maintaining the freely distributed cows. They largely need capacity building and training on various agricultural practices, value addition, processing and fair marketing. The tribal households are given prioritized attention in almost all recommendations related to crop and animal husbandry, other development schemes and protection measures against wild animal damage proposed for addressing the financial and livelihood distress of farmers of Idukki district.

**FIG.34: Idukki map showing tribal settlements**


**FIG. 35: Distribution of tribal households**



## 11.7. AGRICULTURAL LOANS

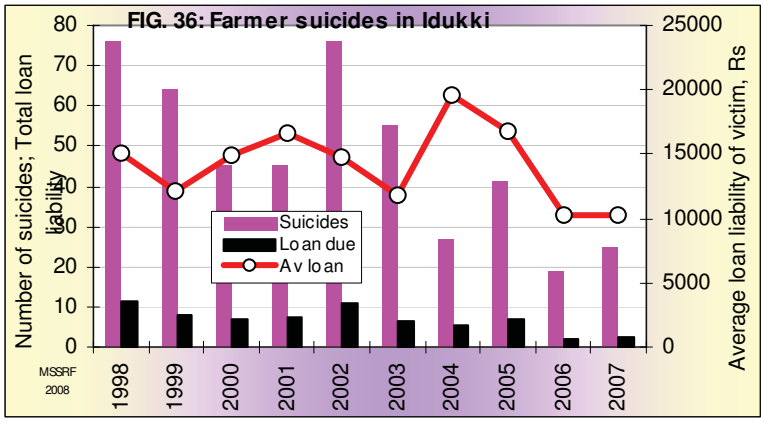
All plantation and spices crops grown in Idukki are cost intensive. Cardamom leads among these crops in annual cost of cultivation, which according to different estimates vary between Rs 74876/h to 2,22,661/ha. Agricultural loan in formal sector in Idukki is being provided by two important agencies. These are the scheduled commercial banks (SCBs) and the District Cooperative Bank (DCB) under the Kerala State Cooperative Bank. There are several SCBs lending loans and the Union Bank of India is the lead SCB in Idukki district with respect to agricultural loan. The SCBs offer agricultural credit from the special agricultural loan portfolio provided to them and this is operated in accordance with the guidelines of Reserve Bank of India. The package of loan being offered to farmers includes crop loan (lowest interest and repayable in one year) and term loan (higher interest and repayable during period exceeding one year). While crop loans are meant for meeting seasonal cultivation cost, term loans are for farm investments, which may yield delayed return, such as re-planting perennial crops, soil conservation, establishing processing unit, etc. In addition there are cattle rearing loan and other special kind of loans like educational loan, all falling under term loan category.

The loan delivery system under the agricultural cooperative banking system is serviced by NABARD with two arms for rural cooperative banking for short and long-term loans. The short-term (crop) loans are delivered through a three-tier system with the Kerala State Cooperative Bank (KSCB) at the apex, District Cooperative Bank (DCB) at the middle and the Primary Agricultural Cooperative Societies (PACS) at the delivery end. The Idukki DCB has 72 PACS, which finally deliver the loan to its member farmers. The long-term loans are disbursed through a two-tier system with the Kerala State Cooperative Agricultural Rural Development Bank (KSARDB) at the apex and Primary Cooperative Agricultural Rural Development Banks (PACARDBs) with branches at district level. In Idukki, KSARDB has four PACARDBs. These are PACARDB-Malanad with five branches, PACARDB-Peerumedu with two branches, PACARDB-Devikulum with two branches and PACARDB-Thodupuzha. In the case of crop loan, the NABARD funds to KSCB at 3% interest rate with limit that each loan account should not exceed Rs 2 lakhs and that interest rate is kept within 7 %. The State cooperative banking sector has its own disbursement and interest systems to provide further concession to different categories of farmers. In the case of term loans, the NABARD offers the fund to KSARDB on the basis of its re-financing scheme at

8.75 % interest rate with no stipulation on the interest at the delivery stage to farmers. It is understood that in Idukki, the PACARDBs are lending at 13.5% interest rate.

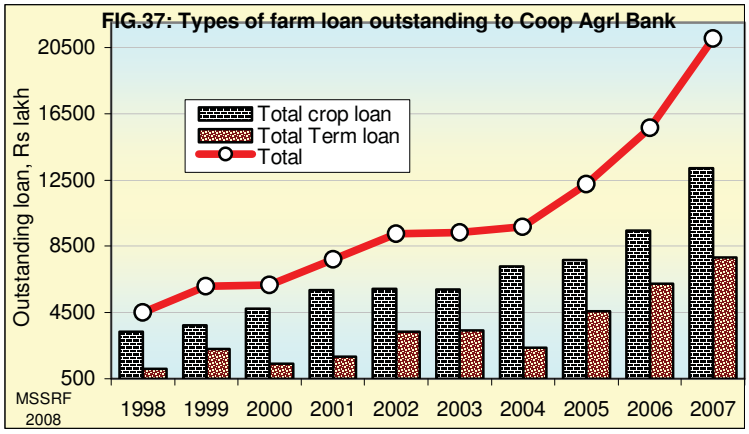
A majority of the written and oral representations came before this Commission pertained to the distress farmers are facing from the loan liability, snowballing interest and the looming threat of recovery proceedings. They are scared that these proceedings may deprive them off their land and house, the only asset they have for livelihood and living in dignity. All their pleas were to liberate them from this liability, which they are normally incapable of paying back, by recommending waiving off the loan capital and interest. Some of then narrated the tragedy of repaying interest far more than the principal, but still being burdened with growing liability. There were women farmers crying for help by intervention on the imminent legal recovery and take over of their small holding and home. The distress this Commission could witness among small and tribal farmers is deep and unforgettable. There is widespread low morale, fear of losing the only livelihood option as well as the huts they live in. For many of these small farmers with fragile farm economy, there is no way to repay a loan, which has become bad and continuously accumulating with compounded interest. Their hopes are shattered, their agriculture in doldrums, and under the growing disgrace and distress they are forced to extreme steps like silent migration from village or committing suicide.

Official figures say that 103 farmers have committed suicide in the district. When this Commission checked with SCBs, they did not wish to say a figure different from the official suicide statistics. The local media personnel stated the number of farm suicides is far higher than the official figure. The DCB provided to the Commission figures on the suicides, which is shocking on two counts. First, the figures state the suicides have been going on since 1998 and 473 farmers had committed suicide between 1998 and 2007 (Fig.36). Second, the loan liability of the victims on an average was very low, ranging between Rs 10210 to Rs 19630 (Fig.36). This shows how such small financial liability had become a heavy and unbearable burden to the farmers compelling to take away their life.

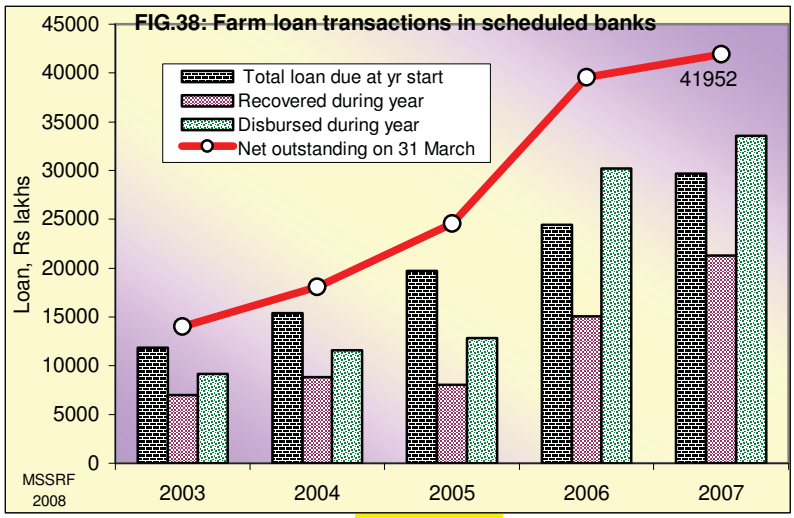


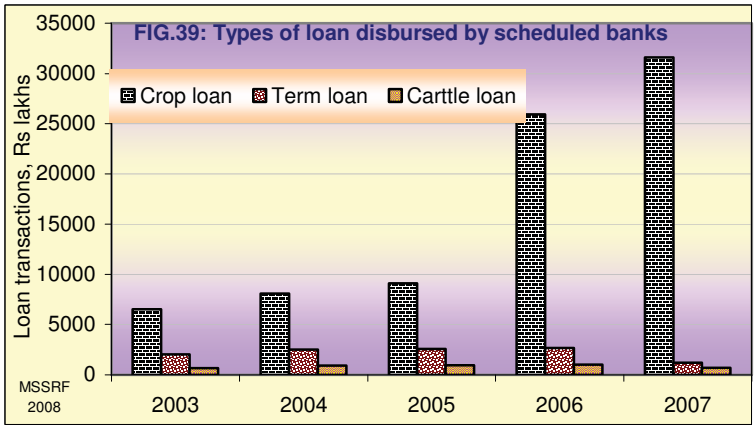
Having seen the financial liability of the suicide victims, this study made an attempt to collect the farm loan particulars for ten-year period ending 2007. The Commission made a request to the lead bank, Union Bank of India and the State level Bankers' Committee headed by the Canara Bank to provide 10 year particulars on all farm loan transactions conducted by the SCBs in Idukki with separate statement on the liabilities of small farmers. Similar request was made to the NABARD official located in Idukki and the DCB with respect to the loan transactions in the cooperative sector during the period. While the DCB and NABARD came with requested data, it was not easy to get the data from the SCBs. After repeated requests at different levels, the data on loan transaction for the period 2003 to 2007 were received from Union Bank of India, South Indian Bank, Indian Oversees Bank, State Bank of India, and Bank of Baroda. The summarized data provided by these SCBs are presented here. Other banks operating in the district did not cooperate with data. In the mean time, some cardamom farmers who had availed loan from banks in Tamil Nadu and Kottayam district reported to have used that loan for cultivation purposes in Kerala represented their case to this Commission. While this might be genuine, the Commission decided not to collect the loan liability data from outside Idukki district, whether from adjoining districts of Kerala or Tamil Nadu.

As on 31 March 2007, under the crop loan portfolio there were 95263 PAC accounts and 302 DCB accounts. During the same period, under term loan there were 32064 PAC accounts and 19033 DCB accounts. Overlapping accounts across PACS and BCB is a possibility. Total loan amount outstanding on this date under crop loan was Rs 9546.26 lakh as principal and Rs 3660.93 lakhs as interest. The crop loan and term loan outstanding in PACs and BCB over the last ten years in Idukki district is presented in Figure 37. The total outstanding loan on 31 March 2007 in PACs is Rs 17646.3 lakhs and Rs 3393.7 lakhs in DCB. About 63 % of these loan dues are crop loans.



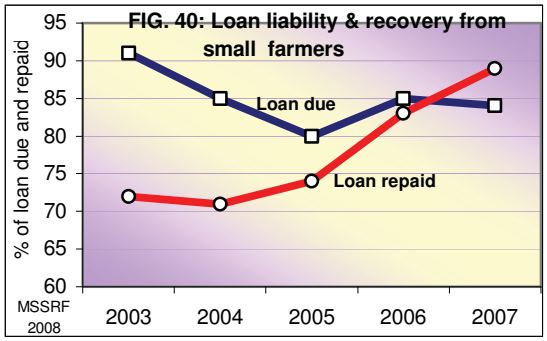
The loan transaction information provided by five SCBs of Idukki district including the lead bank for the period 2003 to 2007 was examined for the loan outstanding at the beginning of each accounting year, loan amount recovered and newly disbursed during the year and the net outstanding loan at the end of the year. The tabulated data are presented in Figure 38.A continuous progression in each of the four components plotted in the Figure 38 was noticed. Interestingly the loan disbursement and recovery increased comparatively during 2006 and 2007. Some of the farmers brought before this Commission the catch behind the relationship between new loan disbursement and recovery of old loan in the SCBs. They follow a smart method of achieving recovery of crop loans, principal and interest, by sanctioning new bigger loan to a defaulting farmer, wherein the outstanding dues are adjusted in the new crop loan and the balance disbursed. This practice being done more at the behest of the bank than at the initiative of farmer causes enlargement of a small loan liability in to a bigger one at faster rate.




The overall outstanding farm loan in the five SCBs in Idukki district as on 31 March 2007 is Rs 41952 lakhs. Striking a similarity with agricultural cooperative loan, nearly 85 % of the loans availed from SCBs are crop loans (Fig.39). The term loan formed only about 10 %, while the cattle loan was 4 % and the loan and for agri-business activities was less than 0.5 %. The percentage share of small farmers (having holdings of 2 ha or below) in the loan disbursed by these SCBs is between 80 to 91 %. Interestingly this share has been declining from 91 % in 2003 to 84 % in 2007 (Fig.40). On the contrary the

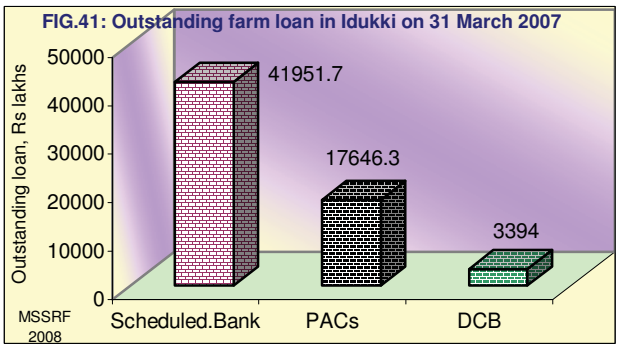
percentage share of loan recovery from small farmers has been increasing steadily from 72 % in 2003 to 89 % in 2007 (Fig.40).




Overall, the total agricultural loan outstanding in PACS District Cooperative Bank and the five SCBs on 31 March 2007 is estimated at Rs 62992 lakhs (Fig.41). The trend on loan accounts indicates that about 85 % of this loan is availed by small farmers and about 82 % on crop loans.

In addition to these loans directly accessed by farmers, NABARD has been assisting the district for various developmental activities, such as soil conservation, community development, public works, water supply, health, tourism, etc under Rural Infrastructure Development Fund (RIDF). The district was not utilizing these funds effectively. For example, Rs. 1000.25 lakhs was sanction for soil conservation activities in this district during 2002-03 to 2006-07. Out of this, only 51 % of the fund had been utilized. Over all NABARD has sanctioned Rs 134.04 crores under RIDF for Idukki district.

This study did not attempt to make an assessment on loan liability of farmers' from the informal (private) lending sources. While a few farmers made a mention that such lending is common in the district, no clarity on the extent of such liabilities was emerging. No representation on the distress due to such loan liability came before this Commission.



# 12

# RESTORING ECOLOGICAL HEALTH

## 12.1. CHANGING CLIMATE, DEGRADING ECOLOGY AND DIMINISHING LIVELIHOOD

Idukki district receives the highest rainfall (3506 mm) in Kerala. It also perhaps has the highest number of rainy days among all districts of Kerala. The district is also unique in maximum and minimum temperatures. The popularity of Munnar hills as a tourist locale owe largely to this weather as well as to the charming scenic views of the hills. This unique weather of the district, particularly in the high ranges, is key to its high suitability to high value plantation and spice crops such as cardamom, pepper and tea and other crops like temperate vegetables and fruits. The weather here is also responsible for promoting high productivity and quality in cardamom, pepper and tea. Needless to say the rainforests and high ranges of the district contributes substantially to the rainfall not only in the district, but also in the whole region of the State. Therefore, the forest cover of Idukki has profound implication on the cropping pattern, crop yield, quality and profitability in and around the district as well as the ecological wealth of the region. The significance of Idukki weather on the ecology, economy and environment of the district as well as the entire region needs no emphasis.

This study during its course of several interactions with farmers came across repeated comments on the changing rainfall and other weather parameters and their impact on different important crops. The local people who measure the rainfall in terms of thread size (by a number implying thread thickness) feel the rainfall classified as '40' is declining. With a view to assess the reality behind these observations, we explored the weather data available with various institutions in the district. Data were kindly provided from six institutions in six locations spread across the district (Fig. 42). These institutions are Kannandevan Plantations in Munnar (data for 73 years), United Planters Association of South India, Vandiperirar (data for 31 years), Cardamom Research Station, Pampadumpara (data for 50 years), Indian Cardamom Research Institute, Mayiladumpara (data for 21 years), Kerala State Electricity Board, Idukki (data for 27 years) and State Agricultural Farm, Arikkuzha (data for 22 years). While the Indo-

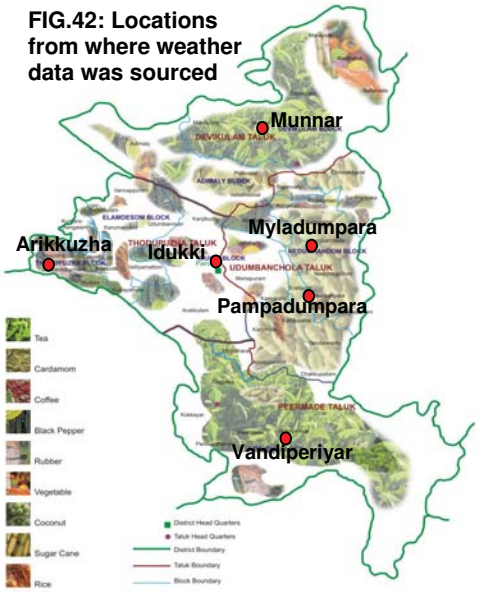
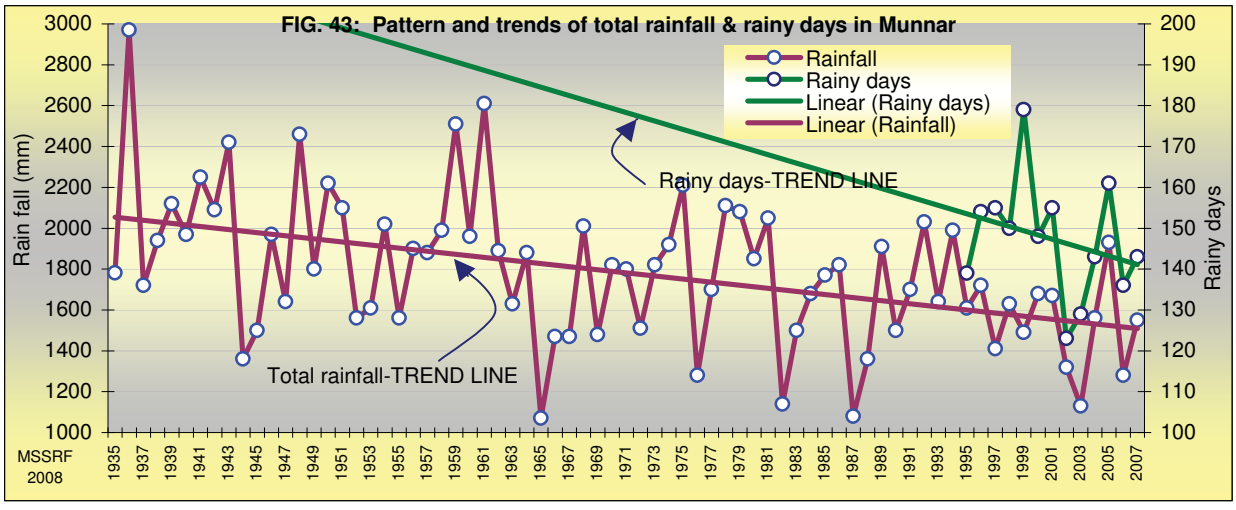



**FIG.42: Locations from where weather data was sourced**

Swiss Project Farm, Mattupetti informed that it has weather data since 1963 we were not successful in getting this data, despite the requests with the farm official.

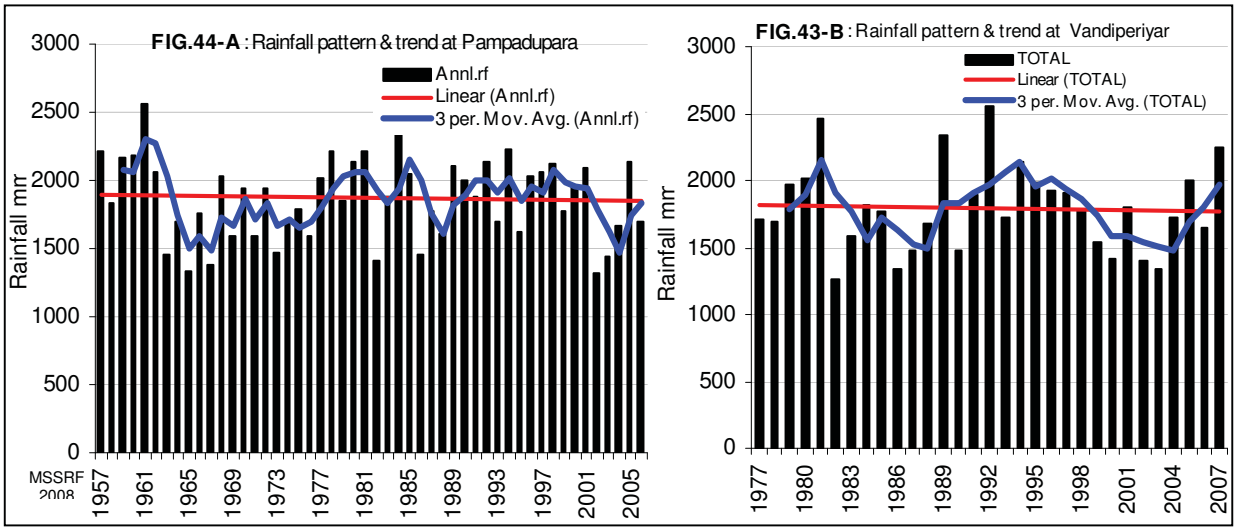
The four components of weather date considered for this study are rainfall, number of rainy days/year and maximum and minimum temperatures. Three of the above locations having at least 30-year data in conformity with the rules of World Meteorological Organization were analysed. Although the Munnar location has the rainfall data for longest period (73 years), the data set was incomplete with respect to number of rainy days and maximum and minimum temperatures. The latter was available only for the recent 13 years. Parameters analysed included mean, standard deviation, coefficient of variation (CV) and linear trend analysis based on three years moving average of annual mean values. Results from the three principal locations were used to draw main conclusions and those from other three locations were used only to re-enforce the trends noticed.

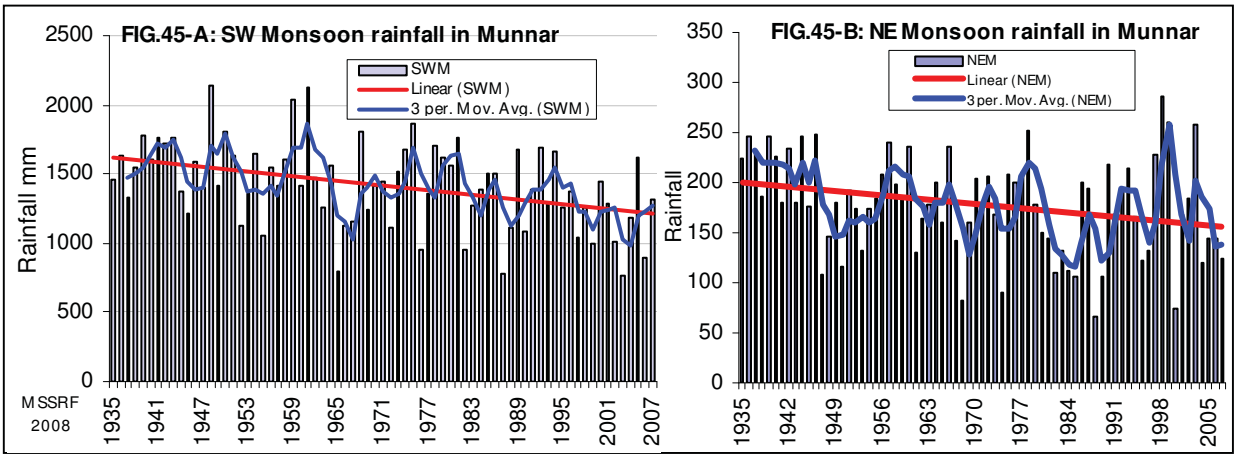
**Rainfall:** The rainfall is found decreasing in all the three locations over the period of available data. Rainfall data available for Munnar, Vandiperiyar and Pampadumpara showed declining trend over years. While the data for longest period of 73 years available at Munnar revealed a very clear and steep downward trend in the total rainfall (Fig. 43) and this decreasing trend is seen at Vandiperiyar and

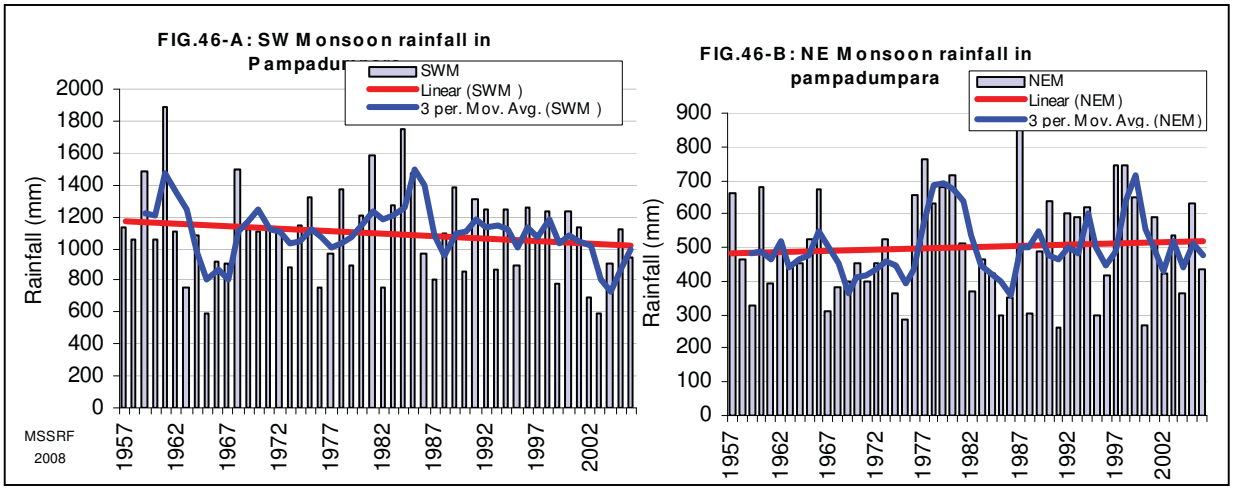



Pampadumpara, although the decrease is less steep (Fig. 44-A and 44-B). Similar decreasing trends are seen in Myladumpara and Arikkuzha, but not in Idukki. Further, examination of the rainfall received during South West (SWM) and North East (NEM) Monsoons showed that the rainfall during SWM is decreasing in all locations except Idukki. Much of the decrease in total rainfall could be largely accountable to the decrease in SWM (Fig. 45-A, B). While the rainfall during NEM is also found

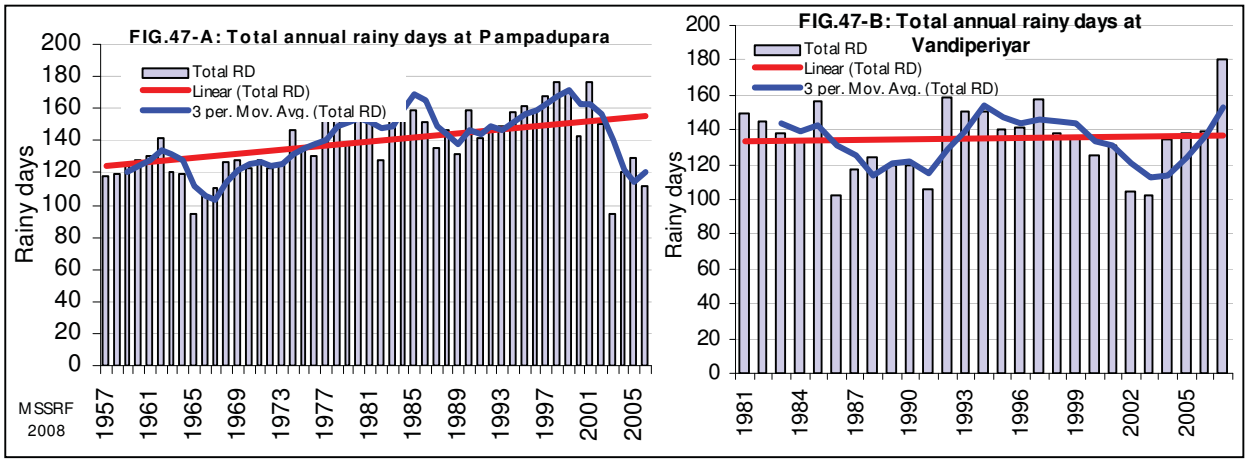
decreasing at Munnar and Myladumpara, it is found increasing at Pampadumpara, Vandiperiyar and other two locations (Fig. 46-A, B). Thus, while over all, the total annual rain and rain during SWM are decreasing in almost all places in Idukki, a shifting trend of higher rain during NEM is seen in parts of Idukki district.



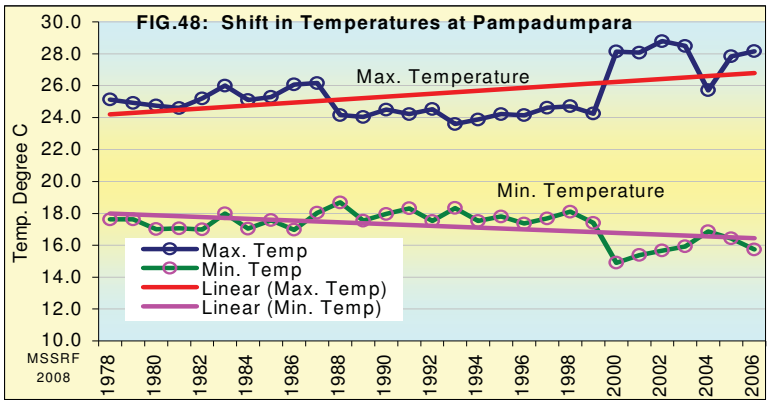



**Total rainy days:** With the changes in total rainfall, the total number of rainy days (TRD) was found shifting over years in all locations. In the absence this data in Munnar, the data for longest period is from Pampadumpara. Both in Pampadumpara and Vandiperirar, while the decrease in total rainfall is relatively lesser than that in Munnar, the TRD have increased (Fig. 47 and B). While the TRD during NEM have increased at both locations, the TRD during SWM has increased only in Pampadumpara. In all other three locations the annual TRD as well as the TRD during SWM and NEM decreased.




**Temperature:** Among the principal locations data on temperature for more than 30 years are available only at Pampadumpara and Vandiperiyar, while the data from Munnar is only for 13 years. Among the other three locations, this data is available only at Myladumpara. In sync with changes in the total rainfall, the maximum and minimum temperatures in all the three principal locations and Myladumpara are found changing. The trend is interesting that the maximum temperature is rising and the minimum temperature is decreasing. The increase more than $2^0$ C in max temperature at Pampadumpara during last 29 years is a major change (Fig. 48). The rate of decrease in minimum temperature is slightly lower, but very significant. This trend was noticed at Vandiperiyar and Munnar. Only at Myladumpara, having 21-year data, showed a different trend with decrease in max temperature and increase in minimum temperature.



The summary of weather changes noted at three principal locations and the other three locations is presented in Table 8.

Table 8: Summary of weather changes in Idukki district

| Location | Total RF | SWM-RF | NEM-RF | Total RD | SWM-RD | NEM-RD | Temp-Max | Temp-Min |
|---|---|---|---|---|---|---|---|---|
| Munnar | - | - | - | - | NC | - | + | - |
| Vandiperiyar | - | - | + | + | - | + | + | - |
| Pampadumpara | - | - | + | + | + | + | + | - |
| Myladumpara | - | - | - | - | - | - | - | + |
| Idukki | + | + | + | - | - | - | NA | NA |
| Arikkuzha | - | - | + | - | - | - | NA | NA |

**Note:** + means increase; - means decrease; NC means 'no change'; SWM means Southwest monsoon; NEM means North east monsoon; RF means rainfall; RD means rainy days; NA means 'not available'.

The above conclusions on the weather of Idukki district over the last 31-73 years from three principal locations and other three locations unambiguously point to the serious dimensions of weather change and associated emerging threats. The declining rainfall, particularly during SWM, and the increasing temperature are bound to have very serious impact on agriculture and its sustainability in Idukki. The increasing maximum temperature and decreasing minimum temperature, simulating the weather of a desert is spelling bad omen to this beautiful natural abode. More over, these changes will impact seriously on the ecology of the district and surrounding region, which may feed back on further aggravation of the changes. The predictable and unpredictable chain action being triggered by the changing pattern of monsoon and temperature is bound to have cascading effects on the people, their livelihood, biodiversity and everything that makes the district unique, rich and beautiful. It is already being manifested in the declining water table, increasing shortage of water during summer period and frequent incidence of drought like situations.

Anthropogenic interference in the Idukki ecology started almost 130 years ago when the Poonjar Raja leased out 58800 ha area to John D Munroe in 1877-79, who started the 'plantation era' in these hill tracts with the establishment of the North Travancore Land Planting and Agricultural Society in 1877. From the initial plantations like coffee, cinchona, sisal and cardamom, it expanded rapidly to tea with large-scale deforestation and influx of migrants. The hills changed rapidly with many roads, settlements, tea factories, etc. The next cycle of migration, encroachment,

deforestation and cultivation of other crops started with "grow-more-food campaign". Concurrently also came the severe pressure on forests by the many hydroelectric projects and associated townships.

The ecological implications of continuous encroachments and changes made in the land use pattern, including the vast CHR area, have now reached to an irreversible stage. The loss of natural forests and the depletion of CHR forests are substantially contributing to the weather changes being witnessed today. In the mean time, the natural fertility and productivity of the region is declining, soil erosion has increased to unprecedented magnitude, environmental pollution is on the rise, incidences of pests and diseases are increasing, water table is declining, and loss of flora and fauna are happening silently. The spreading Eucalyptus cultivation is extracting the last drop of water from the soil column. The snow balling ecological destruction and weather change being witnessed have potential to threaten depletion and eventual death of the river Periyar, which is not only the lifeline of Idukki and Ernakulam districts, but also the source of drinking water to more than 30 lakh people and the only source of industrial water supply for more than 300 industrial units in Ernakulam district. An expert committee appointed by the Government of Kerala in 1996 and headed by V. Gopinathan, then Conservator of Forests, had earlier warned the adverse ecological impact of clearing of undergrowth and shade regulation in CHR area. Another expert Committee headed by N. Chandrasekharan Nair also repeated this warning in 2002. All these things seem to have not moved the people and authority that with appropriate policy and urgent actions alone can save Idukki from the impending disaster.

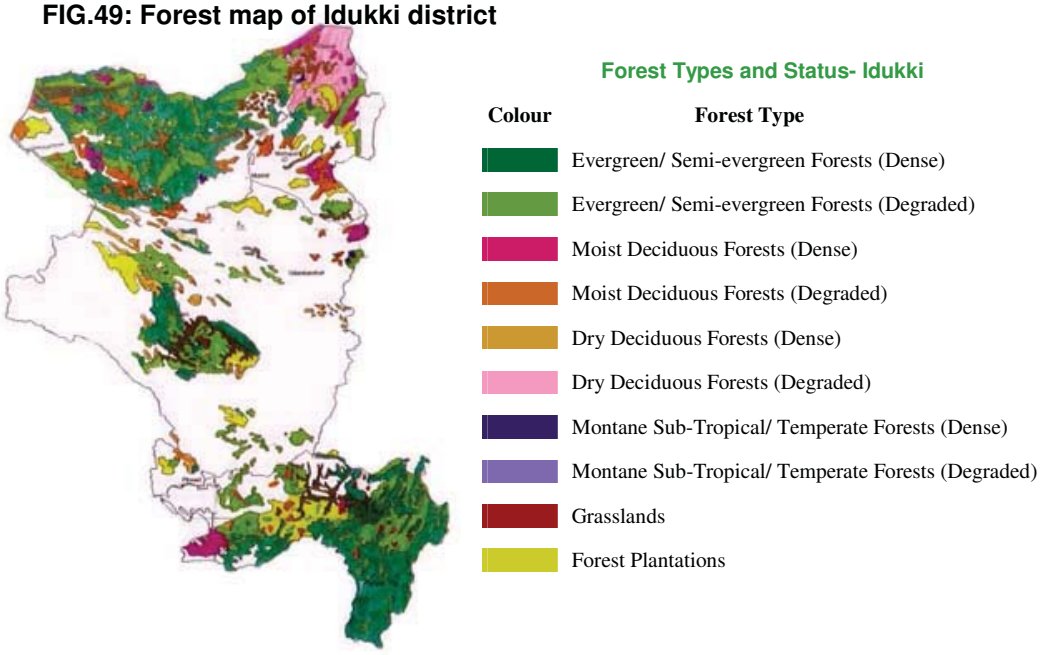
Unless the root cause of rising adverse weather change is directly addressed on a very systematic master plan for restoration of Idukki ecology and following agricultural practices not endangering or challenging natural forces, the weather change of Idukki may continue unabated with outcome, which is very obvious. Such master plan should regulate all kinds of development plans including further migrations and other manifestations of anthropogenic pressure. Massive reforestation, balanced management of forest and forest canopy in CHR area, water and soil conservation for replenishing declining water table, regulated water mining and banning cultivation of Eucalyptus are other important measures to be taken on priority. On the mid-course and final reckoning a good ecology is primary requisite for sustainable good agriculture and the associated livelihoods. It is time to save Idukki and further delay may relapse to irrecoverable state.

## 12.2 ENDANGERED FOREST

Sixty years before, more than 90% of the highlands and a major part of the midlands of Idukki district were under evergreen forest. Down the line, the forest stands severely depleted due to encroachments, deforestation and indiscriminate felling of trees. Although current official statistics states that about 51 % area in the district is under forest, the reality is different. Idukki virtually is the roof of Kerala. The influence of this roof over the weather within the district and far reaching regions of the State is phenomenal. The evergreen forests of the district spread over different elevations and mountain ranges rising above 2300 m constitute the major elements of the roof. Destruction of the forest changing its spread and density is bound to have irreversible change to the weather in Idukki and larger adjoining regions of the State. By protecting the forest, the biodiversity and the native ecosystems are also protected. Hence, it is most important to take urgent corrective measures to restore and maintain forest cover in at least one-third of the total geographic area as prescribed in the national forest policy.

There are at least ten types of natural forest in Idukki (Fig.49), excluding the CHR forest, which was once spread across 87300 ha. Unchecked erosion of forest is continued with the intensification of migration to the district and the transfer of the CHR forest region to the patronage of Revenue Department. The tribal population, which is second largest in the State, has now been settled in many colonies within the district by allotting 1-4 acres of land to each family. Hence their dependence on the forest has substantially declined. There is no longer any shifting cultivation or significant nomadic tribes. On the contrary, there is increasing intense anthropogenic pressure, including from tribal settlements, on the fringe areas of forests with frequent conflicts between man and wild animals and encroachments. Destruction of flora and fauna habitats, encroachment into the corridors of wild animals, increasing man made forest fires, destruction of natural forest and replanting with eco-unfriendly species, environmental pollution with chemicals and alien invasive species, unregulated cattle grazing and tourism promotion are either slowly but certainly killing or increasing the the fragility of existing forests.

**FIG.49: Forest map of Idukki district**




The current issues affecting forests in the districts and possible solutions could be placed under seven categories. These are (i) change over from unsustainable productive forestry to pro-nature industrial forestry (ii) intervention to counter the expanding rain shadow region, (iii) scientific management of forest resources, in particular biodiversity and water, to support agriculture and livelihood, (iv) safeguarding and strengthening CHR forest, (v) leveraging the abundant water resources for alternate income generation, (vi) managing man-animal conflicts in mutually beneficial manner, and (vii) sustainable extraction of non-timber forest produce (NTFP) and promotion of alternate income generation for tribals.

**12.2.1 Change over from unsustainable industrial biomass forestry:** Extensive areas in the district, particularly the most fragile steep hills of high ranges, are being used for biomass farming using predominantly *Eucalyptus* and rarely *Acacia* to feed the pulpwood factories (Fig. 50). *Eucalyptus* is grown very widely in all altitudes, both in private and forest lands. This species is known for fast biomass accumulation as well as depletion of ground water across a deep soil column, which is at least as deep as its height. Environmrentalists say that each tree is a borewell itself

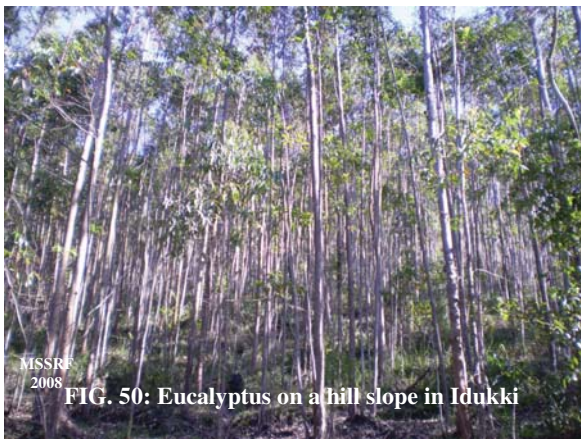



**FIG. 50: Eucalyptus on a hill slope in Idukki**

sucking ground water as fast as it grows. Under dense planting, which is the rule widely followed, these trees do not allow other plant species to thrive along with (Fig. 51). It is also not preferred by birds, insects and pollinators.

Many farmers represented from all across Idukki and particularly from the rain shadow region of the district that the *Eucalyptus* plantations in and around their land are seriously harming the soil productivity, availability of irrigation and drinking water and the local biodiversity. The vegetable farmers of Vattavada and Kanthalloor made a specific request to put a stop to the cultivation of Eucalyptus. This is despite their full understanding that Eucalyptus is the major employment provider in the forest areas. They say the long term harm this species may do to the environment and to their livelihood would far outweigh.


FIG.51: *Eucalyptus* plantation- Early invitation to environmental disaster

Analysis of weather at different locations of the Idukki had shown significant depletion in rainfall and rise in maximum temperature. The water table studies also indicated fall in level, particularly during summer months. Under this context, large scale cultivation of *Eucalyptus* an invitation to faster environmental disaster in idukki and the entire region. Hence, there is urgency to prevent/ban fresh *Eucalyptus* plantation and its coppice crop and switching over to other environment friendly biomass producing species such as subabul (*Leucaena leucocephala*), bamboo, reeds, canes, etc together with good harvesting practices depending on the local ecosystem. Employment opportunities are no way curtailed by this change over. Bamboos and reeds are excellent soil binders and help in improving water table. Adimali, Neriyamangalam ranges of Munnar Division and Mankulam Division were known for abundant stock of reeds and bamboos. Subabul is not only fast growing, but also soil enriching with nitrogen fixation. The whole stem together with bark could be used for pulping. In the case of *Eucalyptus,* the bark has to be removed before pulping and this adds to the cost as well as to environmental problem from the slow decompsing bark. Studies have shown that the cost benefit ratio of subabul in four years is about 2.8.

**12.2.2. Intervention to counter expanding rain shadow region:** The changing weather of Idukki is promoting a frightening phenomenon - the birth and growth of a rain shadow region in an erstwhile lush green forest belt situated in the eastern and northeastern parts of Idukki district along Kerala-Tamilnadu boundary. The growth of this rain shadow region has potentil to cast omnious spell to the weather and environment of its western parts. Cardamom farmers of adjoining area are getting apprehensive about this phenomenon. There is great urgency to conduct scientific studies by involving Kerala Forest Research Institute on the threat looming large from the reported expansion of the region. Concurrently, without losing time, efforts have to be mounted on war footing to green the belt with appropriately chosen species mix by involving local communities and forst department. Similarly, tree planting has to be undertaken in the tea and coffee plantation belt in Peermedu, Udubanchola and Devikulam taluks falling under the jurisdiction of Kumily, Ayyappancovil, Adimaly, Erumeli, Neriyamangalam, Munnar, Devikulam and Mankulam forest ranges, which is heavily depleted of trees. Supply of sapling of chosen species at free of cost to small farmers (2 ha and below) and at 50% cost to other planters is recommended.

### 12.2.3. Managing forest resources, in particular biodiversity and water to support agriculture and livelihood:

Conservation forestry involves soil, water and biodiversity conservation, management of invasive weeds while promoting multi-hierarchial native vegetation. Needless to emphasise the principal role of forest in building and strengthening water resources locally and regionally through river systems. One $km^2$ thickly vegetated forest area is estimated to have capacity to store about 50,000 to 2,00,000 $m^3$ of water. Therefore, management of watersheds within forest has relevance in harnessing water to agricultural activities and other uses. This assumes importance in Idukki in view of the changing weather detected by this study. Action required in Idukki involves scientific studies on soil and water in selected water sheds and catchments and site specific treatment methods for water harvesting and regulation of silting and sedimentation. Such study may be done together with the Kerala Forest Research Institute and the Soil Survey Department, Government of Kerala. Emphasis may be laid on vegetative methods of water shed management such as vegetative check dams, planting of bamboos, reeds, canes, hydrophites, flood tolerent vegetation, etc with minimal or no

earthwork. Checkdams may be built in forest areas fringing agricultural areas to provide irrigation to crop husabandry. While the location of such checkdams should be decided together with the beneficiary farming community and concerned Panchayats, management of this facility for irrigation should be done by a committee headed by farmer representative and comprising officials from forest and agricultural departments, and Panchayat representatives. The Forest Department is requested to be more sensitive to the livelihood needs of the people in the fringe areas. Support is proposed to build eight checkdams to totally serve for crop irrigation.

### 12.2.4. Safeguarding and strengthening CHR forest:

In many areas of the CHR, the forest is partially degraded by felling trees and excess shade regulation. Apart from the greed to illegally encash from the forest trees situated within cardamom holding, trees are felled or connived to dry and fall 'naturally' to meet the fuel requirement for cardamom drying. The need for strict regulation of forest tree density and canopy in CHR area, which is an essential requirement to retain the title or lease of CHR land and for sustainable cardamom production is re-emphasised. While enforcing regulations on these, it is also important to periodically replenish the forest density in CHR area. A programme to meet this need is already underway in Idukki district under the title 'the Cardamom for Rainforest Conservation Programme' (CRCP). This programme being implemented by the Forest Department (?) from 2001 covers the cardamom cultivated areas within Devikulam, Kumily and Ayyappancovil ranges. The components of this programme are shade regulation, judicious fuel extraction, promotion of soil mulching, biodiversity and watershed values, and reforestation in ecologically fragile locations like steep slopes, stream banks, etc. The programme goes hand in hand with upgradation of cultivation practices to strengthen sustainability of production. The CHR forest ecosystem has to be promoted to serve as a multi-tiered and multi-species system to serve multiple functions such as soil nutrient enrichment, moisture retention, checking soil erosion and compaction, enriching soil microbial activity, letting in the right quantum of light, reviving the streams, and maintaining the right micro climate.

Forest Department, concerned Panchayats in CHR area, the Spices Board of India and associations of cardamom farmers may jointly organise and implement a

programm to re-forest the CHR area and to evolve a self-imposed code of management on shade regulation to recommended level and forest protection in a manner that would promote sustainable cardamom production. Species for re-plantation may be selected with preference to locally adapted and appropriate. Nineteen species identified for planting in CHR area are red cedar, Kurangatti (*Atrocarpus fraxinifolius*), jack fruit tree, African shade tree, Karimaram (*Diospyros ebenum*), Karuna (*Vernonia monocis*), Vellakil (*Dysoxylum malabaricum*), Elippa (*Palaquim ellipticum*), Thempavu (*Terminalia tomentosa*), Marutha (*T. Paniculata*), Unnam (*Grawis tiliaefolia*), Thelli (*Canarium tomentosa*), Mayila (*vitex altissima*), Pongu (*Hopea parviflora*), Venga (*Pterocarpus marsupia*), Kumbil (*Gmelia arborea*), Punnappa (*Calophyllum tomentosum*), Anjili (*Atrocarpus hirsutum*), and Vatta (*Macranga indica*). In addition fodder trees, fuel wood, fruit trees and medicinal plant trees (e.g., Sappan wood tree, *Caesalpinea sappan;* Asokam, *Saraca asoca*; Neem, *Azadirachta indica*; Athi, *Ficus racemosa*; Nenmeni vaka, *Albizis lelleck*; Venga, *Pterocarpus sanalinus,* etc.) also could be included considering the need of the farmer. Polybag seedlings of selected shade trees may be generated with the involvement of local SHGs and distributed to farmers at 10 % of the price.

### 12.2.5. Harnessing water resources for alternate income generation:

Idukki district has about 131.3 $km^2$ under water bodies including many dams and reservoirs. The reservoirs include Kundala, Mattupetti, Chenkulam, Kallarkutty, Idukki, Cheruthoni, Kulamavu, Lowerperiyar, Mullaperiyar, Malankara, Edamalayar, Anyirankal, Ponmudi, etc. These water bodies offer great opportunity for inland culture fishery to generate huge fish production, employment and income to local communities including the tribals inhabiting the fringe areas of these water bodies. This can become a highly profitable initiative with cooperation among departments of Forests, Irrigation, Fishery and KSEB and participation of the local communities. Production of several indigenous and introduced tropical and high altitude fishes is a very promising prospect. There are several native varieties of fishes in the waterbodies. For example, 55 species are identified in Periyar lake, out of which three are new and 16 are rare. The exotic Tilapia and common European carp are abundantly available in the lake. The fresh water crabs locally available are delicious to tribal communities.

Although the tribals and other forest dependant communities are engaged in fishing for domestic use and sale, the potential of these water bodies is yet to be studied and exploited. With inter-departmental cooperation, this potential can be realised to benefit the local communities and people of the region for income and nutrition. With this in view a research-cum-fish culture programme covering all water bodies (reservoirs and ponds) is recommended for implementation by a consortium of concerned departments and local communities to realise fish production in two years. Research should cover assessment of local fish and crab species, their habitat requirements and complementarity with chosen introduced species of economic value, culturing suitable fishlings for regular ranching and protocol for sustainable fish harvest.

**12.2.6. Managing man-nature and man-animal conflicts:** Encroachment and settlement in side native habitats breeding or nesting and feeding grounds of wild animals and birds and their migratory corridors are the main reasons for the frequent man-beast conflicts. These conflicts are aggravated by human vandalism causing degradation and shrinkage of habitants, reduction in carrying capacity, loss of buffer zones for mobility and migrations, displacement of habitat, decline in home range, reduction in the availability of shelter, water, food, etc, fear and threat created through hunting and use of explosives and crackers. The human settlements in forest fringes without a buffer zone and in corridors used by animals for food and water are leading to frequent destruction of crop by elephants and wild boars. These are common in Vattavada, Kanthalloor, Marayur, Kundala, etc where largely tribal communities are made to bear the brunt. The Kundalakudi farmers, despite having provided with 5 acres of land (in Melekkudy), are not able to effectively cultivate and earn an income because of regular crop loss caused by elephants. Wild boar is a constant and very difficult problem to vegetable farmers of Vattavada, Kanthalloor, etc. Farmers in Kanthalloor who are fenced out of forest reported about the insensitive attitude of the Forest Department officials in accessing barricaded forest for non-timber forest produce.

The tribal farmers of Kudalakkudi are at the banks of the Mattupetti reservoir like few other bordering communities. While little irrigation may make huge difference to their income from vegetable cultivation, they have been shut out from the taking reservoir water for agricultural purposes. It is recommended that to promote livelihood and

income of farming and tribal communities residing and practicing agriculture as main livelihood within a band of 1000 m from the banks of all reservoirs may be allowed to draw warter from the reservoir exclusively for agricultural purpose by using a pump having motor not exceeding 5 HP. The government of Kerala is requested to effect required policy change to facilitate this. We further recommends infrastructure support to these farming communities to install irrigation pumps.

Solar fencing is recommended to protect tribal resettlements adjoining forest areas and regularly threatened by wild elephants. Provision is made for 26 km long stretch in Melekkudy and Thazhekkudy of Kundala, Kanthalloor, Vattavada, etc. The work has to be undertaken

### 12.2.7. Sustainable extraction of non-timber forest produce (NTFP) and promotion of alternate income generation for tribals:

The recent legislation on 'The Scheduled Tribe and Other traditional Forest Dwellers (Recognition of forest rights) Act, 2006' enacted by the Government of India recognises and vests the forest rights and occupation in forest land in forest dwelling Scheduled Tribes and other traditional forest dwellers who have been residing for generations in such forests. This act acceedes right of ownership, access to collect, use and dispose of minor forest produce (MFP) which has been traditionally collected. The rights also encompass rights in fish and other products of water bodies, grazing and access to seasonal forest resources. Several tribal hamlets in the district are placed within the forest and they have to be trained on their rights as conferred by the recent laws and also for sustainable use of forest resources, modern methods of animal rearing, crop production and value addition. Their proper training is important to make their livelihood and forest sustainable. Such training could include improved techniques of sustainable collection/extraction, processing, storage, and marketing.

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# 13

# ANNEXURE

**ANNEXURE 13.1**

# PROCESS DOCUMENTATION

A participatory approach was adopted involving all stakeholders who have a direct or indirect stake in the development of the region. The study was structured in three phases. To monitor the programme of the commission one of the staff from M.S. Swaminathan Research Foundation was appointed in the Idukki District. The purpose of the first phase was to obtain first hand information on the basic aspects of the district. This included three preliminary visits to the locations. The team visited the District Agricultural office and collected details about the main crops grown in the district. The team also visited the farms of two elite farmers who received recognition for their innovations in cardamom. The team had the benefit of discussions with tea growers and a leading NGO. During the second visit the team finalized the locations for the subsequent meetings of Prof. M.S.Swaminthan. The team had a meeting with District Collector and worked out the logistics of the future visits. Discussions were held with District Kudumbasree officer and Animal Husbandry office and Cardamom growers association**.** The team visited tribal colony and the vegetable growing areas in Vattavada and tribal settlement area of Devikulam taluk.

The second phase was devoted for public consultations with multiple stakeholders. The commission organized farmers'/ labourers' meeting in each taluk of the district. More than 1000 farmers attended the meetings. Prof. M.S.Swminathan headed the first three meetings. 553 farmers attended the first one at Adimali and the attendance in the meeting at Peerumedu was 329 farmers. 459 farmers participated in meeting for Udumbanchola taluk conducted at Kattapapna. They shared their problems and presented large number of representations to the commission. The meeting for Thodupuzha taluk was conducted at Thodupuzha. Besides farmers, policy makers, MLAs, MP and Govt officials also participated in these meetings. The major problems raised were the writing off of loan, rights of land ownership (*patta)*, problems relating to CHR (Cardamom Hill Reserve), high cost of cultivation, price fluctuation, marketing issues etc. Some farmers pointed out the biodiversity deterioration, climate change and scarcity of irrigation water in the district. The commission also conducted meeting

with Govt. officials, Kudumbasree units, Panchayathraj etc. The farmers pointed out that price of milk was even lower than that of mineral water and dairying is becoming less lucrative.

The District Collector Sri. Raju Narayanaswami, IAS (was in office when this study started) and Ashok Kumar Singh, IAS extended all important and strategic support in organizing meetings, furnishing data and providing their own valuable inputs. Commission collected relevant data from various line departments. In this phase team met growers' associations representing different crops, NGOs and scientists of Indian Cardamom Research Institute under Spices Board, Cardamom research Station under Kerala Agricultural University, Tea Research Station under UPASI and Indoswiss project under KLDB. The Directors of the each department detailed the activities of the institutes. The discussion with ICRI helped to understand the state of improved varieties of cardamom and technologies largely used by farmers and the sustainability aspects of current cardamom production. Many farmer's varieties were grown in Idukki than the improved varieties released by three research institutions. Among then Njallani takes the prime position with area exceeding 60% of cardamom growing area of the district. It was interesting to know that many farmers undertake research in their farm and come out with new ideas and some with promising varieties.

In the press meeting conducted at Thodupuza, the journalists brought out certain unique problems faced by farmers and also indicated the surveys and studies undertaken about the district formerly. The commission obtained clarification with regard to the loans and allied aspects from NABARD, lead banks and District Co-operative banks. Commission also collected weather data from various departments and research institutions for statistical analysis.

During its fieldwork, the Commission came across several useful case studies. The working model of open Agri markets run by the farmers group (KADS) at Thodupuzha and vegetable market run by VFPCK, initiatives taken by private entrepreuners, and few *Kudumbasree* units are few to mention. The commission also closely examined the cases of farmers who had undergone many tribulations created by certain policies of the government.

The third phase devoted for obtaining necessary clarification for the finalization of the recommendations. All the memoranda received were carefully compiled. Here the Commission also considered the proposals from different Government agencies. Commission conducted another meeting involving select farmers, representatives of farmer associations, experts, scientists and senior officials of the line departments. Farmers from all the areas including animal husbandry and award winning farmers also attended the discussion. The main objective of the meeting was to clarify various doubts arising from the memoranda and reports received during previous visits of the commission. Commission also visited Spices Board officials at its head quarter, Kochi. The Chairman, Spices Board of India as well as all the directors along with the Secretary attended the meeting. Commission discussed about the working pattern of the Spices Board in the district and learnt about the special schemes and the XI plan proposal of the Board.

The details of the visits the memers of the Commission made and the meetings Commission conducted inIdukki districts are given in the following two Tables.

**Table 1: DETAILS OF THE VISITS OF SWAMINATHAN COMMISSION**

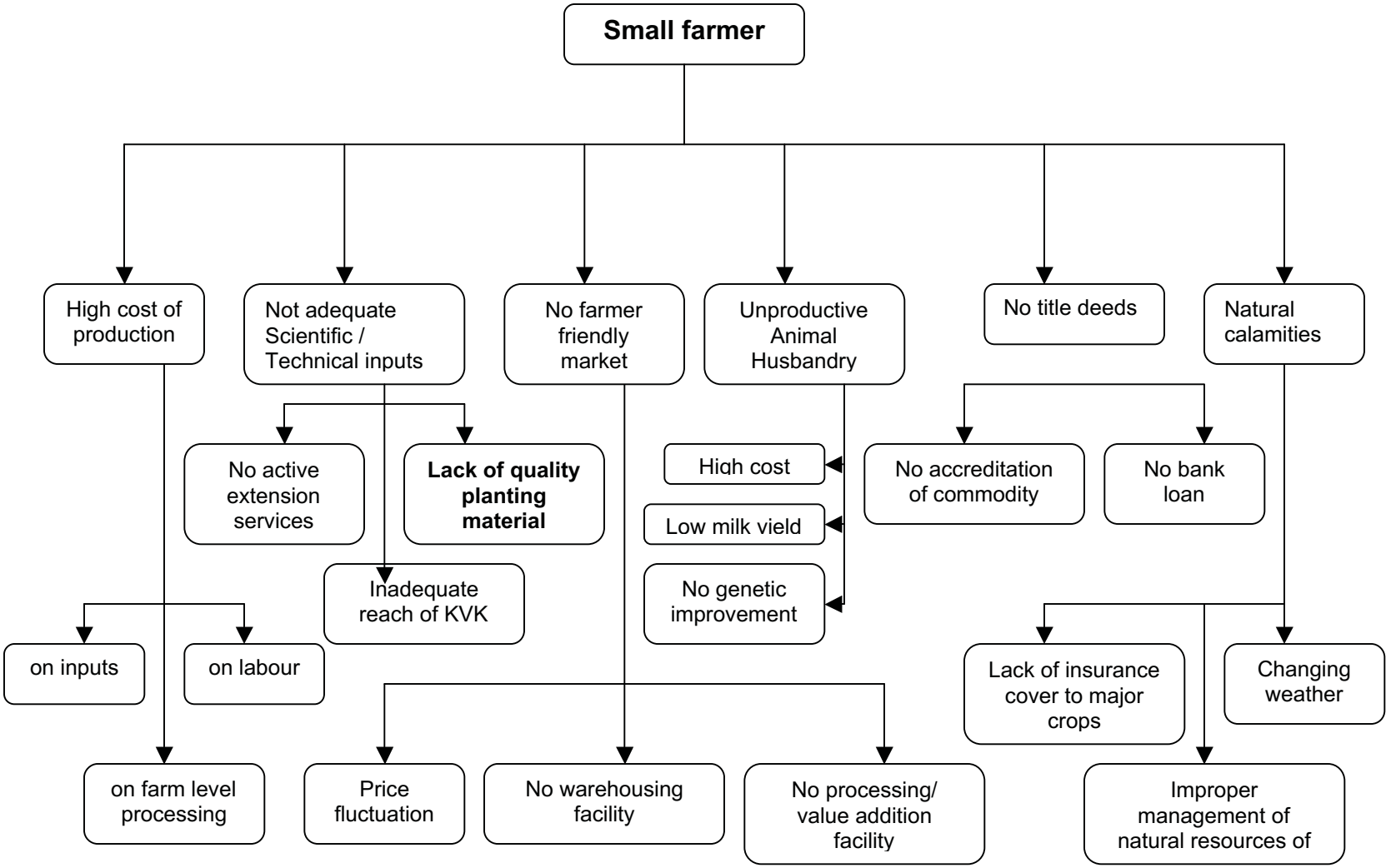
| | | |
|---|---|---|
| 1 | 20.8.2007 | Discussion with Principal Agricultural Officer, Thodupuzha, Additional District Magistrate, Painav, Senior Official of Coffee Board, Idukki and farmers who were recognized for innovation. |
| 2 | 21.8.2007 | Visited the tea growing area of the Idukki district, Peerumedu Development society, Joit Director, Animal Husbandry Dept, Idukki and office of Spices Board, Idukki. |
| | 22.8.2007 | Met Directors of line departments at Trivandrum. |
| 3 | 12.9.2007 | Made arrangements for public hearing of Commission led by Prof. M.S.Swaminathan at Adimali, Vandiperiyar, Kattappana and for meeting with Senior officials and public representatives, and visited KLDB Madupetty. |
| 4 | 13.9.2007 | Final arrangement completed for meeting at Vandiperiyar and Kattappana. Visited cardamom-growing areas. Meeting with Cardamom Growers Association. |
| 5 | 14.9.2007 | Met District collector Sri Raju Narayana Swami, visited District Kudumbasree office, Animal Husbandry office and Press meetings. |
| 6 | 13.10.2007 | Visited District Tribal development office, Lead bank officer |
| 7 | 14.10.2007 | Visited Chappath tribal area and coffee growing areas of Idukki district |
| 8 | 15.10.2007 | Visited Vattavada the vegetable growing area. |
| 9 | 10.11.2007 | Farmers meeting Adimali. Prof. M.S. Swaminathan chaired the session participated by Dr.S.Balaravi and Dr.K.U.K.Nampoothiri, the team members. Local elected representatives (MP and MLAs), district |

| | | |
|---|---|---|
| | | Collector and lead department heads, apart from many farmers and media participated. |
| | 10.11.2007 | Meeting of MP, MLAs, District Panchayat President, Senior district officials including District Collector, heads of line departments, Financial institutions- chaired by Prof Swaminathan and members of study team. |
| 10 | 11.11.2007 | Farmers' meeting at Vandiperiyar chaired by Prof. M.S. Swaminathan and participated by team members, local MLA, MP and many farmers, plantation workers and media. |
| 11 | 12.11.2007 | Farmers meeting at Kattapapna was chaired by Prof. M.S. Swaminathan and partyicipated by the study team, M.P, Local MLAS, many farmer leaders, farmers and media. |
| 12 | 27.11.2007 | Visited Indian Institute of Spice Research Institute, Calicut |
| 13 | 30.11.2007 | Discussion with Director, Dept of Animal Husbandry, Trivandum |
| 14 | 1.12.2007 | Visiting Bureau of Economics and Statistics, Trivandrum |
| 15 | 2.12.2007 | Discussion with Soil Conservation and Soil survey Dept. Trivandrum |
| 16 | 16.12.2007 | Farmers meeting at Thodupuzha with team including Dr.S.Bala Ravi and Dr.K.U.K. Nampoothiri. Visited an organic farm at Thodupuzha and KADS Agri open market at Thodupuzha. |
| 17 | 17.12.2007 | Visited Indian Cardamom Research Institute, Myladumpara and Cardamom Research Station (KAU) Pampadumpara. The team also visited the farm of the institute including pepper nursery. |
| 18 | 18.12.2007 | Meeting with Presidents of Panjayat Raj Institutions and women members of Kudumbasree at the Collectorate |
| 19 | 19.12.2007 | Meeting with senior Government officials of line departments and commodity Boards at the Collectorate. |
| 20 | 20.12.2007 | Visited Tata tea office at Munnar for collection of weather data. The team visited a vegetable farm at Kanthalloor and also attended the farmers meetings at Krishibhavans at Kanthalloor and Marayoor. Local MLA was present. |
| 21 | 21.12.2007 | Visited a tribal colony at Kundara near to Madupetty and discussed the problems with tribal people. Also visited Poopara tribal resettlement area to understand their problems. The District tribal Wefare Officer was present. Alsi visited VFPCK Open Market at Adimali. |
| 22 | 22.12.2007 | Meeting and discussion with journalists at Press club, Thodupuzha |
| 23 | 23.12.2007 | Visit to the National Horticulture Board, Trivandrum and Lead bank Regional Manager (Union Bank of India) at Trivandrum. |
| 24 | 24.12.2007 | Visited office of the Director of Agricultural, Kerala, Kerala Land Use Board and Director of Economics and Statistics. |
| 25 | 26.12.2007 | Visited office of the Department of Soil Survey, Department of Soil Conservation, Planning Board, Kerala, Trivandrum. |
| 26 | 9.01.2008 | Visited NABARD office and collected data with regard to the loan. Discussion held with the District Collector at Painave. Visited VFPCK, vegetable market at Thankamani and conducted meeting with District Cooperative Bank officials. |
| 27 | 10.01.2007 | Representative farmer group and selected Government officials meeting at Kattappana |
| 28 | 11.01.2007 | Meeting with Spices Board Officials at Kochi. |

**Table 2: Details of the meeting conducted by Prof. M.S. Swaminathan Commission in Idukki District**

| Sl.No | Date | Place | Participants | No of participants |
|---|---|---|---|---|
| 1 | 10/11/2007 | Valiyaparambil Tourist Home, Adimali | Farmers at Devikolam taluk | 553 |
| 2 | 10/11/2007 | Tea County Resorts, Munnar | Policy makers and govt officials | 33 |
| 3 | 11/11/2007 | K.R.Theater, Vandiperiyar | Farmers of Peerumedu taluk | 329 |
| 4 | 12/11/2007 | CSI hall, Kattappana | Farmers of Udumbanchola taluk | 459 |
| 5 | 16/12/2007 | Town Hall, Thodupuzha | Farmers of Thodupuzha taluk | 68 |
| 6 | 17/12/2007 | Indian Cardamom Research Institute, Myladumpara | Scientists and Technical staff | 35 |
| 7 | 17/12/2007 | Cardamom Research Station, Pampadumpara | Scientists and technical personnel of KAU | 8 |
| 8 | 18/2/2007 | Collectorate, Painav | Women members of Kudumbasree | 92 |
| 9 | 18/12/2007 | Collectorate, Painav | Presidents of Panchayat Raj Instn. | 32 |
| 10 | 19/12/2007 | Collectorate, Painav | Senior Govt. officials of line depts | 26 |
| 11 | 20/12/2007 | Krishibhavan, Marayoor | Vegetable and sugarcane and lemon grass farmers | 86 |
| 12 | 20/12/2007 | Krishibhavan, Kanthaloor | Vegetable farmers | 39 |
| 13 | 21/12/2007 | Press Club, Thodupuzha | Journalists | 21 |
| 14 | 10/1/2008 | Edassery Resort Kattappana | Lead farmers and senor selected Government officials & scientists | 40 |
| 15 | 11/1/2008 | Spices Board of India, Kochi | Spices Board Officials | 14 |

## PROBLEMS OF SMALL FARM SECTOR IN IDUKKI



**ANNEXURE 13.3**

## LIST OF PARTICIPANTS

**1. Farmers meet on 10.11.2007 at Adimali**

1 Thomas Mundakan, Adimali, Harithakrishi
2 Sunilkumar, Harithakrishi, Adimali
3 K.v. Baby kandanadu, Kallar
4 Johny (Augusthi), Kulangara Konnathadi
5 Pradeep George, Youth Friend (J)
6 Salim Padinjarakara, Thodupuzha
7 Goerge Abraham, Chairman, Society Of Unity Indicanlim
8 Johny Poomattam, Kerala Congress (K), District President
9 N.g. Saju, nerayikkamattathil
10 Sunny Mathew, Varakukalaparambil
11 Sebastian, Parambil
12 K.j. Benny, Kachirayil, Murikkasheri
13 Sibi J. Monupilli
14 Joseph Kuzhikattil, Chattupara
15 Babu, Kunnel, Ponmudi
16. Kuruvila, Kuttiyanikkal, Ponmudi
17 G. Kunjumon, Nedumpillikudi (Haritha)
18 Sreedharan, Ellapara, Machiplavu
19 Thomas Kattukudi, Adimali
20 Yakkob, Pazhukkalil, Machiplavu
21 Thankappan Chirakkal, Rajakkadu
22 Philip Goerge Kochukarodu
23 Saramma, Parakkattil, Panikkankutti
24 Narayanan
25 Kunjumon, Vachakkara
26 Shaji Thottanal-
27 Joseph Thevarparambil
28 Abraham Kanithinkal
29 C.M. Gopi Cherukunnel
30 P.k. Rajesh, chirakkal
31 Sabu, Paravarakathu
32 Sebastian, Kunnumpurathu
33 Leelamma Joseph, Kavalakkattu
34 Kuriyan Kuriyaplavunkal
35 Chacko Aanichamkudi
36 K.j. Thomas Kurinjamkulam
37 N.m. John hops, Adimali
38 Geetha Chiramen, Panikkankudi
39 Adv. Joy Thomas, Chairman, (UDF Idukki Dist.)
40 Babu JosePulikkal, Panamkuzhi
41 Biju Poorimattam, Panamkizhi
42 Babu, Vallopillil
43 Saji Vazhekkuzhiyil
44 M.M. Mani, CPIM Dist. Secretary
45 K.R. Radhakrishnan, Kizhakkanchalil
46 Pushpangadan, Cherukunnel
47 T.M. Varghese
48 Baby Kuriyakose, Kizhakken
49 Somavalli, Pazhayampattu
50 Leelamma Baby, Elamthanam
51 Mathew Joseph, Tharamuttam Eruttukatham
52 Benny Ozhukayil, Pathamkutti

53 Sivan. K.S, Secretary JSS, Idukki District
54 Baby, Avalumthadam Machiplavu
55 T.R. Sreedharan, Adimali
56 Radhamani, Mathirapilli, Mankulam
57 Valsamma Shaji, Thaipurayidam
58 Josekutti George A.K.C.C.
59 Mathew Anthrakuzhikkattil
60 Devarajan Chattuparakudi
61 Thankachan Nagan, Chattuparakudi
62 K.P. Joy, Kunnampillil Adimali
63 Kuttanpilla, Palikkankudi
64 Binu Gopalan, Kunnel Parathodu
65 Bindu Rajagopal, Member Vellanchuval
66 Jayan, Vice President Vellathooval
67 C.M. Gopalan, Chempil Vtl
68 K. Manojkumar, Kozhuvan
69 Baby Joseph Nagarjuna, Thodupuzha
70 Vincent , Kannamangalthu
71 K.G. Antony, Cards (President)
72 Joseph Antony, CARDS
73 V.P. Gorege, CARDS
74 Subashkumar, Payapilli
75 Savior, Ellithanam Adimali
76 Thomas, Vattukkattil, Konnathodi
77 Abil Mathew
78 Manoj, Thodumpillikkudi
79 Jose Antony, Thudavakandam
80 O.R. Sasi, Block President
81 P.J. Johny Parathody
82 Joypeter Panikulangara
83 U.V. Menon, Somparmika
84 Joseph, Puliyammakkal, Mukkudam
85 Sukumaran, Koottukkal, Kathippara
86 A. Selvaraj Anithavilasam Kathippara
87 Mathew Thomas, Thundiyil Rajakkadu
88 Soman, Puthanpurakal, Kathippara
89 Prabhakaran P.C, poonthotiparambil
90 M. Kamarudeen, DTCADB
91 Ammini Raghavan**,** President Adimali Panchayath
92 K.K. Annakutty, ADB Adimali
93 George**,** Perumpalli
94 Joseph Kulangara
95 Devasya Poovanparambil
96 Leelamma Balakrishnan
97 Sobhana Rajan, Member Vellathooval
98 Gopi Raman, Member Adimali Panchayath
99 Thomsan Joseph, Valamparambil
100 Biju Karukapilli
101 Mathew Mathai
102 Abraham Putholin
103 James Kareeparambil
104 P. Mohanan Shathampara
105 M.S. Balakrishnan, Vice President, Konnathody
106 Kochu Pallippuram, Mukkudam
107 P.D. Devasya, Rajakkadu
108 George Thomas, Rajakkadu
109 K.P. Madhu, Keerikattil, Aanaviratti
110 P.J. Jeyson, Parikappil
111 Shiny Mulakad
112 Anil. K.S,

113 K.J. Philip, Kannan Kara, Anachal
114 Joby Philip, Kannamkara
115 P.P. Sasi
116 Thomas, Poovathinkal, Panikkankudi
117 P.I. Varghese Panikkankudi
118 C.S. Abhilash, Vice President, Pallivaal
119 P.J. Sebastian, Secretary, Kerala Karshaka Sangam
120 K.G. Mathew, Karuna SHG, Perunnachal,14th Mail
121 Kesaven. Cheratiyil, Pazhampallichal
122 Biju, Kappil Rajakkadu
123 Jose Jacob, Machanickal
124 N.P. Thankavelu, kurushupara
125 S.V. Subramanian, Caramom Planters Assosiciation, Bodi
126 A.S.S. Subbiah Caramom Planters Assosiciation, Bodi
127 S. Ramanathan Caramom Planters Assosiciation, Bodi
128 B.K. Sreedharan Caramom Planters Assosiciation, Bodi
129 R. Kamalarathan caramom planters assosiciation, Bodi
130 L. Anainath Caramom Planters Assosiciation, Bodi
131 R. Kameshwaran Caramom Planters Assosiciation, Bodi
132 R. Purusothaman Caramom Planters Assosiciation, Bodi
133 P. Mohan Caramom Planters Assosiciation, Bodi
134 Jose George
135 K.K. Thomas, Kunumkuzhil
136 Rajani Thankachan
137 Gramapanchayath Member, Vellathuval
138 P.S. Peethambaran, Pullolil
139 E.P. Baby ellikunnel, Parathodu, Agroclinic
140 Santhosh P.V. Chalakathottiyi Kathipara
141 Raghaven, Varambanplakkal Kathipara
142 Sebastian joseph, Co op Bank, Adimali
143 Joy Antony, Nokkupara
144 C.V. Rajan, Secretary RADB
145 N.P. Radhaswamy
146 N.M. Mohanan
147 Jospeh George, Kolethudavil, Konnathadi
148 Muthu, Ex .MLA
149 George Varkey, Kalappura
150 K.Sureshbabu, C.M.P
151 Mathew Jose, N.C.P
152 Chandykunju, Adimali
153 C.A. George, Chakanikunnel
154 K.J. Joseph Karukapillil
155 Adv. Jony Abraham
156 Basikurupu, Parijatham Estate Vattiyar
157 Sukumaran Vattachalil, Kunjithanni
158 Pushpangadan, Chellipadavil, Muniyara
159 Madhu, Kaniyampadikkal, Kombodinjal
160 Jomon Goerge, Adimali
161 Mathew Kalarickal, Marayur
162 Binoy Udakaparbil
163 V.K. Biju, Konnathadi
164 V.R. Sathya, Kerala
165 K.P. Subashchandran, Baison Vally
166 A.S. Sabu, Anjirakkattuvelil
167 Ramesh Gopalan
168 S.T. Promoter
169 Jijo Madhavan
170 Konnathody Gramma Panjayath Member
171 Jimmi Joseph, Parakunnel, Machiplavu
172 Manoj Chelattu, Valara

173 Bose Johny
174 Sadanandhan, Cheruvil Anachal
175 K.B. Raju Karuvambattu, Rajakkattu
176 N.J. Chathe
177 M.R. Vijayan Mandelil
178 C.R. Surendren, Rajakkad
179 Michael Augasthy Porimattathil, Panamkutty
180 Shaji Mathew, Mangulam
181 K.M. Pily200 Acere
182 David Arakkal, Human Rights
183 Reji Maliyeakkal, Anaviratti, Adimali
184 P.V. Augustain, Adimali
185 Ullas Kathithinkal
186 Mathew Philip DYFI
187 Selin Sebastian, Panchayath Member
188 C.K. Prasad, President, Konnathadi
189 Jose Vettikombil Mankadavu
190 P.j. Sathiyavan, Palakatten, Mannakala
191 P.M. James, Ponthottiyil, Koompanpara
192 T.G. Babu, Devikulam, Taluk, Karshakasamithi
193 Devasya C.V. Chandrankunnel, bisonvalley
194 Joseph Kuruvila, Thekkeparambil Parathodu
195 Raju Karukunnel, Parathodu
196 Soman Pottanplakkal, Pannikkankudi
197 N.V. Baby, Secretary, Kerala Karshaka Sangam Idukki
198 T.P. Manka, President, Kambilikandam
199 P.K. Purushothaman, Puthanpurakkel
200 Devasya, Kambilikandam
201 K. Moitheen Haji, Vice Chairman, INFAM
202 R.O. Varghese, Chithirapuram
203 Dr. M.C. George, INFAM
204 P.M. George
205 Joy John
206 Thomas Parayil Ellakallu
207 Sahyamithra, Nature Clum, Adimali
208 Chacko, Thekkekunnel, Ponmudi
209 Annakutti, Ambazhathinal Ponmudi
210 A.J. Jose, Lal Tawors Ernakulam
211 Thomas Mathew, Thundiyil Mullakadu
212 Adv. Roy Varicatt, President
213 M.N. Joyachawaran, Kerala Congress J
214 K.M. Abdullakunju, General Secretary, Kerala Congress
215 K.K. Mathew, Koonamparayil (Haritha) Koomponpara
216 Rajesh. A.V. Aryanahathil Chattupuri
217 P.K. Abdulkhadar,Pattammavudi, Muthuvankudi
218 George Joseph Thottumalikal, Muthuvankudi
219 C.M. Joseph Chittanmariyil Chenkulam
220 Shaji Punnilathil Kambilikandam
221 K.H. Sidique, Karimattathil, Chenkulam
222 P.S. Francis, Tresurer, Hops, Adimali
223 N.M. Kuriyan, President Highrange Organic Producers Society, Adimali
224 Chandy Abraham, Muringayil, Mukudam
225 K.S. Parameswaran, Kizhkeveetil, Muthirapuzha
226 E.M. Raghavan Master, Kerala Organic Development Society Thodupuzha
227 P.P. Kuriyzkose, VFPCK Machiplavu
228 K.P. Kunjumon, Chairman, Block Panchayath, Adimali
229 Sudevan, Kapyarukunnel, Konnathodi
230 Sunny, Murukkassary
231 P.P. Sabu, Kerala Karshaka Sangam, Irumbupalam
232 A.O. Augustain

233 Varghese Vettiyankal
234 Augustain Joseph, Anikathadathil Murikashery
235 Shaji. V.A. Varakukalaparambil, Murikashery
236 Thomas Mathew, Kakkuzhiyil, Kalayanthani P.O. Thodupuzha
237 K.V. Thomas, Kandachalil Ponmudi
238 Jose Mathew, Neeranal, Kumbanpara (Haritha)
239 Girija Vasudevan, Chittanickel
240 George Varghese Attaparmbil VTL
241 Francis, Vattakuniyil,
242 Vakachen, Kottakkel, Machiplavu
243 V.V. babu vedikkappu
244 Devasya K K
245 Rosamma Varghese
246 O.A. Pareeth, Koopanpara
247 Archanathankappan
248 Shanmukam, Rajakkadu
249 Sreedharn.M.
250 Benny Joseph, Rajakadu
251 K.K. Ramankuttirajakkadu
252 Benny Joseph, Chittadiyil
253 Manual James, Rajakkadu
254 Sabu Vadakkekudyil
255 P.D. Thomas, Rajakad
256 M.P. Shaji, Mylamparambil
257 M.M. Thankan, Moolamkuzhiyil
258 M.N. Mohanan, Moolamkuzhiyil
259 K.N. Ginadevan
260 Santhosh, Vettukallel
261 T.G. Sureshkumar, Rajakkadu
262 Surendran.V.A, Rajakkad
263 P.K. Saidhu, Rajakad
264 Sabu.T.N, Rajakad
265 Binu Vallur, Rajakad
266 Anil V.M. Mullakanam
267 Raghaven, Kalarickel
268 Nishathe, Vettukalummakken
269 Mohankumar, Vettukallel
270 Subhash.P.K. Parakunnel
271 Joseph, Rajakkadu
272 T.K. Sukumaran
273 P.K. Sajeev, Panthalanikunnel
274 K.P. George, Kummamkottil
275 Baby Josephchittadiyl, Rajakkad
276 Madhu Ethickal
277 K.K. chaNdrasekharan
278 K.V. Kuriakose Panikkankudi
279 Sijo Rajakumari
280 Annakutti, Punnakozhiyil
281 Mathai, Chattupara
282 P.K. Sureshkumar
283 T.K. Soman, Thadathil
284 Akhil Vatholil
285 Chellappan, Rajakkad
286 Dominic Joseph, Rajakad
287 Sunjayan. V.K Rajakad
288 Benny Varghese
289 Siby Joseph
290 Babu. E.B
291 George P.P
292 Salomi Joseph

293 Ranimohanan, Kathipara
294 Rajappan, Rajakad
295 M.P. Augustain, rajakad
296 Joy, Palakunnel, Rajakkad
297 Jinesh, Mankunnel Mullakanam
298 Mathew, Parikapillil, Pottankadu
299 Mani. V.J
300 P.J. Philip, Parathod
301 Binumon.V.S, Rajakad
302 Thomas, Pullorkunnel, Rajakkad
303 P.S. Thomas, Rajakad
304 Omana Thomas, Kuzhikattil
305 Mini Thankachankuzhinattil, Padikappu
306 Isack Varghese, Valara
307 Poal Mathew, Kuttisreekutty, Machiplavu
308 K.M. Michael, Cardamom Growrs Association
309 Boban John
310 Johny M.P, Adimali
311 Thankaraj, Puzhakara, Hettalkadu
312 George T.J. Thanikkal
313 Peeter, Adimali
314 P.K. Sudhakaran, Poonakuhiyil, Kunjithanni
315 P.N. Gopakumar, Kunjithanni
316 S.N. Mohanan
317 Shibu Alatharakal, N R City
318 Baby Sebastian Pacholy
319 Mohanan, Vellathoval
320 Shaji Joseph Koloth
321 Sajeevan K.G., N.R.City
322 Roy K.U, Kallikattu
323 Prabhakaran Kanadu, N.R.City
324 Tino, Munnar
325 Titus Jacob, Thannickal Rajakad
326 K.J. Baby, Konath
327 V.K. Salim Maniyara Parathode
328 C.P. Joseph, Parathode
329 K.M. Papplu Parthab, Konnathody
330 Vinodh.G. Chirakandathil Parathode
331 Ammni Biju, Muthirakala
332 Devadaskanthinagar
333 Joseph, Vellathoval
334 Sabu James, President, Seb Kallar
335 K.A. Philip, Kadalickal, Thokkupara
336 Padmavathy Parameswaran
337 Ajitha Prasad, Member Pallivasal
338 M.L. Jayaprakash, Krishnavilasm, Kunjithanni
339 Murugesan, Chithirapuram
340 Sasi Pillai, Adimali
341 Mohandas, C.G.A, Vandanmedu
342 V.K. Janardanan
343 Jose Mathai
344 Sabu Andrews, Kallarkutti
345 P.M. Sabu, Kallarkutti
346 Sunny Thomas, Rajakkad
347 T.J. Sebastian, Thakadiyel
348 K.M. Kuriakose
349 T.J. Thomas
350 P.V. Sivan
351 Baby Sebastin Pacholy
352 T.G. Sasikumar, Rajakad

353 Francis Kumpara
354 Rejimon, rajakkad
355 Vincent K.S.
356 P.R. Biju
357 K.P. Eldhose, Rajakkad
358 K.T. Vinod
359 Gopi
360 A. Peter
361 M.S. Sasithalamali
362 A.V. Raghaven
363 Jose Thachil
364 K.J. George, 1000acere
365 Annakkutty, Koompanpara
366 O.V. Joseph, Adimali
367 Pramod
368 M.P. Doraisamy
369 M.S. Surendran, Mukkudam
370 Omana Sugathan
371 Backer
372 Raju, Chattupara Adimali
373 K.V. Johny, Secretary
374 Baby George, Secretary, Panniyarkutty
375 R. Baskaran
376 Asokan
377 M. Uthayakumar, KCGU TN
378 John Joseph Kolamkuzhiyil
379 Purushothaman Thakidiyel
380 Sebastin Joseph, Rajakad
381 Asokan, Mangalth, Rajakkad
382 Rajan Puthanveettil
383 Viswanathan
384 Abraham, Purayidathil, Rajakkad
385 Sukumaran, Rajakkad
386 Vijayan
387 Sreedharan Vellachalil, Rajakkad
388 Raveedran, Chembanpuratidathil
389 Binoy Jose, Rajakkad
390 Ajeesh
391 G. Mohanadas, vattavada
392 M.B. Vijayarajan, combair
393 T.T. Bijuthottumuriyil, Rajakad
394 N.S. Sasi Naduparambil, Rajakad
395 Divakaran, Kavumprayil
396 A.J. Joseph Ayathinkal, Rajakad
397 Sasidharan Chelaparambil, Rajakad
398 Oothal Kachira
399 Thomas Periyakottil, Rajakkad
400 Stephen, Rajakkad
401 Biju, Kanjirankunnel, Rajakkad
402 Sugadhan.N.S, Naduparambil, Rajakkad
403 N.K. Narayanannair, Pazhayaviduthi
404 Sibi, Edinjakuzhiyil, Rajakkad
405 Raju Karamullil, Rajakad
406 V.K. Narayanan Vilayalil, Rajakkad
407 Aji M.N, Melepurakel, Rajakad
408 Peethambaran, Pullolikal, Sreenarayanapuram
409 P.K.Babu, Rajakkad
410 P.R. Jayaprakash, Rajakkad
411 T.K. Sudhakaran
412 K.N. Divakaran, Kizhakkaputhankudi, Rajakkad

413 P.P. Krishnan, Rajakkad
414 M.S. Gopi, Vadakkamuttath, Rajakkad
415 M.K. Vijyakumar, Vadakemuttathu, Rajakad
416 M.O. James, Rajakad
417 Johny Mulakkal, Rajakkad
418 Sasi.T.G. Thekeparambil, Rajakad
419 K.D. Biju, Rajakkad
420 V.T. Baby
421 T.K. Kumaran, Thuruthel, Rajakkad
423 Mathew.K.J. Rajakad
424 Saimen, Elavunkal, Rajakad
425 Narayanan, Parayil
426 Sabu, Edinkakuzhiyil, Rajakad
427 Manoj.K.P, Rajakkad
428 K.P. Paulose, Kunnapilliyil
429 M.M. Kunjappan, Puthukkattussary, Kathippara
430 Alex .T. George, Thattaruparambil, Kurishupara
431 P.V. John Pottas, Adimali
432 K.K. Soman, Kanjiramthadathil, Rajakkad
433 P.R. Sibi Puthanveettil
434 Saiju, Rajakad
435 Joseph. K.A, Rajakkad
436 Baby Thomas Chakkankal
437 Sirin Ooduthookil Rajakkad
438 Parameswaran.K.P. Kandathilparambil
439 Reji Mon, Kalladayil
440 Sajeevan.P.V, Palakathodiyil
441 Siju, Kallungal, Adimali
442 Shaji Thundathil Adimali
443 Thankachan, Rajakad
444 C.R. Baskaran, Rajakkad
445 Anilkumar, Rajakkad
446 Shaji Joseph
447 Biju George
448 Peter, Konnathadi
449 Sebastian
450 Babu Ulakanchamban
451 K.K. Solaman
452 N.S. Joseph
453 Aji.P.S. Rajakad
454 N.M. Saidmuhammed
455 V.S. Prakash, Kallar
456 M.D. Jose, muthaKkal
457 P.V. Jose, Pulikkunnel
458 T.J. Albert
459 Soji.K.K
460 Sathanandan, Rajakad
461 P.M. Raveendran, Rajakad
462 M.P. Uduppu
463 P.P. Subramanian, Kanakapuzha
464 Jayarajan, N.R.City
465 Stephen
466 Joshykumar, Baisonvalli
467 Shajan, Rajakkad
468 Sajimon.K.R, Rajakkad
469 Sunny.P.T, Rajakkad
470 V.K. Sukunan, Rajakkad
471 Divakaran, Kavumparayil, Mullakkanam
472 Deepu Mullakkanam
473 E.P Jose, Adimali

474 P.S. Subashkumar
475 K.K. Shati, Adimali,
476 Sebastiankandathil, Kombotijal
477 Thomas Parakal Konnathudi
478 Baby Kuruvila, Konnathadi
479 Rani Jonson, Mangapara
480 G.G. Salim, Aiswarya SHG, Marakanam
481 Indu Sunil, Aiswarya SHG, Marakanam
482 Bina Athil Navajoythi, Marakanam
483 Baby Thomas, Pulinadu
484 Salas, Kalangara, Kampilileandom
485 Madaswamy Paradeal, Ponmudy
486 Soman, Kuzhikalathil, Endapathal
487 Baiju Abraham Paraparakathy, N. R. City
488 Augusthy Cheruthanikkal, Rajakad
489 K.K. Kumaran, Kudanadu, Rajakad
490 Thankachan Pulickal, Rajakad
491 Joseph Punnathanath, Rajakad
492 Sajeev, Mankuzhiyil Rajakad
493 Sadasivan, Moovattinkal
494 K.N. Sivan, Koottumakkal, Rajakad
495 K.M. Sathyan Karikulath, Rajakad
496 P.N. Latheesh, Parachalil Kanakapuzha
497 M.R. Biju, Manalil Rajakad
498 Sebastian P.J. Puthanpura
499 Ratheesh Sebastian, Puthanpura
500 K.M. Thomas, Kaithotthil
501 Antachan, Kalakkattil
502 Haneefa Ravuthar
503 G.K. Hariharan
504 Praveen, Mankulam
505 Sajeevan, Pazhayampathu
506 N.A. Mathai, 10th Mail
507 Benny K.K, Kallaradeal
508 Joy Sebastian
509 Baby Pullelikal
510 T.P. Rajappan, N.C.P. Adimali
511 V.N. Kumaran CPI(M) Adimali
512 O.S. Joseph , Rajakad
513 Rajama Suredrean, Kanakkansherin
514 K.M. Joli, karakombil, kallarkutty
515 Karthika Ramanadhan
516 K.N.Gopi, Kulathumkadav
517 Poulos Vazhavelil, Panikkankudi
518 Shandi Sini, Kurukkanpadi
519 S. Manoj A/O Konnathody
520 Shaji.V.P
521 Sajimon PU A/A Bisonathy
522 M.J. Jacob
523 Jony
524 Benny Varghese, A/A, KB, Konnathadi
525 Biju Thomas A/A Konnathody
526 N.V. Molu A/A Adimali
527 Siji. M.B. A/A Adimali
528 Mini K.V. A/A/ Vellathooval
529 Beena R. A/O Bisonvalley
530 Devaki E.K. A/A Adimali
531 E.C. Skaria , Aditional Thahasildar, Devikolam
532 N.A. Devananda Sheny, SFO, Spices Board, Adimali
533 V. Ramanathan, Lead Bank Manager, UBI

534 G.S. Iyer, Nabard
535 M.G. Mohandas, DIST: Animal: Husbendry Officer
536 DR. G.S Madhu, Director, Kudumbasree
537 Rajesh P.K. A/A Munnar,
538 S.K. Suresh kumar Pallivasal
539 JOHN A.J. Aeem. Sub. Division, Adimali
540 S. Sheela, DY. Director of Agri.
541 V.M. Sasikumar D.DA
542 Mathews Kurukkanmala, Deepika Daily
543 Vijayakumar, A.E, MI, Pallivasal
544 DR. P.M. Bijoy, Adimali
545 Tony, Kattappana
546 Reji. P.T,A/A, Mankulam
547 Tomy, Mankulam
548 Deparaj M.L, A/O Munnar
549 M.K. Saseendran
550 M.K. Kausallia, A/O, Vellthoval
551 R. Ravikumar, Dairy Director Idukki
552 Betty Joshna, Dairy Extn. Officers Adimali
553 P.K. Rajeeb, A/A/ Naf,Arekuzha
554 Bindu Chandren AM VFPCK
555 Jacob A.A. Rajakad
556 M.N. Subhash
557 Prasada/A Bisonvalley

**2. Policy makers meeting on 10.11.2007 at Munnar**

558 K.K.Gangadharan, Director of Agri
559 S. Sivaprasad PAO Idukki
560 R. Balachandran, DIST. Soil Conservation Officer
561 K.V. Sanjeev, Asst. Director Agri. Devikulam
562 T.G. Naleson Range Officer Social Forestry
563 P. Rasl
564 DR.V. Selvam, Veterinary Surgeon, Munnar
565 MR. G. Mohandas, Dist. Animal Husbandry Officer
566 DR. G.S. Madhu DMC, Kudumbashree Idukki
567 John. A.J. Aee, M.I. Sub. Divn., Adimali
568 Tomy Goerge EE, MI Dv, Kattappana
569 G.S. Iyer, Manager District Development NABARD
570 V. Ramathan, Lead Dist. Manager, Union Bank
571 M.K. Saseendran J.R. OF C.S (G) Idukki
572 M. Balan President Devikulam
573 Y. Nadarajan, Munnar Grama Panchayath
574 Paily K.P. Dairy Farm Instuctor Munnar
575 Betty Joshna, Dairy Extn. Officer Dairy Department Adimali
576 R. Ravikumar, Dy.Director, Dairy Development
577 Sanojuni.K.T, Dany Director saronini, K Dairy Development Department
578 Unnikrishnan Kunnath, Asst. District Information Officer
579 M.S. Ali Kunju, Dist. Information Officer
580 Vazhoop Soman, Member Dist. Panchayth
581 T.P. Markar Chairman, Milma Ernakulam
582 Jose Abraham M.D. Milma Ernakulam
583 U.C. Mohandas, Sub Collector, Idukki
584 Sathyan K.K. Agricultural Officer, Principal Agriculture Office
585 Shaji M. Manakat, APAO Thodupuzha
586 P.T. Joseph M.L.A EX. Minister
587 S. Rajendran MLA
588 K. Francis George M.P
589 K.K. Jayachandran MLA

590 A.K. Singh, DC

**3. Farmers meet on 11.11.2007 at Vandiperiyar**

591 C.R. Justin
592 M.P. Philip, Elappara
593 M.P. Yesudad Elappara
594 T.K. Unni Elappara
595 A.J. Devasis, Azhumchira
596 Mariamma
597 S.Mani
598 Ayamma
599 M.D Aniyan
600 Hamza, Enchikad
601 Joseph Joseph, Vellyadu
602 Rajaswamy.G. Rajamudi
603 L. Devadas, Rajamudi
604 Aravindakshan, Rajamudi
605 N. Devadas, Rajamudi
606 V. Guruvaiah
607 Shekaran
608 M. Velu
609 Mariyamma John, Arakal
610 Ancy Sabu, Elappara
611 Omana Rajan
612 Anitha John Leo Vice President Elappara
613 K.K. Karunakaran, Valadi
614 C. Johnson, Elappara
615 P. Alphonse
616 Anthonyamma
617 Jose, Vallakkadav
618 Rajkumar
619 Shaji.S
620 P.M. Iyakkutty
621 P.V. Ousepn
622 K.K. Raghaven, Vettuvakkal, Pachamala
623 C. Vasu
624 Vijayamma Prabhakaran, Moolakkayam
625 Gaouri Ousep, Enjikkadu
626 C. Bhaskaran, Mulakkayam
627 K. Krishnankutty, Vandiperiyar
628 Thomas Thekkel, Kokkayar
629 K. Augustain, Secretary, Co.op Bank, Vandiperiyar
630 K. Kuttanpilla, Mullacheril
631 A. Hameed, Enchakkadu
632 Joymon, Maniyambrayil, Chottupara
633 K.V. Sathasivan
634 V.T. John
635 E.K. Jose, SR. Field Officer Spices Board, Perumadu
636 P.K. Prabhakaran Nair, Puthuparmbil
637 Gopalakrishnan Nair, Vayalin, Valadi
638 K.N. Cheriyan, Kuzhivelil, Valadi
639 N. Ramakrishnan
640 Chellemma
641 C. Francis, Rajumudi
642 M. Sivan, Pashumala
643 Ramanan, Rajamudi
644 P.M. Varghese Valadi
645 Ponnappen, Kizhakkechakkuvila

646 Mani, Rajamudi
647 V.L. Perumal, Rajamudi
648 K. Sugathan
649 Shiji, Plaveli, Valadi
650 Thomas, Valadi
651 M. Panraj, Valadi
652 K.C. Joseph, Valadi
653 Bindu.T.K, Peerumadu
654 Regi
655 Annakutty Abraham
656 Sheeba Antony
657 M.J. Paiys
658 Babychen
659 C.L. George
660 Varghese Chackovaladi
661 P.M. Thankappen, Valadi
662 Koodandi
663 U.K. Prasad, Naluparambil
664 V.V. Chandran
665 Vinoj Joseph
666 Chandrasekaran Puthumala
667 Kabeer, Mulakkyam
668 Tom K. Varghese
669 Ramanan
670 P.N. Balakrishnapilla, Valadi
671 K.J. Chacko Valadi
672 Madaswamy, Rajamudi
673 Janardhanan Valadi
674 Pichayinellimala
675 K.V. John
676 V.T. Mariyappen
677 Abdul Kareem
678 V. Velu
679 M.C. Joseph
680 Periyaswamy
681 Jony
682 Shaji, Kumali
683 Biju Thomas, Kumali
684 Thomas P.M, Upputhura
685 Babu
686 Sunny Thomas, Puthiya Parambil
687 Binoy Shamuvel
688 Johnson Ambross, Nellikkavila
689 S. Rajendran Nellikkavila
690 S. Rajendran
691 Jeevadas Nellikkavila
692 Abraham Varghese, Puthuparambil
693 Elikutty, Thoppil
694 Arul, Parakkulam
695 John
696 Balasubramanian
697 George, Thaliyanikel
698 George
699 Mathai Joseph
700 Sadandhan
701 Devasya Augusti
702 Daveed P.M
703 P.V. Mani
704 L. Mani, Ambalamedu
705 A Gaouri, Enjakkadu, Kurusumala

706 Peeterbaby, 55TH Mail
707 K. Arumukham, Ambalamedu
708 K.J. Jose, Vallakkadav
709 Antony
710 R. Sujan
711 A. Nagappan, Rajamudi
712 David, Valadi
713 Shiju
714 S.A. Mani, Vandiperiyar
715 Suresh P.C
716 T.P. Gopalakrishnan Nair
717 Thomas K.J Kuzhivelil VALADI
718 David Joseph, Kuzhivelil Valadi
719 C.J. Joseph, Chamathakal Valadi
720 Joseph Mathaikakkad Valadi
721 K.C. Joseph Kanikunnel Valadi
722 P. Thangadurai Dymoca
723 T.T. Kuttappan
724 Dominick
725 M. Masanm
726 Ajianand, Amirthbhavan, Chenkara
727 M. Varghese
728 Babu Varghese Thekkady
729 Ghee Varghese
730 B.G. Thomas
731 V.S. John Vallipparambil
732 P.I. Varkey
733 Sony Mathew
734 M. Abdulkadher, Karadikkuzhi
735 K.A. Domick, Attappallm
736 K. Sivanandan Devikumar
737 P.M. Yoosuf 56TH Mile
738 R.S. Imbrahim, vallakkadav
739 Sajukurian, Kumily
740 Chacko Thottiyil Valadi
741 Joshiyo Thottiyil Valadi
742 Charley Kadalyparambil
743 Joseph, J. Puthiyoden
744 P.A. Pareethkannu, Vallakambu
745 Pappachen Kurushumala puthuval
746 P.K. Abdul Azees
747 P.C. John Parakel Valadi
748 K.M. Mathew Kuzhivelil, Valadi
749 Jomon Thoms, Valadi
750 Jose P. John Parakel, Valadi
751 V.K. Kunjumon, Valuparambil Valadi
752 T.C. Mathew Thottiyil Valadi
753 Suresh Puthapurayil Valadi
754 Muniyandi Pashumala, Puthukad
755 P. Shivalingam , Ambalamedu
756 E.J. John, vallakkadav
757 Kanakraj
758 Stariya Thomas, Palathra Valadi
759 Joseph Mathew Pazhayattu, Valadi
760 Durairaj, Parakulam
761 Ayanraj
762 Vincent Rajamudi
763 M. Muniyandi
764 Sasi
765 E. Muniyandi, Rajamudi

766 Varghese. P.C.Vallakkadav
767 Yoosuf K.M, Vallakkadav
768 John, Pulikel, Vallakkadav
769 Shaji Joseph, Vallakkadav
770 Jacob Joseph, Vallakkadav
771 Steiphen
772 M. Duriraj
773 Robert M.A 55th Mile
774 T.T. Thomas Kumali
775 Aychuthan P.S
776 Pushpamani P.K
777 P. Sainudeen, Karuppupalam
778 Jospeh Pappy, Ward Member Elappara
779 Ousauop Devasya
780 P.T. Muhammed
781 T.S. Joseph Thekken 63th Mile
782 V.T. Varkey
783 Chandranpillai
784 Augustin Jacob Vallakkadavu
785 George Joseph vallakkadavu
786 Ravidas
787 L.G. Periyaswamy
788 Sebastian
789 Sukumaran, Pashumala
790 P. Babu, Pampanar, Kallar
791 Sebastain
792 Shanmukavel, Pazhumala
793 Ravi Palakel, Valadi
794 Mathew thomas, Vallakkadav
795 Shivanpilla, Vallakkadav
796 Johnson, Vallakkadav
797 P.S. Rajan
798 Nabeesa Pareeth, Rajamudi
799 Abraham
800 M. Rajagopal, Pazhumala
801 P.G. Sadanandhan, Vandiperiyar
802 Sebastian, Periyar
803 Sakeer Hussain .K, Vandiperiyar
804 Gandhi, Rajmal
805 Thomas Mathew, Panthalanikel
806 Philipose John Wallardic
807 Georgedaniel
808 M. Ramaswamy, Valadi
809 Thomas, Kurushumala
810 Joythi
811 Roychan
812 Suji Joseph
813 Gopi 63TH Mile
814 T.K. Pankajakshan
815 C.S. Pradeep
816 Abdurahiman
817 Abdualsalam
818 K.M. Mathew
819 Gimmi Thomas, Vallakkadav
820 Jojo Sebastian, Vallakkadav
821 K.T. Thomas
822 Kunjumon
823 Princ Joseph Vechoor, 63th mail
824 P.M. Karunakaran55th Mail
825 P.U. Mathai, Kallupara,Valadi

826 Modi George, Vagamon
827 M.V.Ravi
828 Jeevadhanan, Ayyappan Kovil
829 Siril, 55TH Mail
830 P.S. Maran, Elappara
831 P. Muthayu
832 Kathri
833 Jose
834 Peeter.R
835 K. Thamar
836 C.J. Kuriyan
837 G.P. Viswanadhannair
838 P. Balakrishnan
839 K.K. Faizel Valadi
840 M. Antony
841 C. Rajan
842 James, Valadi
843 Joseph Chacko
844 Philip Shamuel
845 Muhammed Haneefa, Periyar
846 Virayu
847 V. Rajan, Pambanar
848 Joseph Mathew, Valadi
849 K.C. Thomas, Valadi
850 Georgekutty, Valadi
851 V.S. John, Valadi
852 P.S. Shaji, Kurusumala, Valadi
853 N.M. Jacob, Valadi
854 V.S. Joseph, Valadi
855 Joseph
856 Chinnamuthu
857 T.H. Abdulnazer
858 K.C. Joseph
859 Arun.K
860 Sukumaran, 57TH Mail
861 K.M. David, Valadi
862 M. George, Valadi
863 K.T. Varghese
864 Subramanian, Pampanar
865 Rajasekharan, Pampanar
866 Shnthakumari Bharathan, Pasumala
867 Ibrahimkutty 56TH Mile
868 Bharathan
869 P.R. Sivadasan
870 Kumaran 56TH Mile
871 Joseph
872 P.S. Jayan
873 V.M. Salim, Pampanar
874 Joseph, Valadi
875 M.V. Jayan
876 P.V. Mathew, Vallakkadav
877 P. Vellaswamy
878 Joseph Cheriyan
879 Thankam
890 Esvin
891 Thuskalla, Pampanar
892 Joseph
893 Joseph Thomas
894 K.C. Jacob
895 Saji.P. Varghese

896 Antony Chacko
897 K.A. Zakier Husain, Secretary AIKS Peermade
898 K.G. Tomy AIKS
899 E.J. Jose Edakkad
900 K.K. Anandan, RSP, Vandiperiar
901 Thomas
902 Sebastian
903 Samuvel
904 Devadas.V. A.V.T
905 K.K. Faisal
906 M. Antony
907 K. Michacl, Secretary, CPI
908 Anitha , Vice President, Elappara
909 Joseph Pappy Member Elappara GP
910 Ancy Sabo Member Elappara GP
911 Omana Rajan Member Elappara GP
912 E.K. Jose, SR. Field Officer, Spices Board Peerumade
913 Babu Thomas, AEE, Minor Irrigation, Kumali
914 Bindu.T.K. JR. Inspector of CSAR, Peerumade
915 P.C. Jacob, Dairy Farm Instructor Peermade
916 MR.G. Mohandas, dist. Animal husbandry office
917 DR. Shaji Antony Manager K.C.DB
918 Siby Mathew Upasi TRF, Vandiperiyar
919 DR. Vijayakumar Director Animal Husbandry
920 DR. M. Abdul Khadar, Deputy Director Animal Husbandry
921 Unnikrishnan Kunnath, Asst. District Information Officer
922 Abraham A/O
923 P.I. Najeebkhan A/A, Peerumadu
924 Facy Nazar A/A Vandiperiyar
925 Lathika A.K K/B Elappara
926 Shaji.M, APAO, Thodupuzha
927 Sindhu K. Mathai A/O Peerumedu
928 Any Varghesea/O Peruvanthanam
929 Prince Mathew A/O, Kumali
930 Omanakuttan K/B Vandiperiyar

**4. Farmers meet on 12.11.2007 at Kattappana**

931 T.T Thomas, Thekkel, Kanjiyar
932 Thomas Parakkal, Upputhara
933 Joy Kizhakkeparambil, Chemmannar (Kerala Karshaka Union (M) Idduki
934 Joy Ambatt, Kerala State Milk Society, Idukki Dist
935 Jose Muthanatt, K.S.M.S.A. Block President, kattappana
936 Sadanandan Nair, Thekkeparambil, Kattappana
937 K.T Mohanan Kunneparambil, Upputhara
938 Jhon Pullatt, Chottupara
939 Mathew Varghese, Melett, Irattayar
940 E.J Zacaria, Ieyaparambil , Kunthalampara
941 Sibi M.V , Mannath ,Erattayar
942 Jose Zacaria, Kannamunnayil, Irattayar
943 C.T Sebastian Cardamom plantation Association Nedumkadam
944 Jhony, Cheerakunnel, Kattappna
945 Babychan Thomas, Ramapurath, Nedumkandam
946 Remesh Mathew, Karikkattuparambil, Nedumkadam
947 Thomas, Kokkumoola, M.M.P President, Karunapuram
948 Tomy Thomas, Madiyakkal Nellippara
949 P.K Sabu Kunnath, Padamugham
950 BIJU Abraham, Padamugham
951 DR.Jaiol

952 Alex Epramala, Upputhara
953 Vilson Thomas, Chethimattam
954 V.J. Mathew, Nathkallu, Apkode
955 Reji Joseph, Chettatt, Kamakshi
956 K.B Biju, President
957 Santhosh Kuryachan, VICC President, Upputhara
958 Sajan Manikaprayil, M.D.S. Parathode, Kathapalli
959 Abilash, Kajiram Thanam, Irattayar
960 Davasiya, Padam Manan, Thoppipalla
961 Vijayakumar Kaipurayil
962 Chinnamma Thankappan, Kalapurakkal Pulliyarmala
963 C.P.Gopi, Puvathukunnel Kochara
964 K.S Augasthi
965 Paul P.J ,Pollayil Vazhavara
966 P.Markose, Puthusseriyil Nettithozhu
967 Suasappan P.P, Plaida,House Mali P,O
968 Sunny Joseph
969 Regi Augustine, Poothakuzhiyil, Kattappana
970 Mathew Varghese, Puthuparambil, Vallakadavu
971 K.M Chakko, Kurisummuttil, Mattakada
972 K.R Sukumaran Kalluvattath, Kanchiyar, Secretary, Jaiva Kashaka Sangham
973 P.T Joseph, Panchamanan, Kaliyar, (Jaiva Karashaka Sagham)
974 A.K Madavan Iyavellil, Ambala Kavala, Kattappana
975 Sebastian Vilakunnel, Kerala Congrass (JOSEPH) State Committee member
976 P.O Jhon , Vice President, Kattappana Grammapanchayath
977 Jhon Thomas, Moola Parambil Kamakshi
978 M.M. Thomas Mannamchory, Kochuthorols
979 K.M. Mani, Kaniyamparambil East Muttakott
980 Baiju Thomas, Secretary, APCOS
981 P.K Ramakrishnan, Block Member
982 K. Ramachadran Thajhal
983 E.A Cherian
984 George Ouseph, Ward Member
985 K.C Raman
986 Satheesan Parakkadom
987 Mohana C.B, V D S
988 Saji T.M, VDS Palumala
989 Baby, VDS
990 Chandran Parakkal, Kochuthovala
991 Sarasamma Kumaran, Parakkal, Kochuthovala
992 M.A Lalichan, Mecheriyil K.T.U.C (Jacob)
Genaral Secretary (State Committee)
993 D. Albrat Prarkkal K.T.U.C (JACOB) Dist General Secretary
994 Edathva Raju, Karshaka Congrass State General Secretary, Nedumkadam
995 V.A Thomas, President, Kerala Farmers Development Socity, Nedumkadam
996 T.V Ebraham, Genaral Secertary K.S.M.S Iddukki
997 T.M.James, President Mangathotti, APCOS
998 Babu Sebastian, Chempakapara, 944713137
999 Jose Vadakkal, Vosard, Kumily, 9447980850, 04869-223850
100 P.Mohanan, Secretary, APCOS
0
100 M.V. Sajan
1
100 Baby
2
100 P.E Mathai
3
100 Nelwin. C.Joy, Malanadu Development Society
4
100 DR. K.M Jacob,

1005 Saji Augustine Koloth
1006 Baby Joseph, Puthanparanbil, Kadamakuzhi.Kattapana
1007 K. Sasi Kumar, Secretary, Manthipara K.S.S.Ltd
1008 Salu Jhon Chirattavayalii, Haritha Theyila Karshaka Sagham Secretary
1009 K.M Mathew Kizhakeparambil, Vallakadavu
1010 Adv.K.D Benny, President, Vallakadavu, APCOS
1011 Thomas Devassia, Upputhara
1012 Sajin Mudavan, Upputhara
1013 Shanmughan, Ittaparambil, Puthara
1014 Robin Kezhake Muriyil, Upputhara
1015 Mathew, Kaichira Chambaka Para
1016 P. E Mathew, Puthan Kavalayil
1017 K.S Sasidaran, Kodatt,Veedu, Kattapana
1018 K.P Thomas, Karingam MAVIL
1019 Sebastian, Kariyilakullam, P.O
1020 SAJI George, Malayatt, Kattapana
1021 Gerorge. K.Joseph , EX. Director Vandemedn, Avelapme
1022 Sebastian Varghese, President, Y.M.C.H Kattapana
1023 P.M Kuriyakose
1024 K.A Jose ,Vandanmedu , Jaiva Karshaka Sangham
1025 K.M Raju, Kutharayil Veedu, Kochuthovala .P.O
1026 Mathew E.V Illikal, Puthanpurayil , Vellakudi P.O
1027 Thankappan, Annapara, Kochuthavala
1028 President, Green Vally, Upputhara
1029 Jeo Geroge, Kkolanikal, Erumundayal
1030 Jobin Joseph, Pullikal, Erattayar North
1031 K.J Thomas, Kuzhipalayil, Parakadavu
1032 Sasidaran, Vayalingal, Vazhavara
1033 Purushothaman Nair, Valiyaveetil Vazhavara
1034 Vilson C.L

5
103 Tomygeorge, CPI (M) Kattapana North Local Secretary
6
103 Sabu Thomas, Vettikuzha Kavala,
7
103 Abilash Antony, Elathoor (H) Santhigram, APCOS
8
103 P.S Rajappan (INTUC)
9
104 Kuriyan, Joseph, Illithara, Kalvari Madav APCOS President
0
104 T.A Chacko, Ezhalamughal, APCOS , Secretary
1
104 P.P Divakaran , Chenaykam Paddy , Aadivasi Kanikaran
2
104 K.U Benny, Edapukkalam
3
104 Jose Chittady, Edapukkalam
4
104 Shaji, Mundamplakkal, Sasthamnada
5
104 Tomy, Vichatt Valakadavu,
6
104 C.Raja, Thiruvathira, Sasthamnada
7
104 A.Chinnuchamy
8
104 Sibichan Jhon
9
1050 P.N Shaji, VICE. President, Irattayar gramapanchayath
105 Priyamol Sijo President, Irattayar
1
105 Advt.George Thomas, Mookkilikath
2
105 Vinod Subrahmaniyam, Dist President A.K.D.W.E.S.A. Idukki
3
105 K.C.Y.M Nilivayal Unit
4
105 E.K. Gopi , Idakkat, Kuppakandam
5
105 K.M Sakaria , Kizhakkal Nattakallu
6
105 K.M. Sreedaran Pillai, Udmbancholoa, Estate Workers Union
7
105 K.A Rahim, Udumpanchola, Kombai
8
105 R.M.A Shajahan, Kumali
9
106 R.B Balagangatharan, Udumbanchola, Kombai
0
106 M.G Devassia , Maramattathil , Padippara P.O
1
106 Sibi, Thomas, Vandenmadu
2
106 Raju Balagram
3
106 Jose Sacaria, President, Irrattayar Service CO-Operative Bank
4
106 C.K Balakrishanan, Kunthalampara, Milk Production Unit
5

1056 Sibi Mannar, Irattayar

1057 Tomy, Manniplakal, Irrattayar

1058 Biju, Karuvakulam

1059 P.S Thankachan, Infam

1060 Mathew George, President, Gramapanchayath, Associations Idukki

1061 Jhony, Poomattam, President Kerala Congrass (J) Dist Committee

1062 Varkey Thomas, Mangatt, Kattapana

1063 Jhon P.K, Ponthagal, Irattayar

1064 A.J Fransis, Kerala Pradesh Karshaka Congrass Spint Convinor

1065 Prof. Jhonykutty. J. Ozhukkayil

1066 Salila Vinod, Upputhara Gramapanchayath

1067 Sobhana Sukumaran

1068 N.D Jacob, Namboozhimattam

1069 C.K.Krishnan Kutty, C.P.I Dist Council Member

1070 Mathew Varghese, Kisan Sabha Dist Secretary

1071 P.C Baby Kutty, Pradesh, SHG, Vallakadavu

1072 K.K. Sivaraman, C.P.I.Dist Secretary, Idukki

1073 P.M Alexander , M D S Anakkara

1074 Tomy, M D S Anakkara

1075 Secertary, Highrange Karshaka Samithi

1076 Sajan M D S Ana Kkara

1077 Rajeev Varghese, President S.C.B.

1078 Sreedharan

1079 President Chakkumpalam, Grammapanchayath

1080 Antony Kizhakath, Cheebaran Chakkumpalam, Gramapanchayath

1081 Mohanan kunnel, Vice. President S C B Chakapallam

1082 Mohandas C.N Chittadichal, Kalthottu

1083 Devasia

1084 Y.C Steffin,

1085 Mohandas .S , Puthan parakkal , Nariyampara

109 Omanakuttan , K.M Kandathil
6
109 Kanthalam PARA Kattapanna South P.O
7
109 George Joseph Padavil, Karshaka Congrass Vice President
8
109 Raju Edathwa, Karshaka Congras State Secretary `
9
110 Gimosh .C. Joseph
0
110 K.C Mathew SCB Kattappana
1
110 Thilothma Soman, President, Senapathy
2
110 P.P Eldose Chairman, Senapathy
3
110 Jose Kutty .J. Ohukayil
4
110 President, Malanadu Karshaka Reksha Samithi
5
110 Abraham Mathai, Thottiyil, Irrttayar
6
110 Chacko Devassia, Chennithala, Thekkel, Kochuthovala
7
110 G.R Harikumar , Karukayil (NSS President , Kattapana)
8
110 P.J Lukose , Pavarath, Nariyam Para
9
111 K.N Gopalakrishnan , Kaniyam Parambil , Ikkya Karshaka Sangam
0
111 M.A Lalichan, Mecheriyil, Upputhara
1
111 P.S Surendran , Perumam Paranbil , Vellam Kuzhi
2
111 P.J Joseph , Piyampalliyil Naripara
3
111 Reji, Njalani, Human Right Protaction Committee
4
111 Thomas Thomas, Kavakkalil
5
111 M. Kumaran
6
111 R.N Iyyappan,
7
111 Jacob Thazhathuveetil, 8$^{TH}$ Mala
8
111 Salim Kokkittu, Kattappana
9
112 K.C Thomas,
0
112 P.D Aji Palippara, Upputhara
1
112 Binoy Thomas, Chullavakayil, Kadayakuzhi P O , Vellakadavu
2
112 Prabhakaran .R.N , Kalayamkunnel , Vallavadavu
3
112 Madhu, Kalarikkal, Vannarmedu
4
112 T.R Vijayan, Thottapalliyil, Kanjiyar
5

1126 Elliyamma, Pulikkatharayil, Kanjiyar
1127 Prasad, Njondanmakkan, Kattappana
1128 R. Krishankumar
1129 K, Janardanan
1130 P. Asok Kumar
1131 Mercy Jacob, Panchayath Member
1132 George Jacob, Chirman, YMCA, Idukki Sub Region
1133 Thomas Mathew, Palliyil, Kattappana,
1134 R. Bhaskaran
1135 Ashokkumar
1136 S.Rajamanicayam, Maneger, Kerala farmers forum
1137 Cardamom Growers Union, Vandenmadu
1138 DR. K.G. Daniel
1139 P.D Shaji, Puthanpurayil
1140 Anitha Ramachandan, Venmedu, APCOS
1141 P.V Chandran, Puthanveedu Kattapana
1142 Domanic poulose, nalamnadi, kamakshi,
1143 M.K Joseph, Marippuram ,(Kisan Janathadist President)
1144 Manoj C.K, Chanjanikkal Kattappana
1145 Sreenagari Rajan, President, Iddukki DIST
1146 Varghese, P.G, Pullanithundathil, pambattavana
1147 Roice Mathew, Puliyananikkal, Kuttar, Secretary Kuttar Development Society
1148 Sivanandan, Kandaserriyil
1149 K.S Raveendran, Ariyakkal Thazha KATTAPANA
1150 Sanju Joseph, Kattappna
1151 P.S Rajan, Pulluparambil
1152 Ramachandran, Vettypuzha Kavala, Kattappna
1153 Antony Mathew, Vettanikkal, Nejib Kalarikal, Nedumkandam
1154 Rajan Azhikkaniyil, Kattappna
1155 Joseph Chacko, Chalil, Kanjiyar

1156 Tomy Thomas, Thonikkavil, Iyyappankovil,

1157 Thomas, Madavana, Kattappana

1158 Sunny P.K Peali

1159 Sibi Pullikunnel, Karinotty

1160 Joseph Josco

1161 Ebrahm Joseph, Veruvellan, Iyappankavi, Merykulam

1162 K.K. Sivaraman, Secretary, C.P.I Iddukki Dist Counsil

1163 T.A George, Thiparambil, Merykulam

1164 Rajan Joseph, Vice President, Iyappan Kavil

1165 M.M Vinod, President, ACUS, Mattukada

1166 Mathew K.Y, Chrukida Jalasechna section, Kattapana

1167 Leela Mani Devarajan , Raj Bhavan Anakkara (Delegate&Spice Tourism)

1168 Elizhabath Jhon, Chakkumppallam

1169 DR.Vishu, Kattapana, Technical Adviser,Dairy Plantation

1170 Advt. Joshy manimala, State secratiate member Kerala youth front (M)

1171 V.M Mani ,Santhigram , Nalumukk , Irratayar

1172 Balakrishnan, Pulpara, Kattapana

1173 Sibi Madavana, Kanchiyar

1174 James Joseph, Puthanpurakkal, Kattapana

1175 P.J. Joseph Puvathungal, Kattapana

1176 Local Committee Member C.P.I

1177 George Elavungalchalil, President Iyappan Kavil Servise CO-Operative Bank

1178 S.Sreedharan, Souryamagan, Irrattyar

1179 Sunitha Thankachan, Gramapanchayath President, Kattapana

1180 Sibi Padappayil Block Panchayath Member , Kattapana

1181 V.T Sebastian, (EX MLA) Jose, Njayarkulam Kanchiyar

1182 K.V Jose, President, Bharathiya Karshaka Morcha Iddukki DIST Committee

1183 M.N Mohanan, Gen. Secretary, DO

1184 Tomy Abraham, Vyhempathlitam, Kattapana S.P.O

1185 Celine Savio, Palliparambil House, Thuppimala P.O, Labhakkadu

1186 Joseph P.A, Oravan Thuruthil Kanchiyar
1187 Alichan Chacko, Kochukunnel, Kattapana
1188 Jose, Pottaplakkal, Nedumkandom, High Range Pepper Grower Association
1189 Jojy Idappalikunnel, President, Kerala Congrass, Nedumkadan
1190 Joy Porunolil, Kattapana, President Mandalam Congrass (I) Committee
1191 P.T Thomas, DCC President, Idukki
1192 K.M Augustine, Secretary, KPCC
1193 Adv.T.JO Prakash Joseph, Maripuram Nedumkandam
1194 C.U Joy Cheruvil, (Vice President, Gramapanchayath Senapathi,)
1195 C.M Balakrishnan, President Gramapanchayath, Karunapuranm
1196 Varkey Varghese, Chamatharayil Kattapana, (Vettipuzha Kavala)
1197 O.J Mathew, Kerala Congrass (M) District Secretary
1198 Rarichan, Niranakunnel, Youth Friend (M)
1199 Joy Thomas, Malheplnkal, Vellakadavu
1200 Soman P.S Pongolil, Kadomakuzhy P.O
1201 K.J Kuttichan, Vice President, Malanadu Karshika Grama Vikasana Bank Nedunkandam
1202 Liji Jacob, Irruvelithara, Vandanmedu
1203 Binoy Thomas, Thudiparambil, Mettukuzhi, Kattapana
1204 Robin Joseph, Kizhakemuriyil, Upputhara,
1205 Thomas Kondamala, Karunapuram
1206 Thomas, Thudiparambil, Kattapana
1207 Shaji, Nadakkal, Kochu Thovala, APPCOS (Secretary) Kattapana
1208 Mathew, President, MMBS, Kambammedu Unit Varanganayil, Karunapuran
1209 Annamma George, Valliyathadam, Anakkara, Women In Agricutural Sangam
1210 Kuriyakose Zakariya, Member of Gramapanchayath, Kattapana
1211 Ossappachan, Souriyamkuzhi Uppukandam,(President Niyajakamandalam Karshaka Congrass, Udumbuchola)
1212 Sureshkumar P.S, K.S.M.S.A Secretary, Kattapana
1213 Baby George, Secretary Panniyguko HYAPCOS,
1214 Shijoy Chukkinanikal, Kattapana
1215 K.M. Thomas, (Dist. Vice President, Janathadal)

1216 A.J Mathew, arangath, Kanchiyar (Secretary, Mahathma, Farmers Club)

1217 CHAKO Thomas, Karivellikal, Kanchiyar (Aiswariya Karshaka Sangam )

1218 Babu Mathew, Manimala Kunnel, Ezhukumvayal P.O nedumkandam (President, Ezhukumvayal S.C.B Ltd NO:I 107

1219 Shaji Thomas,Kariyamkulam, Chembalam

1220 Monson, Paradukal House, Kantanekery P.O Kattapana

1221 T.P Thomas, Jose Villa, Thumpasery, Kantanekery P.O, Kattapana

1222 Jose Sacaria, President, Erattyar,S CB Ltd K,279 Erattayar

1223 Siby M.V, Mannathy Erattayar

1224 Jhon Chinnamma, Kochuthottungal, Chottupara

1225 Joseph Thadathil, Vandanmedu

1226 Markose Chacko, Cholachuvattil, Kattapana

1227 Jomy Reji, Vadekkedath, Vandanmedu

1228 Raji Santhosh Kumar ,President , Vandanmedu

1229 S.Viju, vice president, Nedumkandam BLOCK panchayath

1230 T.R Sasidharan, Secretary, CPI Mandalam Committee, Kattapana

1231 M.M Raju, Menad, Vandanmedu

1232 Thankachan, Chebanal, Upputhra

1233 K.S Vijayan, Upputhara

1234 Abraham, Pulliyammakkal, Thankamanl

1235 Lissamma, Kaippanmakkal Kunthalampara

1236 M.S Xaviour, Agst.Assistant, Krishibhavan, Kattapana

1237 Tomy. J Edayel,

1238 T.M. Ashraf, Kathiruveedu

1239 Anil Kumar, K.P, Kollakk ,Kattapana

1240 Thomas N.J, Nellikunnel,

1241 Pradeep George, Kanjirakattu, Kochuthovala

1242 V.C Anil, APCOS

1243 P.V. Kurian, APCOS

1244 K.P Scariea Vaghavara

1245 P.P Mathew, Seceretary, Highrange Samrakshna Samithy

1246 Sabu Ottaplakkal, Kunthalampara
1247 Prabhakaran, Athikuzhiyil 8-Mile
1248 K.B Shaji, Thevarkunnel, Ambalakavala,
1249 Varghese Joseph, Kadukkaparambil
1250 Thomas Michile, Kattapan
1251 Kuriyakose Ulahanan, Kozhimayaparambil
1252 Philip Devassia, Kadavaratt
1253 Cherian Kattakayam
1254 Sunny Bhaskaran, Puvatthummuttil , Siju Augustine
1255 P.Thirukumar, Karuvakulam Estate
1256 K.S Rajan
1257 K.T. John
1258 George Varkey, Thekkel Vazhavara
1259 Thomas Chacko, Cherukanayil, Vazhavara
1260 George Mathew, Puliyankal
1261 Manoj, P.C, Parathanath
1262 Elsamma, Puthuparambil, Thoppipala
1263 Philomina Thomas, Aakkalur, kozhimala
1264 Merykutty Kuriyakose, Parapalliyil, Kozhimala
1265 Thakkamma, Kavanal, Kozhimala
1266 Merykutty Chacko, Therappokkan Kozhimala
1267 Rev.Maxcin Jhon, CPI
1268 Babu K.R Kanjiram Kunnel
1269 P.P Surendran , palam Parambil
1270 V.M Kunjumon , Vattam Nodiyil
1271 Jobin Puthan Vettil, Upputhara
1272 George Devassia, Venatt
1273 A.L Sathisan, President, Iyappankovil
1274 George Vargese, Pattolil
1275 T.V.T Janakiraman, T.V.T Cardamom Plantation
1276 S. Renganathan, Shrimanhgauam Estate, Mali

1266 K.P Achuthaan, N.S.K.P Family Nanda Gapal Vilas Estate, Kalthotty
1267 P.K Ramba, New Gopalvilas Estate Chakkumpallam
1268 M.B Sasidaran , Makkanal, Kattapana
1269 P.Jayakumar , Mannath Vandanmedu
1270 P.T Mathew, Valliyadiyil Kattapana
1271 Pilly Abraham, Thoppil Kattapana
1272 O.Divakaran , Sree Magalam , Nedukanam
1273 Payas, Mannannath, Kumali
1274 Joseph, Puthanpurakkal, Vandiperiyar
1275 P.C Thomas, Puthuparambil, Kumili
1276 Jiju E.E, Elapalakattu
1277 P.Sathish Babu, Nandagopal Velas Kalthoty
1278 D.Jayaprakash, Thaymmal Estate, Narianupara
1290 PKO Pappusamy,
1291 Gopinathan P.K , Puthuparambil ,Vellayamkudi
1292 Thomas Mathew, Puthhett, Upputhara
1293 Varghese, Nirannath, Upputhara
1294 Varkey Antony, Kottur Kanchiyar
1295 Sebastian, Ainthikal
1296 Sebastian, Kizhkkel
1297 Raju Xeviour, Idukki
1298 Vakachan, Kchettani
1299 Sreekumar, Elamattathil Nedumkandam
1300 George Kuyyu Mathew, Paradiyil, Erattayar
1301 Paramasivan . A, Thalodayil Anakkara P.O
1302 N. Andrus
1303 S.P Jayakumar
1304 Jhonson Baby, Puplakkal, Upputhara
1305 Joy, Thadathil Kunnel, Upputhara
1306 Benny, Chiram Kunnel, Upputhara

6
130 Abraham
7
130 Ancy, Podipara, Upputhara,
8
130 Shaji, Podippara, Upputhara
9
131 Kuriyakose, Plavuvechathil, Kochara
0
131 S.Ramakrishnan, Katuvakkulam
1
131 Thomas, Punikkakalayil, Kothpara
2
131 Varghese M, Alanikkal, Kakkathode
3
131 Manoj, Plathara, Upputhara
4
131 Baby, Plathara Upputhara
5
131 Mohanan, Kalathiparanban Poovikatta
6
131 Joy philipose, edana mattathil,
7
131 T.K.S.Megudapetty, T.K.S. Estate Sathardai
8
131 Kollemkudiyil Treders
9
132 Saji Varkey, Chavaranal
0
132 George Varkey, Kannam kombil, Nathukal, upputhara
1
132 Sijo ,Enthanam Kuzhi, President ,Rajakumari ,APCOS
2
132 Varghese Arattupuram , Murukam Thotti APCOS
3
132 Baby P.P, Palliyam Parabath, President, Manjukuzhy, APCOS
4
132 P.T Thomas, (Ex M L A) DCC President, Idukki
5
132 P.B Balan, Paruthipara, Kaladi
6
132 V. Sivakumar, V.V Estate K.Sasthanodi
7
132 Pushpan V.K, Uppiduparayil
8
132 E.S Esmail, Spices Growers Assosiation, Vandanmedu
9
133 George, Mullaplakkal, Upputhara
0
133 Sibi Muthumakudiyil, Upputhara
1
133 Saji K.S, Kuttiyani Kkal, Upputhara
2
133 Jhony, Parakkal, Upputhara
3
133 Mathew Pazhukunnel, Upputhara
4
133 Babychen Podiparayil
5
133 Somasegharan, Edatt, Vandanmedu, Panchyath Karshaka Sangam

6
133 K.S Mohanan, Joint Secretary, CITU, Idukki
7
133 C.A Abdul Salim, Ankoor, Ravothar, Kambam
8
133 A.Virsath Ali, Kamba
9
134 K.M Dourai Raj & Jamuna , Kambam
0
134 Bousalip.A, Plathottathil, Erattyar
1
134 R.Thirykumar,Karuvakulam Estate, Vandanmedu
2
134 R. Mahesh, Karuvakulam Estate, Vandanmedu
3
134 Joseph Joseph, Pathayil, Nariyampara
4
134 Joy Thomas
5
134 Sunitha Issac
6
134 T.M Raghavan, Thakarapparrambil
7
134 Shaji Punoose, Valyamthara
8
134 Goundaraj. S, Puliyanmala
9
135 K.Saithali, Machingal, Karunapuram
0
135 Josseph, Porkkattil, Vamdenmedujaiva Karshaka Ssahakarana Sangam
1
135 K.A Sebastian, President Karshaka Congrass Kamakshi Mandalam
2
135 M.J Thankachan, Madabisseriyil, Valla Kadavu
3
135 Mathew Kallanthara
4
135 Jose Thomas, Arakkal, Hevaanvally,
5
135 V.R Jayaram,
6
135 K.L Raju
7
135 Anto George, Chembankulath, Iyappankovil,
8
135 Pappachi, Mecheriyil, Upputhara
9
136 Thomas, Kunnaykatt, Poolikatta
0
136 K.J Sebastian ,N C P Distpresident ,
1
136 P.C Chacko,N C A Niyojaka Mandalam
2
136 K.A vilson ,bl. No 1226, balagram
3
136 Joseph Kattathadam ,Poovingatta, Upputhara
4
136 Chacko .C Kannakkalil,Upputhara
5
136 Varghese , Kunnaykkatt,Poovikatta

6
136 Santhosh, Kottiriykal,Upputhara
7
136 George Puthanpuraykal, Upputhra
8
136 K.Mathan, Naraka Thara Thoppipala
9
137 Jose, Pakkath Upputhara
0
137 Sumi, Urubadathathil, Kakkathode
1
137 Vilson, Perumthadathil
2
137 Thomas, Thibalangad , Matai Para
3
137 Thomas Joseph, Moolayil, Labbakad
4
137 Sebastinthomas, Varukala Parambil
5
137 V.K Varghese, President, Upputhara APCOS
6
137 Ambika Ramachandran, Varayappollil
7
137 Joseph Antony, Velamparambil, Thovarayar, Kanchiyar
8
137 K.K Soji, Thovarayar P.O, Kanchiyar Kakkaltikada
9
138 K.S Philipose, Kunnel Veedu, Nariyampara P.O
0
138 A.P Soman, Angily Parambil Kumely P.O Puthykkadam
1
138 K.M Ravindran, Kunthalil Kanchiyar, Thovarayar
2
138 Sibichan Joseph, Kamparambil, Kanchiyar
3
138 Benny, Mullur, Vellayam Kudi
4
138 Justin Kadambaril Vellayamkudi
5
138 Sunitha Issac, Idiya Kunnel, KattAPANA
6
138 Jose
7
138 Reji Jacob
8
138 K.J Baby,Kallarikkal ,Pulliyamala P.O
9

**5. Farmers meet on16.12.2007 Town Hall, Thodupuzha**

1390 K.G Antony, KADS, Thodupuzha
1391 Pappachan, Muttom
1392 Sebastain Joseph, Thadathil, Thodupuzha
1394 Cherian.P.P. Agrl. Officer
1395 Joseph Sebastian
1396 K.V. Sanjeev
1397 N.S. Josh, Agiricultural Officer
1398 K.Viswambharan, Krishi Bhavan
1399 Vijayakumar.K.K

1400 Reji P.T.
1401 Rajeesh.P.K, Agirulcutral Assistant
1402 Narayanan, Karimannur
1403 Benny Thomas, Thodupuzha
1404 Haneefa Ravuthar
1405 G.K. Hariharan
1406 Praveen, Mankulam
1407 Sajeevan, Pazhayampathu
1408 N.A. Mathai, 10TH MAIL
1409 Benny K.K, Kallaradeal
1410 Joy Sebastian
1411 Baby Pullelikal
1412 T.P. Rajappan, Adimali
1413 V.N. Kumaran, Adimali
1414 O.S. Joseph , Rajakad
1415 Rajama Suredrean, Kanakkansherin
1416 Baby Joseph Nagarjuna, Thodupuzha
1417 Vincent , Kannamangalthu
1418 Joseph antony, CARDS
1419 V.P. Gorege, CARDS
1420 Subashkumar, Payapilli
1421 Francis George, MP
1422 P.J.Joseph, MLA
1423 Sivaprasad, PAO
1424 Shaji Thomas, APAO
1425 Unnikrishnan, PRO
1426 Boyce Mathew, Muttam, Thodupuza
1427 Sbi Thomas
1428 Polson Thomas, Unnukal

**6. Farmers meet on 17.12.2007 at Indian Cardamom Research Institute, Myladumpara**

1429 Dr. J. Thomas, Director (Research)
1430 Dr. T. K. Hrideek
1431 Dr. Joseph Thomas, Sr. Scientist
1432 K. Lakshmanon, JTA
1433 Sham Job, Clark
1434 Jomon, Project Assistant
1435 P. Natarajan, Sr. Scientist
1436 Benny Mathew, JTA
1437 Ansar Ali, Scientist
1438 Dr. G Anand, Jr. Scientist
1439 Dr. B.Gopakumar, Sr. Scientist
1440 Bannergy, JTA
1441 Jonhson Joseph, Project assistant
1442 Prince Antony, Project assistant
1443 Antony, Project Assistant
1444 P. Vasu, JTA
1445 K. Devanand, Asst. Director
1446 Hafitha, Junior Research Fellow
1447 Smitha K.A, Junior Research Fellow
1448 Amrutha V.T, Project fellow
1449 E. P. Ealiyachan, JTA
1450 G. Ramachandran, JTA
1451 Dr. K.M. Kuruvilla, Scientist
1452 M.R. Balan, Farm Manager
1453 BA. Vadiraj, Scientist
1454 Dr. A.K. Vijayan, Scientist
1455 Dr. P. Senthil Kumaran, Liberairan

1456 Dr. K. J. Madhusoodanan, Deputy Director
1457 Dr. V.V. Radhakrishnan, Scientist
1458 Ranjitha. P, Project Assistant
1459 Balamurugan, Junior Research Fellow
1460 G.Balachandran, JTA

**7. Commission sitting on 18.12.2007 at Collectroate Painav with Panjayathraj**

1461 Bindu Joseph, Mariyenpanan
1462 Sobha Thankachan
1463 M. Sukumaran
1464 Jose Paulose President, Idukki-Kanjikuzhy
1465 G.N. Gurunathan, President, Chinnakanal
1466 C.M. Balakrishnan, President, Kamapuram
1467 V.C. Joseph
1468 Johny K. Thomas, President, vattikudy G.P
1469 Tomy Kavalem, President
1470 R. Gopinathan, President
1471 Unnikrishnan Kunnath, Asst. District Information Officer
1472 Geetha Mohanan, President, Pallivasal
1473 Saji Chandrababu, Baisonvali Gramapanchayat
1474 N. Arockiathas Marayoor Panchayat President
1475 Olickal suresh, president. Kottayar G.P
1476 Jose Joseph, Arakulam Panchayath
1477 Chellamma Damodaran, Arakulam, President
1478 K. Pankajakshan Nair, Agricultural Officer, Arakulam
1479 V.S. Madhu Kumar
1480 Sajikumar, Raveendran, Vice President
1481 Sajimol.V.K, Agricultural Officer, Kanjikuzhy
1482 G. Mohanadas, Vattavada, Kadayathoor
1483 Lal T. George, Agricultural Officer
1484 Baby George, Agirucltural Officer, Kumaramangalam
1485 Biju P. Mathew, Agiricultural officer
1486 Dr. Besin
1487 K.P. salumon
1488 Jony Joshy
1489 S. Manoj, Agrl. Officer
1490 G. Sarasanan Nair
1491 M.S. Johnson, Agricultural officer, Adimali
1492 Valsala gopalan, S.C. Chairperson
1493 Saju.K.C, Agiricultural Officer
1494 David
1495 Cherian.P.P. Agrl. Officer
1496 Joseph Sebastian
1497 K.V. Sanjeev
1498 N.S. Josh, Agiricultural Officer
1499 K.Viswambharan, Krishibhavan
1500 Vijayakumar.K.K
1501 Reji P.T.
1502 Rajeesh.P.K, Agirulcutral Assistant, Munnar

**8. Commission sitting held on 18.12.2007 with, Kudumbasree, Idukki**

1503 Vijayamma Chandran, Krishnavilasam, Pazhayarikandam.P.O Kanjikuzhi
1504 Ponnamma Mohananan, Thakidiyon, Pazhayarikandam P.O. Kanjikuzhi
1505 Thankamma Jose, Kulamakel, Kanjikuzhi
1506 Silviya Jose, Thekkevayalil, Alpara P.O.,
1507 Savithri Satheesen, Puthanpurackel, Keerithode

1508 Leelamani Sasidharan, Thannikathekethil, Mazhuvadi, Alpara P.O.,
1509 Salilamani Sajeevan, ,Kannadil
1510 Syamala Remesan, Vettitharayil
1511 Omana
1512 Ammini Jose, Punnackal house
1513 Sobhana Divakaran
1514 Regi Shaji, Punnackal
1515 Kanchana Jayan, Jayachandrabhavan, Painavu
1516 Ambika Sasi, Chennirickel,Painavu P.O.,
1517 Shiny Mathew, Kuzhipalayil, Idukki, Coloni P.O.,
1518 Shiny Calan, Parackel
1519 Gemini Ajayan, Mattathilanickel
1520 Grecy George, Naduveladathu, Narakakkanam
1521 Mary George, Puthiyakulangara, Manippara
1522 Ambika Janaradhanan, Manippara, Karimban
1523 S. Vijayalakshemy, Munnar, colony
1524 M. Victoria, Munnar
1525 Merykutty George, Vazhathoppu
1526 Sujatha Murali, vazhathoppu
1527 Sylekha, Mariyapuram
1528 Usha Mohanan, Mariyapuram
1529 Jincy Sunny, Vadakkam
1530 Kavitha Benny, Nairupara
1531 Reena Saji, Nairupara
1532 Sheeba Varghese, Thekkenkurichiyil, Nararupara P.O., Idukki
1533 Saly Joy, vadakumkarayil (H), Manippara P.O.,
1534 C.C. Jacob, Pinakadu, Manippara P.O.,
1535 Sudhamani Devadas, Murukumpadiyil, Manippara
1536 Radhamani Pavithran, Thonitharayil, Manippara P.O., Karimban
1537 Tigi Jose Thayyil, Manippara P.O., Karimban
1638 Thankamani Sukumaran, Kallikel Veedu, Manippara P.O.,
1539 Raji Sukumaran, Kallickel Veedu
1540 Mathew Chacko, Manjappara, Vazhathoppu
1541 Paippy Pathros, Manippara, Vazhathoppu
1542 Basheer Thoppil, Manippara P.O.,
1543 John. C.V, Chamaparayil Veedu, Manippara P.O.,
1544 Bindu Joseph, Mariyapuram Gramapanchayth
1545 Valsala Gopalan, Standing Committee Chairperson
1546 Latha Chandran, Ellappara, Rajapuram
1547 Bindu Radhakrishnan, C.C.S. Member
1548 Siji Rani, Pallottukunnel (H)
1549 Jayasreekumar
1550 Laly Baby, Palagatt (H)
1551 Omana sivan
1552 Bindu Mohanan, Puthanpura (H)
1553 Aneesh K. Samad
1554 Bindu Vikraman ,Pullettil (H), Muttam, Thodupuzha
1555 Valsala damodaran, punnackel (h)Vimalagiri p.o., idukki
1556 Rossamma Mathew, Attuchalil, Mariyapuram P.O.,
1557 Gressy Rajan, Veettikunnel, Mariyapuram
1558 Radhamni, Kalarickel, Pullupara
1559 Sunitha Sajeev, Charalel
1560 Selina Joseph, Vice President
1561 Jaya Shaji, Panackel (H), Cheruvallikulam
1562 Shiny Joseph, Koroth, Cheruvallikulam
1563 Jessy Jose Cheruvallikulam
1564 Lillykutty Varghese, Murujapuzha
1565 T.S Kousalia, Kallumthalckel, Mullaringad P.O.,
1566 Elsy Augustian
1567 Suma Anilkumar, Kavelmarukil Veedu

1568 Omna Gopalan, Kunneparambil Veedu
1569 Jolly Joseph, Aaruparayil Veedu, Kulamav, Arakkulam
1570 Kuttyamma Michael
1571 Suseela Gopi, Enchaplackal House, Moolamattoom
1572 Manuel, keerambanal house, keerambal, Kulamavu
1573 Vineetha Biju, Kuzhiyamattathil , Arakulam P.O., Arakulam
1574 Elamma Johny,Vazhaplakudiyil, Manippara P.O.,
1575 Mariyakutty Paulose Uravungal, Thadiyampadu
1576 Leela Satheeshan, Chalapurath, Maniyappara
1577 Jessy Babu, Parakunnel House, Murijapuzha, Cheruvallikulam
1578 Suseela Raveendran, Peruvanthanam
1579 Annakutty Mathew, Murunjapuzha
1580 Rajisajan, Punnamoottil (H), Thadiyampuzha
1581 Kumari Surendran, Parayil, Thadiyampadu,Peppara
1582 Sarojini Soman, Palakattuparambil (h),Thadiyampadu, Peppara
1583 Lini Jose, Nellikkathazahu, Arakkulam
1584 Mercy Thomas,Moolamattoom
1585 Nucy Emmanuel, Vechoor House, Kannickal P.O.,
1586 Celin Jose, Kanakavayal, Peruvanthanam
1587 Lissamma Sebastian, Karithackel, Peruvanthanam
1588 Leela Sivadasan, Puthuparambil (H),Kalayanthani
1589 Varsha Vijayan, Kaniyammoozhiyil, Thekkubhagam
1590 Shiny Girish, Alackel, Kumaramangalam
1591 Bijumol Rajesh, Asharikkudiyil, Mylakkombu, Thodupuzha
1592 Mollyleathy James, Mullanmade, Calverimound
1593 Bindhu Chandran, Pandippara
1594 Valsamma Vincent,Karivalile (H),Kalverimound

**9. Commission sitting held on 19.12.2007 Collectorate, Painave with Government Officeals**

1595 R. Balachandran, Dist. Soil ConservationOffice, Moolamatom, Idukky
1596 K.P.Suresh Babu, Asst. Project Officer, ITDP Idukki, Thodupuzha
1597 V.P. Suresh Kumar
1598 Jessy Chacko
1599 M.K. Gangadharan, Exe. Engineer, PWD Roads, Idukki
1600 Johnson. T.M, Thahasildar, Udumbanchola
1601 K.R. Narayanan,Thahasildar,,Devikolam
1602 Arunkumar.T.V, Manager,VFPCK
1603 Siby Mathew, Thahasildar, Thodupuzha
1604 M. Viswanathan, Development Officer, Rubber Board
1605 K. Vidyadharan, Coffee Board, Vazhavara
1606 Elizabeth Skariah, Dist. Sericulture Officer
1607 Tomy George, EE, MI Division, Kattappana
1608 N. Muraleedharan, EE, KSEB, Katappana
1609 P.N. Chandrasekharan, Sec. Dist Panjayah
1610 Unnikrishnan, Asst.Information Officer, Painav
1611 Raj Mohan
1612 T.G. Natesan, Forest Range Officer
1613 Chandran P.P, Office of Soil Conservation
1614 A.J. Jose
1615 Ajith Kumar, Office of Soil Conservation
1616 Joseph Sebastain
1617 A. Abdul Jabbar, Asst. Director, Spices Board, Vandanmedu
1618 Soman, KWA, Painav
1619 P.V. Ravi, APO
1620 R Hazarika, Tea Board, Kottayam

**10. Farmers Meet on 20.12.2007 Mayoor Gramapanchayat**

1621 Jagatheeshan, Puthachivayal
1622 Ganapathi. U, Marayoor Gramampanjayath
1623 C.R. Ramaswamy, Marayoor Gramam
1624 Ishwaran, Marivayal
1625 Chudalai, Pattikade
1626 Manikandaswami, Marivayal
1627 Mathiyazhakan, Puthachivayal
1628 S.r. Padpanabhan, marayoor gramam
1629 V. Balakrishnan, Meladi
1630 S.R. Prahladan, Marayoor
1631 E. Palpandian, Marivayal
1632 Shekar, Meladi
1633 Rajaya
1634 K.L. Balakrishnan
1635 M.Mani
1636 Yesumttaiah, Melady
1637 V. Suhliah
1638 P. Francis
1639 T.M. Rajasekar
1640 P.K. Kesavan
1641 Ismail
1642 Raveendran
1643 Kathirusan
1644 Devaidkumar
1645 Sivasamy
1646 Jamal
1647 Veluswamy
1648 Ramendran Periyakudi
1649 Subhramanian
1650 Melliappan, Periyakudi
1651 P.T. Somasekaran Nair, Marayur
1652 Vellaswamy, Periyakudi
1653 T.S. Perumal, Pattikudy
1654 K. Raman
1655 Shanmugam, Periyakudi
1656 C. Subburaj, Periyakudi
1657 Gothandapani
1658 K.R. Bhagavathy
1659 S. Jaganatham, Anakkal Petty
1660 Iyappan
1661 Sivan ,Colony
1662 Justin, Anakkal Petty
1663 Thangam
1664 T.K. Thyagarajan
1665 C.V. Jose
1666 Sivadas
1667 Saravanan
1668 Gunasekaran
1669 Rengaswamy
1670 Balamurugan
1671 Elango.K
1672 R. Velankanni, Melady
1673 P.P. Jaganadan
1674 Joseph Abraham
1675 Dominic Abraham
1676 E.S. Mohanan
1677 Johny Mathew
1678 Johnson Thomas, Marayur
1679 K.J. Thankachan

1680 Harichandran, Kammalakkudy
1681 Mahalingam, Kammalakkudy
1682 Singaraj
1683 Veeraswamy
1684 R. Sivadasan Kottakulam
1685 P.K. Perumal
1686 K.S. Kumarasan
1687 P.R. Ayappan
1688 Sivalingam
1689 P. Palgunan
1690 K.R. Thankappan
1691 Chandran
1692 Neelakandhan Nair
1693 P.O. Joseph
1694 S. Lakshmivathi
1695 P.R. Selvaraj
1696 T. Punnoose
1697 S. Murugan
1698 S. Kannan
1699 Madhavan
1700 P.A. Thomas
1701 S. Krishnan
1702 Devaraj
1703 Asha
1704 Usha Hendry
1705 Komakalamani
1706 K.O. John

**11. Farmers meet on 20.12.2007 at Kanthaloor Krishibhavan**

1707 Thamby M. Paul, President, Service Co. Operative Bank Kanthalloor
1708 M. Selvarath Muniyandi, Block Member
1709 Elaiyaraja
1710 S. Madhavan
1711 M.R. Narayanan, Kizhathoor
1712 K.R. Subramaniyan
1713 M. Suresh
1714 A. Chandran
1715 K.G. Krishnan
1716 K. Subramaniayn
1717 M.K. Ramaswamy
1718 C.T. Achyuthan
1719 M.S. Gangadharan
1720 K.R. Ishwaran
1721 M.T. Thomas
1722 O.V. Varghese
1723 S.K. Subramaniyan
1724 P. Pulikutty
1725 K.S. Chandrabos

**12. Journilists meeting on 21.12.2007 Press club, Thodupuzha**

| | |
|---|---|
| 1726 | Harrys Mohammed, Secretary Press club |
| 1728 | K.J.Mathew, President, Press club |
| 1729 | Vinod Kannoli, Vice Prewsident, Press club andMangalam |
| 1730 | P.I.Sabu, Desabhimani |

| | |
|---|---|
| 1731 | P.K.Prakesh, Madhyamam |
| 1732 | P.K.Latheef, Chandrika |
| 1733 | Jaimon Vazhithala, Janmabhumi |
| 1734 | Krishnaraj, Malayalamanorama Daily |
| 1735 | C.J.Issac, Malayalamanorama daily |
| 1736 | K.P.Gopinath, Mathrubhumi |
| 1737 | Basith Hussain, Varthamanam |
| 1738 | C. K. Shasar, Thajas |
| 1739 | Sashidharan kandathil, Veeshanam |
| 1740 | K.G.Pradeepkumar, Asianet |
| 1741 | O.N.Rajagopal, Keralakoumudi |
| 1742 | Indiavision, Thakachan |
| 1743 | G.Bejoy, manorama News |
| 1744 | Unniraapura, Jeevan TV |
| 1745 | Indian Express |
| 1746 | Boby Mathew, Surya TV |
| 1747 | Kairali TV |
| 1748 | Starnet News |
| 1749 | The Hindu, Daily |
| 1750 | Unnikrishnan, Public relation officer, Idukki |

**13. Elite farmers and Government officels meeting on 9.01.2008 at Edassery Resort, Kattappana**

1751 Dr. Joseph Thomas, ICRI, Spices Board, Myladumpara
1752 Dr. S.Varadarasan, ICRI, Spices Board, Myladumpara
1753 T. Ramanujam, Rtd. Scientist, Cumbam
1754 T.Ashoka. Kumar, Kerala Cardamom Growers Association
1755 Reji Njallani, Kattappana
1756 Varkey Devassia, Karakkunnel
1757 Dr. G.Sivakumar, CRS, Pampadumpara
1758 Dr. M.S.Babu Issac, DD (AH), Idukki
1759 Dr. Celln (AH), Idukki
1760 C.M.Gopi, Cherukunnel, Adimali
1761 S.Elango, Vandenmadu
1762 George M.L, Dairy. EX. Officer, Kattappana
1763 R.Ravikumar, DD, Dairy Development
1764 V.P.Sureshkumar, Dairy, EX. Officer, Peermadu
1765 P.G.George
1766 Sabu Verky, Chavaranal
1767 Jose seaviar, Erattayar
1768 Dr. Anina Susan, KVK, Santhanpara
1769 Joseph Xavier, Cardamom Growers Association
1770 K.K.Devasia, Cardamom Growers Association
1771 K.M.Michael, Cardamom Growers Association
1772 T.G.Babu, Cardamom Growers Association
1773 John. P.A, ADA, Kattappana
1774 R.Balachandran, Dist Soil Conservation officer
1775 Joseph Pannolichalil, Marayour
1776 Antony Muniyara, Correspondent, AIR, DD
1778 T.T.Prabhakaran, HOD, AIR, Devikulam
1779 S. Ramananthan, Cardamom planters association
1780 B.K.Sridha, Cardamom planters association
1781 P.K.Sabu, Punnath, Padamugham
1782 Sibi Jose, Puthenpurayil, Edavetty, Thodupuzha
1783 Noble Joseph, Punnolikunnel, Marygiri
1784 K.G.Premkumar, DD, Soil conservation, Kattappana
1785 R. Baskran, Kerala Cardamom Gorowers union
1786 T.F. Joseph, Thekkel, Edavetty, Thodupuzha

1787 Siji Susan George, Agri officer, Kanchiar
1789 Nishamammen, Agri officer, Ayyappenkovil
1790 A.T.Thomas, Agri officer, Erattayar
1791 K.Ramachandran Pillai, Agri officer, Kattappana
1792 Thomas Devasia, Konnathadi
1793 K.G.Krishnan, Kanthalloor
1794 K.S.Govindaraj, Vattavada
1795 K.J. Baby, Kalarikkal

## ANNEXURE 13.4

## LIST OF MEMORANDA RECEIVED

1 K.G. Krishnan & 29 members, Kanthallur
2 Thomas Poovathinkal & 4 members, Konnathodi Village, 6th Ward
3 Priyadarshini SHG, Konnathodi Village, 6th Ward,
4 Shalom SHG, Konnathodi Village, 6th Ward,
5 Snehodaya SHG, Konnathodi, Saramma Joseph & 42 members, Muniyara
6 Kerala State Milk Societies Association, Kattapana
7 Navajyothi SHG, Konnathodi P.O., Sarojini Peethambaran & 29 members
8 A.T. Joseph & 31 members, Aapkodu I 161 (D), Sangam, Vandenmadu
9 V.R. Ramakrishnan & 74 members, Chembalam, Ksheerolpadaka Sahakarana Sangam
10 Georgekutty Nelliveliyil & 17 members Newstar Karshaka Swasraya Sangam, Kombodinjal, Panikkankudi
11 Omana Sukudhan & 21 members, SHG, Konnathodi Village
12 Shobha Sasi & 60 members, Gramalekshmi Swasraya Sangam, Muniyara
13 Churuli, P.R. Prakash & 23 members, Pulari Karshaka Swasraya Sangam, Muriyara P.O., Udumbanchola
14 Manju Thamby & 14 members, Poornnethu Kudumbasree, Muniyara
15 Churuli, Saradha Rajan & 18 members, Udaya Kudumbasree unit, Muniyara P.O., Udumbanchola
16 Churuly, Pushparajan & 13 members Surya Kudumbasree, , Muniyara
17 Anathan Vannappan & 49 members,Choorakettan Farmers, Choorakettan
18 Bejoy John & 139 members, Kerala Cathelic Youth Movement (K.C.Y.M), Neelivayal Idukki Roopatha, Neelivayal
19 K. Rajan & 16 members, Peerumede, Panchayath 8th Ward, Farmers,
20 K.A. Abraham & 18 members, Kanthallur Farmers, Kanthallur
21 P. Ramakrishnan & 5 members, Kanthallur Panchayath 4th Ward, Kanthallur
22 R. Govindaraj & 56 members, Farmers, Kanthallur
23 Inchapathal, Indirashaji & 28 members, Aiswariya Kudumbasree Unit, Mukkudam P.O., Udumbanchola
24 Shaji. K.K. Kollamparambil &21 members,Sanga Sakthi Karshaka Swasraya Sangam, Inchapathal, Udumbanchola
25 Sivankunju & 14 members, Sooryodaya Kudumbasree Unit, Inchapathal, Mukkudam P.O.Udumbanchola
26 Surendran & 50 members Konnathodi Gramapanchayath, Agro Clinic
27 Muraleedharan Nair & 6 members, Vallakadavu Ksheerolpadaka Sahakarana Sangam, Apcos, Kadamakkuzhi P.O, Vallakadavu
28 T. M. James & 97 members, Mangathodi Ksheerolpadaka Sahakarana Sangam, Apcos, Arivilamchal
29 Rosamma Thomas & 52 members Calvarymount Ksheerolpadaka Sahakarana Sangam, Apcos, Calvarymount
30 Baby Pullolikkal, Navadhara Swayam Sahaya Sangam Thinkalkade (EAST), Muniyara Udumbanchola
31 B.A. Thakappan Kottayam kattil & 20 members, Saubhagya Swayam Sahaya Sangam

Thinkalkade (West), Muniyara
32 K.J. Baby & 21 members, Konnathodi, Agro-clinic,
33 Chithirapuram Farmers, Gopalanair & 3 members, Chithirapuram
34 Daniel Chacko & 41 members, Malanadu ksheerolpadaka Sangam, Kochuthovala
35 Madhu Bhaskaran& 21 members, Baisonvaley Panchayath 6th Ward,
36 Ammini Surendran & 29 members, Aiswarya Swayam sahaya Sangam, Marakkanam , Konnathody
37 E.P. Baby & 28 members, Konnathody Krishibhavan, 9th Ward Agro-clinic,
38 Vijayamma Bhaskaran & 140 members, Kanchiyoor, Kattappana, Farmers,
39 Mathew Thomas & 8 members, Biosave development society,Thankamany
40 Rajani Sajeev & 19 members Adarsam SHG, Udumbanchola
41 Sebastian Kandathil & 74 members, Sahyadhri Nature Club, Kombodinjal
42 T.C. Devassya & 6 members, Konnathody Village, Kombodinjal, Agro-clinic
43 K.M. Baby & 89 Members, Ksheerolpadaka Sahakarana Sangam, Manjakuzhi
44 Institute of Social Services, State Committee- Adimali,
45 Kerala Congress (Jacob) Dist. Committee, Idukki, Thodupuzha
46 N.C.P Idukki Dist. Committee, Thodupuzha
47 Kerala Congress (M) Kattappana, Kattappana
48 Chellarcovil Ksheerolpadaka Sahakarana Sangam, Kumily
49 Kochuthovala Ksheerolpadaka Sahakarana Sangam, Apcos, Kochuthovala
50 Bharadeeya Janatha Karshakamorcha, Idukki Dist. Committee, Kattappana
51 High range Estate's Labour Union, (AITUC), H.O. Peermade
52 The National Council of YMCAs of India YMCA South- West India Region, Kattappana
53 Agricultural Assistants Association Kerala, Dist. Committee Idukki,
54 Highrange Estate's Labour Union, Reg.No. H.O. Peermade, Peermade
55 Malanad Co-op. Agricultural & Rural Development Bank Ltd.,Udumbanchola
56 Konnathody Panchayath, 4th Ward, Muniyara North Ward, Agro-clinic,
57 Karshaka Sangam, Kanjipara, Kallarkutti P.O., Devikulam
58 Snehanjali SHG, Valakode, Valakode
59 K.A. Devasia & 7 members, Rajakkad, Village,
60 Kerala Congress (M) Peermade Niyojagamandalam Committee, Vandiperiyar
61 Highrange Manushyavakasa Samrakshana Vedi, Kattappana
62 K. Mathew, Farmer, Peermade
63 Kattappana Panchayath 14th Ward, Farmers, Kattappana
64 Santhigram Ksheerolpadaka Sahakarana Sangam, Apcos, Santhigram
65 Thookkupala Milk Producer's Co-Operative Society Ltd: Apcos, Kallar
66 Greenvalley Swayamsahaya Sangam, Vellayamkudi
67 M.O. Devasya, Kattappana
68 Upputhod Ksheerolpadaka Sahakarana Sangam, Kattappana
69 Shinoj Varkey, Ayyappankovil Panchayath, Udumbanchola
70 Shylavinod, Ayyappankovil Panchayath, Udumbanchola
71 Haritha Farmers Club (NABARD), Bisonvalley
72 National SHG, Kattappana, Ambalakavalayil, Kattappana
73 C.I.T.U, Idukki Dist. Committee, Udumbanchola
74 Ayyappancoil Service Co-operative Bank Ltd., No. 3558, Mattukkatta
75 Kairali Swayam Sahaya Sangam, Muthuvankudi
76 Thekkel Thomas Joseph, Kokkayar
77 Vikas farmers club (Swasrayasangam), Panamkutty
78 Kerala State Karshakathozhilali Federation (AITUC), Peermade
79 Farmers and Stakeholders of Pallivasal and Vellathooval Panchayath, Devikulam
80 Farmers, Karshakasamithi, Devikulam Taluk, Kallarvattayar
81 Kerala Karshaka Union (M), Idukki Dist. Committee, Chemmannar
82 Rani Johnson & 29 members,Mariya S.H.G, Mangappara, Konnathady.
83 Kerala Congress, Dist. Committee, Idukki
84 C.I.T.U Idukki Dist. Committee, Idukki
85 Ward Member, Kattakkayam
86 Kerala Karshaka Thozhilali Congress, State Committee, Kottayam, Idukki
87 Kerala Organic Development Society, Thodupuzha
88 Joseph Porkkadil, Jaivakarshaka Sahakaranasamithi, Vandanmade
89 Georgekutty Mathew, Paradiyil (H), Idukki

90 Rajakumary Ksheerolpadhaka Sahakarana Sangham, Udumbanchola
91 Karshaka Congress (I), Kamakshy Mandalam Committee, Kamakshy
92 Reji Maliyekkal, Kerala Youthfriend (M), Adimali
93 Excel Organic Coffee and Allied Crops (S.H.G), Vazhavara East, Idukki
94 Keralakarshakafedaration, Idukki Dist. Committee, Adimali
95 M. Soman, Member 9th Ward, Uppukandam, Kattappana
96 Greenvalley S.H.G, Kattappana
97 M.A. Lalichan, (K.T.U.C (Jacob), Loantri
98 Agro-clinic Committee 11th Ward, Vadanmade
99 T.T. Thomas, Thekkel, Kanchiyoor P.O., Idukki
100 Kerala State Milk Societies Association, Kattappana
101 Varghese Joseph, Kattappana
102 Mandalam Congress (I) Committee, Kattappana
103 The Udumbanchola Estate Workers Union (A.I.T.U.C), Udumbanchola
104 Cardamom Planters Development Association, Nedumkandam
105 Malanadu Karshaka Reksha Samithi, Kattappana
106 Pappachan K. Elengical, Munnar
107 Kerala Pradesii Karshaka Congress, Idukki
108 M.M.J. Plantations, Pala
109 Joseph Abraham, Anakalpetty Karimbulpadhaka Samithi, Anakalpetty
110 Kundala Tribals, Devikulam
111 M. Karuppaiya, Kanthaloor
112 Kumaraswami & 13 members, Kanthaloor
113 Jancy Charley, Vallikavukal, Mulakuvally P.O, Thodupuzha
114 Kerala Karshaka Sangam, Marayoor Panchayath Committee, Marayoor
115 P.A. Abraham, Kerala Karshaka Sangam, Marayoor Panchayath Committee
116 Mukudan & Family, Thodupuzha
117 Kumari & Family, Thodupuzha
118 Mathew Chacko, Manjapara
119 Thakachan & Family, Thodupuzha
120 Daisy Benny, Thodupuzha
121 Radhamukudan, Thodupuzha
122 Jose Thomas, Thodupuzha
123 T.G. Jose Thayil, Thodupuzha
124 Justin Varghese & Farmers, Marayoor
125 Bindu Chandran, Kamakshy
126 Vimalamaniyamma, Manjaparathotti
127 Ousepu Varghese, Chithirapuram
128 Kerala Organic development society (KODS), Thodupuzha
129 Haritha Krishi Vijnjana Vyapana Kerdram, Adimali
130 Angal S.H.G, Vazhavara
131 M. Velu & Family, Vandiperiyar
132 K.K. Karunakaran & Family, Vendiperiyar
133 M.B. Vijayarajan & 25 members, Devikulam
134 Jobi Philip & Family, Chithirapuram
135 Apcos I 161 (D), Vandanmede
136 Haritha S.H.G, Kallarkutty
137 C.M. Gopi & Family, Adimali
138 K.J. Philip & Family, Chithirapuram
139 Surabhi S.H.G, Konnathady
140 K. Rajan & 16 members, Karadikuzhi
141 V. Thomas & 12 members, Kanthaloor
142 P. Ramakrishnan & 5 members, Kanthaloor
143 R. Govindaraj & 56 members, Devikulam
144 George Joseph Padinjarathil & Farmers, Kattappana
145 Jose Thomas & Family, Kadathuruthi
146 Robert M.A, Karadikuzhi
147 C.T. Abraham, Peermade
148 Anandakrishnan & Family, Peermade
149 Thekkady Organic Farmers Processing & Marketing Society, Kumily

150 Joseph mani, Vandiperiyar
151 P. Sainudeen & Family, 8th Ward, Vandiperiyar
152 Siril M. A & Family, Karadikuzhi
153 P.V. Devasya, Kattappana
154 K. Aravindakshan & Family, Vandiperiyar
155 Anthonyammal, Peermade
156 Cumbummettu Ksheerolpadaka Sahakarana Sangham, Cumbummettu
157 A.J. Devasya & 10 members, Vagamon
158 Yesudas & Family, Heliberiyam
159 Varghese & Family, Peerumade
160 M.D. Aniyankunju, Vandiperiyar
161 V.M. Muhammedsalim, Vandiperiyar
162 Vinoj Joseph & Family, Vandiperiyar
163 Mattukatta Ksheerolpadaka Sahakarana Sangham, Ayyappancoil
164 Monson joseph, Kattapana
165 K.J. Thakachan & Family, Kozhimala
166 Dhanyaharitha S.H.G, Udumbanchola
167 P.A. Noorjahan, Vandiperiyar
168 Hygia Vision Foundation, Adimali
169 The Ezhukumvayal service Co-op. Bank Ltd., Ezhukumvayal
170 S.A. Mani, DCC Member, Vandiperiyar
171 O. Divakaran, Sreemangalam, Nedumkandam
172 P. Sivalingam & Family, Peermade
173 Thankam & Family, Dymock
174 Kisan Janathadal Jilla Committee Idukki, Vandiperiyar
175 Kerala Plantation Labour Federation (CITU), Peermade
176 Konnathady Milk Producers Co-Operative Society Ltd., Konnathady
177 Ksheerolpathaka Sahakarana Sangam, Apcos, Nariyampara
178 E.S. Somasekharan, Rajakkadu
179 Joseph & Family, Kattappana
180 Bensrajan & Family, Arnakal
181 E.V. Kujoonju,,Adimali
182 K.K. Thomas & Family, Konnathadi
183 Paily Abraham, Kochuthodavala
184 T.R. Vijayan, Kozhimala
185 Baiju Balakrishnan, Adimali
186 Ragavan, Cholachuvadu
187 Panniyar Ksheerolpathaka Sahakarana Sangam, Ponmudi
188 V.F. Lilly & Family, Valara
189 Mathew Philip, Secretary DYFI, Adimali
190 A.O. Augustine, District Secretary, Kerala Congress (M), Thadiyampad
191 K.R. Santhosh & Family, Manipara
192 Mery Baby, Mulakuvally
193 Swasraya Karshaka Vipani, Adimali
194 Karimutty Karimbu Ulpadaka Samithi, Marayoor
195 Highrange Karshaka Samrakshana Samithi, Rajakad
196 J.S.S. Idukki District, Rajakad
197 P.N. Gopakumar, Pottankadu
198 Parathod Krishibhavan Branch Agroclinic Swapna Library, Konnathadi
199 Haritha Mithra S.H.G, Konnathady
200 S. Thankachan, Rajakad
201 Saji P. Varghese, Chairman, Grama Panchayat Office, Vandiperiyar
202 K.V. sathasivan & Farmers, Vandiperiyar
203 Tom. K. Varghese, Vandiperiyar
204 Achamma Cheriyan, Vandiperiyar
205 Jaiva Karshaka Sangam, Kanchiyoor
206 A. Aralpandyan, Mandalm Secretary, Peermade
207 Rameshgopalan, Adimali
208 Nobijohn, Rajakad
209 Mathew Uduppu & Family, Vandanmedu

210 P.P. George Service Sahakarana Bank President, Adimali
211 Gramavikasana Samithi, Aladi
212 K.A. Vilson, Kallalpattam colony
213 Chacko Chacko ,Kozhimala
214 Soman P.S, Kattappan
215 Selvam Mariyadas, Peermade
216 M.J. Mani, Vandiperiyar
217 Surendran P.K., Manjapara
218 Chacko Thomas & Family, Thodupuzha
219 Elamma & Family, Thodupuzha
220 Leela Satheesan, Thodupuzha
221 Mariyakutty paulose, Thodupuzha
222 Congress (I) Mandalam Committee, Vandiperiyar
223 P.S. Achudhan, Peermade
224 Joseph Mani, Plamala
225 Chithram S.H.G, Rajakad
226 Kerala State Milk Societies Association, Adimali
227 Mickel Augusthy, Adimali
228 Thankaraj & Family, Pottankad
229 Joseph Chacko, Karikkunnam
230 Mathew Mamman, Muthukuvani
231 Ariya 'B' Kudumbhasree, Secretary ADS, Kanayankavayal
232 Jose Joseph, Panchayath Member, Moolamattam
233 Moly P.C, Thodupuzha
234 Joseph Chacko, Karikunnam
235 Elsy. K.C, Karikunnam
236 Elsamma Thomas, Karikunnam
237 Babu. P.C, Karikunnam
238 John. C.V, Manipara
239 Annakutty Mathai, Manjapara
240 Sukumaran, Mulakuvally
241 Deepa & Family, Karimban
242 Raji Sukumaran, Karimban
243 Radhamukudhan, Mulakuvally
244 Kumaran.K.M, Calvarymount
245 V.U. Charley, Mulakupally
246 T.K. Rajappan & Family, Mulakupally
247 Ushas NHG, Nayarapara
248 Savithri Satheeshan, Keerithod
249 Augusthy Kuriyan, Kulangara, Konnathady, Idukki
250 Adv. E.M. Augusthy, G. Sec, Kerala Pradesh Congress Committee, Kattappana
251 Sri. P.G. George, Pattayakudi
252 Philip George, Organic Coffee and Allied Crops Producer's Society, Ponmudy
253 Kerala Pradesh Karshaka Congress, Peermade Niyojaka Mandalam Committee
254 Communist Party of India, Idukki District Council, Painavu
255 Majo Karimuttam, Youth Friend(M) Kumali
256 The Vandiperiyar Ksheera Vyavasaya Co-operative Society Ltd,Vandiperiyar
257 Swasraya Karshaka Vipani, Kanthaloor
258 United Democratic Front (UDF) Idukki District Committee, Nayarupara
259 Lilly Thomas, Maniyanmakkel, Thudaganadu P.O., Kombery
260 Co-orindation Committee of Cardamom Growers' Associations, Vandanmedu
261 The Kerala Agricultural Development Society, Thodupuzha P.O., Idukki
262 Ikya Janathipathyamunnany, Mankulam Mandalam Committee, Mankulam
263 Mahalma Self Help Groups, Mukkudam P.O., Kambilikandam
264 Kerala Pradesh Karshaka Congress Spices Cell State Committee, Kattappana
265 High range Organic Producers Society, Adimali P.O.,
266 Kerala Congress District Committee, Idukki
267 Karshika Vikasana Samithi & Agro-Clinic, Vandiperiyar
268 A.J. Josep, Advocate & Notary, Lalan Towers, Broadway P.O., Ernakulam
269 All India Kisan Sabha, Idukki District Committee, Painavu

270 World Vision, India, Highrange Area Development Programme, Kattappana
271 P.D. Aji & Family, Kattappana
272 Thomas P.C. & Family, Kattappana
273 Philomina Thomas & Family, Kozhimala
274 Kuriyakose Ulahannan, Parapalil (H), Kozhimala
275 Rooby Thomas & Family, Kozhimala
276 Scariya & Family, Kattappana
277 Kristo Thomas, Kozhimala
278 O.F. Varkey, President, Cherukida Elam karshaka Sangam, Idukki, Kanchiyoor
279 Raju.V. Balagram P.O., Kallarpattamcolony, Idukki
280 K.S. Mohanan, Joint Secretary, C.I.T.U. Dist. Committee, Kattappana
281 Mathew P.C. Pottankadu, P.O., Idukki Dist.
282 Janardhanan, Vandiperiyar
283 Thankachan Joseph Chithirapuram
284 Lilly Jose & 24 members, Rajeevgandhi Memorial Vanitha Farmers Club, Adimali
285 Agro-Clinic Members, Konnathady
286 Nathukallu Ksheerolpadaka Sahakarana Sangam Ltd., Nathukallu Apcos
287 Nettithozhu Ksheerolpadaka Sahakarana Sangam Ltd, Nettithozhu
288 Kissan Janatha Dal, Adimali
289 Elsamma Varkey, Kozhimala
290 Sahyamithra Nature Club, Adimali
291 John. V.S. Vandiperiyar
292 George Varkey, Konnathadi
293 Indian National Congress (I) Madalam Committee, Elappara
294 Lekashmi Devanadam, Kumali
295 Kerala Congress (M), kanchiyoor Mandalam Committee, Kanchiyoor
296 Kattappana Gramapanchayath Kudumbasree Community Development Society
297 E.K. Gopi & Family, Kattappana
298 Shaji Thomas & Family, Chembalam P.O., Nedumkandam, Idukki Dist.
299 Friends SHG, Kattappana
300 Bensrajan & Family, Arnakal P.O.
301 Sri. Rarichan, Youth Friend (M) Idukki Dist.
302 Agricultural Assistants Association Kerala, District Committee Idukki
303 Saji Vazhekudiyil, Parathodu
304 M.P. Philip & 9 members, Elappara
305 Kissan Janatha Idukki District Committee, Cherukarakkunnel, Valiyathovala
306 R. Thirukumar & Family, Kattappana
307 K.U. Benny & Family, Ayyappancovil
308 Joseph Thomas, Balagram P.O., Third Camp, Idukki Dist.
309 Varkey Thomas, Kattappana
310 Nankuthotty Ksheerolpadaka Sahakarana Sangam Ltd Apcos, Erattayar P.O
311 Sunny Bhaskaran & Family, Kattappana
312 Konnathady Panchayath Farm Club, Parathode, Idukki
313 Mathew Thomas & Family, Mullakanam
314 John & Family, Erattayar
315 John Chinnamma, Block-539, Chottupara, Idukki Dist.
316 Vandanmade Jaiva Karshaka Samrakshana Sahaya Sangam, Nettithozhu
317 All India Kisan Sabha, Panchayat Committee, Elappara
318 P.A. Deavasia, Pandanmanal House, P.O. Thoppripala
319 Joymon Joseph, Vandiperiyar
320 M.P. Johny, Mattathil Veedu, Pottankadu, Baisonvalley
321 Augusty Joseph & Family, Kattappana
322 John Pullad, Secretary, Indian Naniyavila Karshaka Samithi,Chottupara
323 Sukumaran & family, Pakulivasan
324 Sheeba Mol P.J Kozhimala
325 Mathew Kaichira, kerala karshaka thozhilali congress, Kattappana
326 Prakthyaksha Raksha Daivasabha, Sreekumarnagar Iraviperoor, Mathaipara
327 Bharatheeya Janadha Karshakamorcha, Idukki Dist. Committee Kattappana
328 Agro-clinic & Farmers, Konnathady
329 Brothers S.H.G. Moolekada Junction kadamakuzhy P.O., Vallakadavu

330 Lavi Daniel Block No. 1223, Idukki Dist.
331 T.J. George, Thaiparambil, Ayyappankovil
332 Raju & Family, Balagram
333 Thomas P.C, Parayil Ellakallu
334 Kunthalampara Ksheerolpadaka Sahakarana Sangam Ltd, Kattappana
335 Kambilikandam Milk Producer's Co- operative Society Ltd. Mukkudam P.O.
336 Association of Agricultural Officers, Kerala, Idukki Branch
337 Idukki Disitrict Congress (I) Committee, Jawahar Bhavan, Nayarupara. P.O.,
338 Spice Growers association, Vandanmaedu
339 Dr. Elizebeth John, women in agriculture, Anakkara, Idukki
340 CSI, Diocese of east Kerala, Melukavumattom, Kottayam
341 Mar Mathew Anikuzhikattil, Bishop House, Karimpan, Manippara, Idukki
342 Ganghiji Study Centre, Thodupuzha, Idukki
343 INFARM Agro movement, Parathod, Kajirappali
344 O.K.Sasi, Ullattil house, Vellathooval
345 Idukki district Congress commirttee(I), Nayarupara
346 Netaji Swasraya Sangam, Mullarikudy
347 Cardamom Growers Association , Vabndanmedu
348 Kerala Cardamom Growers Union, Vendanmedu
349 Malanadu Karshaka raeksha samithi, Thadiyampadu, Idukki
350 Josekutty , President, Malanadu Karshaka raeksha samithi, Thadiyampadu
351 Kannan Devan Planters Association, Munar
352 Jaimon Joseph, Venkitakal, Nayarupara, Idukki
353 Mickle Mathai, Kunnumthozhithil, Mariyapuram
354 Raji Joseph, Njallanil house, Kattappana, Parakkadav
355 Jyothirgamaya, College Road, Muvattupuzha
356 Grorge. K.D, Kollamkunnal, Cheppukulam,Thodupuzha
357 Kulumban Samaraka (memorial) Society, Idukki colony,Cheruthony
358 Kerala Agmarknet, Campco Jn, Adimali
359 Agricultural Tourism for Small Farm, Marayoor, Kerala
360 Harithamithra SHG, Konnathady, Idukki
361 Peermade Development Society, Peermade
362 C.P Sreekumar,Chengazihssari house, Vazhuthakkad, Trivandrum
363 Gopalan. R.T, Ex MLA, DMK, Cumbam, Tamil Nadu
364 Babykuruvilla, Secretary, Jai Kissan Haritha SHG, Konnathadi
365 Joy Antony. The socio economic problems of farmers in Idukki, Study report
366 Vendanmadu development Society, Vandanmadu
367 Padamugham Milk Producers Co operative Society, Padamugam
368 Hirange pepper growers association, Nedumkandam
369 The hirange rural development society, Kattappana
370 Small tea growers association, Kattappana
371 K.K.Devasia, CGA, Vandanmadu
372 P.V.Joha Pottas, Pottas farms, Adimali
373 Tribal Community Development Society, Mannamkandam, Idukki
374 Ikaia Karshaka Sangam, Idukki District Committee, Idukki
375 T.F.Joseph, President, Rice Producers Union, Meenmutty, Thodupuzha
376 Malanadu development society, Parathode, Kottayam
377 Cardamom Planters Association, Bodinayakanur, Theni
378 M.J.Jacob, Member, Kerala State farmers Debt relief commission
379 V.T.Sebastian, Ex MLA, Varikkamakkal, Kattappana
380 Nationalist Congress Party (NCP), District Committee, Idukki
381 C.M.Gopi,Cherukinnel, Chattupara
382 Francis George, MP, Idukki
383 President, Kattapana Gramapanjayath,Kattappana , Idukki
384 President, Vattavada Gramapanjayath Idukki
385 President, Ayyappankovil Gramapanjayath, Idukki
386 Ward member, Adimali Gramapanjayath, Idukki
387 Ward member ,Devikulam Gramapanjayath, Idukki
388 President, Vandanmedu Gramapanjayath, Idukki
389 Ward member,Kattappana Gramapanjayath, Idukki

390 President,Kanchiar Gramapanjayath, Idukki
391 President,Rajakumari Gramapanjayath, Idukki
392 President, Vellathoval Gramapanjayath, Idukki
393 President, Upputhara Gramapanjayath, Idukki
394 President, Chakkupallam Gramapanjayath, Idukki
395 President, Kokkayar Gramapanjayath, Idukki
396 President, Peruvanthanam Gramapanjayath, Idukki
397 President, Irattayar Gramapanjayath, Idukki
398 S.Rajandran, MLA Devikulam
399 Jayachandran K.K, MLA Udumbanchola
400 Ward member, Elappara, Gramapanjayath, Idukki
401 President, Elappara Gramapanjayath, Idukki
402 N.Ramakrishnan, MLA, Cumbam
403 President, Konnathadi Gramapanjayath, Idukki
404 Chairman, Kattappana Gramapanjayath, Idukki
405 President, MankulamGramapanjayath, Idukki
406 Member, Konnathady Gramapanjayath, Idukki
407 President, Senapathi Gramapanjayath, Idukki
408 Vice President,Senapathi Gramapanjayath, Idukki
409 Roshy Augustine , MLA, Idukki
410 President, Kamakshi Gramapanjayath, Thankamani, Idukki

## ANNEXURE 13.5

### LIST OF PROJECT PROPOSAL RECEIVED

1 Ashok Kumar Singh, IAS, District Collector, Idukki
2 Principal Agricultural Officer, Thodupuzha, Idukki
3 Indian Cardamom Research Institute, Myladumpara, Kailasanadu, Idukki
4 Senior Liaison Officer, Coffee Board, Technology Evaluation Centre, Vazhavara
5 UPASI, TRF, Vandiperiyar, Idukki
6 Soil Conservation Unit, Department of Agriculture, Idukki
7 Department of Agriculture, Watershed development project
8 Vegetable and Fruit Promotion Council(VFPCK), Report, Konnathadi Panjayath
9 T.V.Anil Kumar, Manager Project Area, VFPCK, Idukki
10 G.V.Krshna Rau, Chairman, Coffee Board, Bangalore
11 District Mission coordinator, Kudumbasree, Painav, Idukki
12 Soil Survey Organization (SC Unit) Agricultural Department, Idukki
13 Cardamom Research Station, KAU, Pamp[adumpara, .0Idukki
14 Department of Diary Development , Thodupuzha, Idukki
15 Kerala Livestock Development Board, Madupetty, Munnar
16 Spices Board , Cochin
18 NABARD, Thodupuzha
19 Lead Bank, UBI, Thodupuzha
20 District Co operative Banks
21 Forest Department, Kerala
22 Minor Irrigation Division, Idukki
23 Kerala State Elecricity Board, Idukki
24 Ground water department, Idukki, Thodupuzha

## ANNEXURE 13.6

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34 Murugan, M., Josephrajkumar, A., Sainamoelkurian, P., Ambikadevi.D and Vasanthakumar, K. Cardamom Research Station, Kerala Agricultural University. Cardamom and Cardamom Hills Critical Issues – General And Suggested Solutions, Critical Issues-locality wise and Suggested Solutions.
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