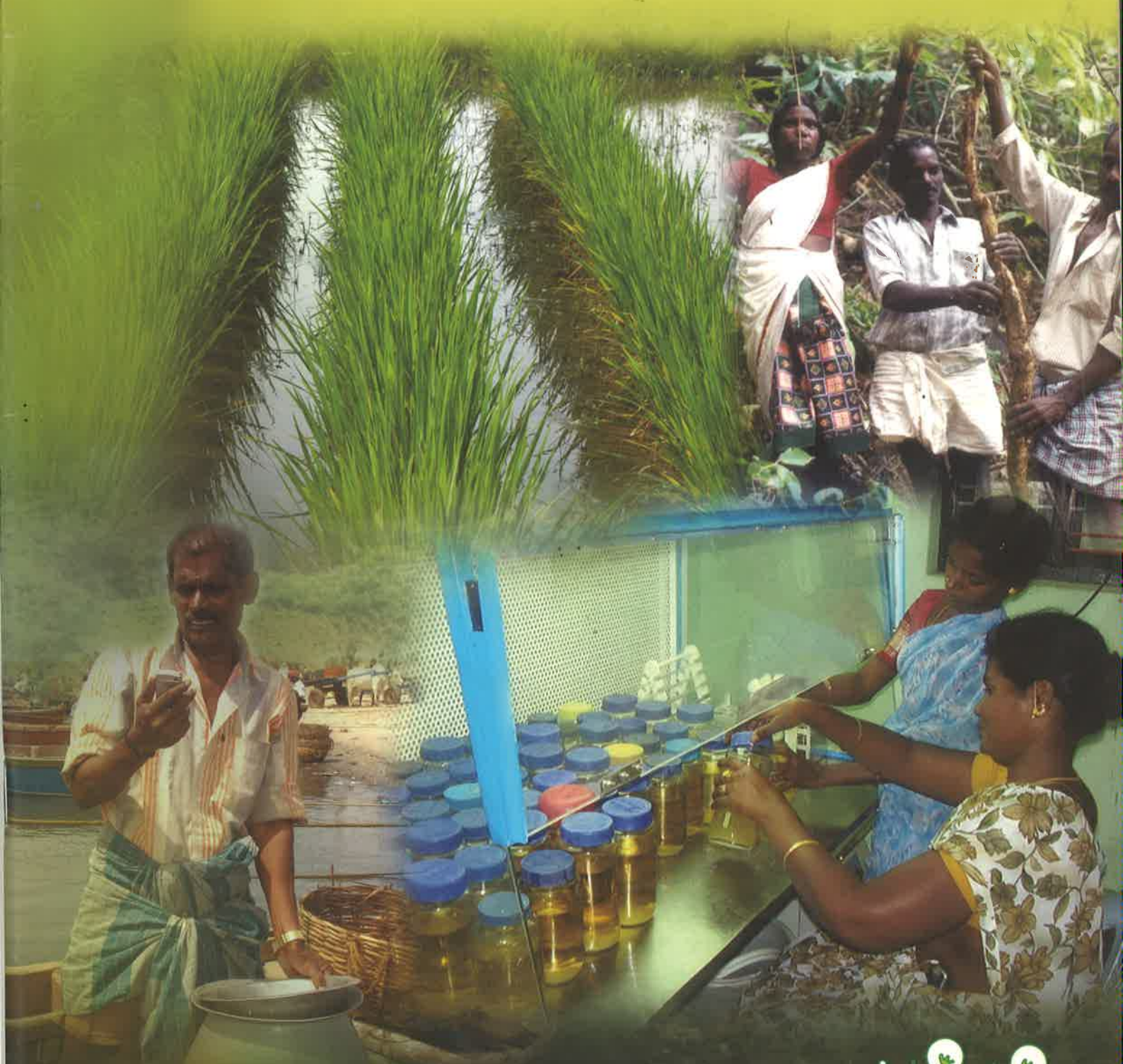


# TWENTY YEARS OF MSSRF

An Adventure in  
Science and Sustainable Development



M S SWAMINATHAN RESEARCH FOUNDATION

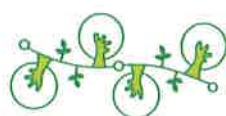




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**An Adventure in  
Science and Sustainable Development**



**M S SWAMINATHAN RESEARCH FOUNDATION**

Chennai.

January 2009

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*Front cover: MSSRF's mission – science and technology for development – is illustrated in this montage of photographs of field work at various locations.*

*Top left: Transgenic rice lines being tested for salt-tolerance in Kalpakkam, Tamil Nadu. (MSSRF has developed a technology to transfer the salt-tolerance properties of a mangrove species to rice.)*

*Bottom left: Fishers on the Tamil Nadu coast use mobile phones to check wave height and detect the presence of fish in the sea.*

*Bottom right: Eco-technology for women's empowerment: Women from a self-help group in Tamil Nadu busy at a low-cost bio-fertilizer unit managed by them.*

*Top right: Community-based biodiversity management: A tribal family of Wayanad, Kerala, collects wild tuber from the natural habitat.*

*Inside Front Cover: Nobel laureate Dr. Norman Borlaug with Dr. M.S. Swaminathan in New Delhi in 2006.*

*Back Cover: Sustainable management of mangrove wetlands – in co-operation with governments and rural communities – is a major MSSRF initiative. Fish being harvested from a fish farm on a mangrove site in Pichavaram, Tamil Nadu.*

## Preface

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The coming of the Industrial Revolution in Europe marked the beginning of a technology divide between rich and poor nations. If technology had been a major factor in the past in the rich-poor divide, the challenge today is to enlist science and technology as allies in the movement for sustainable development with social and gender equity. It was with this motive that the Foundation was set up in 1988, and it has continued to be the driving force guiding and inspiring the work since then. Twenty years down the line, I felt that it was time to stop and look back, and document the progress made towards the goals that were set at that time.

In this publication, I have briefly described the trajectory of the 20-year adventure in linking the best of science with the best of development. This historical review which I have attempted includes contributions and factual inputs from all my colleagues and fellow-workers at MSSRF. I must express my particular thanks to Shri S R Madhu for his valuable contributions in editing the publication and to Shri S. Jayaraj who designed and laid out the publication, as well as to all those who contributed the photographs which lend colour, vitality and solidity to the text.

I hope that through this little volume, readers will get a glimpse of both the body and soul of this institution as it enters its third decade.

*M. S. Swaminathan*

**M.S. Swaminathan**

## Twenty Years of MSSRF

The seed of the idea to set up an autonomous, non-profit and public good research institution was sown in my mind in 1970 by Prof C V Raman when he stayed with us for a couple of days at the Indian Agricultural Research Institute, New Delhi, where I was then the Director. Before leaving, Prof Raman told me that when I retired I should set up an autonomous, non-governmental research institution, which would provide young researchers a home for creative and socially relevant work.

An opportunity for converting this idea into reality was provided by the first World Food Prize which I received in Washington in 1987. After returning from the Philippines, where I headed the International Rice Research Institute for six years, the first task I undertook was to develop a Trust Deed for a research institution that would impart a pro-nature, pro-poor, pro-woman and pro-sustainable livelihood orientation to technology development and dissemination.

The late Dr Manibhai Desai, founder of the Bharatiya Agro-Industries Foundation (BAIF), which he established at the instance of Mahatma Gandhi, kindly helped to prepare the deed. On his suggestion, the Trust was named M S Swaminathan Research Foundation (MSSRF), and was registered on 17 May 1988 at New Delhi, with Prof V L Chopra, Prof V K Ramachandran and myself as the founder trustees.

The year 2008 marks the 20<sup>th</sup> anniversary of the founding of MSSRF, hence I would like to record a few facts about its growth.

*The MSSRF building in Taramani, Chennai (below).  
M.S. Subbulakshmi and Mani Krishnaswamy (right) rendered  
a dedication song at the April 1993 inaugural function.*



*MSSRF work reflects “a pro-nature, pro-poor, pro-woman orientation to technology development.”*





*Farming systems research is a major focus of MSSRF work.*



*MSSRF did a survey of mangrove wetlands in 1991.*



While I was President of the World Conservation Union (IUCN) from 1984 to 1990, I had observed that scientific work on integrated coastal zone management was poor and as a consequence, precious mangrove wetlands were getting degraded. I considered this particularly unfortunate in the context of a potential rise in sea level as a consequence of global warming and climate change. I therefore felt that MSSRF should be located in a coastal area, where research on Coastal Systems could be initiated on the lines of Farming Systems Research (FSR). In 1989, the Government of Karnataka, then headed by the late Shri Ramkrishna Hegde, kindly offered me 5 ha of land and other facilities in the campus of the University of Agricultural Sciences, Bangalore, to establish MSSRF. At the same time, the Government of Tamil Nadu headed by Dr M Karunanidhi also offered one hectare of land and other facilities in the Taramani Institutional Area of Chennai. I decided to accept the kind invitation of Chief Minister Dr M Karunanidhi and establish MSSRF at Chennai, due to its location on the coast. Further, Tamil Nadu has over 1,000 km of shoreline. The State Government headed by Dr. J. Jayalithaa provided an additional hectare of land adjoining the original site.

The scientific work of MSSRF began in June 1989, using facilities kindly provided by the Indian Institute of Technology, Chennai. A lecture I delivered at an international conference in Tokyo in September 1989 on the topic 'Anticipatory and Participatory Research to meet the Challenge of Sea Level Rise', led the Government of Japan to provide funds to MSSRF through the International Tropical Timber Organisation (ITTO) to initiate a mangrove conservation strategy in the Asia-Pacific Region. This support helped to organise a survey of the status of mangrove wetlands in this region in 1991, and an International Training Programme in 1992 on mangrove ecosystem conservation and sustainable management.

At this programme, attended by 20 candidates from 12 countries, the participants prepared a Charter for Mangroves for their respective countries. MSSRF also assisted in the establishment of an International Society for Mangrove Ecosystem (ISME) with me as Founder-President and with its headquarters at Okinawa, Japan. A Mangrove Ecosystem Information Service (MEIS) was also started and a comprehensive international database on mangrove wetlands was compiled.



*A Charter for Mangroves was prepared in 1992 at an international training programme on mangrove ecosystem conservation.*

The Department of Biotechnology, Government of India, also extended support from 1990 onwards for establishing a Mangrove Genetic Resource Centre at Pichavaram, Tamil Nadu, and for initiating research to identify salt-tolerant genes in mangrove species. The idea was to transfer these genes through recombinant DNA technology to rice and other crops of importance to coastal agriculturists. Thus began the twin strategy of MSSRF in relation to mangrove wetlands – namely their conservation and sustainable and equitable use, as well as their use as donors of genes for salinity tolerance. At the same time, research was started on the integrated management of the coastal zone – focusing on capture and culture fisheries as well as coastal forestry and agro-forestry. MSSRF soon gained an international reputation as the “centre of origin” of new findings in the area of sustainable mangrove wetland conservation and regeneration and stable coastal agriculture. It received the **Blue Planet Prize** in Tokyo in 1996, becoming the only institution in Asia to be chosen for this pre-eminent international prize in the area of environment protection

Another significant event in early 1990 was the organisation of the Second International Keystone Dialogue on Plant Genetic Resources. The Chennai Consensus arrived at on this occasion by participants drawn from government, private, academic, and intergovernmental sectors, paved the way for resolving issues relating to access and benefit sharing, leading to the finalisation of the Global Biodiversity Convention adopted at the Earth Summit at Rio de Janeiro in 1992.



*A mangrove genetic resource center was set up in Pichavaram, Tamil Nadu, with support from the Government of India.*

*Below: The Blue Planet Prize awarded in Tokyo in 1996 to MSSRF for pioneering work in environment protection.*





*MSSRF work led to legislation to protect plant varieties and farmers' rights, to the Biodiversity Act, to a hunger-free area programme in Tamil Nadu.*



At the national level, MSSRF prepared in 1996 the first draft of an integrated Act to accord concurrent recognition to the rights of both breeders and farmers. Thus was born the Plant Variety Protection and Farmers' Rights Act of 2001. Similarly, MSSRF contributed an early draft of the Biodiversity Act, which provided Panchayats pride of place in the conservation and sustainable and equitable use of biodiversity and proposed the establishment of local-level Biodiversity Heritage Sites, such as Sacred Groves. Currently, MSSRF is assisting in the development of a National Biotechnology Regulatory Bill, which will enable the safe and responsible use of biotechnology, based on a transparent and credible process of risk-benefit assessment.

Over the years, MSSRF has been invited by both Tamil Nadu and other State Governments and the Government of India to prepare strategies for achieving specific goals such as Nutrition-Secure Tamil Nadu, mitigating agrarian distress in the Kuttanad and Idukki districts of Kerala, and a rice revolution strategy for Assam. While presenting the State Budget for 1996, the Chief Minister Dr M Karunanidhi, made the following statement:

***Feed the people***

***Who are hungry***

***Educate the people***

***To uplift the world. – Subramania Bharatiyar***

*To fulfill this dream of Mahakavi Bharatiyar, this Government will launch a new "Hunger Free Area Programme" to eradicate poverty-induced hunger. A number of schemes are already under implementation to alleviate poverty and to cater to the nutrition requirements of different groups of the population. Gaps in this coverage will be identified which can then be specifically targeted under the Hunger-Free Area Programme. Provision has been made in the budget for preparing a detailed strategy to implement this programme in association with Dr M S Swaminathan.*



From the beginning, professional and financial integrity and accountability to donors have remained the bottomline of MSSRF's work culture. This has been established by the presentation of annual reports on 7<sup>th</sup> August of each year (starting in 1990), getting accounts audited on time, prompt reporting on FCRA returns and 35 (I) (ii) submissions under the Income Tax Act, and sending audited utilisation certificates to all donors, regularly.

In addition to strategic, anticipatory and participatory research, MSSRF has laid stress on human resource development from its inception. Forty-two scholars have so far taken their Ph.D degrees from Madras and Osmania Universities on the basis of the research done at MSSRF, and 15 more students are currently in various stages of their Ph.D thesis work. Offering opportunities for professional growth for scientists has been another goal of MSSRF. As a result, many former MSSRF staff were selected for senior international positions as well as important scientific positions in government and non-government institutions. Several scientists have received important awards and recognition. For example, Dr Ajay Parida received the Prof Umakant Sinha Memorial Award of the Indian Science Congress Association, the B M Birla Science Prize for Biology of the B M Birla Science Foundation, Hyderabad, and the National Biosciences Award. He has been an Elected Fellow of the National Academy of Agricultural Science, New Delhi, and the National Academy of Sciences, Allahabad. Dr Sudha Nair was honoured with the Prof B D Tilak Lecture Award by the Prof B D Tilak Scientific Research and Education Trust, Pune. Dr. M. Lakshmi and Dr. Sudha Nair received the National Woman Bioscientist Award of the Department of Biotechnology, Ministry of Science and Technology.

MSSRF has been pro-active in both education and human resource development not only in the area of post-graduate education, but also in children's education.



*Dr Ajay Parida*



*Dr Sudha Nair*

*MSSRF has carried out several activities to promote both education at all levels, and human resource development.*





*MSSRF's project ACCESS focused on children under the age of six. The project led to a network of institutions on the care and development of the young child.*



*The Touch and Smell Garden, for visually impaired children (above), was another initiative for children.*

The project ACCESS (Action for Child Care and Education Services and Strategies) which ran throughout the nineties, focused on the under-sixes, a much neglected and vulnerable group in development in the country as a whole. One of the major achievements of this project was the setting up and nurturing of FORCES (Forum for Creche and Child Care Services), a network of institutions concerned with the care and development of the young child. When the project wound up in 2001, the significant outcomes were summed up as follows in a post-project review:

- “FORCES at both national and state levels (Tamil Nadu). The latter now leads in advocacy and policy lobbying in Early Child Development (ECD), following a smooth transition of leadership
- An ECD trainers’ network in Tamil Nadu. It is today an effective group of ECD professionals concerned with training and curriculum development
- A National Task Force committed to, and at present working on, the development of quality rating tools in ECD for multiple purposes
- An extensive and catalogued collection of resources and training materials in ECD in print, audio, and video (now digitalised), and
- A group of mature and motivated young professionals well-placed in several developmental fields”.

Taking only the first four outcomes, it is satisfying to note that the network has continued to develop and strengthen these activities, though MSSRF is no longer the leader, with continued nurture and support from MSSRF. This approach is a conscious policy in keeping with the title given to the review, **As the Salt in the Sea**, an indication that the concerns and attitudes underlying the work should in future permeate the entire work pattern and culture, without necessarily being identifiable as a separate identity. That this has happened, at least to some extent, is the best indicator of success.

Among other major initiatives for children, mention may be made of the Touch and Smell Garden for visually impaired children, Genome Clubs for introducing school children to the significance of scientific advances in the area of biodiversity and biotechnology and the **Every Child A Scientist** programme for imparting scientific literacy and awareness

among children. These programmes have stimulated the development of large national programmes such as the DNA Clubs sponsored by the Department of Biotechnology, Government of India, in schools in several parts of the country.

A similar trajectory can be seen in the case of women's issues. In the first few years, work relating to women was covered by the label **Reaching the Unreached**. It was soon widened to the broader area of gender and development. With an endowment grant from the Venkateswara Hatcheries in the name of Smt. Uttara Devi, a resource centre in Gender and Development was set up in order to mainstream gender concerns within the Foundation. This stimulated research on gender issues in various areas in which the Foundation was working. It also helped to introduce concerns about gender equity across all programmes, and led to a number of publications over the years, as well as workshop and training materials, in print and video. In 2002, the Ford Foundation established a chair on Women and Food Security to promote studies on the role of women in conservation, cultivation, consumption and commerce, further strengthening gender studies.

Outstanding among outcomes is the work on gender issues in relation to biodiversity. Starting with the book **Gender Issues in Biodiversity Management** in 1997, the first of its kind world-wide, which stimulated more such studies globally, there have been a series of studies and publications focussing on women's contributions to biodiversity conservation and management. MSSRF was the first to draw attention to the comparative neglect of women's Intellectual Property Rights in the path-breaking legislations on biodiversity. It has successfully sought (international) recognition for women as traditional knowledge holders, and continues to battle for a more inclusive approach to the dissemination of science and technology as a whole. In order to assist women professionals to take to a career in biotechnology, MSSRF assisted the Government of Tamil Nadu and the Department of Biotechnology, Government of India, in setting up India's first and only Women's Biotechnology Park at Siruseri village near Chennai.



*Reaching the unreached: Research and action were carried out on women's issues, widening into the broader area of gender and development.*

*A women's biotechnology park, the first of its kind in the world, was set up at Siruseri in Chennai.*





**Voicing Silence** (1993-2008) is an unique effort at gendered theatre. Starting with the simple objective of giving “voice to the voiceless”, using “women’s theatre for women’s empowerment” it has grown into a powerful presence in feminist theatre, combining three strands of work.

- Developing plays from a feminist perspective

The 12 plays range in *content* from reworking of traditional myths to current social issues: the *genres* from folk and traditional to avant-garde; the *format* and *location* from street and open spaces to auditoria; the *audiences* from rural to metropolitan; the *occasions* from women’s conferences to cultural *jathas*, college shows and local festivals. The *sponsors* too have varied; educational institutions, small town festival committees, women’s groups, Dalit groups, NGOs, literary societies, and Tamil diaspora in India, as well as mainstream theatre festivals.

- Working with different communities of women, supporting them to use theatre as a tool for self-expression.

Theatre has been a unique path to empowerment, enabling women to speak out, “giving them a voice,” in their own idiom. The workshops have culminated in simple productions, sometimes performed to audiences, sometimes not.

The communities of women who partnered in this venture include women quarry workers and beedi workers, rural Dalit women, school teachers and adolescent school girls, political activists, and members of rural women’s self-help groups. For four continuous years, work with a group of professional women actors from traditional Tamil theatre genres led to several finished performances. Most recently, work for two consecutive years with transgendered persons (*aravanis*) led to a theatre campaign for their rights.

- Organizing collective sharing of experiences or women’s theatre festivals periodically. KULAVAI, the name of the interactive women’s theatre festival conducted from time to time by **Voicing Silence**, is a Tamil word connoting the ululations of women on ritual occasions and ceremonies, and refers to celebrations.



*MSSRF taps women’s theatre to empower women through varied activities under its project “Voicing silence”.*

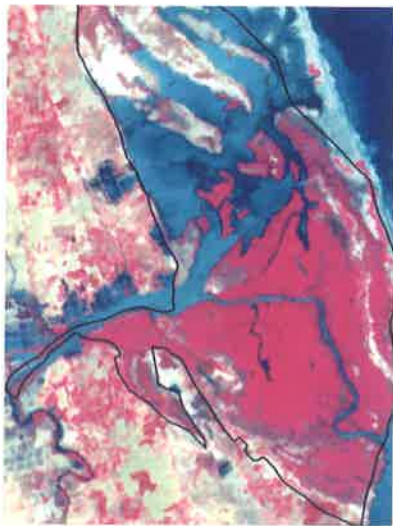
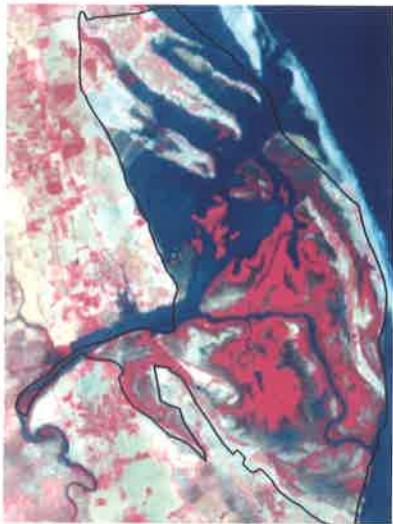
KULAVAI 96, at the national level, was the first attempt to link theatre persons interested in gender issues with cultural activists and NGOs addressing women's issues through theatre. KULAVAI 97 was a confluence of professional women stage artists of Tamil Nadu from a range of forms – traditional genres to the contemporary street theatre of protest. KULAVAI 99 was a celebration of women's voices from the four southern states on the same themes. KULAVAI 2002, dedicated to women directors, featured a seminar to critique and understand the work of women directors, and showcased the work of three. KULAVAI 2003, in a one-day festival, presented nine women solo performers from around the country, in a day-long series of performances, speaking in different voices, styles, forms and languages.

Looking back over the past 20 years, mention may be made of some major scientific and socially significant contributions (the examples are illustrative and not exhaustive).

- In the area of mangrove research, over 1,475 ha of degraded mangrove forests were restored at six sites in Tamil Nadu, Andhra Pradesh and Orissa. Over 6.8 million saplings were planted by 5,240 families drawn from 33 Village Mangrove Councils. This is the largest community mangrove forest restoration programme ever undertaken in the country. Mangrove atlases have been prepared for Tamil Nadu, Andhra Pradesh and Orissa.
- A science-based, people-centred and process-oriented approach has been developed and demonstrated to restore and conserve mangrove wetlands. This approach and model is being replicated by both governmental and non-governmental agencies in restoring mangrove wetlands located along the east coast of India.
- Maps prepared by MSSRF using remote sensing pictures reveal that the mangrove area in Tamil Nadu increased to 4,050 ha in 2006

*MSSRF undertook India's largest mangrove forest restoration programme at six sites in Tamil Nadu, Andhra Pradesh and Orissa. The programme's approach is being replicated by other agencies on the east coast of India.*





Remote sensing pictures (above) show that mangrove area in Tamil Nadu has gone up substantially.

from 2,100 ha in 1993. After the tsunami of December 26, 2004, community interest in mangrove and non-mangrove bio-shields grew. About 55 ha in Tamil Nadu and 60 ha in Andhra Pradesh have since been covered with bio-shields, which will help to reduce the fury of seawater intrusion in coastal areas during cyclones.

- The Community Agro-biodiversity Programme of MSSRF is unique in the sense that it has triggered the formation of gene, seed, grain and water banks at the village level, thereby helping to link all parts of the production, consumption and marketing chain in a mutually reinforcing manner. The field gene bank helps to revitalise the *in situ* on-farm conservation traditions of local communities. This community agro-biodiversity conservation and sustainable and equitable use system won for the tribal families of Koraput in Orissa the **Equator Initiative Award** at the UN Conference on Sustainable Development held at Johannesburg in 2002, and the first **Genome Saviour Award** of the Protection of Plant Varieties and Farmers' Rights Authority of India in 2007.
- Infrastructure for community conservation of agro-biodiversity has been created at Kalpetta, Wayanad, Kerala, in land donated by my family and at Jeypore, Koraput district, Orissa, on land kindly provided by the Government of Orissa. The MSSRF Centre at Koraput has been named after the late Mr Biju Patnaik, in recognition of his contributions to building modern Orissa. The Kalpetta Centre has promoted local level food security by organising the cultivation of a wide range of tubers, which can be appropriately referred to as "life saving crops". In both Wayanad and Koraput, rice varieties with medicinal properties, such as *Navara* in Kerala, or excellent culinary properties, such as *Kalajeera* in Koraput, have been promoted to link conservation and commercialisation in a symbiotic manner. The improved *Kalajeera* strain developed through participatory breeding with tribal families has been named *Kalinga Kalajeera*. Similar work is in progress in Kolli Hills in Tamil Nadu with reference to millets belonging to the genera



An improved landrace, named *Kalinga Kalajeera*, developed through participatory breeding with tribal families in Koraput, Orissa.

*Panicum*, *Paspalum*, *Setaria*, *Eleusine* and other under-utilised millets and pulses. Participatory breeding is the pathway adopted by MSSRF to improve the productivity and profitability of underutilised crops. MSSRF's work on underutilised or "orphan" crops, has led to a wider understanding of the need to diversify the grain components of our food security system and to introduce such nutritious crops in the Public Distribution System (PDS) and School Noon Meal programmes.

- The movement for saving biodiversity to save lives and livelihoods will gain momentum only if local communities see this as a sustainable method of ending the prevailing dichotomy between the prosperity of nature and the poverty of the people. For this purpose, MSSRF has initiated a Biovalley Programme in Orissa -- biodiversity-rich watersheds where appropriate linkages can be achieved among bio-resources, biotechnology and business (micro-enterprises supported by micro-credit). This programme will be essentially managed by tribal women and men and will be serviced by the Biju Patnaik Medicinal Plants Garden and Research Centre at Jeypore.
- In order to assist farm and rural women and men to get benefits from the provisions of the Plant Variety Protection and Farmers' Rights and Biodiversity Acts, a Community Gene Bank and herbarium have been established at MSSRF, Chennai. This is a unique facility for helping farmers and primary conservers to get recognition and reward from the Gene and Biodiversity Funds. Further, training programmes are held for Panchayati Raj leaders.
- In the area of Biotechnology, MSSRF's policy is to bring about appropriate combinations of Mendelian, molecular and participatory breeding. The areas chosen for attention over 18 years ago, **namely tolerance to salinity and drought, have become most relevant in the emerging era of global climate change, sea-level rise and reduced precipitation.** The scientifically innovative and socially relevant work carried out by the biotechnology team had led to MSSRF being designated as a Centre of Excellence by the Department of Biotechnology. In 1990, MSSRF initiated anticipatory and strategic research for developing genetic material for resistance/ tolerance to abiotic stresses like salinity and drought in important food plants. The aim of this research is the development of novel genetic combinations for use in participatory breeding programmes with farming families. Thus, MSSRF functions as a pre-breeding centre and works together with farm families in the development of strains possessing resistance to salinity/ drought. *Avicennia marina* and *Porteresia coarctata* were chosen as donors for tolerance to coastal salinity, and *Prosopis juliflora* was used for identifying genes for drought resistance. So far, about 50 full-length genes and many partial sequences have been isolated for abiotic stress tolerance.
- The Review Committee on Genetic Manipulation, Government of India, approved limited field trials of three transgenic rice lines during 2004–05 and 2005–06. Large-scale sequencing and a functional genomic approach have also been adopted in *Prosopis*

*The Biovalley Programme in Orissa promotes biodiversity as well as the livelihoods of tribal communities (below) who manage the programme.*

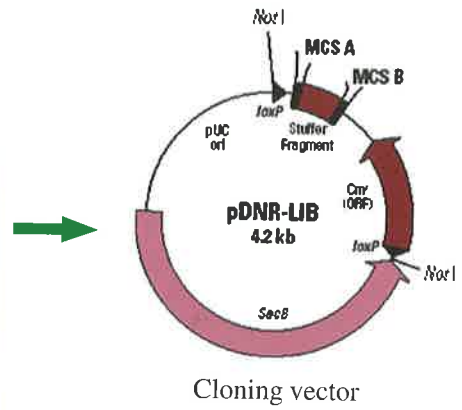


*A community seed and grain bank has been established to help rural men and women.*





# Transfer of Salinity-Tolerant Genes from Mangroves to Rice



Limited field trials of transgenic rice



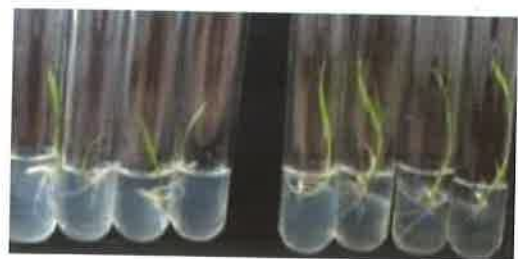
Transgenic plants in greenhouse



Rice calli used for transformation



Regeneration of transformed calli



Rooting of rice plants



*juliflora*. Thus, a new chapter in breeding strains of rice, mustard and pulses has been opened up, thanks to transgenic technology. This is the first time in the world that a mangrove species has been used as a donor of salinity tolerance, and a species widely regarded as a tenacious weed, i.e., *Prosopis juliflora*, has been mobilised for providing genes for drought tolerance. *Outlook* magazine (18 July 2005) listed this research carried out by a young team of scientists of MSSRF among the ten most important examples of scientific work carried out in India during 1995-2005, which can change our lives for the better. In addition, the group has also helped develop pre-breeding material for iron-rich rice varieties.

- A significant contribution has been made in the area of application of molecular marker systems in mangrove species, wild relatives and land races of cultivated legumes (*Vigna*, *Cajanus* sp.), millets and rice for understanding species relationships, developing unambiguous species identification systems, depicting population genetic structure and evolving site-specific conservation strategies
- Other programmes like bio-prospecting, bio-remediation and micro-propagation are also making good progress. In addition, the production and demonstration of high-quality planting material of *Jatropha curcas* is paving the way for launching science-based bio-fuel programmes. Conservation of 80 rare, endangered and threatened (RET) plants has been undertaken in a holistic manner from collection to propagation and to rehabilitation in natural habitats, and training of local people and scientists in the methodology. Reproducible *in vitro* propagation protocols have been developed for a number of RET species (viz. *Casearia rubescens*, *Ceropegia bulbosa*, *Ceropegia jaini*, *Crotalaria logipes*, *Frerea indica*, *Kaempferia glanga*, *Myxopyrum serratulum*, *Piper barberi*,

*MSSRF work on jatropha (below) seeks to pave the way for science-based bio-fuel programmes.*



### SALINITY-RESISTANT RICE



*Outlook magazine has described MSSRF research on mangroves as one of the top ten examples of scientific work during the decade 1995-2005.*

*MSSRF seeks to conserve 80 rare, endangered and threatened plants (below). The work includes collection of plant material, propagation, rehabilitation in natural habitats, and training of both scientists and local people.*





*Dr Jacques Diouf, Director-General of FAO, visited MSSRF in 2001, and delivered a millennium lecture. There has been close collaboration between FAO and MSSRF in several research areas and in the conduct of seminars and consultations.*

*Rauwolfia micrantha*, *Rauwolfia tetraphylla*, *Syzygium travancorium* and *Uraria picta*). *In vitro* protocols have also been developed for valuable and economically important species like *Aegle marmelos*, *Bacopa monnieri*, *Curculigo orochioides*, *Eupatorium triplinerve*, *Gymnema sylvestri*, *Hemidesmus indicus*, *Jatropha curcas*, *Sauropus androgynous*, *Tinospora corodifolia*, *Tylophora indica*. The group has also developed vegetative and micropropagation protocols for a number of mangrove species, and successfully transferred them into mangrove forest areas in Tamil Nadu and Puducherry, with the active participation of SHGs and forest officials, with appropriate training. The isolation, purification and characterisation of bioactive molecules from the mangrove ecosystem, against *Helicoverpa armigera* and an array of bacterial human pathogens have resulted in a number of biopesticide formulations possessing anti-pest and anti-microbial principles.

- The lichen group at MSSRF has made excellent progress during the last few years, working on diverse aspects of lichens viz: lichen diversity and ecology, bioprospecting for secondary compounds, lichen culture and molecular studies on lichens. Several lichen species have been identified, which can serve as bioindicators to monitor environmental pollution. Site-specific protocols to quantify data on lichen diversity and its distribution, ecosystem characteristics and pollution have been developed. Culture protocols for fungal, algal and whole thallus culture for 22 lichen species have been established to produce the bioactive secondary compounds *in-vitro*. Currently, three novel bioactive compounds which show potential for combating cancer and tuberculosis have been isolated and characterised. Databases on lichen species with appropriate images have been developed to spread awareness among scholars and scientists. MSSRF maintains a lichen reference collection with more than 3,000 specimens.



*In vitro* propagation and field transfer of *Syzygium travancorium*, an endangered plant species.

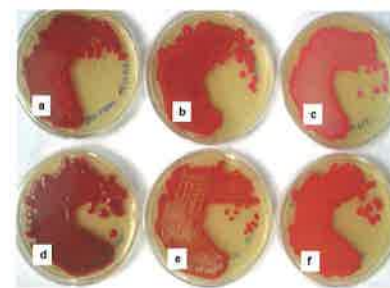
*Tissue cultured plants of Excoecaria agallocha in temple premises of Nataraja temple at Chidambaram, Tamil Nadu.*





- The microbiology group has helped to assess the diversity and polyphasic characterization of microbes associated with the rhizosphere of the mangrove and the coastal agriecosystem. Two new genera viz., *Swaminathania salitolerans* gen. nov., sp (LMG21291<sup>T</sup> = MTCC3851<sup>T</sup>) and *Mangrovibacter plantisponsor* gen. nov, sp. nov (MSSRF40<sup>T</sup>) and two new spp. viz. *Vibrio porteresiae* sp. nov (MSSRF30<sup>T</sup>=LMG 24061<sup>T</sup>=DSM 19223<sup>T</sup>) and *Vibrio rhizosphaerae* sp.nov. (MSSRF3<sup>T</sup>) have been reported. Three more are in the pipeline. All the reported organisms exhibit nitrogen fixation, phosphate solubilisation and biocontrol activity against plant pathogens. Many saline-tolerant plant growth-promoting bacteria have been identified.
- Under the annual inter-disciplinary dialogue series of MSSRF, organised under the generic title, “New Technologies – Reaching the Unreached”, the first in 1990 related to biotechnology. This led to the organisation of Biovillages, initially in Puducherry and later in Tamil Nadu, Orissa and other places. Biovillages aim to generate opportunities for skilled employment both in the on-farm and off-farm sectors of the rural economy, based on local bio-resources. At the same time, they strive to conserve and enhance the natural resources endowment of the village. The Biovillage model of sustainable rural development is based on “ecotechnologies” resulting from appropriate blends of traditional ecological prudence and frontier science. Hence, it has attracted international attention and the concept is spreading in neighbouring countries.

In order to intensify research on ecotechnologies, the JRD Tata Ecotechnology Centre was set up in 1996 with support from the Sir Dorabji Tata Trust. The building of this Centre was opened in 1998 by the late Shri K R Narayanan, the then President of India. The work of this centre was evaluated by Drs Manjul Bajaj and S C Rajshekar in 2008. The team concluded that “The Centre’s work has led to the mobilisation and creation of many vibrant, articulate and well-run self-help groups and community based organisations. Given that the Centre staff comes mostly from a technical background and that most project sites are modestly staffed with a team of 3-5 members, this is considered a very significant and commendable achievement”.



*New species of genus vibrio identified by the Microbiology group of MSSRF.*

*President Narayanan, Dr Murlu Manohar Joshi and Justice Fatima Bibi, then Governor of Tamil Nadu.*

*Opposite page: President K R Narayanan and Tamil Nadu Chief Minister M Karunanidhi at the inauguration of the J R D Tata Ecotechnology Center in 1996.*

Eco-enterprises and income-generating activities set up by ecotechnology group of MSSRF



Mushroom production



Trichogramma production



Pseudomonas production



Trichoderma production



Value addition to tamarind



Silk reeling



Integrated farms



Paper and paper board



Community Learning Centre



Biofertilizer production

Let me highlight a few of the contributions of this centre.

- More than 10 grassroots institutions have been nurtured over the last decade and two of them function as micro-finance institutions. The Community Learning Centre (CLC) approach of the Centre is recognised as a best practice by UNESCO in promoting functional literacy – currently 17 are under operation and in four of the villages 100% functional literacy level has almost been achieved. A community-managed B-class weather station is a successful model – being replicated in three more sites. IMD (Indian Meteorological Department) has recognised this model and wants to link it with VKCs (Village Knowledge Centres) for dissemination. Annual business transactions of 567 SHGs across the sites covering 8,505 households stand at about Rs. 13.47 crore through bank credit and business. Twelve SHG women members have been elected as Panchayat leaders.
- The microbial group has also established a niche in the research and development of biological software; new enterprise options have been demystified in the area of biological software production; value addition to existing options has enabled better market access. Over the years the work carried out has paid significant attention to the land-lab-land continuum and this is also one of the lead groups working on a polyphasic approach to understand the role of microbes and in harnessing them for sustainable agricultural practices in the areas of Integrated Nutrition Management (INM) and Integrated Pest Management (IPM). During 2006-07, these units produced more than 28,600 kg of biological software (*T. viridae*, *Pseudomonas fluorescens*, *Azospirillum*, *Phosphobacter* and VAM). In addition, these units have also produced *Trichoderma* cards. The production process of *Beauveria bassiana* and *Paecilomyces lilacinus* has been standardised and will now be tested for production by the units.
- Following the tsunami of December 26, 2004, the Centre steered agronomic rehabilitation strategies through participatory field demonstrations by promoting soil reclamation processes. It also introduced water management techniques and livestock integrated



*One of the 17 Community Learning Centres set up by MSSRF. Their approach has been recognized by UNESCO as a "best practice".*

*The microbial group of MSSRF has researched and developed many kinds of biological software, including Trichoderma cards (below left) and biofertilizer (right).*







*Small-scale enterprises such as crab fattening (top) and ornamental fish production, have been set up by the J R D Tata Ecotechnology Centre.*

farming systems (IFS); promoted the community seed bank concept to conserve local land races, and identified alternative options for improving the livelihoods of fishers, both men and women, from the fishing community. MoUs have been facilitated with several business and management schools to develop assured and remunerative market linkages. The partners include banks, corporates and international networks like the Eco-agriculture Network and the Commonwealth of Learning.

- The JRD Tata Ecotechnology Centre is setting up thematically focused institutional facilities in specific locations like the 'Fish-For-All Research and Training Centre' at Poompuhar, one of the tsunami-affected sites. This Centre will function as a training and demonstration centre for the fishing community (marine, inland, mechanised, artisanal, non-traditional fishermen; fish vendors, fishing labourers, fisherwomen) on a learning-by-doing model. It will strengthen and diversify existing livelihoods and identify alternative livelihoods for the resource-poor, and add value to the chain from capture / culture to consumption. A Mentoring and Capacity-Building Centre for SHGs has been established at Pillayarkuppam village in Puducherry. On an average, 28,000 trainee days are spent in a year on capacity - building. Many of the trained women SHG members and farmers have evolved into local resource persons; grassroot institutions facilitate horizontal transfer of knowledge during training programmes.
- The Centre has now shifted from the small-project-mode approach to large-multi-site umbrella projects like the bio-industrial watersheds project and the climate management initiatives. The strategy in the bio-industrial watershed approach is to augment local agro-eco-systems, adding value to available resources, enhancing livelihoods through suitable technological interventions, selecting the micro-watershed as the unit for action research and development and with a human-centric approach. The main focus areas include Integrated Natural Resources Management, especially soil and water management; crop diversification and productivity enhancement; post-harvest value addition and market linkages and promoting bio-industries and input services in five sites. In two sites, work is being implemented in partnership with the Punjab Agricultural University, Ludhiana, and the Jawaharlal Nehru Krishi Viswa Vidyalaya, in Jabalpur, Madhya Pradesh.
- The "Vulnerability Assessment & Enhancing Adaptive Capacity to Climate Change in Semi-arid regions of India" (V&A) project focuses on securing the livelihoods of rural poor and vulnerable communities by promoting appropriate adaptation measures and coping strategies related to agriculture, water, livestock and rural energy. The project is being implemented in Udaipur district of Rajasthan and Mehbubnagar district of Andhra Pradesh. The project has helped to enhance people's adaptive capacities to manage the adverse effects of climate change through strategic capacity - building programmes, technical advice and improvement of existing best practices with community participation. The V&A project has also helped to take stock of the different training modules used by the extension services to update knowledge in existing delivery



A weather station to help the rural community set up at Kannivadi in Tamil Nadu.



systems, and incorporate information about climate science and best adaptation practices. The V&A project is being implemented in association with non-governmental and State Government agencies, with financial support from the Swiss Agency for Development Cooperation. The results obtained under this project will provide useful inputs in implementing the Missions on Water, Sustainable Agriculture and Energy Use Efficiency envisaged under the National Action Plan for Climate Change. The work on climate change related issues is being strengthened under a collaborative project coordinated by the University of Edinburgh, UK.

- The report on Measures of Impact of Science and Technology on Agriculture and Rural Development in India, that was brought out in 2007 with support from the office of the Principal Scientific Advisor to the Government of India, highlighted the significant achievements under public good research in the country. The follow-up study on designing technology delivery systems for mitigating agrarian distress is expected to develop an action plan for an effective technology delivery mechanism at the grassroot level.
- In the area of Food Security, a significant contribution is the preparation of Food Insecurity Atlases of Rural and Urban India and an Atlas on the Sustainability of Food Security in India. The Rural Food Insecurity Atlas has been updated and will be published soon. All these Atlases have been prepared with financial and technical support from the World Food Programme. In 2001, MSSRF launched the **Mission 2007: Towards a Hunger Free India** in order to achieve substantial progress by 2007 in eliminating chronic, hidden and transient hunger. Commending this programme, Shri Atal Bihari Vajpayee, the then Prime Minister of India, stated:

*The sacred mission of a "Hunger Free India" needs the cooperative efforts of the Central and State Governments, local self-government bodies, non-governmental organisations, international agencies, and - above all, our citizens. We can indeed banish hunger from our country in a short time. Let us resolve today to make this mission substantially successful by 2007, which will mark the sixtieth anniversary of our independence.*



Three atlases relating to food security were prepared by MSSRF with support from the World Food Programme.





*Workshop on Household Entitlement Cards in Koraput, Orissa.*

- MSSRF has promoted Community Food Security Systems by revitalizing earlier food traditions. These have included a wide range of cereals, millets, legumes and tubers and the establishment of Community Foodgrain Banks. The Community Foodgrain Banks form a part of the Gene-Seed-Grain-Water Bank continuum referred to earlier, and are a mechanism to address transient hunger during lean periods and natural calamities in remote tribal areas. They become an entry-point for local level food security through capacity-building and initiatives to promote nutrition and livelihood security. Emphasis is laid on proper storage structure to prevent loss due to moisture and pest attack, and storage of locally grown and consumed cereals.
- As regards micronutrient malnutrition, emphasis has been placed on introducing horticultural remedies to nutritional maladies and the promotion of homestead kitchen gardens. Action research projects have been undertaken to study the family food habits and nutritional status of young children, in particular, in tribal communities in Wayanad district, Kerala, and Koraput district, Orissa; the findings have led to strategies to promote greater nutrition awareness through dissemination workshops and street plays. Household Entitlement Cards have been devised to increase awareness on government programmes for food and nutrition and community demand for these programmes.
- On the academic front, a short-term course curriculum on Hunger, Famine and Food Security was developed for the UN University of Peace, Costa Rica. Work is ongoing on enriching the nutrition curriculum at the undergraduate level with the participation of academicians and practising nutrition professionals.
- Advocacy is a major plank of MSSRF work. It ranges from a case for including millets in the PDS to sensitizing policy-makers on food security issues. A series of regional and national level workshops was held under the banner of 'Mission 2007: Hunger Free India', culminating in an Annual Dialogue on the same theme in 2006. A National Nutrition Conclave organized in 2007 has led to the formation of a Coalition for Nutrition Security. It will push for making nutrition security a national agenda.



*Weight growth monitoring of children – a part of action research projects on nutrition.*

*Opposite page:  
Prof. M.S. Swaminathan with  
MSSRF staff after the Blue Planet  
award in 1996.*

- MSSRF is the coordinating centre for a national project supported by the International Fund for Agriculture Development (IFAD) for saving genetic resources of underutilised crops such as millets, and promoting their cultivation and consumption through value addition. This project has led to promoting a movement for saving dying crops and dying wisdom. An international workshop on Agrobiodiversity in April 2006 led to the Chennai Platform of Action calling for concerted effort and policy support for this cause.
- The establishment of feed and fodder banks has been promoted in areas like Ladakh, where precious animals like the Pashmina goat face starvation during severe winter months.
- In the agrarian distress “hot-spot” regions of Vidarbha in Maharashtra, steps are being taken to empower women farmers to take to low-risk agriculture. This programme, titled *Mahila Kisan Sashaktikaran Pariyojana*, is helping to bring a new life of hope and cheer to women farmers in general, and the widows of those who have taken their lives, in particular. Continuing the education of children is another priority in areas affected either by natural calamities or economic disasters.
- Bridging the urban-rural digital divide is an important goal of the Information, Education and Communication (IEC) Programme. The Annual Inter-disciplinary Dialogue in 1992 was on Information Technology. At this dialogue, the concept of Village Knowledge Centres (VKC) was developed to achieve knowledge and skill empowerment in rural areas, using the tools of the new information and communication technologies like the Internet. The setting up of VKCs started in 1998 in villages in Puducherry. Connectivity, content creation, capacity building, care and management of the VKC and linking knowledge with application received concurrent attention. To make a difference to the lives of rural women and

*The first Village Knowledge Centre was set up in Puducherry in 1998, and 17 such centres have come up. These centres have helped bridge the rural-urban knowledge divide.*





men, the content must be location-specific, dynamic and demand-driven. Also, the community should have a sense of ownership of the VKC to ensure its sustainability. Encouraged by the success of VKCs and the introduction by the Indian Space Research Organisation (ISRO) of Village Resource Centres (VRCs) with satellite connectivity, the Jamsetji Tata National Virtual Academy for Rural Prosperity (NVA) was launched in 2003. The Fellows of the Academy are rural women and men who have mastered ICT applications. There are now over 1,000 Fellows of the Academy drawn from all parts of the country as well as from Afghanistan, Philippines, Nepal, Kenya, Nigeria and Sri Lanka. Addressing the first Convocation of the NVA, the former President of India, Dr A P J Abdul Kalam, remarked in 2004 that the “Academy is a celebration of rural India’s core competence”. NVA fosters the integrated application of the Internet, cable TV, community radio and the cell phone. The last mile and last person connectivity is achieved through Internet – cell phone synergy.

*Dr A P J Abdul Kalam with members of the Jamsedji Tata National Virtual Academy for Rural Prosperity launched in 2003. Members of the academy are rural men and women who have mastered information technology applications.*

- In 2004, MSSRF launched *Mission 2007: Every Village a Knowledge Centre*, in order to take the power and benefits of ICT to every village in the country. A National Alliance consisting of several hundred partners was formed for this purpose. In 2007, on the occasion of the 60<sup>th</sup> anniversary of India’s Independence, the partners of Mission 2007 decided to continue the programme in the form of *Grameen Gyan Abhiyan (GGA)*, with the Secretariat located in NVA. GGA has encouraged a wide variety of ICT models — such as the community-based public good model of MSSRF; government-initiated models like Akshaya, e-Seva, ISRO’s VRC, Bhoomi, and Common Service Centres (CSC); as well as entrepreneur-led models like Drishtee, n-Logue, Rural BPOs and Tarahat; corporate sector



The Motorola Gold Award was conferred on MSSRF for its work in applying information technology to aid rural prosperity.

MSSRF has become an interdisciplinary organization that fills gaps in research, extension and education, through a network of research centres in Tamil Nadu, Puducherry, Kerala, Orissa and Maharashtra. Chennai functions as the hub through a well-developed infrastructure.

models like ITC's e-chaupal; and mobile-based models like IFFCO's mobile services, QUALCOMM's Fisher Friend Mobile Application, m-Krishi etc. The NVA serves as an umbrella organisation for this rich variety of initiatives, all designed to bridge the digital and gender divides and thereby ensure inclusiveness in access to ICT. Some of the Fellows of NVA participated in and delivered lectures at the World Summits on Information Society held in Geneva and Tunis.

- A Jamsetji Tata Training School (JTS) is being set up to provide opportunities for a lifelong upgrading of the professional skills of NVA Fellows. At the same time, JTS will offer placement services for large national programmes like the Government of India's CSCs and ITCs e-chaupals. The contributions of MSSRF in the application of ICT for rural prosperity have received recognition from leading scientific journals like *Nature (UK)* and *Scientific American (USA)*, and from other sources such as the Stockholm Challenge Award and the Motorola Gold Award.
- Another important institutional device for linking science and society through the mass media was the establishment of the *The Hindu* Media Resource Centre in 1998. This centre has sponsored numerous dialogues and lectures on topics of public and political concern like genetically modified organisms, climate change, water saving and sharing and ecotechnology. The HMRC also helps to train young media personnel in various aspects of science communication.
- The MSSRF Library is rich in books and publications relating to environment protection and sustainable development. The library has a CD-Rom section, which is extensively used by scholars from all over the country.
- The work carried out by the organisation has resulted in several publications in the form of papers in peer-reviewed journals, books, monographs, and other publications and presentations at international and national conferences, workshops and consultations.



From a small beginning in 1988, MSSRF has grown over the past 20 years into an effective inter-disciplinary organisation concentrating in areas where there are gaps in ongoing research, education and extension. Special attention has been given to technology delivery systems resulting in institutional innovations like biovillages, Village Knowledge Centres and community food and water security systems through local level gene, seed, grain and water banks. The infrastructure developed at Chennai serves as the hub of a network of research centres located at Kalpetta, Wayanad, Kerala; Jeypore, Koraput, Orissa; Puducherry and Poompuhar, Tamil Nadu, all having their own buildings and field facilities.

Capacity-building infrastructure has been strengthened at Kalpetta (with support from the Government of Japan) and at Jeypore (with support from Mitsubishi Corporation under its Corporate Social Responsibility programme). As and when funds become available, research and training facilities for an Integrated Coastal Zone Management Centre will be created at Chidambaram on land already purchased by MSSRF.

The work carried out so far and that described in this Report would not have been possible without financial support and technical suggestions from the following:

- Central and State Government Departments and other institutions
- National, bilateral and multilateral donors
- Individual donors both in India and abroad and groups of donors like the Friends of MSSRF in Tokyo, and the Friends of Swaminathan, Australia (FOSA).
- A large number of eminent scientists who have generously given their time to serve on various advisory and steering committees.



*Rural and tribal men and women have enthusiastically adopted new technologies promoted by MSSRF.*

*MSSRF's field activities mobilise science and technology for development.*







*Creative and committed scientists are one of the major strengths of MSSRF.*

- Above all, rural and tribal women and men whose infectious enthusiasm for the adoption of socially and environmentally relevant technologies has provided the necessary stimulus and motivation for symbiotic scientist – farmer partnerships at all locations where MSSRF scientists are working.

It is good scientists – not good-looking buildings – who help to build a great scientific institution. MSSRF has been fortunate in this respect from its very beginning, as the scientists, scholars, administrative and accounting personnel and field staff have shown a combination of professional excellence and social commitment. We owe a deep debt of gratitude to them for making MSSRF what it is today – a leading research organisation of science for inclusive rural happiness.

Thanks are due to the Executive Directors of MSSRF – Prof P C Kesavan (1999-2003), Dr M Velayutham (2003-2007) and Shri Achyut M Gokhale (October 2007 onwards) – for their dedicated stewardship of the organisation. Above all, we are indebted to the Trustees of MSSRF, who have given generously of their valuable time and rich experience and expertise for setting goals and standards and providing policy oversight to the work of the organisation. Recently, Dr K Kanungo, a distinguished and devoted past Trustee passed away. He was a pillar of strength to MSSRF in its formative years and was widely admired and respected both by staff and students for his wit and wisdom. Our sincere condolence goes to Smt Meera Kanungo and their son, Dr Shivraj Kanungo and other members of the family. We also lost a few years ago Dr K N Shyamsundaram Nair, who not only served as a Trustee for 10 years, but also spearheaded the Biovillage programme in the early nineties.

In 1989, MSSRF started its research activities with three staff members, one of whom, Dr N Parasuraman, still remains a committed and dynamic member of the MSSRF family. Today the staff strength has grown to



*Biju Patnaik medicinal plant centre at Jeypore, Orissa, inaugurated in 2007.*

330 (185 scientific staff, 10 advisors, 135 technical, administrative, accounting and supporting staff). Looking ahead, it is important that MSSRF maintains its pioneering character and continues to develop and disseminate innovative methods of technological empowerment of rural families, like biovillages, biovalleys, village knowledge centres, pulse villages and community food and water security systems.

A pre-requisite for maintaining and enhancing its pioneering character is the ability to attract and retain creative scientists, filled with a desire to take our country to an era of bio-happiness resulting from the conversion of our rich bioresources into sustainable rural livelihood opportunities. This will call for a substantial endowment fund, the interest from which can assure job security to scientists having the capacity and urge to become transformational agents. I therefore wish to conclude this brief synoptic survey of the highlights of the journey from a Registrar's table in Ajmere Gate, New Delhi in May 1988 to the present day with a sincere thanks to all past and potential donors.

**1 January, 2009**

**M S Swaminathan**

# The MSSRF Timeline

## Calendar of Events, 1988-89 – 2007-08

### 1988-89

Registration of the Trust in Delhi on May 17, 1988.

### 1989-90

Swaminathans move to Madras in May 1989.

Begin work in a room in IIT; Dr Rajeshwari and Mr Parasuraman join the staff.

Keystone International Dialogue on Plant Genetic Resources held in January 1990.

Move to rented premises in March 1990.

### 1990-91

First Annual Interdisciplinary Dialogue in the series "New Technologies: Reaching the Unreached" on biotechnology held in January 1991. Discussions at this dialogue provide the seed for what was to become the Biovillages Programme.

First International Training Programme on Mangrove Conservation, February- May 1991 (ITTO).

### 1991-92

Bricklaying by friends at site of new building in Chennai, April 14, 1991.

First Annual Report of MSSRF released on August 7, 1991.

Second Interdisciplinary Dialogue on the theme of Information Technology held in January 1992 which was the origin of the Information Village or Village Knowledge Centre programme.

Mangrove Genetic Resource Centre established in Pichavaram.

*Bricklaying at the site of MSSRF's building in April 1991.*



*MSSRF's rental home during 1990-93.*



*International training programme on mangrove conservation (above).*

*First annual report of MSSRF released in 1991 by Mr. Duman Bhai, founder-member, BAIF (below).*



### 1992-93

Release of book on Biotechnology Dialogue - the first MSSRF publication to be brought out by a publisher.

India- China Biovillage Project launched in Qianxian Province of China.

### 1993-94

April 14, 1993 – Inauguration of MSSRF's new building in Chennai.

Community Gene Bank, a part of the Scarascia-Mugnozsa Genetic Resources Centre, launched in January '94 in Chennai. Its function: to collect, catalogue and conserve land races and wild relatives of crop plants traditionally grown by tribal and rural families.

Interdisciplinary Dialogue on Methodologies for Recognizing the Role of Informal Innovation in the Conservation and Utilisation of Plant Genetic Resources, held by MSSRF in January 1994. Product of the dialogue: draft of an Act to reward and recognize conservers of plant genetic resources, which led to the Plant Varieties Protection and Farmers' Rights Act passed in 2000 by Parliament.

### 1994-95

MSSRF work exempted from tax under Section 35-1-ii of the Income Tax Act, following recognition as an institution of excellence by the Department of Scientific and Industrial Research.

### 1995-96

UNESCO Chair in Ecotechnology set up at MSSRF, with Prof Swaminathan as Chair.

Technical Resource Centre for the Implementation of the Equity Provisions of the Convention on Biological Diversity (CBD) set up in Chennai.

Production of bio-software by self-help group members begins at Kannivadi, Tamil Nadu.

Asian Ecotechnology Network set up by UNESCO.

*In vitro* propagation for large-scale production of planting material developed for several Rare, Endangered and Threatened (RET) species and mangrove species.

MSSRF demonstrates a simple cost-effective technique to restore degraded mangrove species.

Joint Mangrove Forest Management (management by government in co-operation with village communities) initiated along east coast of India.



*Launching of biovillage project in China.*



*Inauguration of MSSRF's new building in Chennai by Ms. J. Jayalalithaa, then Chief Minister of Tamil Nadu, and Governor Bhishma Narain Singh..*



*Scarascia Mugnozsa Community Gene Bank launched in the presence of the Mugnozsas.*



*Dedication of Borlaug Hall at MSSRF.  
From left: Dr Norman Borlaug, Mr C Subramaniam,  
Dr. Swaminathan and Mr. Federico Major of UNESCO.*

### 1996-97

Blue Planet Prize for 1996 conferred by the Asahi Glass Foundation of Japan for “efforts to realize sustainable agriculture and rural development through ecosystem activities”.

Bricklaying for JRD Tata Ecotechnology Centre in Chennai - April 14.

Hunger-Free Areas Programme (HFAP), inaugurated by Tamil Nadu Chief Minister Dr M Karunanidhi.

### 1997-98

Biotechnology group identifies and isolates mangrove gene for salinity tolerance.

Inauguration of first Village Knowledge Centre by Dr Ismail Seregeldin, then Vice-President of the World Bank and Chairman of the Consultative Group on International Agricultural Research.

Land allotted for Biocentre at Puducherry – 1997.

Publication of book on Gender and Biodiversity, edited by M.S. Swaminathan, by Konarak Press. The first book anywhere on this subject.

### 1998-99

Dedication of JRD Tata Ecotechnology Centre building at MSSRF in Chennai, July 29, 1998.

Bricklaying for Community Agro-Biodiversity Centre in Kalpetta, Wyanad, and launch of Community Agro-biodiversity Conservation Corps. People’s Biodiversity Registers (PBRs) are developed for four panchayats in Kerala.



*Dr Ismail Seregeldin inaugurates first Village Knowledge Centre in Puducherry.*



*Bricklaying for Community Agro-biodiversity Centre in Wayanad, Kerala.*

*JRD Ecotechnology Centre building at MSSRF dedicated in July 1998.*



MSSRF hosts meeting of the UN Standing Committee on Nutrition's (UNSCN) Commission on 'Nutrition Challenges of the 21<sup>st</sup> century' in Chennai, in Nov 1998.

Participatory Plant Breeding (PPB) – a process of incorporating the knowledge and needs of farmers into breeding programmes – launched at MSSRF project in Jeypore, Koraput district, Orissa. Jeypore is one of the world "centers of origin" of rice. PPB uses traditional and local land races of rice which have been conserved by local farmers, especially tribals, for centuries.

*The Hindu* Media Resource Centre set up August 1998 in Chennai.

### 1999-2000

Inauguration of Bio-centre at Puducherry, April 2000.

Donations mobilized for short-term and long-term cyclone relief and rehabilitation in Orissa. A number of small donors, and the Reynolds Pen Company, fund immediate relief and rehabilitation. Large donations obtained from PriceWaterhouse Cooper for construction of two multi-purpose cyclone shelters in the villages of Gyaspur and Mallikapur.

*Social Vision for Science*, a publication to commemorate 10 years of MSSRF, released.

Community Gene Management networks are set up to demonstrate the link between biodiversity conservation and food security. MSSRF initiates pilot models of a community-managed Gene-Seed-Grain Bank continuum in tribal villages of Jeypore (Koraput district, Orissa).

Broadcasting of wave height and weather information to fisher community in Village Knowledge Centers begins.

### 2000-01

Inauguration of the office building of the Community Agrobiodiversity Centre (CAbC) and setting up of the Every Child a Scientist (ECAS) programme in Kerala in November 2001.



*Donations for cyclone relief in Orissa.*



*Community-managed gene, food and grain bank promotes food security in Koraput district, Orissa.*

*Office building of the Community Agrobiodiversity Centre in Kerala.*



The first-ever Women's Biotechnology Park launched in Siruseri near Chennai, November 2000.

Website on vegetable marketing launched in Odanchhatram village, Tamil Nadu, to help traders of Dindukkal.

Young Woman Scientist Award for Dr. N. Lakshmi of MSSRF conferred by Department of Biotechnology, Government of India.

Stockholm Challenge Award (Global Village category) conferred on MSSRF for its work in promoting social inclusion through Information and Communication Technology.

### 2001-02

The Food Insecurity Atlas of Rural India, the first in a series of three atlases produced in collaboration with the UN World Food Programme, released by the Prime Minister of India, Shri Atal Bihari Vajpayee, in New Delhi in April 2001. "Make India hunger-free," said the PM in his inaugural address.

The Food Insecurity Atlas of Urban India, released by the President of India, Dr A P J Abdul Kalam, in October 2002.

The Atlas of the Sustainability of Food Security in India, released in February 2004.

Greenhouses set up by local self-help groups in Kutch in earthquake-hit Gujarat, to support micro-enterprise in horticulture. Funds provided by "Friends of MSSRF", Japan.

Convocation of Ago-biodiversity Corps held in May 2001 in Kerala.

Inauguration of multi-purpose cyclone shelter in Gyaspur, Orissa, with funds mobilized by MSSRF from Price Waterhouse Cooper.

Mangrove Atlas of Tamil Nadu, Andhra Pradesh and Orissa prepared by MSSRF released.

Woman Scientist Award for 2001 conferred on Dr Sudha Nair of MSSRF by Department of Biotechnology, Ministry of Science and Technology.

### 2002-03

Equator Initiative Award conferred on tribal communities in Koraput, Orissa, for their work in biodiversity conservation through an MSSRF project. Award handed over at World Summit on Sustainable Development in Johannesburg, South Africa on 26 August 2002.

*Representatives of Orissa tribal communities with the Equator Initiative Award won by them for biodiversity conservation.*



*Prime Minister Vajpayee releases Food Insecurity Atlas of Rural India in New Delhi.*



*Multi-purpose cyclone shelter set up in Gyaspur, Orissa.*



*Mangrove atlas released by Ms. Lucia Edwards, then High Commissioner of Canada, in July 2004.*



Poomani self-help group from Tamil Nadu wins award for bio-pesticide production by a self-help group at the Youth Employment Summit in Alexandria, Egypt.

National Virtual Academy for Rural Prosperity set up in 2003 by MSSRF in Chennai.

Salt-resistant genes from mangroves successfully transferred to rice. Successful culmination of MSSRF research work on mangroves.

Touch and Smell Garden – a part of the Every Child a Scientist programme – opened in Chennai August 2002. The aim: to make visually impaired children experience the joy of nature, and explore nature through touch and smell. The garden has plants of different kinds – some aromatic, some thornless, some medicinal, many that are economically important – with leaves of various textures. Braille signboards and tactile signals in the garden direct the visually impaired children to the plants.

Weather Forecasting station launched in Kannivadi, Tamil Nadu, under the JRD Ecotechnology Centre.

Gender and wild foods study, begun in 2001, completed. The study examined both the role of wild foods in ensuring food security for communities in Wayanad, especially tribals and the gender dimensions of knowledge and management.

Green belt and genetic garden for fruit crops developed in Kudamkulam, Tamil Nadu – a dryland area.

#### 2003-04

First field trials of transgenic rice conducted in Kalpakkam, Tamil Nadu.

The 30<sup>th</sup> annual session of the UN Standing Committee on Nutrition hosted by MSSRF in Chennai March 2003. This is the first time in the history of the SCN that a civil society organization hosts its annual session.

National Alliance formed for *Every Village a Knowledge Centre*.

*Swaminathania salitolerans* recognized as new bacterium capable of fixing nitrogen and of making phosphates soluble in saline soils. Named after Dr Swaminathan by the microbiology group of MSSRF. Artificial reef built in Gulf of Mannar to promote biodiversity.

Gender in Agriculture and Rural Livelihoods Curriculum – a teachers' manual – developed in collaboration with the Kerala Agricultural University,

*Artificial reef built in Gulf of Mannar to promote marine biodiversity.*



*Members of Poomani self-help group from Tamil Nadu in action. They won an award for bio-pesticide production.*



*Touch and Smell garden opened in Chennai.*



*Swaminathania salitolerans – new bacterium named by microbiology group of MSSRF.*





released in both print and electronic form. The curriculum is meant for a one-semester two-credit module for undergraduate students of agricultural colleges and universities .

The first Fellows of the National Virtual Academy for Rural Prosperity (NVARP) honoured in August in Chennai by Mr. Ranil Wickramasinghe, then Prime Minister of Sri Lanka.

*The Hindu* Media Resource Centre launches a 52 - week rural development radio programme for All-India Radio.

*Mission 2007: Hunger Free India* campaign launched.

A National Food Security Summit organised in New Delhi in February 2004 on the occasion of the release of the Atlas of Sustainability of Food Security in India. A series of regional workshops organised by MSSRF (in collaboration with the UN World Food Programme and the National Commission of Farmers) between September and November 2004 in Hyderabad, Ahmedabad, Shillong and New Delhi, followed by a national workshop in New Delhi. Aim: to bring together diverse groups of stakeholders to discuss measures for a hunger-free India.

#### 2004-05

December 26, 2004: Tsunami devastates Tamil Nadu and other states and a number of countries, particularly in South East Asia. Mangrove-rich areas not affected – highlighting the value of mangroves as a bio-shield, a point consistently stressed by MSSRF.

2004 designated as International Rice Year by the UN. Five FAO-supported workshops to commemorate the year held in collaboration with local organizations – two of them in Chennai, the others in Jeypore (Orissa), Pattambi (Kerala) and Shillong (Meghalaya).

The national interdisciplinary seminar in Chennai held in Sept 2004 was on the theme “Gender Concerns and Food Security Issues in Rice Livelihood Systems in India: Challenges and Opportunities”.

First five Village Resource Centres opened in Tamil Nadu, the first at Pillaiyarkuppam, Puducherry.



*Visiting Sri Lankan Prime Minister Ranil Wickeremasinghe honours a Fellow of the National Virtual Academy for Rural Prosperity in Chennai.*



*A mangrove bio-shield (above and below) will help protect Tamil Nadu from cyclones.*



*Village Resource Center building opened in Pillaiyarkuppam.*

MSSRF's Community Gene Bank observes 10<sup>th</sup> anniversary.

Bhoomi Puja of Biju Patnaik Medicinal Plants Centre held in Jeypore, Orissa.

Project of INCOIS (Indian National Centre for Ocean Information Services) begins. Relates to tracking of fish shoals and dissemination of information to fishermen.

### 2005-06

Convocation of the First National Virtual Academy held in July in New Delhi, with President A.P.J Abdul Kalam as Chief Guest.

International Conference on Human-centred Sustainable Development Paradigm held in Chennai in August 2005 on the occasion of Dr. M.S.Swaminathan's 80<sup>th</sup> birthday, with over 650 participants, including his former students.

To mark the 80<sup>th</sup> birthday of Prof Swaminathan, the 80 RET Species Protection Scheme is launched in August. Under the scheme, 80 to 100 rare, endangered and threatened (RET) species of Western Ghats to be studied. Eight research fellowships to be awarded.

"Fifteen Years- Fifteen Steps," a video documentary on MSSRF, released and screened at the International Conference in August. The documentary highlights progress and achievements in the six Programme Areas of MSSRF.

Chennai Platform for Action launched in April 2005. Developed by participants – some 100 policy-makers and experts from 25 countries – at an international consultation in Chennai to enhance the contribution of plant genetic resources to meeting the Millennium Development Goals (MDGs), especially that of reducing hunger and poverty. Organized jointly by the International Plant Genetic Resources Institute, the Global Forum on Agricultural Research and MSSRF.

October 2005: Prof Swaminathan visits Vidharbha, the region worst affected by farmer suicides, in his capacity as chairman of the National Commission on Farmers. As a relief measure, two Village Resource Centres in the region inaugurated in January 2006. A programme for educational support and livelihood rehabilitation of suicide-hit families formally launched in Nagpur on May 1, 2006, Maharashtra Day.



Fishermen get information about the sea – wave height, speed etc. A project with the Indian National Centre for Ocean Information Service (INCOIS).



Former students offer scroll and gift to Prof. M. S. Swaminathan on the occasion of his 80<sup>th</sup> birthday at an international conference in Chennai.

Enhancing plant biodiversity can help combat hunger.



Rare, endangered and threatened species of Western Ghats are being studied by researchers under a special fellowship scheme.



## 2006-07

National Biosciences Award – for application of biotechnology in coastal agricultural improvement – conferred by the Government of India on Dr Ajay Parida of MSSRF on March 6, 2006.

Bhoomi Pooja performed in Poompuhar (February 2007) to establish the first Fish-for-All Training and Research Centre.

MSSRF work rated among the top ten innovative researches in India by *Outlook* magazine.

An additional 26 acres acquired by the Community Agrobiodiversity Centre, Wayanad, Kerala, for conservation and demonstration. A small part of this land utilized to build a Community Training Centre with training, office and residential facilities.

MSSRF completes studies and recommendations for the Government of India on sustainable development for wetlands in Kuttanad and Idukki districts. The government had requested these studies in view of widespread farmer distress, and declared a special rehabilitation package for 31 distressed districts of Andhra Pradesh, Karnataka, Kerala and Maharashtra.

Genome Saviour Award, February 2007: The Panchavati Gramya Unnayana Samiti, an association of tribal farmers in Jeypore, Orissa, honoured with the Genome Saviour Award for conservation of rice germplasm by the Plant Varieties Protection and Farmers' Rights Authority of India – in recognition of the collective efforts of farmers to conserve crop agro-biodiversity resources.

A project launched to build and strengthen the capacity of the rural poor in Andhra Pradesh and Rajasthan to cope with the adverse impacts of climate change and improve their disaster preparedness. The project will integrate knowledge in water, agriculture and rural energy.

Mr N.Parasuraman, the first staffer of MSSRF (he joined in 1989 at the age of 17 after completing Class X), obtains PhD degree in Interdisciplinary Sociology from Madras University. His thesis: "Professor M.S.Swaminathan – Life and Achievements".

MSSRF launches Knowledge on Wheels programme in August 2007 in Chennai. Programme includes tele-optthalmology and soil and water testing vans.

A 'Greens Ecoshop' launched by a self-help group in Wayanad, Kerala, with support from the Community Agrobiodiversity Centre. Function of the ecoshop: to market organic produce and bio-inputs produced by farmers and self-help groups.

*"Greens Ecoshop" launched by a self-help group in Wayanad, Kerala.*



*Bhoomi Pooja for a Fish-for-All Training and Research Centre in Poompuhar, Tamil Nadu.*



*Tribal farmers of Jeypore, Orissa, are honoured with the Genome Saviour Award.*



*N Parasuraman, first staffer of MSSRF, gets his PhD. from Madras University.*



A Village Knowledge Centre set up at Thachambath tribal hamlet along with a Village Resource Centre at the Community Agrobiodiversity Centre, Wayanad, Kerala.

### 2007-08

Dedication of Biju Patnaik medicinal plants garden and research Centre at Jeypore, Orissa, on 14 April.

The mission *Every Village a Knowledge Centre* renamed Grameen Gyan Abhiyan.

Another rural women's enterprise, a plastic-free sanitary napkin unit, set up by self-help group members of the biocouncil at MSSRF's Puducherry biocentre.

10<sup>th</sup> year of the Community Agrobiodiversity Centre, Wayanad, Kerala, observed with a national conference on "Revitalising agrobiodiversity for alleviating poverty and hunger" at the newly completed Community Training Centre of the Community Agrobiodiversity Centre.

A major achievement: Drought-tolerant gene from mangroves transgenically transferred to rice in Chennai.

Mahila Kisan Sashaktikaran activity launched in Vidharba to empower women farmers, by setting up clusters of women farmers in villages. A federation to be formed over a period of time. The idea is to give the women an identity as 'farmers' and help ensure sustainable livelihoods, also to give them a voice and a platform.

Following 10 years of MSSRF work in participatory plant breeding, a new rice variety, Kalinga Kalajeera, has been developed in Orissa. The Kalinga Kalajeera Rice Growers' Cooperative Society has been formed.

In December 2007, MSSRF launches a new project, "Fisher-friendly mobile application." It makes available to fishers information on wave height, weather, government announcements and schemes, markets for fish, potential fishing zones, yellow telephone pages, as well as "flash news".

The CD-ROM library set up in 1995-96 in Chennai crosses the 9- million mark for records on agriculture.

*The Hindu* Media Resource Centre of MSSRF is being presented the Jawaharlal Nehru Award for Science Communication for 2008 by the Indian Science Congress Association.



*Low-cost sanitary napkin unit at Puducherry.*



*Medicinal plants garden and research centre dedicated in Jeypore, Orissa.*



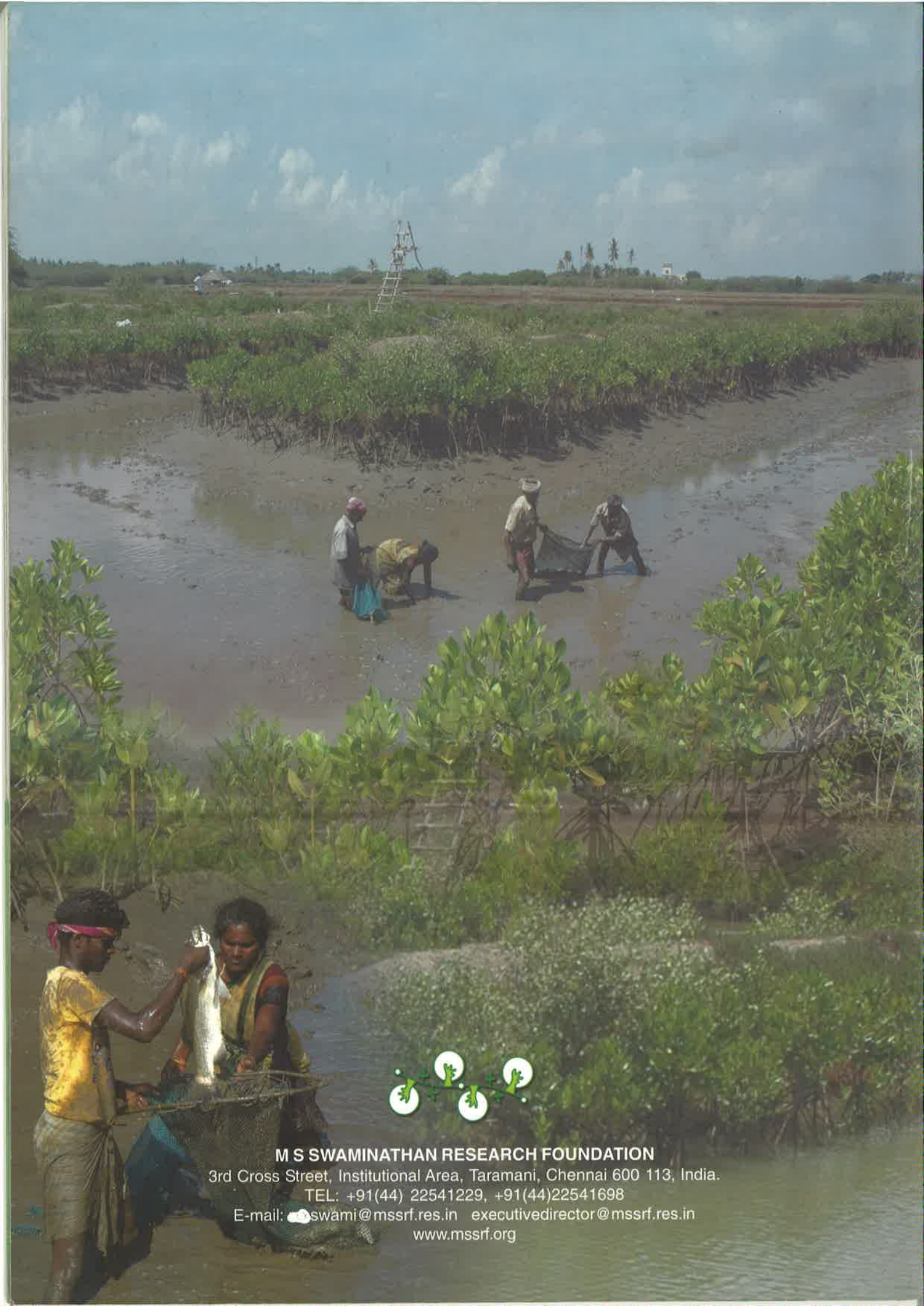
*Training women farmers of Vidarbha in good agricultural practices.*



*Mobile phones that are indeed fishers' friends at sea.*



Aquaculture based Integrated Intensive Farming System Model Farm at Manitiri, Kendrapara, ORISSA



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