

Friends of Swaminathan Australia

Who is M.S. Swaminathan?

Scientist and humanist Professor M.S. Swaminathan has been acclaimed as one of the most influential Asians of the 20th century. The UN Environmental Program describes him as the "Father of Economic Ecology" and former general secretary Javier Perez de Cueller, calls him "a living legend, who will go into the annals of history as a world scientist of rare distinction".

Born Aug. 7, 1925 in Tamil Nadu, India.

1952 Graduates from Cambridge, UK, with a PhD in genetics.

1967 His team develops a high-yield, cross-bred wheat seed that starts a Green Revolution across Southeast Asia.

1974 Chairs U.N. World Food Congress in Rome.

1987 Receives World Food Prize in Washington.

1988 MS Swaminathan Research Foundation registered in Chennai, India, as a non-profit trust with the aim of driving a pro-nature, pro-poor and pro-women orientation to a job-led economic growth strategy in rural areas.

2001 Appointed chairman, Pugwash Conference on Science and World Affairs.



Who Are We?

Friends of Swaminathan Australia (FOSA) is an extension of the 'Friends' network throughout the US and Japan. It was established to enable individuals and corporations in Australia to make a real difference to global poverty by setting up their own **micro-credit banks** to support environmentally sustainable projects in developing countries in South Asia. Funds from your bank are distributed as interest-free loans to small, mainly rural, self-help groups who work together to establish a micro-enterprise, such as pig farming, hybrid seed production or handicrafts.

Many of these groups have already paid their loans and become models for other groups. As loans are repaid, the money is allocated to another micro-enterprise and so the extraordinary transformation of people's lives begins again.

FOSA also seeks to raise funds and equipment to support the development of **rural knowledge centres** to enable farmers' organizations and village women to easily access, via new technology, the scientific and technical information they need to solve local problems and enhance the quality of their lives, as well as to communicate their own insights and needs back to scientists.

Called "**Mission 2007: Every Village a Knowledge Centre**", the project has brought together NGOs, government and international bodies as well as private corporations to create an alliance to establish a "Knowledge Centre" in each one of India's 600,000 villages by Aug 15 2007, the 60th anniversary of India's independence.

The achievements of "Friends" so far:

- Funded 77 micro-credit banks which are run by the distinguished MS Swaminathan Research Foundation (www.mssrf.org) in rural South India.
- Sent over 1200 computers to rural development and educational projects in India and the Philippines.
- Supported informal and formal elementary education in India and Ghana.
- Provided urban design and management expertise and financial support for a slum resettlement colony of 12,500 people in Delhi.



Four ways you can help

1. Micro-credit Banks

A donation of \$2,500 can establish a village micro-credit bank, which can be named for a family, a new baby, a company or perhaps in memory of a loved one.

You can track the progress of loans made through your bank on our website www.fosa.org.au.

Partial funding of a micro-credit bank is also possible.

2. Mission 2007

Used or new (Pentium or later please) computer equipment for use in village Knowledge Centres are needed.

Donations can also be made toward the setting up and running of specific village centres and will be trackable on the internet so you can see your money is working hard.

3. Assistance to the 'Friends'

You can host an information meeting or connect us to donor individuals or corporations. Please also tell your friends about our organisation and attend our fund raising events.

4. On site-participation

We welcome families/ individuals/ students to visit their projects on-site and will help to organise accommodation and logistics.

An Invitation to Make a Difference

Name _____

Address _____

Email _____

Phone _____

Commitment is for _____

Micro Credit Bank

Rural Knowledge Centres _____ Other _____

If your donation is to set up a bank, please tell us what you would like to call it _____

If you are making a partial donation to a bank, please indicate the bank's name _____

Donation amount _____

Method of payment/amount

Cheque _____

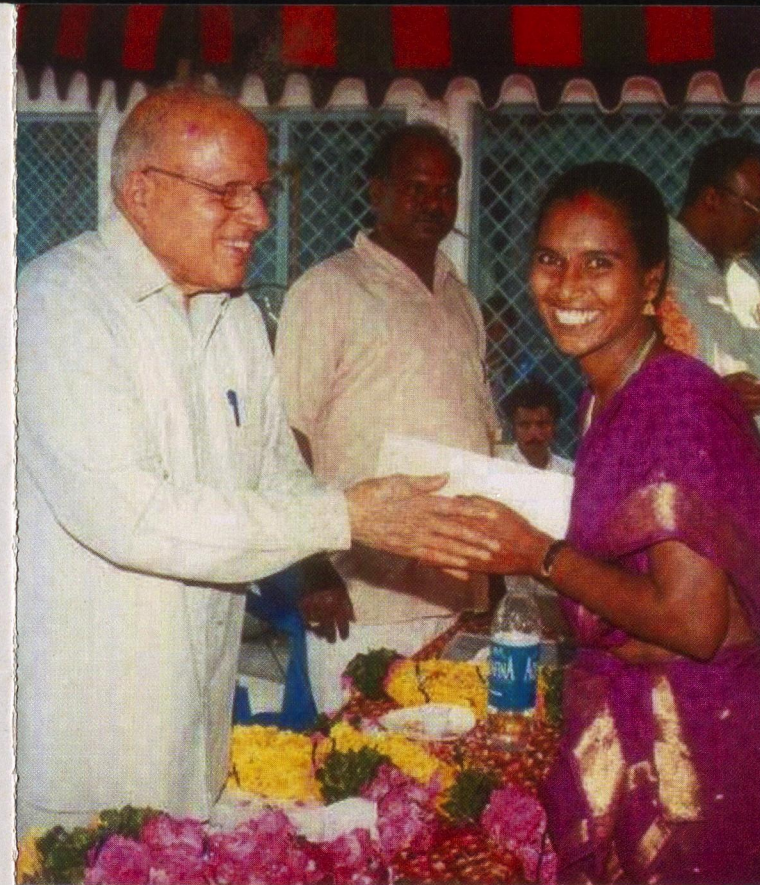
Cash _____

Bank Transfer:

ANZ, 307 Clarendon St, Sth Melbourne, Vic, 3

BSB: 01 34 35 Acc no: 354000235

Account name: Community Investment Program Inc. (Umbrella name for FOSA)



Contact Us:

Friends of Swaminathan Australia

PO Box 1213 South Melbourne

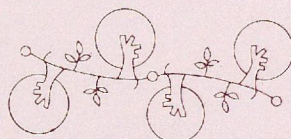
VIC, 3205

email: mail@fosa.org.au

Phone inquiries: Barbara Wolveridge

Mob: 0418 760004

For more information, go to www.fosa.org.au



M. S. SWAMINATHAN RESEARCH FOUNDATION

Dedication Ceremony

April 14, 1993

Centre for Research on Sustainable
Agricultural and Rural Development

The Chairman, Trustees and Staff
of the
M. S. Swaminathan Research Foundation

request the honour of your presence

at the

DEDICATION CEREMONY

of the

*Centre for Research on Sustainable Agricultural
and Rural Development*

at

*3rd Cross Street, Taramani Institutional Area
Madras - 600 113*

at 5.15 p.m. on April 14, 1993

Kindly bring this card with you and be in your seat by 04.30 p.m.

H. E. Dr. BHISHMA NARAIN SINGH

Governor of Tamil Nadu

has kindly consented to deliver the inaugural address

Hon. Dr. J. JAYALALITHA

Chief Minister of Tamil Nadu

has graciously consented to deliver the Dedication Address

Shri R. VENKATARAMAN

Former President of India

will preside

Shri C. SUBRAMANIAM

Chairman, National Foundation of India

will deliver the key note address

Shri KRISHNAKUMAR

Union Minister of State for Non-Conventional Energy Sources
and Agriculture

will switch on the Solar Power Generator

PROGRAMME

5.15 p.m. **Visit to Gene Bank of Endangered Plant Species
and exhibition**

Invocation - Sangeetha Kalanidhi
Dr. M.S. SUBBULAKSHMI

Lighting of Kutbuwilakku - **Hon. Dr. J. JAYALALITHA**

Welcome - **Dr. M.S. SWAMINATHAN**

Keynote Address - **Shri C. SUBRAMANIAM**

Felicitation - **Dr. SONG JIAN**
State Councillor and Chairman,
Science and Technology Commission of China

Ms. JOAN HOLMES
President, Global Hunger Project

Prof. KENZO HEMMI
Adviser, Ministry of Foreign Affairs, Japan

Dr. E.A. SIDDIQ
Director, Directorate of Rice Research, Hyderabad.

Presidential Address - **Shri R. VENKATARAMAN**

Dedication Address - **Hon. Dr. J. JAYALALITHA**

Inaugural Address - **Hon. Dr. BHISHMA NARAIN SINGH**

6.30 p.m. *Vote of thanks* - **Dr. VINEETA HOON**

National Anthem

Dr. & Mrs. M. S. Swaminathan

cordially invite you to

Dinner

on Wednesday, April 14, 1993 at 7.30 p.m.

at the Madras Club, 8 Adayar Club Road

Madras - 600 028

R.S.V.P. : 41 69 23

Security Regulations

1. Kindly be in your seat by 4.30 p.m. and bring your card and cover with you.
2. Do not carry hand bag, parcels or briefcases.
3. Kindly co-operate with the security personnel.

PROGRAMME

5.15 p.m. **Visit to Gene Bank of Endangered Plant Species
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6.30 p.m. *Vote of thanks* - **Dr. VINEETA HOON**

National Anthem

Dedication Ceremony on April 14, 1993

Welcome by M.S. Swaminathan

Today is Tamil New Year's Day and may I welcome you all by wishing everyone a Happy New Year. In May, 1989, my wife and I shifted our residence from New Delhi to Madras for establishing a Research Centre designed to provide unfettered opportunities to creative women and men to harness science for promoting sustainable rural livelihoods and for conserving nature and natural resources. A major challenge before scientists is the development and dissemination of technologies which will attract and retain youth in rural professions and which will add economic value to the time of rural women and men, particularly those belonging to landless labour and small and marginal farmer households. Our aim was not to add one more research institution to the long list of illustrious institutions already in existence but to fill gaps in ongoing efforts to integrate the sciences of ecology and economics with the social goals of employment and equity. The conservation of natural resources and the generation of new opportunities for skilled jobs in villages were set as the major goals of our research and training agenda.

In 1989, the Tamil Nadu Government generously provided on long term lease at nominal rent the site on which this building stands. Our staff and well wishers laid stones in the present site on Tamil New Year Day in April 1991. With the generous financial help of philanthropists committed to sustainable development and my family members and former students, the

construction of this building began in February 1992. During the last one year we received support from a wide range of individuals and organisations, both national and international, ranging from farmers, students, industrialists, financial institutions, State and Central Government Departments, Members of the media, and the general public as well as bilateral and multilateral development organisations. All this made today possible. As a token our gratitude to our principal donors we shall name some of our laboratories after those mentioned in the printed brochure.

Every one present here has played a role in converting an idea into reality. My colleagues and I are overwhelmed with a sense of gratitude. Having watched this building come up brick by brick during the past 14 months, my first feeling of indebtedness goes to the numerous women and men workers who toiled in sun and rain, often long hours but always with a smile, to bring into existence this facility. I have assured them that we, in turn, will work hard to contribute to the improvement of the quality of life of the poor and thereby prove worthy of their smile.

The printed brochures contain acknowledgements to the many who have been involved in various capacities in the design and construction work and to whom our heartfelt thanks go. I would particularly like to express our tribute to the Architect, Mr. A. Venkat for his creativity and commitment to the cause of

blending the traditional and the modern in architecture and to the Chairman of the New Metro Construction Company, Mr. M. Balasubramaniam and his dedicated assistants, Mr. Jai Krishna and Mr. Gandhi for their cost, quality and time-consciousness. Dr. Manmohan Attavar, Mr. Ramesh (Madras Electrical Consultancy) Mrs. Rohini Shankar, Mr. Muralidharan and the Blue Star Company have all rendered invaluable help. Mr. Narasimhan, Engineer on our staff, supervised the work at all stages with care and devotion.

Constraints of time prevent me from mentioning all to whom we are indebted. The different institutions in the Taramani area particularly Anna and Madras Universities, CLRI, IIT as well as the Loyola College, Tamil Nadu Agricultural University, Tamil Nadu Animal and Veterinary Sciences University and the scientific community of Madras have extended their full cooperation and guidance. My family starting with its senior member, my father's brother, Sri. M.K. Narayanaswami, who is fortunately here today, have extended moral and financial support.

I began by saying that the goal of this centre is the provision of unfettered opportunities for creative and socially relevant scientific work. This is because good science can sow the seeds of limitless possibility for improving the quality of human life within the carrying capacity of supporting ecosystems. However, science is not a magic wand with which alone we can end hunger, eradicate poverty or promote harmony between nature and humankind. These will depend largely upon political will and

action and government policies. This is why I consider ourselves particularly fortunate that we have with us today some of our eminent political visionaries.

Our Governor is widely respected for his ideals and Gandhian values. He has served the country with distinction in many areas. I thank him for his gracious presence.

The Hon'ble Chief Minister of Tamil Nadu has the distinction of being the first Chief Minister to have declared a policy of universal and compulsory primary education in an Indian state. She has initiated several action plans for ushering an era of peace and prosperity for the people of Tamil Nadu. We are fortunate to have her with us and I welcome her very warmly.

Our former President, Shri. R. Venkataraman has to his credit a glorious record of service to the country and has endeared himself to everyone by virtue of his qualities of head and heart and his humility and helpfulness. It is our good fortune that we have such a great friend, philosopher and guide in our midst.

My own professional career owes much to the guidance and encouragement received from Shri. C. Subramaniam, the architect of India's green revolution. It was he, who in the mid-nineteen sixties, helped in a big way to take the fruits of science from the laboratory to the field. Even today he is working tirelessly to bring the results of modern technology to the dry lands.

Mr. Krishna Kumar, the Minister of State for Non-conventional Energy Sources and Agriculture has shown his characteristic dynamism within a short period of time in transforming a small government programme for harnessing solar and wind energy into a mass movement. The installation here with the support of the Ministry of Non-conventional Energy Sources and the Department of Scientific and Industrial Research of the Government of India of a new system of solar power generation designed by Central Electronics Limited is a reminder that the use of solar energy more widely in our laboratories and Gene Banks is an idea whose time has come.

We began this function with a moving rendering by Sangeetha Kalanidhi Dr.M.S.Subbulakshmi of a song composed by Paramacharya, the sage of Kanchi, whose birth centenary falls next month, appealing for universal peace and love. I thank her and Shri. Sadasivan for their inspiring presence. The scientists currently participating in an International Dialogue on Eco-technology and Rural Employment here in Madras have brought home the point that though the technological and economic strengths of individual nations may vary, our collective ability to promote a world without hunger, poverty and environmental degradation is considerable. I thank them as well as the Members of the Diplomatic community for their presence.

Between them, China and India have nearly 40% of the human population. Sharing of experiences between our two nations is therefore extremely important for the future of global food and

ecological security. I am therefore happy we have with us H.E. Dr.Song Jian, Minister He Kang, H. E. the Ambassador of China to India and several distinguished Chinese experts. I am equally happy that the Trustees of the Hunger Project and of the National Foundation of India are here. I welcome all of them.

For good scientific research and training, adequate infrastructure in the form of laboratories and equipment is essential. However, it is the creativity, social concern, team spirit and hard work of the scientists and staff of a research institution that determine the relevance and excellence of its output. In this respect, we have been extremely fortunate and I want to thank my colleagues for their single minded devotion to the ideals of the centre. I also thank our Trustees and office bearers of the Society for the time they are so generously giving for the centre.

I welcome each and every one of you and appeal for your continued guidance, encouragement and support.

May I now request the Hon. Chief Minister to light the Kuthuvillakku, the traditional symbol of cheer, hope and wisdom.

WEDNESDAY, APRIL 14, 1993

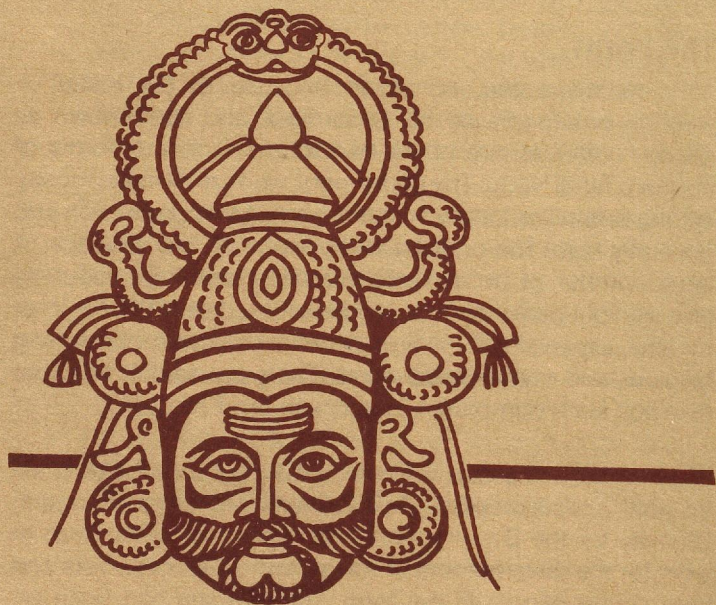
MINUTE TO MINUTE PROGRAMME

| | | |
|-------------------|---|--|
| 5.15 to 5.30 p.m. | Visit to Gene Bank of Endangered Plant species and exhibition | |
| 5.30 to 5.38 | Invocation | : Sangeetha Kalanidhi Smt M.S.Subbulakshmi |
| 5.38 to 5.44 | Welcome | : Dr M.S.Swaminathan |
| 5.44 to 5.46 | Lighting of Kuthuvilakku | : Hon.Dr.J.Jayalalitha |
| 5.46 to 5.54 | Keynote address | : Shri C.Subramaniam |
| 5.54 to 6.10 | Felicitation | : Dr Song Jian : Ms Joan Holmes : Prof.Kenzo Hemmi : Dr.E.A. Siddiq |
| 6.10 to 6.17 | Presidential Address | : Shri R.Venkataraman |
| 6.17 to 6.21 | Switching on the Solar Power Generator | : Shri S.Krishnakumar |
| 6.21 to 6.28 | Dedication address | : Hon.Dr.J.Jayalalitha |
| 6.28 to 6.35 | Inaugural address | : Hon.Dr.Bhishma Narain Singh |
| 6.35 to 6.38 | Vote of thanks | : Dr Vineeta Hoon |

NATIONAL ANTHEM

Panchabhootam

an experiment in development theatre



Folk Theatre for Development Communication

Traditional performing media, often called folk performing arts, have a long, rich and sophisticated performing tradition and can hence play a tremendous role in development communication. Speaking easily in the idiom of the people, traditional performers are skilled communicators with an intimate knowledge of their audiences. Though the content of these performances is usually built around religious or mythological themes, at a deeper level they are concerned with universals of the human condition; so there is no reason why they cannot deal with significant contemporary issues and themes, within the framework of media whose forms and devices are well understood by the people.

With this perspective, the M.S. Swaminathan Research Foundation, which is mandated to combine the best of traditional with modern approaches to achieve its goal, embarked on the project of developing plays in traditional media carrying messages related to conservation and sustainable development. The art form chosen for the first venture was *Kattaikkoothu* and the message - conservation of natural resources, the forest being the key to the harmonious long-term existence of Man in Nature.

The Form

Kattaikkoothu, so called because of the *Kattai* or wooden ornaments of the performers, and also known as *Therukkoothu*, is one of the traditional folk drama forms of northern Tamil Nadu. The performers, who are all male, mostly belong to families for whom this is a hereditary profession and generally learn the craft by early exposure and practice. A large number of professional *Koothu* companies regularly give all-night performances in rural areas, during the summer months, especially at the time of certain festivals, performing religious and mythological plays. There are said to be more than 300 such companies in northern Tamil Nadu.

In 1990, a group of *Koothu* artists got together and set up the *Kattaikkoothu Kalaivalarchi Munnetra Sangam*, (Society for the Development and Promotion of *Koothu*) to work for the development of the art form, support artists and train young people in the form. The *Sangam* has been or-

ganising an Annual *Kattaikkoothu* Festival in Kanchipuram in January-February every year since 1991. The *Sangam* also runs a *Kattaikkoothu* training centre for children and youth, including, for the first time, girl students - a bold step, since *Koothu* is traditionally performed only by men.

This year the *Sangam* took up, in collaboration with the M.S. Swaminathan Research Foundation, and with the financial support of the Sasakawa Peace Foundation (Japan) the idea of working on a new play, using the traditional form to convey specific 'developmental' messages. It was decided to use the off-season winter months to rehearse and stage the play in a number of rural locations, since the artists are free at this time. *Pancha Bhutam* (The Five Elements) is the first full-length experimental play to be attempted in this style and has been performed in sixteen villages between December 92 and February 93.

The Director

The play has been written and directed, and the songs composed, by P. Rajagopal, President of the *Sangam* and himself a renowned *Koothu* artist. Rajagopal had earlier written and produced a two-hour children's play entitled *Enkalukum Uyir Undu* (We Also Live) on the theme of the importance of conservation of trees, which was performed by the students of the *Kattaikkoothu* Training Centre in 1990-91 under the National Environmental Awareness Campaign.

The Performers

Twenty-five professional artists, including musicians, from several different *Koothu* companies joined together for this series of off-season performances. Most are outstanding performers, and several are very young, including children and youth from the *Kattaikkoothu* training centre.

The Process

The play *Pancha Bhutam* grew out of a series of interactions between Rajagopal (and a few other *Koothu* artistes) on the one hand, and development professionals (educators, scientists and communicators) on the other. As *Koothu* depends largely on the oral performance and interpretation of the text by the performers, this process of modification

continued not only during the rehearsals, but even during the performances. Using feedback from audience, critics and colleagues, the play was being constantly reworked, so that the final performance was more evolved than the first one.

The Story

The play opens in conventional style with a scene at the heavenly court of **Indra**, king of the gods, where the sage **Narada** points out to the gods the sad and devastated state of the Earth. Down below, the people and the village leaders of **Pavazhanadu**, a kingdom on Earth, are puzzled about the cause of the continued troubles afflicting them - drought, famine, disease and destruction. The villagers request the protagonist, a village youth named **Bhagirathan**, to find the answer and save the village. He sets out on the quest for a solution, accompanied by his wife, **Panchavarnam**, (Note: **Bhagirathan** is the name of a famous mythological character who, by his perseverance, brought the river **Ganga** to Earth).

Meanwhile the five elements, *Pancha Bhutam* (earth, fire, air, water and space) disgusted by the treatment given to them by human beings, revolt and leave Earth. They go to **Mt. Kailas**, the abode of **Lord Siva**, to complain about their troubles, and there refuse to return to Earth. **Lord Siva**, unable to coax them to return, disguises himself as a *sanyasi*, (holy man) and comes down to Earth to guide the two young people. He tells them the cause of their troubles and explains that the only way to bring back the *Pancha Bhutam* is to grow a forest, since the forest alone can protect and nurture them. Not only that, they must grow a forest of one crore (ten million) trees in one night. They are stunned by the size of the task, but decide to try. They meet many dangers and difficulties, as they seek the help of the village community, the village leaders/elders, and the friendly animals, to fulfil the task in time. Through many adventures, some frightening and others comic, they realise the importance of forests in protecting the five elements and conserving Mother Earth, as well as the lesson that success depends on united effort. In the end, harmony is restored as **Ganga** falls graciously once more to Earth, and **Man and Nature** learn to live together.

Some Unique Features of the Play

- The 'development' theme is tackled entirely through the theatrical and narrative devices and forms of *Koothu*. The 'problem' posed in the story is solved within the framework of the story itself, by twists and turns of the plot, introduction of new characters and typical *Koothu* conventions. The play makes full use of the *Koothu* device of the *Kattiyankaran* who elucidates many new concepts while performing his functions as herald, narrator, and comedian, reacting with swift wit and repartee to each situation. Another typical feature of *Koothu* is the rich comedy and brilliant improvisations based on observations of daily life which are skilfully woven into the texture of the play.
- Animal characters, symbolising the forces of Nature, use some degree of naturalistic acting; but consistent with the dramatic conventions of *Koothu*, the animals speak only among themselves and not with human beings. The animals in the story, led by the elephant, offer their help to human beings in characteristic ways: the bullock ploughs the land, the sheep fertilises it, the parrot scatters the seed, the elephant waters the plants and the dog guards the plot.
- The conceptualisation of *Pancha Bhutam* is also according to *koothu* conventions - *Agni* (fire) and *Vayu* (air) are male *Kattaivesham* while *Ganga* (water) and *Bhoomi* (earth) are female *Kattaivesham*. (The latter is quite rare in *Koothu*). *Akasha* (space) planned as a hermaphrodite, is shown as a neutral male figure. The *Pancha Bhutam* enter with a typical *koothu* style *thirai pravesam* (curtain entry).
- The *Nattanmaikkarar* or village elders are realistically costumed and humorously depicted, even held up for questioning. Through these characters, village class and caste relations are gently satirised and the way in which vested interests in the village exploit situations for their own benefit is portrayed with effective irony.
- The female protagonist is a strong, charming and autonomous character, and the husband-wife relationship a tender one. The degree of gender equality shown here is rare in *Koothu*.

- Costumes and masks specially devised for this show, give special attention to colour schemes. The animals wear prominent head masks, with faces covered, and loose robes allowing free movement. The use of masks is itself an innovation in *Koothu*, which normally relies entirely on elaborate facial make-up. Each of the *Pancha Bhutam* is costumed fully in one dominant colour, using the following colour scheme. *Agni* - red, *Ganga* - blue, *Bhoomi* - brown, *Vayu* - black, *Akasha* - white.

The Audiences

The play, which addresses the traditional *koothu* audience in its usual open-air village setting, has been well received. Usually the audience already knows the story to be performed; but in this case, though the story was unfamiliar, it was observed on several occasions to not only seem to have been followed but greatly appreciated. The crowds sat right through the chilly nights, wrapped in shawls, offering the best tribute that could be expected, in a situation where audiences can and sometimes do, vote with their feet. Requests for performances have already come in and it is expected that this new play will soon find its way into the regular repertoire of *Koothu* performances sponsored by village communities.

Documentation

The play has been documented on video-tape, in a compact 45-minute presentation carrying the essential message as well as the flavour of the live performance, with both Tamil and English sound tracks. The video cassette is available for use as a tool for awareness creation.

Kattaikkoothu Kalai Valarchi

Munnetra Sangam

70 Vedasala Nagar

Sevilimedu P.O.

Kanchipuram - 631 501

M.S. Swaminathan

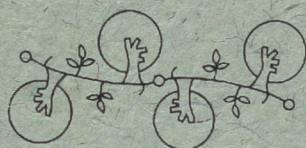
Research Foundaton

3rd Cross Street

Taramani Inst. Area

Madras - 600 113

**N. I. Vavilov Research and Training Centre
for Sustainable Management of
Biological Diversity**



M. S. SWAMINATHAN RESEARCH FOUNDATION

M.S. SWAMINATHAN RESEARCH FOUNDATION

N.I. Vavilov Research and Training Centre for Sustainable Management of Biological Diversity

**Special facilities for arresting genetic erosion and promoting
the sustainable use of biological diversity**

1. SAVING THE ENDANGERED SPECIES

The M.S. Swaminathan Research Foundation, Madras has established a greenhouse for growing and multiplying endangered plant species of the Western and Eastern Ghats, listed in the "Red Data Books of Indian Plants", published by the Botanical Survey of India in three volumes (1987, 1988 and 1990). These volumes list 814 species, under threat largely due to the destruction of habitats. They are categorised as follows.

- a. Vulnerable
- b. Rare
- c. Endangered
- d. Possibly extinct/Presumed extinct
- e. Indeterminate

Status in Tamil Nadu

| Category | No. of species |
|--------------------------------------|----------------|
| a. Vulnerable | 23 |
| b. Rare | 44 |
| c. Endangered | 30 |
| d. Possibly extinct/Presumed extinct | 18 |
| e. Indeterminate | 8 |
| Total | 123 |

Potential for multiplication of the endangered species through sexual and/or micro propagation using tissue culture techniques and mist propagation chambers, will be studied.

The greenhouse will serve as a "live" gene bank of endangered species and will be an *ex situ* source for supplying 'live' plant material for conservation work.

A Tissue Culture Laboratory has been established to develop protocols for *in vitro* propagation of selected endangered species. The Mist Propagation Chamber will help to multiply rapidly elite material. The aim of these experiments is the production of large numbers of the endangered plants both for reintroduction in their native habitats and for screening for potential economic value.

2. COMMUNITY BIODIVERSITY PROGRAMME

The Community Biodiversity Programme of the Foundation aims to bring institutions like the Botanical Survey of India, Tropical Botanic Garden and Research Institute, Trivandrum, Institute of Forest Genetics and Tree Breeding, Coimbatore, Kerala Forest Research Institute, Peechi, and the N.I. Vavilov Centre for the Conservation and Sustainable Management of Biological Diversity of the M.S. Swaminathan Research Foundation into a collaborative partnership with non-governmental organisations and community groups in the urgent task of halting genetic erosion in the Western and Eastern Ghat regions of Tamil Nadu and Kerala. A Biodiversity Network including rural women and men as

well as professionals is being developed for linking both the formal and informal systems of conservation and sustainable utilisation of plant genetic resources in mutually reinforcing manner.

Plants will be assessed for their medicinal or other economic value, and propagation methods will be standardized to produce these selected plants in bulk. These will then be distributed to tribal and rural families for cultivation, so that the economic benefits of growing such plants, and of conserving natural populations, will accrue directly to rural women and men. Tie-ups between rural growers/producers and manufacturing/processing firms will be promoted.

3. COMMUNITY GENE BANK

Between now and 2000 AD, India's population is expected to reach about 1000 million. Simultaneously, farmland is expected to be engulfed by urbanization and environmental degradation of a large scale. For maintaining a satisfactory food security system, crop production should increase by 3% a year, with most of the increase coming from greater productivity on existing farmland. National food security depends heavily on our ability to breed better adapted and high yielding food crops. This is not an impossible task because between 1960 and 1980, cereal yield increased by about 750 kg per hectare, thanks largely to new high yielding cultivars.

The success behind the breeding programmes largely depends on the availability of wider germplasm, particularly land races and wild relatives of crop plants - cultivated by tribal and rural families. These land races are uniquely adapted and are genetically diverse forms of cultivated plants and hence serve as repositories of valuable genes particularly for tolerance/resistance to a wide range of biotic and abiotic stresses.

Tribals living in remote areas are less influenced by the outside world and hence, are still cultivating traditional cultivars and landraces. They thus serve as custodians of valuable genetic wealth. It is in recognition of their unique role in the conservation of culture and biological wealth that the United Nations has declared 1993 as "*The Year of the World's Indigenous People*". The theme for the year is "*Indigenous People: New Partnership*". The Community Gene Bank Programme is a contribution to strengthening this partnership. Many of the tribal areas are in the process of urbanisation and modernisation. Hence, there is an urgent

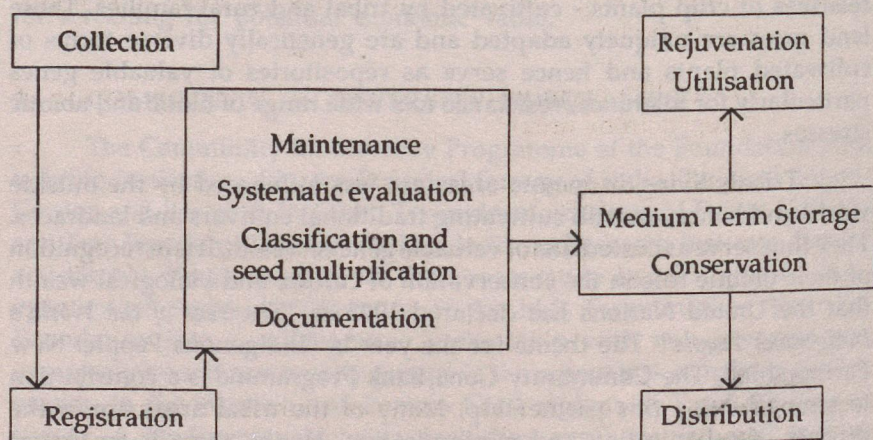
need for the collection, identification and conservation (both *ex situ* and *in situ*) of the germplasm available with the tribals/aboriginals.

The *ex situ* conservation will be done mainly by preserving the germplasm (mostly seed material) in a medium term cold storage facility where seeds can be stored for about 5-7 years at 4 degrees Celsius and 25% relative humidity, in the Community Gene Bank (CGB), of the M.S. Swaminathan Research Foundation, Madras. The gene bank will be linked to the long term seed repository at the National Bureau of Plant Genetic Resources, New Delhi, which would also share the duplicate samples collected by the centre. It is also planned that the *ex situ* conservation effort will be supported by screening and multiplication using tissue culture and propagation under greenhouse conditions.

The *in situ* conservation will be done by working with the tribal families and rural communities to continue the cultivation of these invaluable land races. The germplasm thus collected will be used to evaluate the land races for useful traits, and in turn used for the improvement of crop varieties.

Collection: Collections will be crop plants and land races from the tribal areas. They would include those of relatives of cultivated crop plants, rare and endangered species and medicinal plants. The Gene Bank would aim at collecting only such material that is not being carried out by other agencies. All the collections will be available for those interested and the details collected will form the basis for creating a database.

COMMUNITY GENE BANK ACTIVITIES



4. GENETIC GARDEN FOR SUSTAINABLE MIXED FARMING

At the Livestock Research Station at Kattupakkam, Chengalpattu-M.G.R. District, about 40 km south of Madras, the Foundation has established, in collaboration with the Tamil Nadu Veterinary and Animal Sciences University, a Genetic Garden for Sustainable Mixed Farming which will serve as a *Biological Software Library* for promoting sustainable advances in crop productivity.

The Genetic Garden will have several components including nitrogen-fixing tree species, tree species of economic value yielding food, fruit, fibre, firewood and fodder, medicinal plants of veterinary importance, high-yielding and improved varieties of fruit species, species that are resistant to biotic and abiotic stresses and species resistant to insect pests.

The Sustainable Soil Health Software Library will provide the most appropriate material to users, depending on the nature of the soil and farming system. The software would include items to help improve the chemical, physical and microbiological aspects of soil fertility maintenance.

Some examples of such software are :

- Vermicomposting (using earthworm cultures for converting agricultural waste into fertile humus)
- Nitrogen-fixing tree and shrub species including stem nodulating species
- Species like neem whose seed cake helps in slow release of nitrogen from urea
- Rhizobial cultures, *Azolla* and blue-green algae
- Plants which produce biological compounds inhibiting soil borne pests
- Plants of use in soil conservation
- Plants which serve as perennial sources of high biomass production.

5. GENETIC RESOURCES CENTRE FOR ADAPTATION TO SEA LEVEL RISE

Mangrove ecosystems, which constitute a bridge between terrestrial and aquatic ecosystems, are seriously threatened by human interference. Keeping in view the possible problems arising from global warming in the future, immediate steps are required to conserve the existing mangrove species and the genetic diversity within them.

A global strategy has been prepared by the Foundation in collaboration with the International Tropical Timber Organisation (ITTO) for collection and preservation of mangrove genetic resources. The establishment of the Mangrove Genetic Resources Centre, at Pichavaram (Tamil Nadu), with the cooperation and assistance of the Tamil Nadu State Forest Department and the Department of Biotechnology, Government of India, is the first step in this direction. The proposed ITTO sponsored global network of such centres would help to preserve for posterity a representative sample of existing genetic variability in Mangrove ecosystems. The establishment of a National Network of Mangrove Genetic Resources Centres is under the consideration of the Ministry of Environment and Forests, Government of India. A Mangrove Ecosystem Information System (MEIS) has also been established. A Training Manual for training Managers of Mangrove Genetic Resources Centres has been prepared.

6. SACRED GROVE CONSERVATION PROJECT AT ST. THOMAS MOUNT

The concept of Sacred Groves is very old in India right from the day when forest management was first thought of by Chanakya, an able minister during the Chandragupta period. Certain forest areas were marked as places for *Ashram* where sacred people worshiped and thereby preserved the forests by preventing activities like felling of trees and hunting of animals.

In recent times sacred groves are maintained as patches of vegetation of clumps of trees, preserved due to sacred beliefs, which strictly prohibit human entry excepting at the time of local deity's festival. However, due to the population explosion and for want of forest produce and grazing areas, these sacred groves have been treated as common property resource which lead to their gradual degradation and disappearance.

And hence a project on Sacred Groves was conceived, to generate both an awareness of the need for conservation and of the ecological and economic benefits that will accrue due to protection and conservation of trees and plants. This will definitely foster a healthy human-nature relationship which will go a long way in conservation and protection of the environment. The area selected for this project is St. Thomas Mount located near Madras city a site of great historical and spiritual significance. The St. Thomas Mount Sacred Grove is being established in collaboration with the World Wide Fund for Nature - India (Tamil Nadu Branch).

ACKNOWLEDGEMENTS

The M.S. Swaminathan Research Foundation wishes to place on record its deep gratitude to the Swedish International Development Authority (SIDA) for its generous assistance for establishing Greenhouse and Mist Propagation Chambers as well as the tissue culture facility for saving endangered plant species. The work involving the erection of the greenhouse and the Mist Propagation Chamber was taken up by M/s. Indo American Hybrid Seeds, Bangalore. Dr. Manmohan Attavar, President and Dr. K.R. Bhandary, Technical Director of IAHS have spared no effort in making it a model of perfection. We are grateful to Mr. Don Sharp for his guidance and help. Endangered 'live' planting material to be kept in the greenhouse has been made available through the kindness of the Directors of the Tropical Botanic Garden and Research Institute, Trivandrum, the Institute of Forest Genetics and Tree Breeding, Coimbatore and the Kerala Forest Research Institute, Peechi. We acknowledge the help of M/s. Octanorm India Limited in the fabrication of the tables for keeping the rare plants. The programmes relating to the organisation of the Community Biodiversity Network, NGO Biodiversity Forum, training programmes for rural women and men and establishment of Sacred Groves have been generously supported by the Sasakawa Peace Foundation and SIDA. We are indebted to Ms. Masayo Hasegawa of the Sasakawa Peace Foundation and Dr. Marie Bystrom of SIDA for their deep interest in this work and for their encouragement.

The Community Gene Bank has been established with the kind support of the Government of Italy through the International Board for Plant Genetic Resources (IBPGR). M/s. Blue Star took up the

installation of the dehumidifiers and air conditioning systems and the National Bureau of Plant Genetic Resources (NBPGR) provided the necessary technical guidance.

We gratefully acknowledge the support and co-operation of Dr. V. Gnanaprakasam, Vice Chancellor, Tamil Nadu Veterinary and Animal Sciences University and his colleagues at the Livestock Research Station, Kattupakkam for providing land and other facilities for the establishment of the Genetic Garden for Sustainable Mixed Farming.

We are also deeply indebted to the Tamil Nadu Forest Department for its whole hearted support and cooperation in the establishment of the Mangrove Genetic Resources Centre at Pichavaram.

Our thanks are due to the Department of Biotechnology and Ministry of Environment and Forests, Government of India and the International Tropical Timber Organisation, Japan for their financial assistance in setting up the Genetic Resources Centre for Adaptation to Sea Level Rise at Pichavaram. We also wish to thank the following for providing technical support and other facilities for undertaking this work.

Indian Agricultural Research Institute, New Delhi.

International Centre of Genetic Engineering and Biotechnology,
New Delhi.

SPIC Science Foundation, Madras

Centre for Advanced Studies in Marine Biology, Porto Novo,
Tamil Nadu.

Centre for Advanced Studies in Botany, University of Madras,
Madras.

Institute of Remote Sensing, Anna University, Madras.

National Remote Sensing Agency, Hyderabad.

M. S. Swaminathan Research Foundation

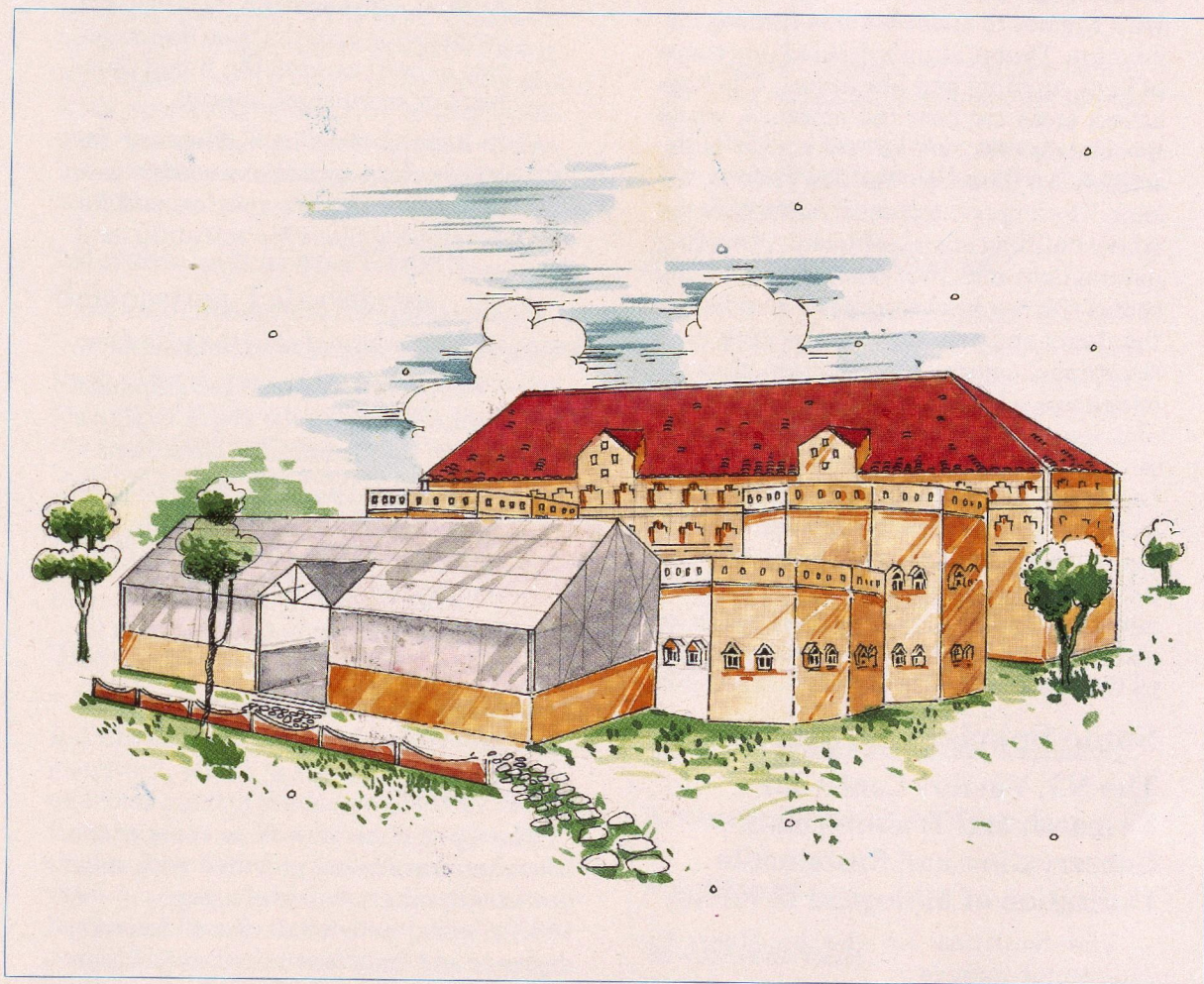
3rd Cross Street

Taramani Institutional Area

Madras - 600 113 INDIA

Tel. : (044) 2351299

Centre for Research on Sustainable Agricultural and Rural Development



**M.S. SWAMINATHAN
RESEARCH FOUNDATION**

The Centre for Research on Sustainable Agricultural and Rural Development, built on land kindly made available on long lease by the Government of Tamil Nadu, has been conceived with a double helix as the design symbol. An octagon of 14.85 m x 14.85 m has been used as the basic module of the building, interlinked with squares to achieve a free-flowing circulation. The building is divided into zones of high, medium and low access. The high access areas are near the entrance, while the laboratories, where low access is essential, are found on the first floor at the back. The large central courtyard makes the whole building energy-efficient, providing natural light and cross ventilation to all the rooms. Timber has been totally avoided for the doors and windows, in keeping with the ethos of conservation. Though planned to house a scientific institution, traditions of Indian architecture have not been forgotten, reflected in the open-to-sky central courtyard, the sloping tiled roofs and the facade. The facilities in the building include laboratories, training hall and seminar room, library, greenhouses, Gene Bank and mist chambers, besides work space for staff and visiting scholars and an administrative area.

Some Special Features

The N.I. Vavilov Centre for Research and Training on the Conservation and Sustainable Utilisation of Biological Diversity

The facilities for the biodiversity programme include :

- A living Gene Bank of endangered plant species of Tamil Nadu and Kerala.
- A Community Gene Bank for the conservation of seeds of land races, primitive cultivars and wild species collected from tribal areas and hot-spot locations in the Western and Eastern Ghats.

- A Herbarium of rare species and plant material conserved by tribal families.
- A Tissue Culture facility for propagating rare and endangered species as well as for undertaking genetic enhancement research.
- A Mist Propagation facility for propagating material from tissue culture as well as from the living Gene Bank of endangered species.
- A Remote Sensing Laboratory for monitoring coastal biodiversity- particularly mangrove species, and for developing plans for scientific land use.

Financial support for these facilities has been generously provided by the following:

- Swedish International Development Authority for all the above facilities except the Community Gene Bank.
- International Board for Plant Genetic Resources with funds provided by the Government of Italy, for the Community Gene Bank.
- Swiss Development Cooperation for equipment.
- Department of Biotechnology, Government of India, for equipment.

Solar Power

The Gene Bank as well as some of the laboratories are being provided with solar power as a primary source of energy. A 10 KVA solar photovoltaic system has been designed and installed by Central Electronics Ltd. Financial support for using solar power as a primary source of energy has been provided by the Ministry of Non-conventional Energy Sources and the Department of Scientific and Industrial Research of the Government of India.

Electronic Library

The CD-ROM library to be established in collaboration with the C.A.B. International

with financial support from the British Council, will serve the user community by providing the latest information, through display, demonstration and training in the use of modern information technologies. It would include a microcomputer network, an on-line information system, CD-ROM Information Services, and an electronic database, particularly CD-ROM databases, in the field of agriculture and allied areas. The library would cater to the needs of a wide spectrum of users including scientists, technologists, researchers, students, industrial houses, managers, administrators and others.

Microbiological and Genetic Engineering Laboratories

These laboratories, supported financially by the Department of Biotechnology, Government of India, are intended for developing biological software essential for sustainable agriculture, such as new nitrogen-fixing plant varieties, genetic material possessing tolerance to biotic and abiotic stresses and organisms useful for biomonitoring and bioremediation.

The Courtyard Garden

Biodiversity was chosen as the theme for the landscape design of the central courtyard, which is the major open space and focal point of the centre. Inspiration for this design was derived from *Tolkappiyam*, the ancient Tamil grammar written over 2000 years ago, which has classified the land of the Tamils into five agro-ecological zones. This scheme was adopted not only because it reflects the knowledge and perceptions of our forbears, but also because it is exhaustive in its characterisation of land use, people, fauna and flora and the social and cultural aspects of each category.

The following are the five agro-ecological zones described in *Tolkappiyam*, which will be represented symbolically in five areas united by a central water body.

- *Kurunji* : Hills and associated hilly environs, where hunting and gathering are the main occupations.
- *Mullai* : Forests and wooded lands associated with pastoral systems.
- *Marutham* : Cultivated lands of the plains and river courses where agriculture is dominant.
- *Neithal* : Coastal belts where fishing and sea-based livelihood are found.
- *Palai* : Desert lands recognised to result from degradation of Mullai and Kurunji.

An expression of thanks

A debt of profound gratitude is due to our many supporters, including friends and well-wishers, former students and colleagues. But for their financial and moral support, this centre could never have taken shape.

Rooms are being named in honour of the following

M.K. Sambasivan and S. Thangammal

M.K. Narayanaswami and N. Rajammal

S. Bhoothalingam and B. Mathuram

B.R. Barwale

Ramkrishna Bajaj

Norman Borlaug

John and Alice Tyler

Soichiro Honda

ACKNOWLEDGEMENT

M/s. Nataraj & Venkat

M/s. New Metro Construction Company

C.V. Muralidharan

Alex Jacob

M/s. Madras Electrical Consultants

M/s. Indo-American Hybrid Seeds

M/s. Central Electronics Limited

M/s. Rohini Shankar Associates

M/s. Tropics

M/s. Blue Star

Architects

Builders

Airconditioning Consultant

Structural Consultant

Electrical Consultants

Greenhouse Construction

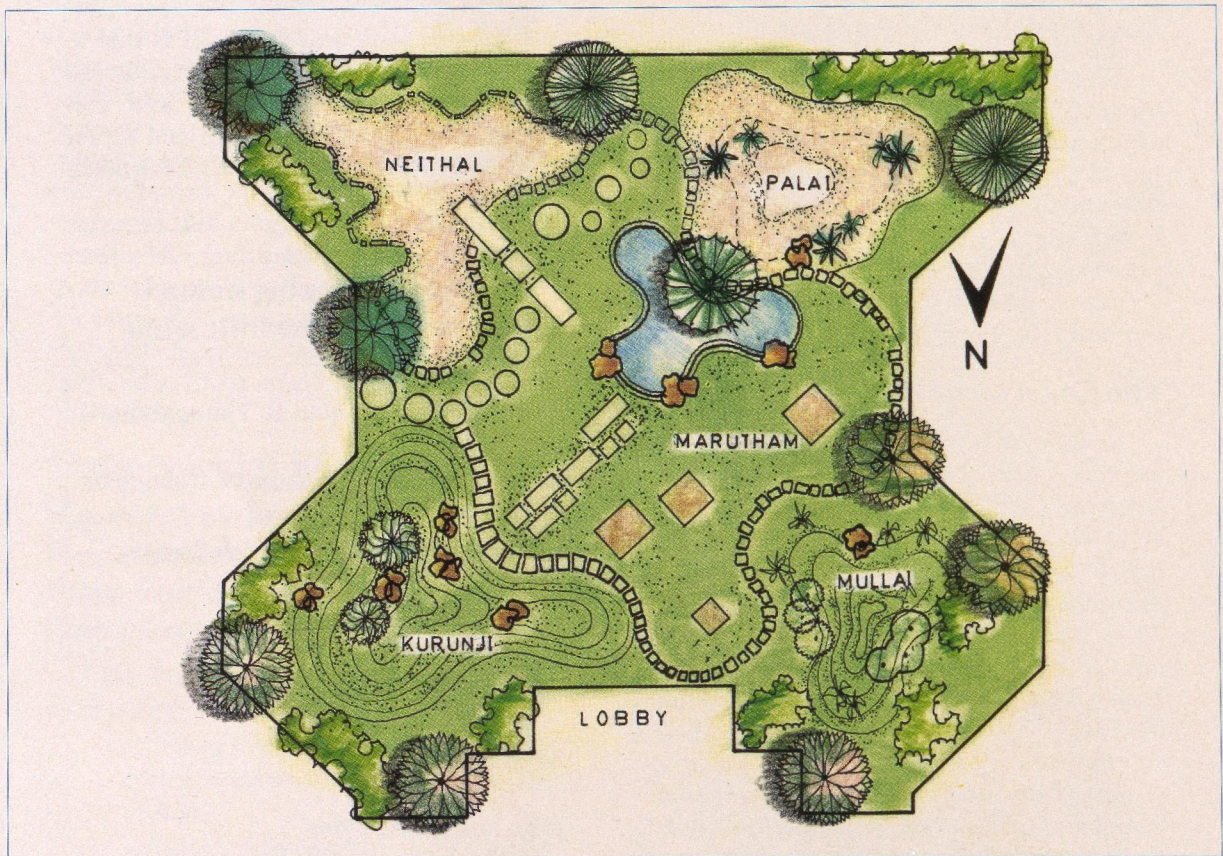
Solar Power Generator

Designers

Landscape Consultants

Community Gene Bank

Central Courtyard



M.S. Swaminathan Research Foundation
3rd Cross Street
Taramani Institutional Area
Madras 600 113 INDIA
Tel. : (044) 2351299

PRAYER OF
SAINT FRANCIS OF ASSISI

Provided by the Franciscan Mission Center
St. Michaels, Arizona 86511

Lord, make me an instrument
of your peace.

Where there is hatred, let me
sow love;
where there is injury, pardon;
where there is doubt, faith;
where there is despair, hope;
where there is darkness, light;
and where there is sadness, joy.

O Divine Master, grant
that I may not so much seek
to be consoled as to console;
to be understood as to under-
stand;
to be loved as to love; for it is
in giving that we receive;
it is in pardoning that we are
pardoned;
and it is in dying that we are
born to eternal life.

Staff Song

August 6, 1993

1. Be not dismayed what ever be tide
God will take care of you
Beneath His wings of love abide
God will take care of you

Refrain

God will take care of you through every day over all the way
He will take care of you - God will take care of you

2. Through days of toil when you are tired
God will take care of you
When dangers fierce your path assail
God will take care of you

Refrain

3. All you may need he will provide
God will take care of you
Nothing you ask will be denied
God will take care of you

Refrain

4. No matter what may be the test
God will take care of you
Lean weary one upon His breast
God will take care of you

Refrain

1. Be not dismayed what ever be tide
God will take care of you
Beneath His wings of love abide
God will take care of you

Refrain

God will take care of you through every day over all the way
He will take care of you - God will take care of you

2. Through days of toil when you are tired
God will take care of you
When dangers fierce your path assail
God will take care of you Refrain

3. All you may need he will provide
God will take care of you
Nothing you ask will be denied
God will take care of you Refrain

4. No matter what may be the test
God will take care of you
Lean weary one upon His breast
God will take care of you Refrain

6

Again & Again in History

Some special people wake up

They have no ground in the crowd

They move to broader laws

They carry strange customs with them

And demand room for bold and audacious actions

The future speaks ruthlessly through them

They change the world

Ranier Maria Rilke
1899

GOLDEN JUBILEE BIOTECHNOLOGY PARK FOR WOMEN

Kelambakkam, Chennai



MISSION STATEMENT

*“To provide
opportunities for
professionally
qualified women to
take to a career of
remunerative self-
employment
through the
organisation of
environment
friendly
biotechnological
enterprises”*

Sponsored by

Government of Tamil Nadu

**Department of Biotechnology,
Government of India**

**M. S. Swaminathan Research
Foundation**

**Tamil Nadu Industrial
Development Corporation**

“.... biotechnology is a developing technology, with a view to securing the benefits of this technology to our state within a short period and providing self-employment opportunities to women entrepreneurs, a Biotechnology Park will be established exclusively for women entrepreneurs at Kelambakkam.”

Hon'ble Dr. M. Karunanidhi,
Chief Minister, Tamil Nadu

“..the launching of the First Golden Jubilee Biotechnology Park for Women marks a significant step in the technological empowerment of women”.

Hon'ble Prof. Murli Manohar Joshi,
*Minister for Human Resources Development & Science and Technology,
Government of India*

A meeting of women scientists and technologists was organised by UNDP-UNIFEM and M.S.Swaminathan Research Foundation in December, 1996 at Chennai. The members and experts realised the inherent capabilities of women in management and the need for women entrepreneurship development became a prime concern. The three day workshop focused on giving educational and vocational training in various subjects viz. entrepreneurship development, communication skills, creativity and innovation, quality management and control, inventory on resources and production management. It was also felt necessary that resources and strengths of

women need to be channelised to develop their full potential so as to take their rightful place as equal partners in all spheres. In order to give shape to these ideas, concept of setting up of Women Biotechnology' Park - a novel approach came up. This is also recognised as one of the priority areas identified by the Department of Biotechnology (DBT), Government of India, in the report of the Working Group for the formulation of the Ninth Five Year Plan (1997-2002). A Task Force on Biotechnology Based Programme for Women and Rural Development, has also been constituted by DBT during 1997-98. The Task Force members appreciated the concept and

recommended DBT's support and the proposed Park has been included among the approved programmes for commemorating the 50th anniversary of India's independence.

The Government of Tamil Nadu and the Department of Biotechnology, Government of India have approved the establishment of the first Women's Biotechnology Park in the country at Kelambakkam, located at 41 km from Chennai.

The proposed Park which is coming up in 20 acres of land at an estimated cost of Rs.10 cr. would aim to develop an integrated approach involving technology identification, incubation, dissemination, training and retraining, development of necessary techno-infrastructure through feasibility studies using the criteria of value addition and market demand.

A business plan for the Park has been prepared and the Tamil Nadu Government has entrusted the task of implementing the project to the Tamil Nadu Industrial Development Corporation (TIDCO). His Excellency The President of India, Shri K.R. Narayanan, has kindly agreed to lay the Foundation Stone for this unique Park on 29th July, 1998.

Based on the call made by M.S. Swaminathan Research Foundation, 65 women entrepreneurs have indicated interest in joining the Park as members and producers. It will be managed by professionals with active stake holder participation. Highest standards of environmental management will be adhered to, in accordance with the chapter 16 of Agenda 21, of United Nations Conference on Environment and Development (UNCED) dealing with environmentally sound management of Biotechnology.

The park will be designed based on the principle of decentralised production supported by appropriate centralised services to promote a series of high tech biotechnology based enterprises aiming to capture a number of niche markets in the areas of Ag-biotech, Food biotech, Medical biotech etc. When fully developed this Park will consist of industrial incubation centres, ultra modern multimedia information complex, quality verification reference laboratories etc. The R&D institutions, the corporate sector and the financial institutions would assist the women entrepreneurs in achieving the objectives of the Park. The Park will serve as a model to foster the technological and economic empowerment of women.

Identified Areas

Agricultural Biotechnology

Tissue culture, Ornamentals, Horti-crops, Medicinal plants, Fresh produce, Organic manure, Biocontrol agents

Food Biotechnology

Processed and Semi-processed foods, Spices and Oleo-resins, Animal and Poultry feed, Health products

Medical Biotechnology

Blood banks, Diagnostic kits, Nutrient media for routine Clinical Microbiology

Quality Control

Testing laboratories for Quality Control of Food components. Cosmetics, Clinical and Soil/Water

These activities will be supported by a Technical Resource Centre for Capacity Building, Developing Market Linkages and Information Empowerment

For further details Kindly contact :

Dr. Sudha Nair

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3rd Cross Road, Taramani Institutional Area

Taramani, Chennai 600 113

Ph : 235 1229/1698, Fax: 2351319

Chairman & Managing Director

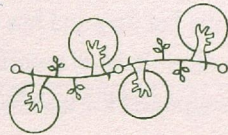
Tamil Nadu Industrial Development Corporation Ltd.

19-A, Rukmini Lakshmipathy Road

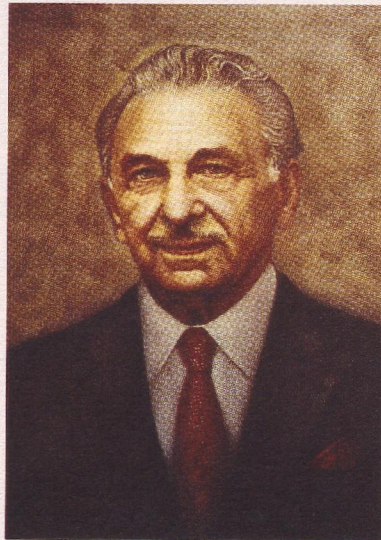
Chennai 600 008

Ph : 855 4479/80/84, Fax: 855 3729

J.R.D. Tata Ecotechnology Centre



M. S. Swaminathan Research Foundation



“No success or achievement in material terms is worthwhile unless it serves the needs, or interests of the country and its people and is achieved by fair and honest means.”

Bharat Ratna J.R.D. Tata

Inauguration
by
His Excellency The President of India
on
Wednesday, 29th July 1998

History

Established in April 1996 with the generous financial support of the Sir Dorabji Tata Trust, the work of the Centre was formally initiated on 29th July, 1996, the birthday of Bharat Ratna J. R. D. Tata. In March 1997, the Tata Trusts agreed to provide financial support for the construction of a building, and the work commenced on April 14, 1997 on 2.04-acres plot of land adjacent to the main research centre of M.S.Swaminathan Research Foundation kindly made available by the Government of Tamil Nadu. The Council for Advancement of People's Action and Rural Technology (CAPART) gave financial support for the building and has recognized the Centre as a Technology Resource Centre (TRC) for capacity building. The State Bank of India is contributing to equipping the Centre. The Ministry of Non-conventional Energy Sources has generously supported the installation of a 10 KW_p solar power panel.

Goal

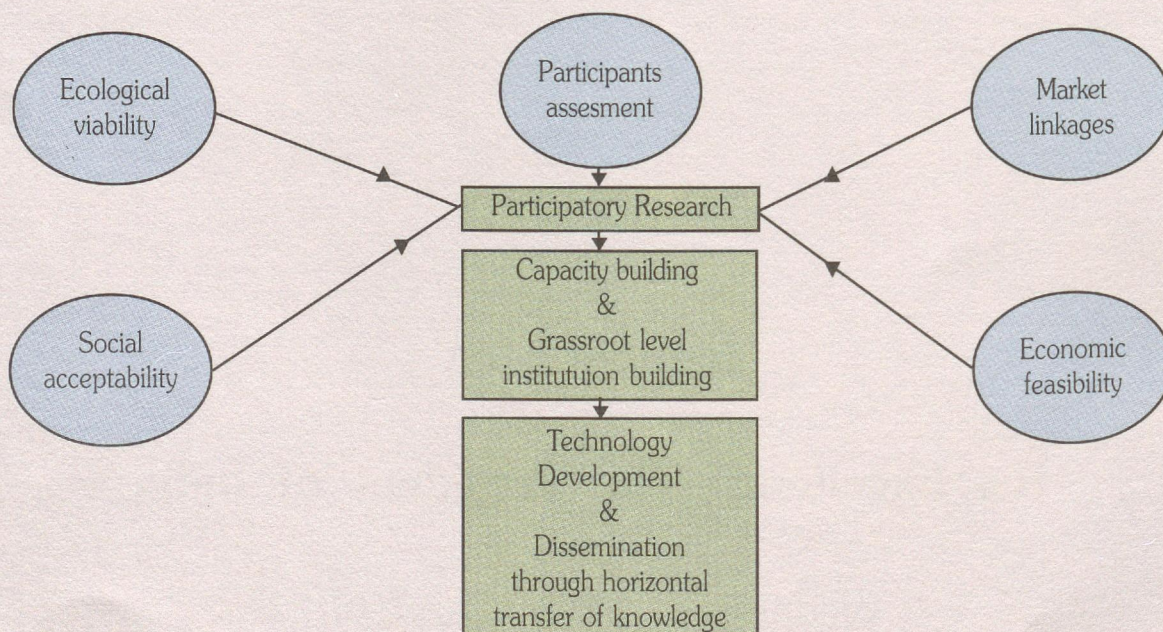
The major goal of the J.R.D. Tata Ecotechnology Centre is to seek remedies to some of the following maladies of contemporary development pathways :

- ☆ Environmental degradation
- ☆ Potential adverse changes in climate and sea level
- ☆ Endemic hunger and extensive human deprivation
- ☆ Feminisation of poverty
- ☆ Rapid expansion of population resulting in heavy pressure on the carrying capacity of the ecosystem.
- ☆ Jobless economic growth

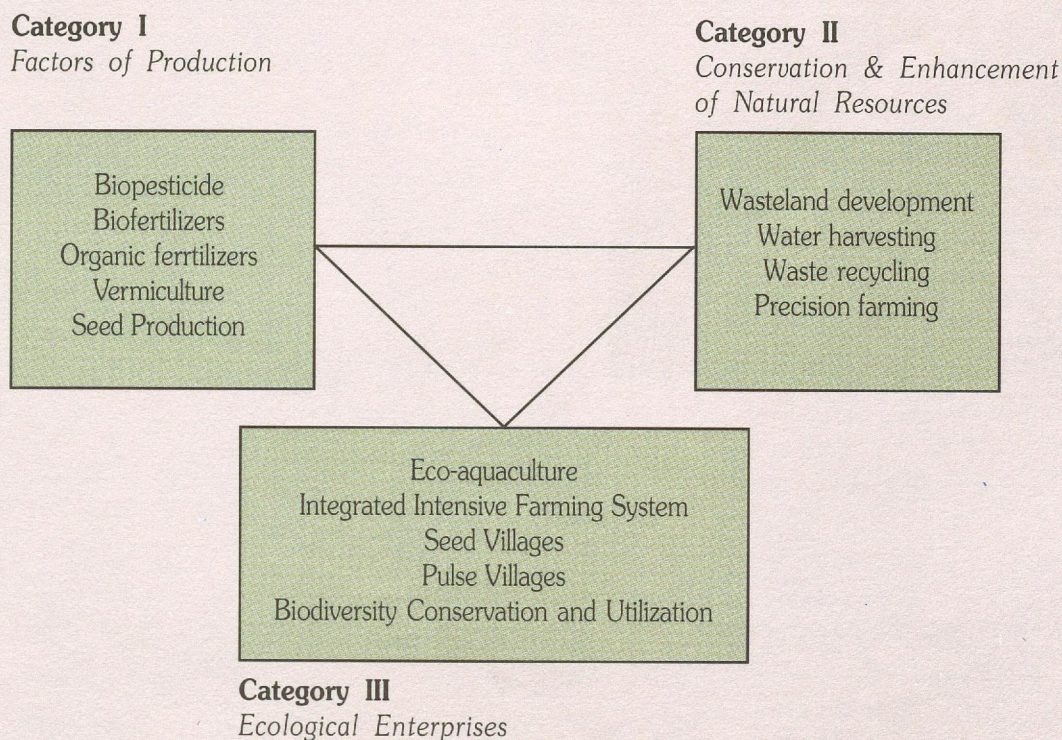
By providing sustainable options to overcome these problems, the Centre wishes to promote an 'ecology of hope'.

The pathway

J.R.D.Tata Ecotechnology Centre strives through partnerships, participatory research, capacity building and networking, to develop methods for promoting job-led economic growth based on a pro-nature, pro-poor and pro-women orientation to technology development and dissemination.



The ongoing research and training activities fall into the following categories:



In all these areas, the Centre undertakes participatory research, training and capacity building activities.

The building

Its function

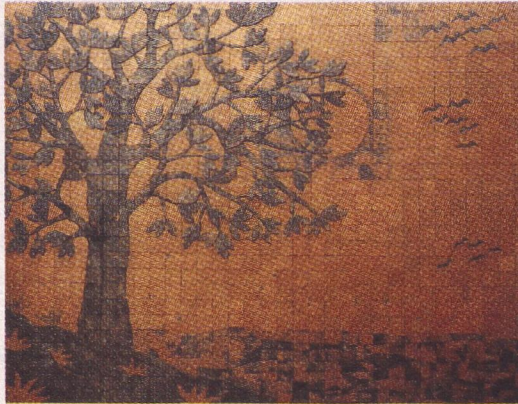
Appreciating the need for such a centre, Government of Tamil Nadu offered a 2.04 acres plot of land to M.S.Swaminathan Research Foundation, Chennai. The building will have training facilities and accommodation for 50 persons. Modern methods of training and development will blend with traditional systems of communication. Concepts like Computer-Aided Training (CAT), Computer-aided Extension (CAEx) and 'Simultaneous Distance Training' will be introduced, along with traditional folk media such as puppetry and folk arts. The building will host training programmes to the tune of 75,000 trainee days every year, covering more than 500 trainees. Besides, conferences and workshops will be conducted in areas relevant to ecotechnology.

Its structure

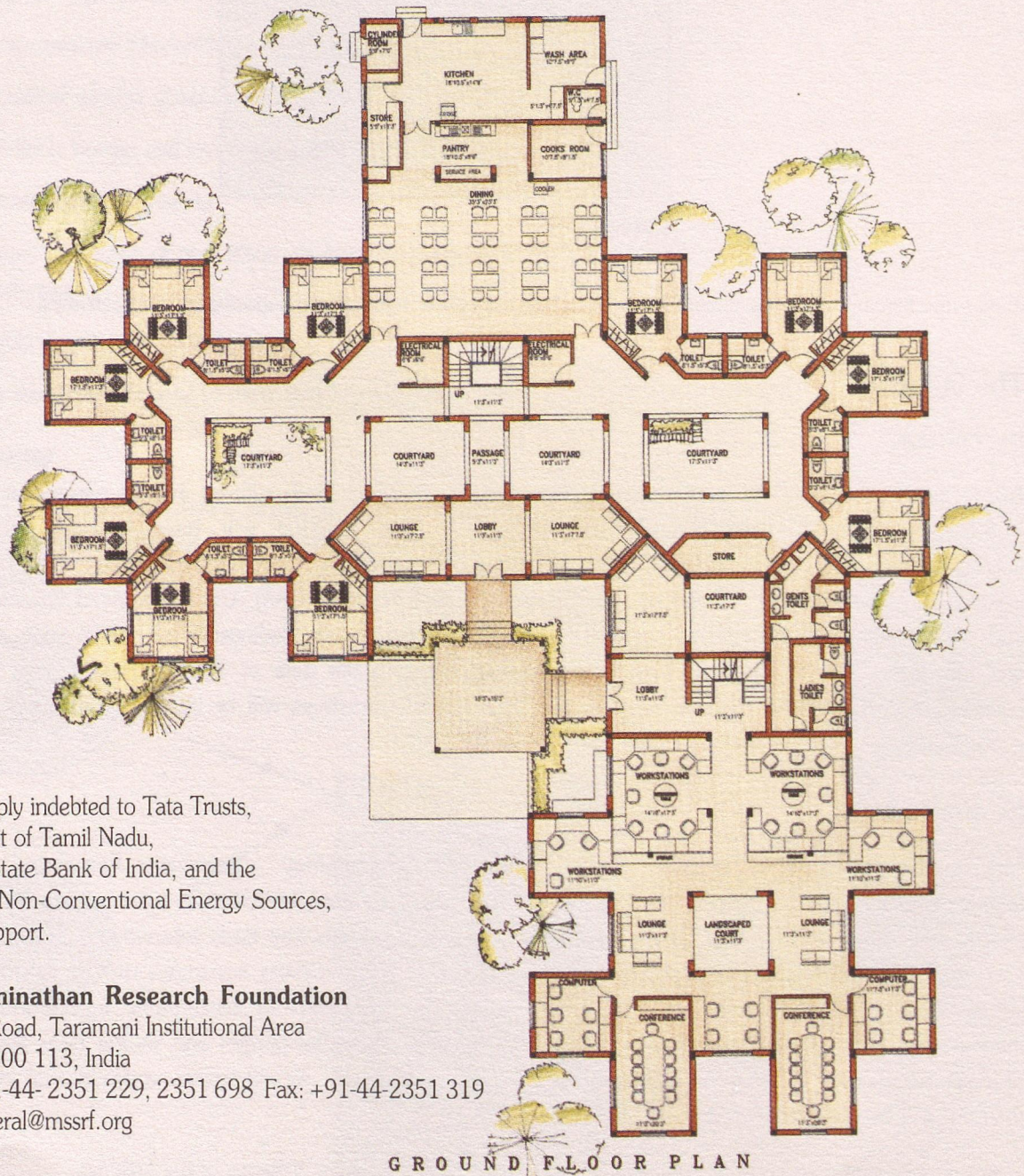
The building attempts to embody the principles of ecotechnology. Rainwater harvesting and water management systems have been incorporated along with provision for utilizing solar energy for its various energy requirements. A blend of modern and traditional structures has been interwoven. The multipurpose auditorium is a flexible space designed like a traditional koodam making maximum use of natural light and ventilation. The landscape and the garden reflect the principles of sustainable agriculture and land management such as waste-recycling and vermi-composting. A herbal garden and shelter belts illustrate ways of conserving and utilising natural resources. The concept of sacred grove, a traditional conservation method, will be given a contemporary form.

These principles and concepts are reflected in the mural which adorns the entrance of the building.

PANCHA BHOOTHAM



The tree is a living and organic symbol of the *Pancha Bhootham* or the five elements (air, earth, water, fire and space). The tree contains, integrates, represents, conserves and restores all the five elements. It binds the soil and protects the earth; saves and stores water; purifies and circulates air; transforms sunlight into usable and useful products; and shelters and nurtures many living things. *Pancha Bhootham*, symbolised by the tree, is a reminder of the roots of consciousness, a source of inspiration and a lesson in Nature's ecotechnology. The tiled mural, designed by K.Jinan was crafted by the members of KUMBHAM, a women's pottery society in Nilambur, Kerala.



We are deeply indebted to Tata Trusts, Government of Tamil Nadu, CAPART, State Bank of India, and the Ministry of Non-Conventional Energy Sources, for their support.

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GROUND FLOOR PLAN

PLANT SPECIES OF MSSRF SACRED PARK

TREES

| Botanical Name | Common Name | Family | Significance |
|---|------------------------------|----------------|---|
| 1. <i>Aegle marmelos</i> (L.)Correa ex Roxb. | Bengal quince (Vilvam) | Rutaceae | Religious value. Leaves & wood used for worship. All parts used in indigenous medicine. Fruit alkaloid - <i>Allo-imperatorin</i> ; serves as adhesive, treatment of chronic diarrhoea, dysentery, constipation & tonic for heart and brain. Green fruit - Preservative (Morabba), rind - dyeing and tanning. Root - ingredient for <i>Dasamula</i> (10 roots) used in Ayurvedic medicine. Root bark - Intermittent fevers and as fish poison; Leaves - Alkaloids <i>Aegelenine</i> & <i>Aegeline</i> - in Ophthalmia, ulcers, dropsy beriberi |
| 2. <i>Azadirachta indica</i> L. | Neem (Vepam) | Meliaceae | Religious value. Alkaloid - <i>Beta-sitosterol</i> , <i>Azaderectin</i> ; Leaf extracts - Anti diabetic, antiviral and bacterial properties, treatment of stomach worms, ulcers, used with other plants for leucoderma, mild antiseptic, aid digestion & insect repellents. Stem bark - malarial fever and cutaneous diseases. Wood - termite resistant furniture. Fruit - tonic, purgative, Seed oil - main constituent <i>Nimbidin</i> - Therapeutic; used in creams, soaps & pastes. Gum - stimulant, demulcent & tonic useful in catarrhal affections. Sap - useful in skin diseases. |
| 3. <i>Bambusa</i> sp. | Bamboo (Mungil) | Poaceae | Used as food & fodder; as timber; paper manufacturing. Used in ayurvedic medical practices for urinary infections; decoction of leaves used to treat fevers. Foliage has preservative qualities. |
| 4. <i>Bauhinia purpurea</i> L. | Geranium Tree (Mandharai) | Caesalpinaceae | Root - Carminative; root bark poisonous. Stem bark : astringent, used in diarrhoea, ulcers, dyeing & tanning industry. Flower: Alkaloid: <i>Quercetin</i> ; buds eaten as vegetable & pickled, have laxative & anthelmintic properties |

| Botanical Name | Common Name | Family | Significance |
|---|---|---------------|--|
| 5. <i>Calophyllum inophyllum</i> L. | Alexandrial Laurel (Punnagam) | Clusiaceae | Religious value. Seed oil contains <i>Calophyllolide</i> . Used for burning & as varnish for wood work, lubricant (replacement for castor oil); for soap making; unfit for human consumption. Useful in treatment of leprosy; used as stimulant in rheumatism & gout; for skin diseases. Paste of kernels used for painful joints; anti arthritic. Leaves; Inhalation for migraine & vertigo. Flowers & stamens: used as ayurvedic drugs. Fruits: has emetic & purgative properties. Stem bark: astringent; used for ulcers & sore eyes. |
| 6. <i>Couroupita guianensis</i> Aubl. | Cannon Ball tree (Nagalingam) | Lecythidaceae | Religious value. Wood fruit shells used as utensils. Pulp eaten and made into a beverage. |
| 7. <i>Delonix regia</i> Rafin. | Flamboyant flame tree Gulmohr; (Mayarum) | Leguminosae | Seed: contain gum used in food & textile industry. |
| 8. <i>Diospyros ebenum</i> Koenij. | Ebony (Tumbi) | Ebenaceae | Best ebony yielding tree; Jet black wood. Wood used for musical instruments & for furniture. Fruit: Edible. Plant: Astringent, attenuant, lithontriptic & a fish poison. |
| 9. <i>Embilica officinalis</i> Gaertn. | Indian gooseberry (Nellikai) | Euphorbiaceae | Fruits: Astringent, diuretic, cooling, laxative, eaten raw or boiled, rich source of Vit C (20 times as much as orange juice). Wood used for agricultural implements. |
| 10. <i>Erythrina stricta</i> Roxb. | Indian Coral tree; (Mullu Murukku) | Leguminosae | Flowers given as an antidote to poison. Bark: used for biliousness, fever, rheumatism, itch, asthma, leprosy & epilepsy. |
| 11. <i>Excoecaria agallocha</i> L. | Blinding Tree (Thillai) | Euphorbiaceae | Religious value. Used as fish poison. Wood used for toys. Latex: used as a caustic in treatment of ulcers. Juice used in rheumatism, leprosy, paralysis, & cutaneous affections, purgative & abortifacient. Leaves: Poisonous. Roots: used for swellings of hands & feet |
| 12. <i>Ficus benghalensis</i> L. | Banyan (Aalam) | Moraceae | Religious value. Fruits eaten in times of scarcity. Latex used to treat rheumatism and lumbago. Infusion of bark used for dysentery and diabetes. Leaves tonic and cooling. Wood suitable for paper pulp. |

| Botanical Name | Common Name | Family | Significance |
|---|---|---------------|--|
| 13. <i>Ficus religiosa</i> L. | Peepal (Arassam) | Moraceae | Religious value. Fruits and tender buds eaten in times of scarcity, wood used for packing. Bark used to cure ulcers and skin troubles. |
| 14. <i>Garcinia spicata</i> Hook. f. | Garcinia (Kokattai) | Guttifera | Wood used for construction. Bark used in dye making. |
| 15. <i>Madhuca indica</i> J.F. Gmel. (<i>Bassia latifolia</i>) | Mohwa; Butter Tree (Kattu illupei) | Sapotaceae | Religious value. Oil used for manufacturing soaps. Used for edible and cooking purposes in rural areas. Used in treatment of skin diseases, rheumatism, head ache, laxative, used for piles. Oil cake used as manure. Flowers: rich source of sugars, vitamins and calcium, eaten raw or cooked. For tonics used for cough, cold & bronchitis. Wood: for buildings. |
| 16. <i>Mimusops elingi</i> L. | Indian Nedler; Bullet Wood(Magizham) | Sapotaceae | Wood used for building purposes, agricultural implements. Fruit is edible. Young twigs used for cleaning teeth. Bark: decoction is used as gargle. Used as fodder. |
| 17. <i>Phoenix sylvestris</i> Roxb. | Wild Date Palm (Eecham) | Arecaceae | Tree tapped for its sap to make jaggery & sugar. Refreshing drink from sap, good source of Vit B and C. Fruits edible and restorative. Leaves used for making mats, baskets, thatch. Roots used for tooth ache. |
| 18. <i>Pterospermum xylocarpum</i> Santapau & Wagh | Pterospermum (Pulavu) | Sterculiaceae | Ornamental flowers. Leaves used in leucorrhoea as smoked like tobacco. |
| 19. <i>Punica granatum</i> L | Pomogranate (Madhulam) | Lythraceae | Rich source of vitamins. Dried bark of root & stem used to in the treatment of tapeworms, juice has an ingredient of cooling and refrigerant properties, fruit rind used to cure diarrhoea and dysentery. Flower buds used in bronchitis. |
| 20. <i>Salmalia malabarica</i> (DC.) Schott & Endl. | Silk Cotton (Mullilavu) | Bombacaceae | Wood for used for timber. The floss is suitable for cushions, mattresses etc. Bark exudes gum which is astringent, stimulant tonic properties, used to treat dysentery, haemoptysis of pulmonary T.B, & influenza. Oil is used as cattle feed. Young roots, leaves and flowers are eaten as vegetable. Dried powdered flowers used to make bread. Paste of bark used for skin eruptions. |

| Botanical Name | Common Name | Family | Significance |
|--|-------------------------------------|----------------|--|
| 21. <i>Sapindus mukorossi</i> Geartn. | Soapnut Tree (Bundi Kottai) | Sapendaceae | Fruit valued for saponins, has expectorant properties used in chlorosis and epilepsy. Soap nut are used as detergents. |
| 22. <i>Saraca asoca</i> (Roxb.) De Wilde | Asoka (Ashokam) | Caesalpinaceae | Most sacred for hindus. Used for worship. Drug obtained from bark which stimulates uterine contractions. Bark cures biliousness, dyspepsis, dysentery, piles, ulcers & pimples. Leaves has blood purifying properties. Juice used in stomach ache. Dried flowers used in diabetes. Wood used for buildings. |
| 23. <i>Strychnos nux-vomica</i> L. | Snake wood (Etti) | Loganiaceae | Leaves applied on wounds and ulcers. Root and bark used in fever, epilepsy. It is a powerful poison in large doses. Used topically for hair and scalp. Active alkaloids: <i>Strychnin</i> , <i>Vomicine</i> & <i>Brucine</i> ; is a powerful stimulant and produce convulsions. Fats from seeds used in rheumatism. Juice of fresh wood used in dysentery, fever, cholera and dyspepsia. |
| 24. <i>Swietenia mahogany</i> Jacq. | Jamaica mahagony tree (Mahagony) | Meliaceae | Wood used as highly priced timber. <i>Mahogonin</i> obtained from its seeds. |
| 25. <i>Syzygium cumini</i> L. | Black plum; Jamun (Naga pazham) | Myrtaceae | Fruits edible, used for diabetes. Seeds rich in proteins and calcium. Used to make preserves, squashes and jellies. Liquor distilled from it. Used for timber. Leaves palatable. |
| 26. <i>Tamarindus indica</i> L. | Tamarind (Puli) | Caesalpinaceae | Fruit pulp is used in culinary preparations. Principal acid <i>Tartaric acid</i> ; prevent kidney stone formations. Pulp is used as carminative, refrigerant, cooling agent, laxative and used for bilious disorders. Gargle used for sore throat. Seeds used in textile industry. Timber used. Tender leaves eaten as vegetable. |
| 27. <i>Terminalia arjuna</i> (Roxb.) Wright & Arn. | Arjuna (Marudham) | Combretaceae | Religious value. Timber used. Bark used in tanneries. Contains <i>Betasitosterol</i> . Powdered bark with milk used in fractures and contusions. It is a tonic and has febrifugal properties. Juice of fresh leaves used in ear ache. Twigs used to cure blisters and ulcers of the mouth. |
| 28. <i>Terminalia catappa</i> L. | Almond (Badam) | Combretaceae | Timber used in house building. Leaves used in Rheumatism, scabies & leprosy. Seed edible and rich in Vit E. |

| Botanical Name | Common Name | Family | Significance |
|---|--|-------------|---|
| 29. <i>Thespesia populnea</i> Soland. ex Correa. | Indian tulip tree (Poovarasam Kallal) | Malvaceae | Cultivated as ornamental tree. Timber used. Bark, leaves, flowers and fruits used in cutaneous affections. Fruit decoction is an antidote for poisoning. Seed has purgative properties. Plant effective in malaria. Active principal: <i>Betasitosterol</i> . |
| 30. <i>Wrightia tinctoria</i> R. Br. | Pala Indigo plant (Veppalai) | Apocynaceae | Wood used for match box manufacture. Bark and seeds used in flatulence, bilious affections, dropsy and stomach ache. Flowers used as vegetable. Leaves are the source of the blue dye Indigo. Leaves used as wrappers for beedies |

SHRUBS

| Botanical Name | Common Name | Family | Significance |
|--|-------------------------------|----------------|--|
| 1. <i>Adhatoda vasica</i> Nees. | Adathoda (Adathodai) | Acanthaceae | Chief ingredient - <i>Quinazoline</i> Source for the Drug Vasaka - used for bronchitis; All parts used for cold, cough, whooping cough, asthma, sedative expectorant, antispasmodic and anthelmintic properties. Leaf juice - Diarrhoea, dysentery and glandular tumours. Alkaloids <i>Vasicine & Vasicinone</i> - weak cardiac stimulant & has antianaphylactic activity. |
| 2. <i>Atalantia monophylla</i> DC. | Wild Lime (Kurundhu) | Rutaceae | Berries pickled and used in chronic rheumatism and paralysis. Leaf juice - used for hemiplegia, itching and other cutaneous complaints. Roots - antispasmodic stimulant and resolvent properties. Alkaloid: <i>Limonoid & Atalaphylline</i> |
| 3. <i>Calotropis gigantea</i> (L.) Ait. f. | Milk weed (Errukan) | Asclepiadaceae | Religious value. Leaves: used as green manure for paddy & wheat; correct alkalinity in soil. Root bark: constitutes a drug. contains <i>Alpha & beta amyirin</i> , mild stimulant, expectorant, used in leprosy & eczema; gives relief in diarrhoea, dysentery, & asthma; useful in elephantiasis, lupus & chronic rheumatism. Latex: contains <i>Calotropin, Calotoxin & Gigantin</i> . Highly toxic; used to cure bites of rabid dogs; used in tanning and dying leather. Flowers: has <i>alpha & beta Calotropeol</i> ; have digestive & tonic properties useful in cold, cough & asthma. |
| 4. <i>Citrus aurantifolia</i> (Christm.) Swingle | Sour lime (Elimiccham) | Rutaceae | Rich in Vitamins, minerals, alkaline salts, extensively used for culinary purposes. Aperient, astringent, antipyretic & sedative. Fruits: Antiseptic, styptic & sudorific. Peel: alkaloid: <i>Ergosterol</i> ; used as spice & condiment. Infusion of leaves given for fever, jaundice, sore throat, head & stomach ache. Root infusion: dysentery & accompanying ailments. |
| 5. <i>Citrus sp.</i> | Wild Lime (Kodi limiccham) | Rutaceae | Rich in Vitamins, minerals, alkaline salts; used in ayurvedic medical practices. |
| 6. <i>Dimorphocalyx glabellus</i> Thw. | ----- ----- | Euphorbiaceae | |

| Botanical Name | Common Name | Family | Significance |
|--|-----------------------------------|-------------|--|
| 7. <i>Dodonaea viscosa</i> L. | Hedge plant (Velari) | Sapendaceae | Leaves: used for treatment of wounds, swellings, rheumatism & sprains. Bark: employed in astringent baths & fomentations. Leaves & twigs used as manure. Wood: for making tool handles. Seeds edible. Principal constituent: <i>Sitosterol</i> . |
| 8. <i>Glycosmis pentaphylla</i> (Retz.) Correa. | Glycosmis (Pannai) | Rutaceae | Juice of leaves used for fever, liver and skin troubles |
| 9. <i>Hibiscus rosa-sinensis</i> L. | Shoe Flower (Chembarthi) | Malvaceae | Flowers eaten raw or pickled. Crushed flowers yield dye. Flowers considered as refrigerant. Paste applied to swelling & boils. Decoction of flowers used in bronchial catarrh. Leaves: laxative, decoction of leaves used as a lotion in fever. |
| 10. <i>Jasminum arborescence</i> Roxb. | Jasmine (Gundu malli) | Oleaceae | Flowers fragrant, ornamental, juice of leaves used in treatment of bronchitis. |
| 11. <i>Jasminum multiflorum</i> (Burm.f.) Andr. | Downy Jasmine (Madurai malli) | Oleaceae | Dried leaves used for ulcers. Flower ornamental |
| 12. <i>Jasminum sambac</i> (L.) Ait. | Arabian Jasmine (Adikku malli) | Oleaceae | Fragrant flowers, ornamental. Flavouring tea, perfumes, yellow pigment used as substitute for saffron. Flowers used for congested head ache. Decoction of leaves used for fevers. Roots and leaves used in eye lotions. |
| 13. <i>Lawsonia inermis</i> L. | Henna (Maruthani) | Lythraceae | Leaves used as dye for silk & wool; used as prophylactic against skin diseases; has astringent properties; used externally in form of paste for boils, burns, bruises & skin inflammations. Decoction used as a gargle for sore throat. Active principal : <i>Lawsonone</i> . Wood: to make tools. |
| 14. <i>Nyctanthus arbor-tristis</i> L. | Coral Jasmine (Parijatham) | Oleaceae | Fragrant flowers are esteemed as votive offerings in temples and made into garlands. Contains the same essential oil as Jasmine. Flower stalk used for dyeing. <i>Beta sitosterol</i> is principal ingredient.. Bark of tree used as tanning material and leaves used for polishing wood and ivory. Leaves: used as expectorant, in fevers & rheumatism; decoction used as laxative, diaphoretic & diuretic, given to children for expulsion of worms. |
| 15. <i>Ochn obtusata</i> DC. | ----- ----- | Ochnaceae | Wood used as walking stick, leaves used to treat sores and asthma. |

| Botanical Name | Common Name | Family | Significance |
|---|------------------------------------|---------------|---|
| 16. <i>Randia candolleana</i> Wight. & Arn. | Randia (Malaimanga) | Rubiaceae | Wood is light and used |
| 17. <i>Rauwolfia tetraphylla</i> L. | Rauwolfia (Bara Chandrica) | Apocyanaceae | Roots used as an adulterant. Plant is poisonous. Fruit furnishes a black dye. |
| 18. <i>Securinega leucopyrus</i> (Willd.) Muell. | Securinega (Vellaippulanji) | Euphorbiaceae | Leaves are eaten. paste used to cure sores. Berry sweet and edible. Wood used as fuel. Stem bark is used a fish poison. |
| 19. <i>Solanum erianthum</i> D. Don. | Potato tree (Chundakai) | Solanaceae | The roots used to violent pains all over the body, vertigo and urinary troubles. Leaves used for treatment of horses afflicted with glanders. Cultivated for fruits eaten in curries. |
| 20. <i>Tricalysia sphaerocarpa</i> (Hook. f.) Gamble | Tricalysia (Kattukofivera) | Rubiaceae | Berries known as wild coffee, as roasted seeds smell and taste like coffee, eaten by birds. |
| 21. <i>Vitex nigundo</i> L. | 5 leaved Chaste tree (Nochi) | Verbinaceae | Leaves has insecticidal properties, Smoking of leaves used for fever, head ache & ear ache, Ointment of juice used as hair tonic. Roots are used in dyspepsia and rheumatism. Flowers in diarrhoea and liver disorders. |
| 22. <i>Walsura trifoliata</i> Harms. | Walsura (Kanji maram) | Meliaceae | Bark possess stimulant expectorant properties. Pulp of fruit is a fish poison. Wood used for agricultural implements. |

HERBS

| Botanical Name | Common Name | Family | Significance |
|--|---------------------------------------|---------------|--|
| 1. <i>Aloe vera</i> Tourn. ex L. | Indian Aloe (Chirukattalai) | Liliaceae | Alkaloid: <i>Aloin</i> . Leaves: Cathartic and cooling.; used in eye troubles, spleen & liver ailments; used for x-ray burns, skin disorders. Leaves and flower stalks pickled; dye for silk, wool and linen. |
| 2. <i>Alpinia galanga</i> (L.) Willd. | The greater galangal (Peraratthei) | Zingiberaceae | Alkaloids: <i>caryophyllenol I & II</i> . Drug used in rheumatism & bronchial catarrh. Tonic, carminative & stimulant. Used as adjunct in cough and digestive mixtures. chief use :Clearing the voice. Possess anti tubercular properties. Seed - contains anti ulcer principal. Active ingredient : <i>Methyl cinnamate</i> , |
| 3. <i>Alternanthera sessilis</i> (L.)DC. | Amaranthus (Ponnanganni Keerai) | Amaranthaceae | Herb used as vegetable; used for indigestion; Hazy vision, night blindness and dysentery, diarrhoea. Root - Used externally to treat inflamed wounds. Alkaloid: <i>Betasitosterol</i> . Has antiulcerative properties. |
| 4. <i>Amorphophallus campanulatis</i> Blume ex Decne. | Elephant foot yam (Chena) | Araceae | Used for religious worship. Corms used as vegetable. Main ingredient of corm: <i>Calcium oxalate</i> ; alkaloid: <i>Betasitosterol</i> . Expectorant; increases appetite and taste; used externally to treat acute rheumatism; dysentery & piles. Roots - used in ophthalmia & boils. |
| 5. <i>Anisochilus carnosus</i> Wall. | Anisochilus (Karpuravalli) | Lamiaceae | Stimulant, expectorant & diaphoretic. Leaves - Alkaloid: <i>Luteolin & Apigenin</i> ; has cooling properties. cures liver disorders & other allergic manifestations. Domestic remedy for coughs and colds. Leaves used as vegetable, to dress wounds. Oil - direct muscle relaxant. |
| 6. <i>Clerodendron inerme</i> (L.) Gaertn. | Clerodendron (Pichangan) | Verbenaceae | Leaves used as febrifuge. Leaves has medicinal properties. |
| 7. <i>Croton sparciflorus</i> Morong. | Croton (Eliamanakku) | Euphorbiaceae | Fatty oil has drying properties, Cake used as manure. leaves for sprains. |
| 8. <i>Curcuma longa</i> L. | Termeric (Manjal) | Zingiberaceae | Rhizome used as condiment and colouring agent. Turmeric used in compositions for sprains and bruises. Used for wound healing as antiseptic and as insect repellent. |

| Botanical Name | Common Name | Family | Significance |
|---|---|---------------|---|
| 9. <i>Cymbopogon citratus</i> Stapf. | Lemon Grass (Vasanai) | Poaceae | Used in soaps and flavoring. Used for beverages. Use as a carminative. |
| 10. <i>Cynodon dactylon</i> Pers. | Bermuda Grass (Arugam Pullu) | Poaceae | Religious value. Important as pasture. Rhizomes used in urinary troubles. Decoction diuretic and has medicinal properties. |
| 11. <i>Dioscorea pentaphylla</i> L. | Potato Yam (Kattu kalangu) | Dioscoreaceae | Edible tubers; leaves eaten in times of scarcity. Tubers used to disperse swellings and as tonic. Lot of starch. Useful in leprosy, piles & gonorrhoea. |
| 12. <i>Eclipta prostrata</i> L. f. | Trailing eclipta (Karisilang kanni) | Asteraceae | Used in liver disorders, spleen and hepatic enlargements and skin troubles. |
| 13. <i>Imperata cylindrica</i> Beauv. | Thatch Grass (Dharbai Pullu) | Graminae | Religious value. Reported to be a good source of Vit A & C. Good soil binder. Make good thatch, ropes & mats. A kind of beer made from this. Rhizomes have a restorator tonic & antipyretic properties. Decoction of root stocks used in diarrhoea, dysentery & gonorrhoea. |
| 14. <i>Leucas aspera</i> Spreng. | Dead White Nettle (Thumbai) | Labiatae | Religious value. Fragrant, eaten in times of scarcity, used as antipyretic, juice of leaves is used as external application for psoriasis, skin eruptions and painful swellings. Flowers ; along with honey for cold & cough. |
| 15. <i>Melothria madraspatana</i> L. | Melothria (Musumusukkai) | Cucurbitaceae | Tender shoots to treat vertigo, roots used for tooth ache and used in cough syrups. |
| 16. <i>Mentha arvensis</i> L. | Field Mint (Pudina) | Lamiaceae | Stimulant and carminative. Leaves used as digestive and in rheumatism. Leaves used a vegetable. |
| 17. <i>Mimosa pudica</i> L. | Touch-me-not (Thottarcurungi) | Leguminasae | Tender plant - cattle feed. Has a toxic alkaloid <i>Mimosine</i> . Decoction of roots used for urinary complaints & glandular swellings. Juice of leaves used for dressings, sores & piles. |
| 18. <i>Ocimum americanum</i> L. | Purple Stalked Basil (Karun Thulasi) | Labiatae | Fragrant leaves used for flavoring salads, Seeds used as food in scarcity, considered diuretic and tonic, used in preparation of cooling drinks. Decoction of plant used for coughs, dysentery, tooth aches. |
| 19. <i>Ocimum kilimandscharicum</i> Guerke | CamphorBasil (Kamakasturi, Karupu) | Labiatae | Primary source of camphor; oil used s mosquito repellent. |

| Botanical Name | Common Name | Family | Significance |
|---|-----------------------------------|---------------|--|
| 20. <i>Ocimum sanctum</i> L. | Sacred basil (Tulasi) | Labiatae | Religious value. Juice of leaves has diaphoretic, antiperiodic stimulating and expectorant properties. used for treatment of bronchitis, cutaneous diseases, decoction of root used in malarial fevers. Leaves used in salads, reputed to have medicinal properties. |
| 21. <i>Phyllanthus niruri</i> Hook. f. | Jaundice Herb (Keelanelli) | Euphorbiaceae | Fresh roots used in treatment of jaundice. Has astringent, diuretic & antiseptic properties. Used in stomach troubles, dropsy. Decoction of leaves used as refrigerant for the scalp. Latex mixed with oil used in ophthalmia, sores and ulcers. Stem contains <i>Saponin</i> . |
| 22. <i>Solanum nigrum</i> L. | Black nightingale (Munatakali) | Solanaceae | Leaves and tender shoots eaten like spinach. Used to cure dropsy. Berries used as tonic, diuretic, in cardiac ailments, fevers, ulcers and eye troubles. |
| 23. <i>Solanum xanthocarpum</i> Schrad. & Wendl. | ----- ----- | Solanaceae | |
| 24. <i>Talinum portulacifolium</i> (Forsk.) Aschers. ex Schwf. | Talinum (Pasali Keerai) | Portulacaceae | Used as vegetable and aphrodisiac. Leaves rich in iron. |
| 25. <i>Vetiveria zizanoides</i> (L.) Nash. | Kus Kus (Vettiveru) | Poaceae | Roots possess pleasant aroma. Used for making window blinds and as a coolant. Oil of vetiver used in perfumery and cosmetics, used as a carminative, Decoction of leaves diaphoretic, and for rheumatism. |
| 26. <i>Withania somnifera</i> Dunal. | Aswagandha (Aswagandhi) | Solanaceae | Important drug in ayurveda. Roots used for hiccup, female disorders, cough, rheumatism, dropsy and as a sedative. Alkaloid: <i>Withasomine</i> . Respiratory stimulative, mild depressant, sedative effect. Used to treat ulcers and scabies. Alkaloid of leaves <i>Withaferrin</i> has tumor inhibiting activity. |
| 27. <i>Zingiber officinale</i> Rosc. | Ginger (Inji) | Zingiberaceae | Rhizome used as spice, for flavoring foods and culinary preparations. Has antioxidative properties, used as a carminative and stimulant. |

CLIMBERS

| Botanical Name | Common Name | Family | Significance |
|---|---|----------------|--|
| 1. <i>Abrus precatorius</i> L. | Crab's eye (Kuntumani) | Fabaceae | Leaves - vegetable, used for cough, cold, treatment for leucoderma, itching & other skin diseases. Seeds - Alkaloid <i>Abrin</i> ; Poisonous, abortifacient, treatment of ulcers, nervous system; paste applied locally in sciatica, stiffness of shoulder joints & paralysis. Has anti tumour activity. |
| 2. <i>Asparagus racemosus</i> Willd. | Asparagus (Sadhaveri) | Liliaceae | Fresh root : Animal feed; Eaten as vegetable. Flowers perfumed contain <i>Quercetin</i> . Young shoots used as a preserve. |
| 3. <i>Cissus quadrangula</i> L. | The bone setter (Perandai) | Vitaceae | Stem: made into curries & chutneys; useful in piles, asthma, muscular pains, burns, wounds, bites of painful insects & digestive ailments. Ash of plant is a substitute for baking powder. Extracts of plant exhibits cardiogenic & androgenic properties. Rich source of Vit C. Alkaloid: <i>Betasitosterol</i> . Used for fracture healing |
| 4. <i>Clitoria ternatea</i> L. | Mussel Shell creeper (Shankapushpam) | Fabaceae | Religious value. Roots are powerful cathartic and diuretic. Flowers a blue dye. Leaves used as fodder. |
| 5. <i>Eupatorium triplenerve</i> Vahl. | Eupatorium (Ayapani) | Compositae | Plant a stimulant & tonic in small doses. Laxative, decoction of plants considered detergent. Cardiac stimulant. Alkaloid: <i>Aiapanin</i> & <i>Ayapin</i> . They have haemostatic properties. Leaves contain carotene & Vit C. |
| 6. <i>Gymnema sylvestre</i> R.Br. | Indian Pecacuanha (Adigam) | Asclepiadaceae | Leaves when chewed paralyse for a few hours the sense of taste. Leaves used in diabetes. Leaf powder is a cardiac stimulant and diuretic. |
| 7. <i>Leptadenia reticulata</i> Wight & Arn. | Leptadenia (Palikkodi) | Asclepiadaceae | Plant is a stimulant & restorative; used in nose and ear troubles. Leaves & roots used in skin affections and wounds. <i>Gamma sitosterol</i> is the principal ingredient. Tubers, shoots and follicles used as vegetables in time scarcity. |
| 8. <i>Pachygone ovata</i> Miers ex Hook.f. & Thoms. | ----- ----- | Menispermaceae | The dried fruits of plants used as a vermicide and fish poison. |
| 9. <i>Piper betle</i> L. | Beetle leaf (Vethallai) | Piperaceae | Used as a digestive, stimulant, carminative. Good source of calcium, well absorbed by body. Contains Vit B. Oil used in treatment of respiratory disorders. Used as a preserve. |

| Botanical Name | Common Name | Family | Significance |
|--|---|----------------|--|
| 10. <i>Piper longum</i> L. | Indian long pepper (Tippili) | Piperaceae | Fruits used as spice, pickles and preserves. Roots and stem used in drug making in ayurvedic medicine. Used in respiratory ailments, sedative in insomnia and epilepsy, as general tonic. Used as counter irritant and analgesic. |
| 11. <i>Solanum trilobatum</i> L. | Prickly leaved solanum (Tudhuvelum) | Solanaceae | Bitterroots, Berries and flowers used to treat cough, all parts of the plant used to treat chronic bronchitis. Leaves eaten as vegetable. |
| 12. <i>Tinospora cordifolia</i> (willd.) Miers. ex Hook. f. & Thoms. | Bile killer (Amirthavalli) | Menispermaceae | Used in ayurvedic preparations to cure general debility, dyspepsia, fevers and urinary diseases. Tribals use it for fractures. Dried powdered fruit used for jaundice, rheumatism and cardiac disorders. Dry stems show anti spasmodic, antiinflammatory and antipyretic properties. Has three bitter compounds <i>Tinosporon</i> , <i>Tinosporic acid</i> and <i>Tinosporol</i> ; used in diabetes. Decoction of leaf used for gout and applied for ulcers. |
| 13. <i>Vanilla planifolia</i> Andr. | Vanilla (-----) | Orchidaceae | Dried beans used as a flavoring agent & essence. Principal constituent is <i>Vannilin</i> . Sometimes used in medicine. |
| 14. <i>Ventilgo madraspatana</i> Gaertn. | Winged Seeded climber (Surali) | Rhamnaceae | Root bark gives dye called <i>Ventilagin</i> . contains the drug Emodin which is a tonic and a stimulant, prescribed for fevers and dyspepsia. Mixed with oil and used for skin troubles. |