The Future of Rice in Wayanad

BioDIVA Inception Workshop

Kalpetta, Wayanad District, Kerala State, India
16-18 February 2011

Workshop Report

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Glossary of Terms

CBO
Community Based Organisation

HYV
High Yield Varieties

MGNREGA
Mahatma Gandhi National Employment Guarantee Act

NGO
Non-Governmental Organisation

Panchayath
Council of elected members from a village or a group of villages.

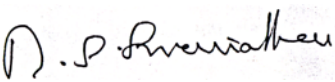
Foreword

„The future of rice" workshop raises fundamental questions about agricultural production and rural development in Wayanad. In February 2011 it brought together international scientists, local politicians and concerned citizens to reflect on the analytical needs of a rapidly changing district. Witnessing the fast disappearance of paddy-fields and their replacement by banana and arecanut-plantations or real-estate, it is a timely measure to take a holistic look at current land use change patterns.

I welcome the concerted action taken by young scholars to understand the driving forces and consequences of these social and ecological changes. The prominent feature of the BioDIVA research project is its collaboration of Indian and German scientists and development practitioners on an equal footing.

Much of the workload rests on the motivated bi-national Ph.D. tandems, consisting of one German and one Indian scholar. Organising and guiding this endeavour requires and open debate on concepts and ideas to create new ways forward to transform Wayanad towards sustainability with the means of jointly generated knowledge.

I extend my best wishes towards the international and national participants and the BioDIVA team and look forward to the emerging transformation knowledge for equitable and sustainable use of agrobiodiversity.



Prof. M.S. Swaminathan
Founder and Chairman
M.S. Swaminathan Research Foundation

I. Executive Summary

The inception workshop introduced the background and conceptual framework that guides BioDIVAs research process. Presentations and commentaries dealt with the agroeconomy, agrobiodiversity and land use change, whilst transdisciplinarity and gender served as a uniting basis. Keeping this in mind, links between the disciplines will be carefully crafted while conducting research. The key role of transdisciplinarity as a framework for participatory research is being built upon by the involvement of all stakeholders and by integrating their differing interests. However, the transdisciplinary research approach is new to Kerala. It enables to transfer farmers´ experiences to other stakeholders in a form of collaborative learning. Merging their knowledge with academic concepts, and using synergistic modelling approaches by pouring into one mould has the potential to create transformation knowledge.

Interactive platforms such as tea chats and field trips gave insights into the perceptions and realities as seen and experienced by the local experts, scholars and land managers in the field. The policy aspect emerged as a key issue, as the government plays a role at state and central level with regards to agricultural production, agricultural/ rural labour. They influence economic aspects of rice farming: input subsidies, markets and product identity, valuation, infrastructure and labour regulations are factors in land-use change and use of agrobiodiversity in Wayanad. The project will derive relevant, accurate and timely results for policy and people.

On-going disparity between the economics and ecology of paddy fields emerged as a central challenge for BioDIVA. Setting agrobiodiversity in the wide field of land use change, BioDIVA aims at raising awareness about the functions, services and values of the system.

The participating experts and researchers agreed upon ongoing collaboration and exchange. However, the next step ahead is to formulate clear and streamlined research approaches and to foster cooperation. The analysis of land use change in Wayanad will contribute towards knowledge for transformation for a sustainable future. One aspect is to support Panchayath Raj Institutions in their activities in policy formulation and implementation.

II. Highlights of the Programme

Day 1: Wednesday, 16.02.2011

09:00 Inaugural Session

Welcome address & Briefing by the Master of Ceremony, Dr N. Anil Kumar, Director, CAbC, M S Swaminathan Research Foundation

Introduction to the workshop: Background and objectives
by Dr Martina Padmanabhan Senior Research Fellow, Leibniz University Hannover

Opening address and Key note speech
by Prof. Dr K. P. Kannan, Professor, Centre for Development Studies, Trivandrum

Lighting the Lamp & Inaugural Address
Sri. K. L. Poulose, District Panchayath President, Wayanad

09:05 Felicitations
Prof. M. K. Prasad, Executive Chairman, Information Kerala Mission & Chairman, Steering Committee, CAbC, M S Swaminathan Research Foundation

Sri. A. Ratnam, Member Steering Committee, CAbC, M S Swaminathan Research Foundation

Message from The Stakeholder Workshop by Smt. C. P. Premakumari

11:00 Technical Session

Aims and scope of the BioDIVA research project
Rethinking sustainable and equitable use of agrobiodiversity: presentation by Dr habil. Martina Padmanabhan

13:30 Tea chat: Identifying research gaps to sustain agrobiodiversity of rice production systems
Group 1: The future of tribal communities: Gender and food security
Group 2: Economic Valuation of Rice Fields: The role of ecosystem services
Group 3: Decline of Paddy: Role of institutions, social process and economic factors

Group 4: The inter-linkage of traditional knowledge, biodiversity and land use change

16:00 Tea chat presentation and discussion

19.00 Welcome Dinner Buffet (With Gandhakasala Payasam)

Day 2: Thursday, 17.02.2011

09:15 Presentation in plenary

Sustainability and Gender Equity in Rice Production
by Prof. Janet D. Momsen (University of California, UC Davis)

10:00 Commentary by Prof. Dr Geethakutty:
The Case of Kerala

11:00 Moving Towards Equitable and Sustainable Landscape: Participatory Land Use Analysis in Wayanad
by Melvin Lippe (BioDIVA, Leibniz University Hannover)

11:30 Commentary by Dr N. Anil Kumar:
Bridging Politics, Landscape and People: How Can Research and Regulation Join Hands?

12:45 Briefing for the Field Trip
Presentation of village and communities, culture and social background coordinated by Girigan Gopi, BioDIVA Research Group

14:00–18:00 Field Trip

19:30 Cultural Event: BioDIVA Dinner

Day 3, Friday 18.02.2011

09:10 Plenary
Presentation and reflection of field trips findings from each of the 'village visiting groups'

10.00 Panel discussion

PD Dr Brigitte Kaufmann, DITSL, German Institute for Agriculture in the Tropics and Subtropics

Dr S. Bala Ravi, Advisor, Biodiversity, M S Swaminathan Research Foundation

Prof. Ulrike Grote, Institute of World Trade and Environmental Economics, Leibniz University, Hannover

Dr Seema Purushothaman, Fellow, Ashoka Trust for Research in Ecology and the Environment, Bangalore

Dr Kamalam Joseph, Centre for Water Resource Development and Management, Kozhikkode

12.30 The Next Steps of BioDIVA: The Centrality of Feedback Workshop & Closing Remarks
by Dr Martina Padmanabhan & Dr N. Anil Kumar

III. The BioDIVA Project

The BioDIVA project conducts inter- and transdisciplinary research in the social-ecological domain of rice production systems. BioDIVA seeks to develop sustainable ways of farming and agriculture activity to maintain the rich agrobiodiversity of local rice farming systems. The project will analyse and strengthen the key role of women and tribal communities engaged in rice farming.

BioDIVA, situated at the Institute of Environmental Planning, Leibniz University Hanover, Germany together with the M. S. Swaminathan Research Foundation (MSSRF), India will jointly carry out this research applying innovative approaches. One such innovative approach is the consistent integration of the expertise of its research fellows from the disciplines of agroecology, institutional analysis, land use change modelling, resource economics, and rural sociology with the locally acquired knowledge and experience of local farmers and stakeholders.

The project's main study area lies in Wayanad district in Kerala State, the total duration of the project's activities, including logistic and administrative processes, research, analysis and publication lasts from February 2010 until January 2014.

Inception Workshop

Although the name Wayanad literally means the "land of paddy fields", the decline in area under rice cultivation and rice production, particularly of traditional rice varieties and the on-farm conservation of these traditional varieties has started to change the agricultural and socio-economic situation of Wayanad district.

Map of Wayanad in Kerala (South India)

Overview Kerala State : www.mapsofindia.com/maps/kerala/districts/wayanad.htm

© www.mapsofindia.com

Wayanad district:www.mapsofindia.com/maps/kerala/kerala.htm

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Elements, maps, waypoints and additional mapping progresses processed by IUP-B.Niemeyer

Particularly the food and livelihood security of the local ethnic communities i.e. Paniya, Adiya and Kuruma has been impacted upon by these changes. It is believed that land use change and land use intensification have triggered the degradation of ecosystems, the services and associated landscape functions.

The BioDIVA inception workshop "Future of Rice in Wayanad" is the starting point of an inter- and transdisciplinary research endeavour to examine the social-ecological complexity of rice production systems in Wayanad District. BioDIVA has a strong focus on participatory analysis and seeks to integrate local stakeholders involved in rice farming from the start of its research and project work. The tools of land use modelling were introduced, participatory approaches which promote the development of a sustainable future for rice production in Wayanad were discussed among all workshop participants.

The larger scope of BioDIVA project was discussed with policy makers, scientists and members of civil society and community based organisations. A field trip to local communities and villages was central to the workshop to encourage a lively engagement of workshop participants, rice farmers, men and women who rely on rice farming and other key land managers of the local communities.

The participants of the workshop, in particular the gathering of distinguished and renowned international and Indian experts, decision-makers, farmers and development practitioners identified concerns and intersections of areas of common interest. The discussions at the interface of social, ecological and economic, dimensions of rice production systems officially opened the field research phase of the BioDIVA project in Wayanad District.

Objectives of the workshop

Whilst setting the scene for the coming years of data gathering and analysis, the inception workshop pursued the following objectives:

- Introduce BioDIVA research project and group
- Identify intersections and areas of common interest
- Establish base for ongoing partnerships
- Officially open field-phase
- Receive advice and feedback

IV. Overview of the Report

This report provides a structured summary of the technical presentations, discussions and impressions. Moreover, it illustrates the process of drawing out the best results by bringing together experts from academia and the field; researchers, community workers and farmers alike.

The cultural setting was paid tribute to during an inaugural session with the lighting of a ceremonial oil lamp; keynote speeches conveyed friendly intentions and the will to start a dialogue.

Presentations and technical sessions paved the ground and provided a platform for sharing informed input from the various disciplines with all participants, followed by plenary discussions that enabled the participants to express their views, clarify queries and share from their experience.

Inaugural session

The workshop consisted of a variety of sessions, each intended to derive the maximum amount of informed opinions, experts' advice and encourage a dynamic discussion.

Group work in tea chats and field trips granted an opportunity for participants to free themselves from the limitations of a plenary setting and engage in a more immediate manner with each other, the people and topics that lie at the centre of BioDIVAs work. Guiding questions[1], the election of chair persona for the tea chat and the express obligation to report back from group events provided a structure within which each group and group member could maximise their input. Results of discussions, immediate observations and findings paired with reflection and analysis from within the present setting were thus available and applicable for the research endeavour.

Field trip scene

A closing panel discussion enabled selected experts to share their views on predefined sets of topics after having experienced and shaped the inception workshop. Furthermore, having been immersed in the physical and socio-cultural setting in which the project operates and getting to know the project team, they were able to tailor their advice to the requirements and rigour of the subjects to be studied and the researchers themselves.

1 See Annex iii

V. Stakeholder Workshop "The Future of Rice", February 14th

The stakeholder workshop took place in the run-up of the International Inception workshop at the Community Agrobiodiveristy Centre (CAbC) of the M.S.Swaminathan Research Foundation (MSSRF) in the Arani Community Training Centre.

The objectives of the stakeholder workshop were fourfold:

1. to introduce BioDIVA, its scope and concept to local stakeholders; especially those who are not fluent in English, but are central in the management of local agrobiodiversity

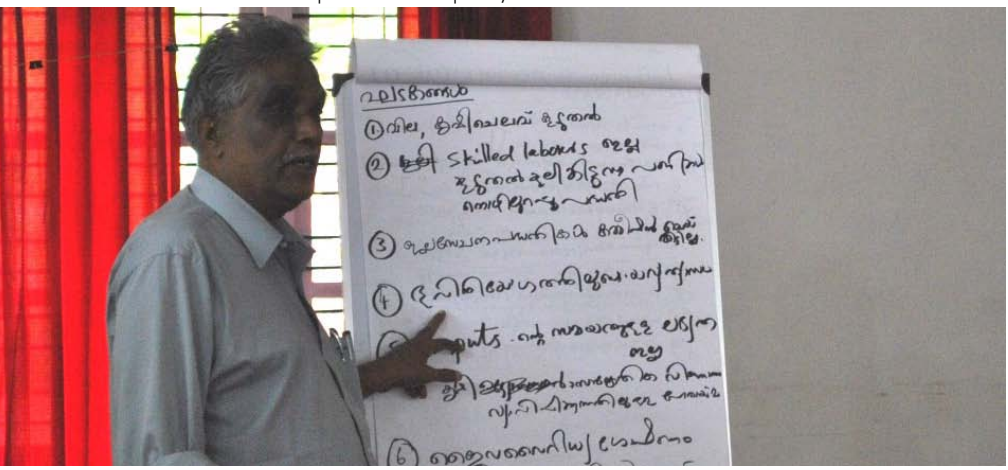
Stakeholder workshop

The rationale was to provide a comfortable working environment for mainly Malayalam speaking stakeholders, tailored to the specific needs of interaction between the local stakeholders such as farmers, representatives of the local tribes, local decision makers and implementers. Selected representatives from these target groups, together with community field workers followed the invitation of BioDIVA and the MSSRF.

2. to distinguish BioDIVA as a research project in contrast to an intervention programme, development cooperation or agricultural extension organisation
3. to establish a common understanding for the ongoing collaboration for research and dialogue in upcoming stakeholder workshops
4. to receive feedback and personal opinions of local community members as further input to the international inception workshop

Over the course of the half-day workshop, BioDIVA was welcomed and introduced by Dr. N. Anil Kumar; Dr. Martina Padamabhan and Girigan Gopi introduced the background, aims and up coming activities of the project. Honourable sub-collector of Wayanad Sri N. Prasanth, IAS, inaugurated the stakeholder meeting; in his speech he welcomed this meeting of minds to support informed decisions. Furthermore he highlighted the issues that are faced by the local administration and the interaction with the local land managers. He emphasised that policy makers and administration need accurate data and scientific knowledge to describe and understand the ongoing situation of land conversion. Existing legislations appear not to be suitable in addressing the ongoing land use change.

In order to gather some concrete opinions and highlight issues that will show the way during the inception workshop, the stakeholder meeting split into three discussion groups to identify social, ecological and economic problems related to rice farming in Wayanad according to participants' perception. The three groups represented Panchayath Raj members, women (labourers and farmers) and male landholders cultivating rice. The groups discussed the major problems in rice cultivation, then identified possible remedies. The outcomes of the discussion were then presented at the inaugural session of the international inception workshop.



M.D. Abhinandana Kumar, President of local CBO Seed Care presenting the result of group work

Problems identified by all three groups

1. Government policy and infrastructure:
   a. Lack of infrastructure
   b. Irrigation system is inadequate
   c. Policy level confusion and lack of support from government

2. Changes in market structures
   a. Rice cultivation is not profitable compared to other crops
   b. Higher labour costs and labour shortage
   c. Industrialised agriculture is increasing

3. Socio-cultural concerns
   a. Lack of social recognition for rice farmers, young people are losing interest in rice farming
   b. Changes in cultivation practices
   c. Reduction in local rice varieties
   d. Land fragmentation

4. Environmental factors
   a. Climate change, changes in rainfall patterns
   b. Increased incidence of pests and diseases
   c. Soil water storage capacity and ground water level depleted

Factors that contribute to the identified problems were listed to illustrate possible causes and consequences:

1. Low market price vis a vis high input costs
2. Shortage of skilled labour: Farm labourers are attracted towards other crops or other sectors such as construction
3. Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) guarantees 100 days paid employment in rural areas. This means that also skilled farm labourers are employed in low-skill day jobs

4. Irrigation schemes have not been completed and officially started
5. Decreasing joint family systems, decline in group farming
6. Farming inputs and technical knowledge to the field - extension workers are under-equipped
7. All inputs come from industry and need to be paid for
8. Monsoon rains are delayed, erratic, unreliable

Locally applicable solutions suggested

1. Government and policy level:
   a. Increase mandates for Panchayaths, which are willing and able to give incentives
   b. Increase government subsidies and other incentives such as value addition
   c. Provide demand driven infrastructure support for rice cultivation
   d. Mission mode irrigation programme, complete pending irrigation schemes
   e. Mechanisation through Local Self Governments (LSGs)/Farmer Clusters
   f. Lab to Land (extend research and development activities to the farm)
   g. Support and training for farm extension workers, in schools and at family level on rice farming practices
   h. Reduce demand for land by building apartment buildings

2. Market structures
   a. Establish labour bank
   b. Group and communal farming to be expanded
   c. Decrease the production cost (MGNREGA should be extended for rice cultivation, changes in the existing policy norms)
   d. Supply farm inputs such as green manure and seeds in form of subsidy and incentives

3. Socio-cultural
    a. Social and financial incentives for rice farmers (e.g. crop insurance, bonus privilege card, proper marketing strategy, create awareness among general public)

The stakeholder workshop created an open and cooperative atmosphere to frankly discuss the problems in local rice production as perceived by different, but key stakeholder groups. The perceived solutions already show a political will and concern as citizens to create favourable conditions for continuing production of rice in Wayanad, may it be of local landraces or improved varieties.

During the evaluation at the end of the Inception Workshop requests to involve local stakeholders, particularly men and women farmers also in the international setting were brought forward. A need was felt to involve practitioners from the very beginning. Nevertheless, the stakeholder workshop served the purpose to build a trustful relationship with diverse rice producers such as male progressive farmers, tribal women labouring in the fields and Panchayath Raj presidents of concerned localities.

VI. Inaugural Session

Welcome address by Dr. N. Anil Kumar

Dr. N. Anil Kumar is director of the Community Agrobiodiversity Centre (CAbC) of the M.S. Swaminathan Foundation. He serves as the counterpart of Dr. Padmanabhan in terms of leadership and supervision of the BioDIVA India team.

Dr. Anil Kumar briefly introduced the BioDIVA project and participants involved including key note speakers for this session. He emphasised the need for combining scientific knowledge and practitioners' experience in solving the problems such as erosion of agrobiodiversity. He explained the efforts taken by M.S. Swaminathan Research Foundation in order to protect rice fields and rice landraces. Reiterating the role played by the farming communities in providing ecosystem services and conserving plant genetic resources, Dr. Anil insisted that research should benefit the farming communities by bringing knowledge about the importance rice ecosystem in enhancing human welfare.

Welcome address by Dr.habil. Martina Padmanabhan

Dr.habil. Martina Padmanabhan is the initiator and leader of the BioDIVA project. She is a rural sociologist with a special interest in natural resource management, gender and rural development. She conducted research in Ghana, Ethiopia and India.

Martina Padmanabhan started her welcome address by introducing her personal affinity to India and her Indian family background. She then went on to state that BioDIVA is a "dream became true", there had been a long preparation phase of several years which is now bearing fruit.

Dr. Padmanabhan proceeded to introduce the rationale for BioDIVAs research: The dilemma of a wonderful landscape slowly disappearing due to land use change and the focus of BioDIVAs research on rice systems in Wayanad, where rice is central in daily nutrition and food security. However, changing patterns of land use change can be observed and this workshop aims at identifying and securing co actors for future collaboration. A strong emphasis on international and intercultural features of workshop is placed, reflecting the inter- and transdisciplinary nature of the whole research project.

Inaugural address by Hon. K.L. Poulose

In his speech, Sri Poulose mentioned generational changes and explained that the younger generations are not interested in agriculture and farming as a livelihood base anymore. He lists several Environmental changes as complicating factors:

- changes in soil quality
- poorly managed storage and utilisation of water resources

and suggests the introduction of micro-irrigation systems as one solution.

Declining paddy fields strongly affect agriculture and food security; furthermore Kerala state depends heavily on other states, it is described as a consumer state and is accordingly seen as less involved in production of food or other goods for daily consumption.

He proceeded to highlight the policy aspect because support from the government concerning rice cultivation is little to none. The policy level barriers restricting them to take measures to enhance incentives for rice farmers. He emphasised the need for farmer-friendly policies and approaches to conserve agrobiodiversity of the State.

Mr. K.L. Poulose, is the elected President of Wayanad District Panchayath. He hails from a farm family and himself engaged in farming. He has taken several measures for the progress of farming communities during his tenure as the President of District Panchayath. He is interested in conserving agricultural landscapes.

Felicitations by Prof. M.K. Prasad

Prof. Prasad highlighted issues of gender equity and tribal concerns in agricultural production. He favours the notion that BioDIVA aims at gender equity in line with FAO and other multilateral organisations.

In his view, world food production is undertaken by female workers, highlighting the need for future research to be gender sensitive. Gender mainstreaming seems to be a good approach; however he stressed that not enough is undertaken to achieve gender equity. He hopes that the project will raise awareness regarding uneven gender balance in agricultural production, marketing and land management issues.

Prof. M.K. Prasad is a well known environmental activist in Kerala. He spent more than thirty years in academic field and served as the Pro-Vice Chancellor of the University of Calicut.

VII. Session Summary

Dr. K.P. Kannan is professor of Development Economics at Centre for Development Studies (CDS), Thiruvananthapuram, Kerala. He served as fellow and Director of CDS. He was an expert member of the technical secretariat of the "World Commission on Social Dimensions of Globalisation" in 2002-03 at International Labour Office, Geneva, Switzerland. He was also served as "Indian Planning Commission Chair Professor of Development Economics" at CDS Thiruvananthapuram.

A. The Challenge of Agricultural Development and the Future of Rice Cultivation in Kerala

Prof. Dr. K.P. Kannan

Dr. K.P. Kannan's lecture outlined Kerala's agricultural status from an economic point of view: He described how the economy in India is completely changing, with Kerala state experiencing structural transformation from a once agrarian economy to a non-agrarian one. In 2004-05 agriculture and related activities accounted for only 22% of state income and 37% of employment compared to 22% and 57% for India as a whole. Recent data for 2008-09 show that in Kerala the share of agriculture and related activities in state income has declined to just 11 to 12 %.

This raises the following question: What are the priorities, if agriculture appears no longer a priority in development planning? The central challenge therefore is to transform agriculture to a level of productivity and income that will sustain a critical minimum of workers and households

In a more detailed analysis, he provided arguments against three myths in popular imagination about agriculture in Kerala:

1. Kerala is not food secure:

However, the recent food security atlas published by MSSRF (Report on the State of Food Insecurity in Rural India 2008) reported that Kerala was the only state in India to be least food insecure from 1998-2000 and from 2004 onwards.

2. Agriculture is not viable in Kerala:

Kerala has the second highest value generated per hectare of land, and stands at third place in terms of net income.

3. Workers in Kerala are unwilling to engage in agricultural work:

This statement does not take the whole picture with into account, a large proportion of the younger generation in Kerala are now better educated, than earlier generations, meaning they seek employment that merits their education and bears higher economic rewards. Conversely, Kerala is now witnessing a steady inflow of migrant labour from eastern and central India for a variety of unskilled manual work.

However, despite these developments and facts, Prof. Kannan stated that agricultural production in Karala still needs to develop

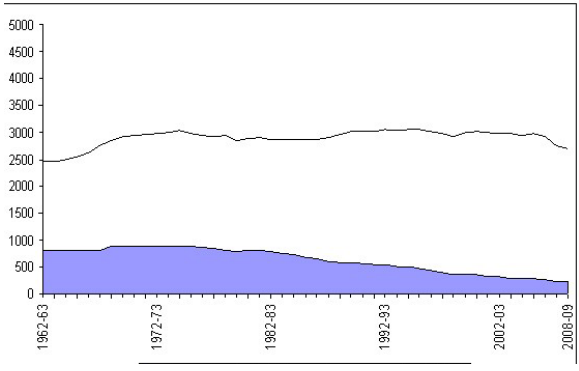
further to ensure and maintain a higher level of productivity. He suggested to make best use of land available in India, to tap into the potential provided by improved education that supplies skills to famers who can adopt appropriate modern technology. Furthermore the stagnation of efforts by policy makers and implementers needs to be addressed to take Kerala's special situation into account and profit from it.

Prof. Kannan listed some factors favouring enhanced agricultural activity and production:

1. Higher level of education of farmers and land managers
2. The resulting openness to new technologies and crop varieties
3. High density of farmers' organisations such as cooperatives and other associations such as Padasekhara Samitis
4. A well spread out network of research, development and extension agencies in agriculture
5. Introduction and gradual institutionalisation of the Panchayathi Raj at the village, block and district levels to whom nearly 35 percent of the plan funds are handed over

He identified factors that impede agricultural production to be

1. Lack of efficient use of water available and failure of irrigation system. Only around 16%of the gross cropped area is irrigated with Government canals accounting for only less than 30% of this area
2. High cost of labour, wage increase for agricultural work has been much faster than the increase in labour productivity.
3. Low level of skill and specialised knowledge of those who remain and work in agriculture
4. Absence of an institutional mechanisms to mitigate risks associated with agriculture (e.g.: crop failure) and the absence of an adequate social security cover to those who work in agriculture



Trend in Paddy cultivation in Kerala 1962/63 to 2008/09

5. Highly fragmented and small size of agricultural holdings. 87% of the holdings in Kerala are marginal with less than 1ha

Presentations at Technical Session

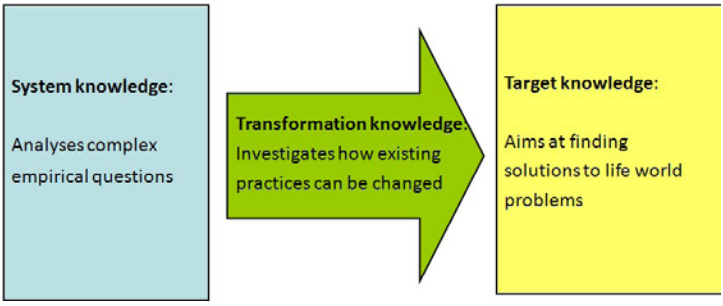
B. Aims and scope of the BioDIVA research project

Dr. habil. Martina Padmanabhan

Dr. Martina Padmanabhan started with an overview of the rationale for the project. Observations and data show that various socio-economic and environmental factors are contributing to changes in land-use patterns in Wayanad, such as the area under paddy cultivation shrinking and being converted to banana plantations. This is compounded by the fragmentation of agricultural land and the effects of global climate change such as changing rainfall patterns and the reduced capacity of the landscape to store water.

These changes have an impact on the gender division of labour, tribal labourers especially the women do not find enough work in paddy fields as banana plantations only hire men.

BioDIVA conducts social-ecological research and is concerned with "Societal Relations with Nature" (Jahn 2004). It seeks to understand social transformation processes and generates knowledge required to steer such processes in a sustainable direction.



Link between transdisciplinarity and transformation knowledge

Viewed from a social and historical perspective, knowledge on cultivation practices by farmers and labourers is fading. In addition, policies and strategies often clash, for instance, the Indian Biodiversity Act 2004 is contradicted by other policy measures e.g. supporting banana cultivation.

The research approach is transdisciplinary research to generate transformation knowledge, because pure academic approaches are often too detached to bring about change (IAASTD 2009). It is also vital to recognise the various

kinds of expertise among practitioners such as farmers, administrators, politicians, NGOs. There is also a belief that solutions can only be achieved through a joint approach and participatory research.

Another pillar of BioDIVA's research approach is interdisciplinarity, to integrate disciplinary paradigms and searching for unity of knowledge beyond the disciplines of Economics, Ecology, and Sociology together with Institutional analysis and land use change modelling.

The envisaged outcomes are the establishment of a platform for dialogue on land use change. Scientific analysis on land use change is delivered to practitioners and policy makers, together with strategies and possible solutions that are developed together with stakeholders.

In concrete terms, outputs in the shape of a handbook "Developing Agrobiodiversity", process documentation and disciplinary, interdisciplinary and transdisciplinary publications in English, German, Malayalam are aimed for.

Professor Momsen is an agricultural economist and human geographer who has conducted field research in Central America, Africa and Asia. She has published several well-received books and articles on the topic of gender and land use, gender and development and agricultural development.

C. Gender and Agrobiodiversity

Prof. Janet Henshall Momsen

Prof. Momsen described the concept and rationale for research and intervention projects needing to take into account the role of gender and gender sensitive research in agriculture, biodiversity and land resource management.

After scoping the general aspects of biodiversity, emphasising that the variety and variability of genes, species and ecosystems are a global capital asset, Prof. Momsen briefed on the two different approaches to biodiversity: Classic and neo-liberal Economic.

She then highlighted the different relationships women and men have with the natural world. For example, in forested areas men often know more about primary forests, women about secondary forests. Whereas in arid regions men are primarily responsible for livestock while women collect wild foods. In most areas women are responsible for water and fuelwood collection.

When studied in-depth, women use, manage and conserve a wide diversity of crops. They are active in seed exchange networks and maintain local seed banks that store and preserve rare crop varieties. Women often select the seeds to be saved by the family taking into account food tastes, culinary requirements, ceremonial and medicinal needs and traditions.

From an economic point of view, women contribute a high input to the agri-export business. They provide most of the labour force for the production of horticultural crops for export. However, due to the nature of this work, women exposed to hazardous agro-chemicals in cash crop industry

The key issue is to recognise the importance of gendered knowledge on agrobiodiversity. Development projects which underestimate women's knowledge and roles may tend to increase rather than alleviate women's workload vis à vis men's and marginalise women while increasing male power. New high yielding varieties of plants may give greater yields but may not meet the nutritional and culinary needs. By-products often used by women such as straw for mat-making and fodder is reduced.

Commentary:
Gender and Agrobiodiversity—the case of Kerala

Prof. P.S. Gheethakutty

Professor Gheetakutty's commentary added to the discourse on the role of and need for research into gender related issues in agrobiodiversity by drawing specifically on the case of Kerala.

She highlighted that the role of gender in agrobiodiversity and agriculture is still not properly researched. Even though certain tasks and decisions regarding agrobiodiversity are shared by both men and women as joint decision makers, within the joint decision making process, the power relations and knowledge play vital role. These dynamics and structures are neglected by researchers which raises the question whether women's knowledge is taken as granted or neglected.

Similarly the gender roles in agriculture, especially from 'land preparation to harvest' are well documented. But what happens after harvest is less well documented or researched. For instance, women hold unique knowledge in seed selection, storage, maintaining viability of seeds, prevention of pest or disease attack, seed treatment

It is therefore necessary to bring the neglected part of wisdom of women with respect to agrobiodiversity for the effective implementation of policies and programmes for promoting conservation, sustainable utilization and equitable sharing of benefits derived from agrobiodiversity.

Professor Gheethakutty is professor of Agricultural Extension with specialisation in Gender mainstreaming in Agriculture and Rural Development. Serving as member of various national level planning and policy advocacy committees, Management groups on Women Empowerment and Monitoring and Evaluation Teams

Melvin Lippe is member of the BioDIVA research group with a background in Agricultural Sciences, Food Security & Natural Resource Management in the Tropics and Subtropics. He is currently assisting the project leader in managing the research process of the PhD students and is developing a social-ecological system description of project sites by using spatial explicit land use modelling approaches.

D. Moving towards Equitable and Sustainable Land Use – Participatory land use analysis in Wayanad

Melvin Lippe

Melvin Lippe outlined the concept and possibilities of land use analysis and modelling at different levels. He went on to illustrate the methods and approaches that will be used by BioDIVA, emphasising the reliance on establishing a rapport with the participating communities by starting a dialogue amongst equals.

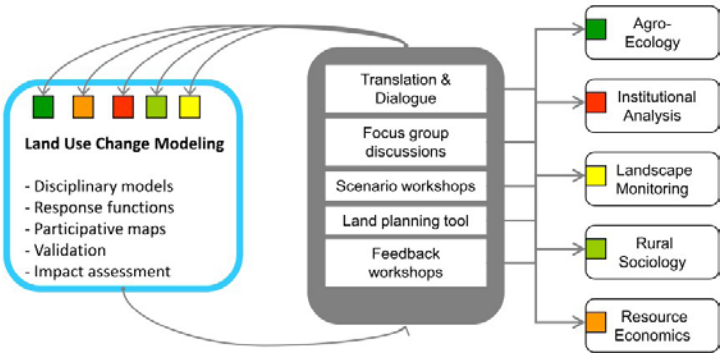
Landscapes as social-ecological system have three components: Land use, Land function and Land management. The proposed study includes remote sensing, landscape level monitoring, participatory land use analysis and results from the Agroecology subproject.

The sub-project will analyse changes in land use pattern over time, identify key drivers for land use change and socio-ecological indicators for the change and finally put forward a tool for decision making and land use management (model system).

The resulting maps include the maps of human actors' socio-economic and demographic factors and the agronomic factors of their land-based resources.

Participatory land use analysis is useful because it integrates local knowledge into research and decision making processes. It creates a baseline for further in-depth studies and increases the chance for sustainable solutions.

However, as with all participators approaches, local knowledge and local bias, gender and life



System analysis with interdisciplinary knowledge

experiences, formal and informal background of participants should be considered critically. Furthermore, the use of proxy indicators and qualitative means may show weak links with biophysical land use functions.

Melvin Lippe closed his presentation by outlining the next steps: Integrating the lessons learned from the stakeholder workshop and learning from the experiences of the inception workshop participants in order to set up a participatory land use analysis in Wayanad.

Comments and discussion

1. If social learning with maps is a point of interest and the objective is to analyse the land use change in a participatory method, many social factors need to be taken into account
   - » It will be easy for the modeller as the BioDIVA group is inter- and transdisciplinary. Spatial maps will be prepared by participatory methods, panchayath level factors are to be explored more.

2. The participatory approach should place the farmers in the centre, asking them to shape and conduct the discussion, rather than saying "I do it, you participate"!

3. How can the scientifically prepared GIS map relate or be combined with the participatory mapping
   - » Need GIS maps for spatial models, a validation of the map with the participatory approach and feedback workshops or vise-versa is possible.

4. What kind of participation is really sought?
   - » Spend time with interested participants and stakeholders in their villages, use PRA tools such as village mapping to get an idea about how people perceive their village in terms of resource availability, soil properties etc.

5. How can the information given in the participatory discussion be validated?
   - » Through transect walks, soil/water sample analysis etc.

Commentary:
Bridging politics, landscape and people:
How can research and regulation join hands?

Dr. Anil Kumar

Dr. Anil Kumar drew from his experience as a long-standing expert in the field. In his daily work he frequently crosses the lines between research, implementation at grass-roots level and the policy environment in which decisions for equitable use of agrobiodiversity are conceived and carried out.

Based on this, he highlighted some critical issues on building bridges between findings of empirical research, the (ever-changing) reality on the ground and the different policies that determine regulations for land use.

Dr. Anil started with an appreciation of the brilliant presentations; however he pointed out that strategies to move forward are needed. In Kerala, using the participatory approach is relatively easy as the grass root organisations are strong in the field. For example MSSRF has done a couple of resource maps and Peoples' Biodiversity Registers (PBRs).

With regards to land use change, he emphasised that even though there are regulations against the conversion of paddy land in place, the heterogeneity of the agricultural landscape is changing to a more homogenous one due to land conversion. As a possible solution, training and information dissemination for policy and decision makers is suggested (Ecological literacy).

Furthermore, as with the village level climate risk managers, land use change managers need to operate through men and women trainers at village level.

VIII. Tea Chat sessions, conclusions and plenary

The Tea Chat sessions intended to introduce the participants of the BioDIVA Inception workshop to the central issues concerning the future of rice. Such central issues are for example tribal concerns, economic and gender dimensions of land use, the legal framework and the importance of traditional knowledge for biodiversity conservation.

The objective of this informal means of approaching the different perspectives on rice farming was to bring out the knowledge of the participants of the workshop, thereby enabling them to share with and learn from each other. By actively involving participants at this early stage, it was hoped to create an atmosphere of exchange and mutual appreciation. The main focus of the discussion was to identify "Research gaps to sustain agrobiodiversity of rice production systems".

After a brief round of introductions with each participant's affiliation and motivation for taking an interest in BioDIVA, each group selected a volunteer who was willing to present the results of the discussion to the plenary afterwards.

The role of the chair person was to start the discussion of two hours by issuing a very brief statement of opinion for about five minutes . Provocative theories were welcomed in order to get the discussion going. Furthermore it was the chair persons task to ensure that everyone has a fair share in the discussion.

Outcomes from Group 1: The future of tribal communities—Gender and food security

The group hosted by prof. Geethakhutty discussed the following main themes

- Access to resources and cultivation
- Gender roles in paddy systems and the five Roles of female farmers:
    1. Women-headed farms
    2. Co-farming: male & female farm
    3. Women who are involved in any kind of enterprise
    4. Group farming
    5. Female labourers

Important factors influencing rice cultivation were identified as religion, caste, ethnicity, social factors. Land rights are also a major issue, religious and cultural factors play a role in property rights and inheritance laws.

The chair highlighted some factors of involvement by gender. The Panchayaths are required to adhere to a minimum quota of 50% of female representatives in committees, but in reality there are almost none because the institutional setting is male oriented and women are not used to being a part of official spaces. In marketing cooperation, women are hardly involved. Therefore gender disaggregated data is needed because rice demands mainly female workers as opposed to coconut, banana, ginger,whereas vegetables are almost gender neutral. In the chair's experience, poor women are better organised than male farmers, in self-help groups for example. Women often lease land in order to conduct cultivation by group farming; these women can present themselves on a district level.

Women are interested in rice cultivation because of the nutritional and cultural value.

Roles of institutions, social pressures and economic factor are issues to be examined

Comments and discussion

- What are the three most important research gaps?
  - » Identification of traditional varieties and why women continue to cultivate and manage seeds.
- For what reason it is neccessary to promote women as conservers of traditional varieties that are threatened?
  - » Need to identify which varieties are preferred and cooking quality of the varieties
  - » Varieties that are divided according to the demand of the male and female farmers
  - » Property rights and the ownerships of the land
- Conclusion: Joint membership of institutional participation is needed for good gender balance in the society.

Outcomes from Group 2: Economic valuation of rice fields—the role of ecosystem services

The tea chat group on evaluation of rice ecosystems was chaired by Prof. Seema Purushothaman from ATREE.

Prof. Seema Purushothaman opened the session with a brief and critical overview on the development of valuation of ecological goods and services since the 1990s.

- Lack of methodological clarity in valuation of ecosystem services used at present
- Difficulty in applying Contingent Valuation Methods in valuing non-market services of ecosystems in the context of developing countries
- Meaning of money is different to different actors and cultures, leading to distortions in the final valuation.

Major observations of the team

- Economic valuation is an effective tool for creating awareness about the value of ecosystem services in general
- Valuation exercises could lead to frame effective and informed policy measures according to the merit of ecosystem services
- Valuation exercises may help explore different scenarios and trade-offs of possible options
- Valuation methods such as 'Multi Criteria Decision Analysis' are taking into account the views and ideas of different stakeholders and different scenarios

Outcomes from Group 3: Decline of Paddy—Role of institutions, social process and economic factors

The group chaired by Dr. G. Gopikuttan engaged in a after a lengthy discussion on socio-economic factors and their impact on institutions' strategies and modes of operation, the following points were agreed upon:

Factors contributing to the decline of rice farming chronologically

1. Partition of joint family system and land ownership
2. Role of multinational companies in land acquisition and change
3. Land reforms:
    - Disconnection of owner and cultivator
    - Informal renting system
4. Agriculture was a part of culture
5. Outmigration associated with increase in education and increased wage rate, impacting on labour cost
6. Lack of proper extension mechanism
7. No proper marketing mechanism. Oligopoly (private) and state system
8. Open market and fixed price system
9. Role of credit, labour and land institutions
10. Existing micro enterprises and Self Help Groups

Outcomes from Group 4: The inter-linkage of traditional knowledge, biodiversity and land use change

Dr. Anil Kumar led this group which focused mainly on the identification of research gaps and the means by which to address them:

1. Documentation of the traditional knowledge right from field preparation
2. Documentation of both methods and processes which can be integrated with modelling
3. Enumeration of land gradient parameters, certain parameters need to be collected, agreed upon and set to fit into the model
4. Ecological parameters and traditional knowledge also should be documented, as they are interconnected and interpreted.

Further points raised were:

- Seed management and storage
- Possibility of setting aside and declaring a monopoly procurement area for traditional variety of rice
- If there is a focus on documenting knowledge and process knowledge, it is also important to consider how knowledge is created

IX. Field trip

Introduction and Outline

The field trip included four different villages within a 10 to 15 km radius of the Community Agrobiodiversity Centre (CAbC). Groups of 6-10 workshop participants had the opportunity to observe ongoing land use, meet and discuss with local stakeholders and land managers on how the conversion of rice fields impacts on their livelihoods in economic, environmental, cultural and social terms.

In addition, one objective of the fieldtrip was to get a personal impression of the diversity of perspectives on the "future of rice".

The workshop participants were accompanied by experienced staff of CAbC, who have been working closely with the communities and were in a good position to act as intermediaries and translators.

The trip was preceded by a 15 Minute briefing for the field trip by Girigan Gopi, in which he outlined the location, community structure, cultural and social background.

It was emphasised that the field trips shall yield deeper insights and provide a platform to root the theoretical discourse of the first one and a half days in the realities of the field sites.

Girigan Gopi briefing the group for the field trip

In order to bring out the differences and similarities of the situation for Kurichiya tribals, Kuruma tribals, organic farmers and farmers' associations, the same guiding questions in all four parallel field-site visits were given:

1. What are the changes you are observing in paddy cultivation?
2. What do these changes imply for women?
3. What do these changes mean to men?
4. Is there a difference between the generations?

It was also advised to pay attention to the respondents, their gender, age, whether men answer on behalf of the women present etc.

Site description

Site 1: Kanacherry (Kanyampatta)

Facilitator: Girigan Gopi, local contact person: Ms.Devaky, Vice President of the Wayanad District Panchayat

Kanancherry is the site of Kuruma tribal settlements, consisting of three hamlets (Kananchery, Kolipeta, Athikuni). The homogenic tribal structure is to be noted, as only members of the Kuruma tribe live there. They engage in settled agriculture, owning the land used mainly for rice cultivation. Both traditional and modern rice varieties are cultivated. Gender division of labour is visible, with women working as unpaid family labour. The culture and rituals are closely linked to rice farming

Site 2: Kaniyambetta (Palliyara)

Facilitator: Prajeesh Parameswaran, local contact person: Mr.Palliyara Raman, leading rice farmer of the local Kurichiya tribal community

Kaniyambetta is the site of a settled Kurichiya tribal hamlet. Property holding is controlled by the head of the joint family system. The social organisation of a 'Joint family' system is vanishing. The low lying land is used for rice cultivation, of both traditional and modern varieties, for own consumption.

Organic or low external input agriculture is practiced, while livestock rearing is subsidiary source of income. Also here, rice is closely linked to culture and rituals

Site 3: Pozuthana (Anoth)

Facilitator: T. Reveendran, local contact person: Mr.Divakaran, retired government servant, chairman of WARDA, a farmers' association group

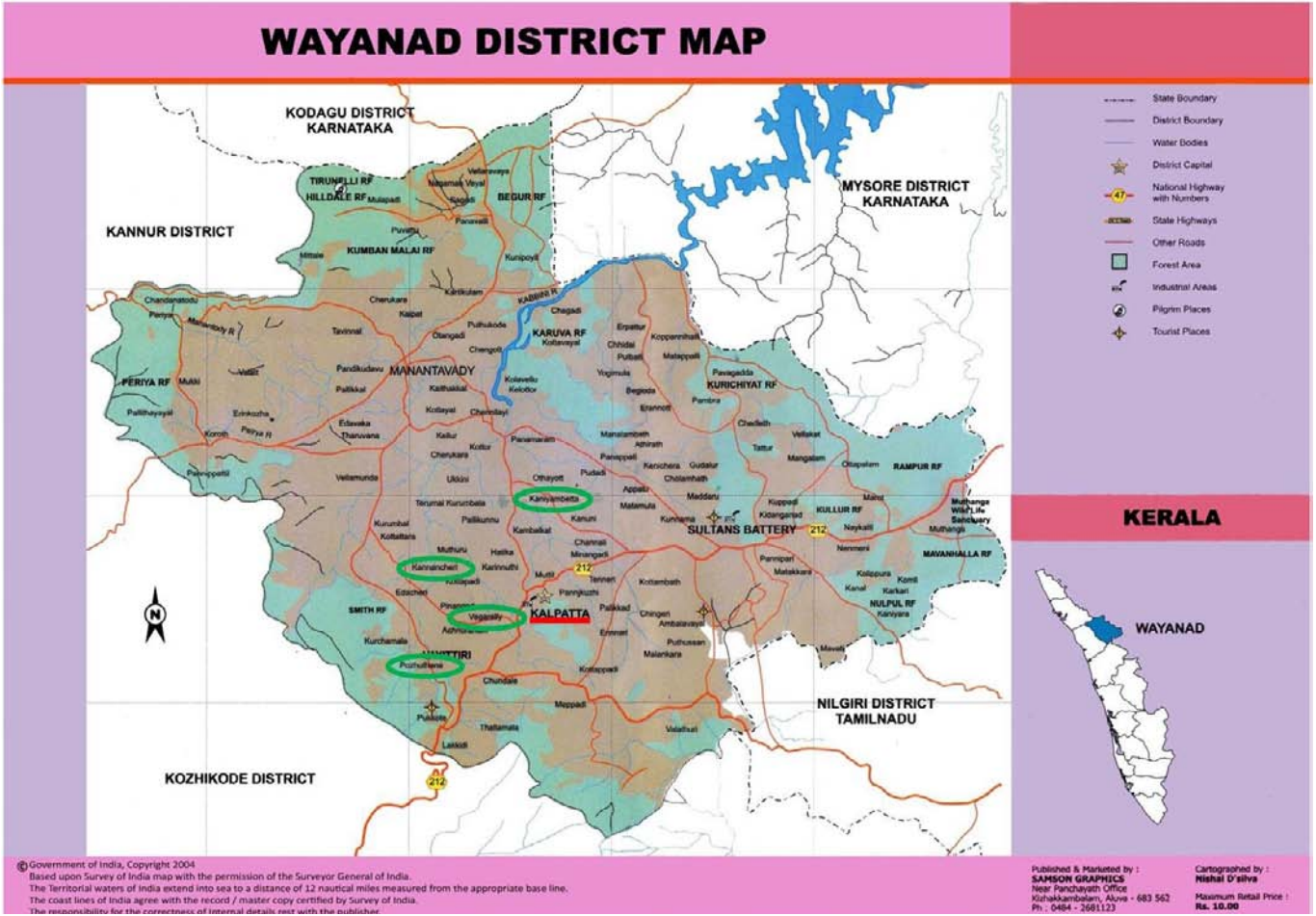
This site displays a heterogeneous social mix of farmer families belonging to different religions and caste groups. In addition, both rice and banana are cultivated.

Site 4: Vengapally (Kovapally)

Facilitator: Monish Jose, local contact person: Mr. P. A. Rasheed, social worker and promoter of organic farming in Wayanad district

This is another Kurichiya tribal hamlet, which is in the process of change from a joint family system to nuclear families.

Rice cultivation is predominant, however, conversion to banana cultivation is also visible, with an increased pressure on land.


WAYANAD DISTRICT MAP
KODAGU DISTRICT
KARNATAKA
KANNUR DISTRICT
MYSORE DISTRICT
KARNATAKA
NILGIRI DISTRICT
TAMILNADU
KOZHIKODE DISTRICT
KALPATTA
MANANTAVADY
SULTANS BATTERY
KARUVA RF
KURICHIYAT RF
KUMBAN MALAI RF
BEGUR RF
HILLDALE RF
TIRUNELLI RF
PERIYA RF
SMITH RF
NULPUL RF
MAVANHALLA RF
RAMPUR RF
KULLUR RF
KABBINI R.
State Boundary
District Boundary
Water Bodies
District Capital
National Highway with Numbers
State Highways
Other Roads
Forest Area
Industrial Areas
Pilgrim Places
Tourist Places
KERALA
WAYANAD
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The territorial waters of India extend into sea to a distance of 12 nautical miles measured from the appropriate base line.
The coast lines of India agree with the record / master copy certified by Survey of India.
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Reporting back and discussion

Site 1: Kanancherry

The group discussed social-economic strategies with the local farmers and land users. They found out that agricultural work is mainly done by men, however for daily income, farmers depend on other ways of employment. It is worth noting though that payment modalities are a crucial issue because most of the time farmers get paid every 3 months. One observation is that there is a shift between banana and rice cultivation depending on the need or farming conditions, farmers do not completely move to banana, after some years, they may go back to rice cultivation

More specifically, four reasons for conversion were identified:

1. Changing rainfall patterns
2. Decreasing yield per unit area of traditional varieties
3. Decreasing livestock numbers
4. Post-harvest operations – machines are needed for harvesting

When looking at the gender perspective of rice and banana cultivation, women are content to work in paddy fields, as they are used to it, however, they depend on labour opportunities from outside to add to their income. In terms of cultural and culinary preferences traditional rice varieties are preferred.

Site 2: Kaniyambetta

The group returned with a detailed report on the general and specific setting and circumstance in Kaniyambetta. The village is home to 7 tribes: Kurichya, Kuruma, Adiya, Paniya, Kattunaika, Thachanadu Mooppan and Kadar. The first two enjoy a higher status in society, whilst the Paniyas, who together with the Adiya and Kattunaikka, make up 70% of the local population, have a lower status.

Land holding consists of 10 acres each of dry and wet lands. Currently cultivated crops include rice –both land races and HYV - on 4 acres, coffee, arecanut, pepper, ginger, two types of banana, rubber on 4 acres. Preferred rice land races are Veliyan, Thondi, Chennal, Chowmate, Seeraga and Ghandakasala. Ritual life revolves around rice. Rice production is attached with the deity Kallampatty Baga-

vathy and is therefore a culturally valuable crop.

The access to land use is restricted – Land reforms led to the loss of 60 acres of total 80 acres. Changes in paddy cultivation have occurred, with a general shift to other cash crops. Before this shift, crops grown included Millet, Maize, Mustard, Rice and Tuber crops

Problems around farming were perceived to be a drop in water table and a higher incidence of pests and diseases. As for the changes perceived by women and men, women said that technology orientation had risen, whereas the men stated that an erosion of agriculture along with reduced ownership is taking place. They also state that exploitation by private traders is growing, while the government is not intervening. Overall, both groups said that there were no losses or gains in rice production, although they are generally satisfied with their own consumption. Rice is a major energy provider and maximum physical and straw yield (1.5 tons).

Should the government provide assistance they are willing to accept and form associations, however they are not ready to invest by themselves as costs for land are rising, even though they would like to acquire more land.

The local land users suggested that the research should look into issues of land degradation, improved irrigation options, market forces and consumption patterns.

Site 3: Pozhuthana

The interaction with the local farmers and land users showed that women self-help groups appear to be important in this community, even though they are mostly initiated by outsiders. Mix of farming preferences, some farms cultivate mainly banana, others focus mainly on rice, some produce both. When seen chronologically, 50 years ago land use was 100% paddy, today, some 10% of the land remains under rice cultivation.

There is environmental awareness and related health issues, water resources, climate, and the impact of working on tea plantations and banana, where higher rates of cancer have been observed.

When looking from an agronomic perspective, four types of preferences were observed:

1. Traditional varieties are actually preferred because they are perceived to be healthier however, economic benefit is lower due to low wages and market price
2. Some use higher yield varieties for specialty marketing such as weddings, highlighting the possibility of linking traditional varieties with culturally significant events
3. Some farmers grow bananas because it is more profitable; they use pesticides without precautions which is a cause for concern for the neighbouring farmers
4. Farmers are used to grow paddy but not banana; furthermore soil management and property change issues were raised

When discussing about possible future scenarios, the land users stated that they believed there would be hardly any agriculture, leading to the question of income and livelihood options for the coming generation. It is already apparent that younger people are already taking up employment in other sectors. The market also plays a role, new cultural food habits might actually be a new opportunity.

After these observations the group added some closing remarks regarding the research process, emphasising that household selection is important. Initially it may appear to be easy to conduct interviews, however it is important to bear in mind that getting useable and valid data is difficult

Site 4: Vengapally

The group heard from the local farmers that rice is mainly used for home consumption. Older housewives are not happy with banana because they prefer rice for its cooking and culinary properties.

Outside factors that impact on rice farming were also discussed, most importantly, the effects of climate change alter the timing of rainfall and the pattern, changing seasonality, low water levels.

A discussion ensued as to whether the main concern is really climate change on its own or the resulting change in vegetation cover and deforestation. Regardless of this however, it was universally agreed that the refusal of the government to provide crop insurance is a major impediment, together with lower subsidy rates for rice.

Furthermore, the Mahatma Gandhi National Rural Employment Act (MGNREGA) is a controversial issue, the available information and failure to implement the scheme properly on the part of Panchayat institutions hightens the need to explore the impact of MGNREGA on labour composition and availability.

X. Panel Discussion

The panel discussion aimed largely at two things: On the one hand it should enable Indian and German experts to engage in an open reflection on similarities and differences in approaches, experiences and attitudes towards the same field of scholarship. On the other hand it should offer the BioDIVA researchers insights and advice by Indian and International scientists to help make the project a success.

Moderated by Mohan Dhamotharan, the following topics were touched:

1. From a disciplinary perspective what does each panel member perceive to be the greatest challenge. What recommendations can they give to deal with these challenges?
   What can be done to ensure that knowledge of local experts is integrated throughout the research process?
2. What do the panellists hope for the BioDIVA project and what kind of support could they offer as an expert?

The project's leader Dr. Martina Padmanabhan and her counterpart at MSSRF Dr. Anil Kumar were available to react to concern and queries.

Panel members:
PD Dr. Brigitte Kaufmann, DITSL, German Institute for Agriculture in the Tropics and Subtropics

Dr. S. Bala Ravi, Advisor, Biodiversity, MSSRF

Prof. Dr. Ulrike Grote, Institute of World Trade and Environmental Economics, Leibniz University, Hannover

Dr Seema Purushothaman, Fellow, Ashoka Trust for Research in Ecology and the Environment, Bangalore

Dr Kamalam Joseph, Centre for Water Resource Development and Management, Kozhikode

The panel discussion started with a focus on the realisation of the transdisciplinary approach. While it is considered useful, the research setting is described by complexity and uncertainty. Therefore, it is difficult to form precise research questions and some issues to focus on could be:

1. Land fragmentation, low rice productivity, lack of water management practices, structural changes.
2. Important questions to consider:
   - Who is going to succeed?
   - Is agriculture still the way to go in the future?

3. Main challenge for BioDIVA is to identify a joint definition of the research problem.
4. Give opportunities and set times and locations to include different stakeholders. The integration of knowledge and attitudes is a process that takes negotiation. Institutionalisation of stakeholders´ views and perspectives needs to be done.

The recommendation is to identify stakeholders for whom traditional rice varieties play an important role. This addresses the issue of valuation e.g. there might be a bigger value inside than from the outside.

It is also important to find and specifically identify farmers and their characteristics as land users who still value rice higher than other crops. Furthermore, the questions of influencing and shaping should be addressed: Who can actually influence the future of rice – looking at the institutional setting.

In the current agricultural production, little room for cultivation of traditional rice varieties is left due to growing pressures for income from farming, in general, there is little room for rice production systems.

It should also be considered that from the consumer side, the willingness to pay is hardly available. This could be a marketing problem; however some vital questions need to be answered:

1. How can differentiation be achieved? Through fair trade? Geographical indication? Labelling and certification are expensive and difficult, as the traditional rice varieties Wayanad are little known.
2. How can value be added to Wayanad's agricultural products?

One solution could be payment for ecological services such as a CDM project; however, two points need to be considered: alternative

funding and marketing strategies. The dialogue with different stakeholders and academics needs to be sustained. Local marketing of the project is crucial, e.g. in local newspapers; informing stakeholders and the public about mid-term results, build trust through events such as ´seed fair´ or a common football match.

biodiversity are offered to land users and conservers. A recommendation is to assess the need to pay or offer other incentives for farmers for growing traditional varieties.

It was added that there is a lack of public awareness in general regarding farming and agrobiodiversity.

Rice varieties

With regards to methodology: qualitative discussions with local experts need to be included.

Another member focused mainly on farmers' rights and the ways in which different crops have been introduced to India from outside. However in this particular case, farmers' rights are not an important issue in India. Furthermore the regrettable situation that no payment or other incentives for ecosystem services in area of high

The real benefits of traditional rice varieties are unknown to the public. In addition, researchers and implementers do not have the right to impose their ideas on farmers, which adds to the debate on stakeholder participation and the levels thereof. Another aspect to consider when looking at landscape changes is water resource management issues, problems related to land use change are often irreversible.

A recommendation for possible areas of research and intervention is to look into the rising level of tourism in Wayanad and the opportunities and threats it offers. This coupled with a high mobility of the population means that the need for water is growing.

One word of advice was that scientific inquiry and reports can be "messy", offering little room for quantification. The integration of local knowledge is key to BioDIVAs research approach. When looking at the working mode for the research group it was pointed out that great challenges lie in interdisciplinary work; before enforcing interdisciplinarity, disciplinarily depths need to be addressed and identified.

From an agroeconomic perspective, it was emphasised that economic research approaches need to be considered carefully and raised issue of subjectivity: why only consider biodiversity and rice? Over time, other crops may also be included in the study to give a fuller picture.

Other areas of inquiry are identification of payment mechanisms, and mentioned methodological issues around rice and valuation strategy bias in CDM because hypothetical markets are not the reality.

XI. Next Steps

Dr. Padmanabhan wrapped up the workshop by presenting the plans for the coming 3 years: a timeline depicting the different levels of activities in and out of the field, conferences, publication and networking activities and workshops were shown.

Most importantly, the central role of regular feedback workshops with all stakeholders was emphasised, as the topics studied by the BioDIVA team need verification and ownership by all involved.

2011	2012	2013
Field phase 1	**Field phase 2**	**Scenarios establishment**
Stakeholder workshop	Conference - Germany "How to be transdisciplinary"	Handing over instruments to PRIs (Including maps)
Inception workshop	Learn + consolidate relationships	Kalpetta conference
Field entry	Data, Panel survey	Conference – MSSRF, Chennai
Building relationships and reputation with Panchayath Raj Institutions (PRIs)	Feedback workshops	Ph.D. qualifications
Feedback and stakeholder workshops (specific issues with Smaller groups)	Policy workshop - Kalpetta	Transformation knowledge
Trustful relationships	Handbook writing	Vision alive for Wayanad
Data gathering, analysis	Progress and results	

As seen in the summary table, the following is planned for the coming three years:

2011

From February onwards, Bio-DIVA will enter the field phase of disciplinary, interdisciplinary and transdisciplinary data collection. The next step is to select field sites and research assistants. With the inception workshop and the stakeholder workshop the aim is to start building relationships and reputation of trustworthiness. The social-ecological baseline study, the development of an economic survey and valuation and the careful planning of the ecological on-site collection of plants and animals shall be discussed and presented in feedback workshops on regular intervals. The outcomes are working relationships and mutual learning and dialogue, not only among the international team, but with local practitioners, administrators and policy makers alike. The output will consist of data for subsequent disciplinary and interdisciplinary analysis and process knowledge for transformation towards sustainability. A policy workshop on district level in Wayanad will present first results for further discussion on the future of rice.

2012

In the coming year a second field-phase allows BioDIVA to deepen the knowledge and capitalise on the learning of the first one. A finetuning of research questions

and methodology is supported by a consolidated rapport with men and women farmers as well as with institutions of administration and politics. The research will go into its second panel phase and first results are presented in feedback workshops on local level but also on Kerala state level. A major contribution will be the writing of the handbook "Developing biodiversity" for policymakers and practitioners.

2013

The final year of BioDIVA will witness a public debate on the different scenarios established on what the future of rice might look like and what options there are to influence the situation of rapid land use change. One central aim is to hand over the outcomes and especially the methods to the panchayath raj institutions so that they are able to bring about the changes they are opting for. A policy workshop at national level in New Delhi will bring the results from the case study Wayanad district to influential politicians and concerned groups.

BioDIVA will officially close with a conference in Chennai and the release of the handbook.

BioDIVA hopes that the transformation knowledge gained and the spirit of making a future for rice in Wayanad continues and results in a joint effort between men and women farmers, local institutions and researchers.

XII. Outcomes of Workshop

To conclude, the two and a half days of interaction and lively discussion yielded the pillars for the upcoming work of BioDIVA:

1. Agreement of collaboration between the participating experts and the researchers
2. Highlighting of the role of government policies at state and central level regarding agricultural production, agricultural/ rural labour
3. The role of markets and product identity, valuation of speciality crops
4. It is crucial to achieve transdisciplinarity by involving all stakeholders
5. A clear need to formulate clear and streamlined research approaches between the disciplines in order to derive valid policy recommendation that will be tested and questioned was emphasised

Annex i: Workshop Participants

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Annex ii: Programme

The Future of Rice in Wayanad

BioDIVA Inception Workshop
16-18 February 2011, Kalpetta, Wayanad District, Kerala State, India

Venue: Green Gates Hotel, Kalpetta

ORGANIZERS:

M S Swaminathan Research Foundation (India)

BioDIVA, Institute of Environmental Planning, Leibniz University Hannover (Germany)

Partnering with

Leibniz Universität Hannover

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The Future of Rice in Wayanad

Programme

DAY 1: Wednesday, 16.02.2011
Plenary

Moderators and facilitator during the workshop:
Dr habil. Martina Padmanabhan: Team leader, BioDIVA project, Germany
Dr N. Anil Kumar: Coordinator, BioDIVA project, India
Mr Mohan Dhamotharan: Consultant, Germany

09.00	**INAUGURAL SESSION (Rapporteur: Isabelle Kunze)** **VENUE NO. 1**
09.05	**Welcome address & Briefing by the Master of Cermony** by *Dr N. Anil Kumar*, Director, CAbC, M S Swaminathan Research Foundation
09.15	**Introduction to the workshop: Background and objectives** by *Dr Martina Padmanabhan* Senior Research Fellow, Leibniz University Hannover
09.30	**Opening address and Key note speech** The Challenge of Agricultural Development and the Future of Rice Cultivation in Kerala by *Prof. Dr K. P. Kannan*, Professor, Centre for Development Studies, Trivandrum
10.00	**Lighting the Lamp & Inaugural Address** *Sri. K. L. Poulose*, District Panchayath President, Wayanad
10.15	**Felicitations** *Prof. M. K. Prasad*, Executive Chairman, Information Kerala Mission & Chairman, Steering Committee, CAbC, M S Swaminathan Research Foundation *Sri. A. Ratnam*, Member Steering Committee, CAbC, M S Swaminathan Research Foundation
10.30	**Message from The Stakeholder Workshop** *Smt. C. P. Premakumari*
10.35	**Closing Remarks & Vote of Thanks** by the Master of Ceremony Dr N. Anil Kumar, Director of MSSRF's Community Agrobiodiversity Centre (CAbC) & Coordinator, BioDIVA, India

10.40	**Tea and coffee break** **VENUE: POOL SIDE** GROUP PHOTO
11.00	**TECHNICAL SESSION (Rapporteur: Lydia Betz)** **VENUE NO. 2**
	Aims and scope of the BioDIVA research project Rethinking sustainable and equitable use of agrobiodiversity: presentation by *Dr habil. Martina Padmanabhan*
12.00	**Discussion** – The sustainable and equitable use of agrobiodiversity
12.30	**Lunch break**
13.30	**TEA CHAT** **VENUE NO. 3** Research gaps to sustain agrobiodiversity of rice production systems
	Introduction to Tea Chat, Mr Mohan Damodharan, Consultant, Germany, followed by Group Discussion at tables
1.	**The future of tribal communities: Gender and food security** by *Prof. Dr Geethakutty*, Professor & Project Co-ordinator in Gender studies in agriculture at Kerala Agriculture University, Thrissur, Kerala Overview of research gaps to sustain rice production systems in Kerala, relevant state measures - laws and regulations, policies, programmes (5 minutes input) Rapporteur: Isabelle Kunze **VENUE NO. 3A**
2.	**Economic Valuation of Rice Fields: The role of ecosystem services** by *Dr Seema Purushothaman*, Fellow, Ashoka Trust for Research in Ecology and the Environment, Bangalore Challenges to develop an economic valuation scheme of rice ecosystems by integrating unconventional economic tools (5 minutes input) Rapporteur: Girigan Gopi **VENUE NO. 3B**
3.	**Decline of Paddy:Role of institutions, social process and economic factors** by *Dr G. Gopikuttan*, Professor (Rtd), Dept of Economics, NSS College, Pandalam, Kerala (5 minutes input) Rapporteur: Prajeesh Parameswaran **VENUE NO. 3C**
4.	**The inter–linkage of traditional knowledge, biodiversity and land use change** by *Dr N. Anil Kumar*, Director, MSSRF Community Agrobiodiversity Centre Results and outcomes of MSSRF research in Wayanad district (5 minutes) Rapporteur: Lydia Betz **VENUE NO. 3D**
15.45	**Break**

16.00	**TEA CHAT PRESENTATION (Rapporteur: Monish Jose) VENUE NO. 2**
	Presentation of Tea Chat group work and outcomes by selected group speakers Feedback from all Tea Chat participants
17.30	Closing
19.00	**WELCOME DINNER BUFFET (With Gandhakasala Payasam)**

	DAY 2: Thursday, 17.02.2011
	PLENARY (Rapporteurs: Girigan Gopi & Prajeesh Parameswaran) VENUE NO. 2
09.00	**Welcome** by moderator Mr Mohan Dhamotharan Presentation of the day's programme Questions and feedback of day one
09.15	**Sustainablity and gender equity in rice production** Presentation by *Prof. Janet D. Momsen* (University of California, UC Davis)
10.00	**Commentary** by *Prof. Dr Geethakutty* **& Discussion**: The case of Kerala
10.30	Tea and Coffee Break
11.00	**Moving towards Equitable and Sustainable Landscape** **Participatory land use analysis in Wayanad** Presentation by *Dr Melvin Lippe* (BioDIVA Research Group, Leibniz University Hannover)
11.30	**Commentary** by *Dr N. Anil Kumar* **& Discussion**: Bridging politics, landscape and people: How can research and regulation join hands?
12.45	**Briefing for the Field Trip** Presentation of village and communities, culture and social background coordinated by *Mr Girigan Gopi*, BioDIVA Research Group
13.00	Lunch break
14.00	**FIELDTRIP**
	The field trip encompasses four different villages within a 10 to 15 km radius of CAbC to provide the workshop participants the opportunity to observe ongoing land use changes. We meet and discuss with local stakeholders how the conversion of rice fields impacts on their livelihoods in economic, environmental, cultural and social terms.

	The field trips visits the following villages:
	Kaniyambetta (Team 1) Contact Person: Mr Palliyara Raman, leading rice farmer of the local Kurichiya tribal community Facilitator: Mr Prajeesh Parameswaran, BioDIVA Research Group
	Kananchery (Team 2) Contact Person: Ms. Devaky, Vice President, District Panchayath, Wayanad Facilitator: Mr Girigan Gopi, BioDIVA Research Group
	Pozhuthana (Team 3) Mr Divakaran, retired govt servant, farmer and social worker; chairman of WARDA, a farmers' association group in Wayanad district Facilitator: Mr T. Raveendran, M S Swaminathan Research Foundation
	Vengappally (Team 4) Contact Person: Mr P. A. Rasheed, a social worker and promoter of organic farming in Wayanad district Facilitator: Mr Monish Jose, BioDIVA Research Group
18.00	Arrival at Green Gates Hotel
19.30	**Cultural Event** **VENUE NO. 1** **BioDIVA Dinner**

	DAY 3: Friday, 18.02.2011
	PLENARY (Rapporteur: Lydia Betz) **VENUE NO. 2**
09.00	**Welcome** by moderator Mr Mohan Dhamotharan Presentation of the day's programme Questions and feedback of day two
09.10	Presentation and reflection of field trips findings by a selected representative from each of the 'village visiting groups'

10.00	**PANEL DISCUSSION (Rapporteurs: Isabelle Kunze & Monish Jose) VENUE NO. 2** Moderator Mr Mohan Dhamotharan
	Fostering partnerships The plenary reflects on the lessons learnt and elaborates how to continue the dialogue on sustaining agrobiodiversity and rice production in Wayanad District with BioDIVA. Distinguished national and international professionals discuss from their perspective of specific expertise the trends in the field of agrobiodiversity and reflect on the situation in Wayanad.
	PD Dr Brigitte Kaufmann, DITSL, German Institute for Agriculture in the Tropics and Subtropics
	Dr S. Bala Ravi, Advisor, Biodiversity, M S Swaminathan Research Foundation
	Prof. Ulrike Grote, Institute of World Trade and Environmental Economics, Leibniz University, Hannover
	Dr Seema Purushothaman, Fellow, Ashoka Trust for Research in Ecology and the Environment, Bangalore
	Dr Kamalam Joseph, Centre for Water Resource Development and Management, Kozhikkode
11.30	**Tea Break** **Open Plenary until 12.00 (Rapporteur: Prajeesh Parameswaran)**
12.30	The next steps of BioDIVA: The centrality of feedback workshop & Closing remarks by *Dr Martina Padmanabhan* & Dr *N. Anil Kumar*
	Evaluation of workshop by the moderator- Mr Mohan Dhamotharan **Vote Of Thanks** Ms Hannah Arpke (Leibniz University, Hannover) & Mr N. Gopalakrishnan(M S Swaminathan Research Foundation)
13.15	**Lunch and farewell**

Annex iii: Guiding Notes

How to conduct a „Tea Chat"

The "Tea Chat" intends to introduce the participants of the BioDIVA Inception workshop to the central issues at stake concerning the future of rice, which are tribal concerns, the economic and the gender dimension, the legal framework and the importance of traditional knowledge for biodiversity conservation.

The objective of this rather informal way of approaching the different perspectives on rice is to bring out the knowledge of the participants of the workshop, thereby enabling to share with each other and learn from each other. By actively involving participants at this early stake, we hope to create an atmosphere of exchange and mutual appreciation.

You have kindly agreed to chair one of four "tea chat "sessions and give a 5 minutes introduction to your topic. I would like to ask you to consider the following as a chairperson:

- Please initiate a self-introduction with names, affiliations and the specific interest in BioDIVA.
- Ask for a volunteer, who is willing to present the results of the discussion to the plenary afterwards (10min). Please equip the person with flip-chart paper and pens
- Your role is to spark of a discussion of two hours by a very brief statement (5 min). You can chose to present your view on the topic in 3 to 5 very condensed statements. Your theses may very well be a bit provocative to get the discussion going.
- Please make sure as a chair, that everyone has a fair share in the discussion. You might like to keep a speakers list.
- Kindly get the attention of participants who are taken away by their own contribution, that we would like get another opinions on the subject.
- Keep in mind to identify "Research gaps to sustain agrobiodiversity of rice production systems" while steering the discussion.
- Please ensure, that at about 15:00 h people discuss towards a joint output and the presenter takes notes, which are agreed upon by everybody.
- Please make sure participants enjoy the break at 15:30

Thank you very much for hosting the tea-chat!

On what to focus during the field trip?

The objective of the fieldtrip during the inception workshop to four different destinations is to get a personal impression of the diversity of perspectives on the "future of rice".

In order to bring out the differences and similarities of the situation for Kurichiya tribals, Kuruma tribals, organic farmers and farmer associations, the aim is to follow up the same lead questions in all four parallel fieldsite visits.

We would like you to engage in conversations with our local hosts along the following lines:

1. What is rice production for you?
2. What are the changes you are observing in paddy cultivation?
3. What do these changes imply for women?
4. What do these changes mean to men?
5. .....?

Please note who is answering you. Are men answering on behalf of women or are women directly reporting?

We wish you a good trip and many fascinating insights!

Focus of the panel discussion

The panel discussion has two things in mind: On the one hand it wants to engage Indian and German experts an open reflection on similarities and differences in approaches, experiences and attitudes towards the same field of scholarship. On the other hand the BioDIVA team is eager to know, how Indian and International scientists perceive the work and intentions presented here and what they would recommend to make the project a success.

Dear panel participant,

Thank you for agreeing to join the panel. In the course of the discussion, moderated by Mohan Dhamotharan, these subjects will be likely touched:

- From a disciplinary perspective as a ..... what to perceive as the greatest challenge and what are your recommendations to deal with it?
- What can be done to ensure that knowledge of local experts is integrated throughout the research process?
- What is your wish for the BioDIVA project? What kind of support could you offer to achieve this?

Thank you very much for taking your time to reflect on the workshop and your vast experience!

Anil Kumar and Martina Padmanabhan will do their best to respond to your suggestions in an outlook on the next steps of BioDIVA

Annex iv: Presentations

On the following pages, you will find printed versions of the following presentations, in the order they were held at the workshop:

1. The Challenge of Agricultural Development and the Future of Rice Cultivation in Kerala (Dr. K. P. Kannan)
2. Aims and Scope of the BioDIVA Research Project (Dr. habil. Martina Padmanabhan)
3. Gender and Agrobiodiversity (Prof. Janet Henshall Momsen)
4. Moving Towards Eiquitable and Sustainable Landscapes: Participatory Land Use Analysis in Wayanad (Melvin Lippe)
5. Introduction to Field Sites (Girigan Gopi)

The Challenge of Agricultural Development and the Future of Rice Cultivation in Kerala

[Background Paper]

By

K. P. Kannan

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Kerala, India

[This paper is being circulated as a Background Paper for the author's Keynote Address at the BioDIVA Project Inception Workshop on February 16, 2011 at Wayanad, Kerala organized jointly by the MS Swaminathan Research Foundation, Chennai and the Community Biodiversity Centre, Wayanad, Kerala. This paper was delivered as the Dr. K.N. Shyamasundaran Nair Memorial Lecture on 13 August 2010 at the College of Horticulture, Vellanikkara, Thrisur and organized by the Kerala Agricultural University.]

Agricultural Development in an Emerging Non-Agrarian Regional Economy: Kerala's Challenges

K. P. Kannan

While the Kerala society has a vibrant record in discussing and debating its challenges in economic development, there is something which is yet to catch the public imagination. This relates to the ongoing structural transformation in the Kerala economy from an agrarian one dominated by agriculture in terms of both income and employment to one of a non-agrarian economy dominated by non-agricultural activities (see Table 1). In terms of text book knowledge such a transformation occurs only at a much higher level of income than the one Kerala presently enjoys. In 2004-05, agriculture and related activities accounted for only 22 percent of state income and 37 percent of employment compared to 22 percent and 57 percent for India as a whole. Recent data for 2008-09 show that in Kerala the share of agriculture and related activities in state income has come down to just 11 to 12 percent and, I would hazard, that employment share could be around 30 percent. While the Kerala scenario is certainly a more desirable one in terms of employment, does it mean that agriculture should no longer be considered a priority issue in its development planning? Certainly not. This is because agriculture and related activities have an important role in ensuring the availability of food for the people as well as supplying raw materials to a variety of agro-based industries. However it is important to remember that Kerala is only a part of a much larger country. Historically this has enabled Kerala to specialize in the cultivation of high value crops and thereby higher incomes from agriculture. It is in this larger context that we need to examine the challenge of agricultural development in Kerala.

The current challenge is to arrest the increasing inter-sectoral inequality in sectoral product per worker arising out of a fast growing non-agricultural economy and a stagnating agricultural one (see Table 2). This new stagnation in agricultural production has been preceded by an impressive growth performance for a little more than a decade; as such the current phase of stagnation has occurred at a higher level of productivity than before (see Figures 1 to 4). A concomitant feature of this situation is not only the decline in the share of

workers/households engaged in agriculture (which is not an undesirable one given the low land-man ratio) but also a steady exodus of the younger age group to non-agricultural activities. This seems to have resulted in an absolute decline in the gross cropped area (see Figure 5). The central challenge therefore is to transform agriculture to a level of productivity and income that will sustain a critical minimum of workers and households.

In this lecture I want to start with refuting at least three myths that in my opinion are ingrained in popular imagination. The first one is that Kerala is not food secure. This fly at the face of empirical reality that has been documented in several studies including the recent food security atlas published by the M.S. Swaminathan Research Foundation (see *Report on the State of Food Insecurity in Rural India* 2008). This latest study has reported that Kerala was the only state in India that was Least Food Insecure during 1998-200; it has retained its position in 2004-06 as well with two more states – Punjab and Himachal Pradesh - joining the league This is because it is now well accepted that food security is not entirely dependent on production but more importantly by the ability to access food by all sections of the people and its proper consumption in terms of nutritional and related health outcomes. Viewed from this larger perspective Kerala has not only a very high purchasing power in India (being the first among the Indian states in terms of per capita consumer expenditure since the late nineties) but also a relatively well-functioning public distribution system (e.g. distribution of rice at subsidized rates through ration shops, free mid-day meals for school children up to the 7^{th} standard, and supplementary nutrition for pre-school children and pregnant mothers through *anganawadis*) to make food available to the relatively poorer sections of the people. In addition, it also has a better record in sanitation and care of the children. As such producing food locally is not a *sin qua non* for ensuring food security.

The second myth relates to a popular impression that agriculture is not viable in Kerala. This is also not empirically correct because available evidence shows that Kerala stands second highest in terms of value generated per hectare of land followed by Punjab. In terms of net income it is the third highest (see Table 3). What this means is that Kerala farmers are quite efficient in making the best use of the limited land available here through crop selection, mixed cropping as well as application of modern technology.

A third myth relates to the oft-repeated statements to the effect that Kerala workers are either lazy or unwilling to do agricultural work. This is an oversimplified understanding without taking into account the totality of the dynamics of socio-economic conditions in Kerala. I must point out here that an overwhelming proportion of the younger generation in Kerala are now better educated than the earlier generation. In fact most of those belonging to the younger generation – below 35 years – have at least ten years of schooling. An increasing proportion are now completing the twelfth standard and above. This has raised the aspirational level of younger generation searching for 'jobs' that offer regularity in employment and social security. In sum, they are seeking jobs and not work of a casual kind that that are often associated with low labour status. This is reflected in the fact that over 80 per cent of those registered in the employment exchanges have at least an SSLC. This should also be juxtaposed against the increasing opportunities in the non-agricultural sector especially in services for employment with higher wages and salaries for the relatively better educated. For Kerala there is the additional attraction of the labour market in Gulf countries with much higher levels of earnings even for those with only high school level of education. All these continue to contribute to a movement of young people away from agriculture. That is why Kerala is now witnessing a steady flow of migrant labour from eastern and central India for a variety of unskilled manual work with wages that are two to three times the wages in those regions.

All these arguments are not intended to convey that agriculture development is not a problem in Kerala. On the contrary, my main purpose is to emphasize the fact that Kerala's agriculture has to move further to a higher level of productivity through the adoption of appropriate modern technology facilitated by appropriate organizational and institutional arrangements. What should be worrying the government as well as the people is that Kerala agriculture has got into another phase of stagnation since the late nineties preceded by a period of growth since the mid eighties. If we take the last four decades, the period up to the mid-nineteen eighties has been one of stagnation in agricultural production followed by an impressive growth performance till the late nineteen nineties. This is now followed again by a period of stagnation. But the overall growth performance of the Kerala economy since the

second half of the nineteen eighties has been quite impressive reaching an unprecedented growth rate of 7.8 percent per annum during the last decade led by both the secondary and tertiary sectors (see Table 2). In the context of the Kerala economy growing to a high rate of growth since the late eighties, the poor performance of the agriculture sector has resulted in increasing the intersectoral inequality in income thereby further pushing people away from agriculture. Since it is the better educated who find it easier to move out of agriculture, the agricultural sector also lags behind other sectors in terms of educated people. However I must add here that the average education of those engaged in agriculture in Kerala are much higher compared to all other states in India. Correspondingly Kerala has much higher potential for increasing agricultural productivity and thereby income and consequently to retain the required number of people in agriculture assuring not only livelihood security but also a decent income. It is the realization of this potential that has emerged as a major challenge in the present context of Kerala.

Favourable factors for agricultural development

The first and foremost favourable factor for further agricultural development in Kerala is the fact that the Kerala economy as a whole is in a stronger position to support agricultural development than before. As I said earlier this is because close to 90 percent of income in the economy is generated from non-agriculture which makes it easier for the Government to protect and support agriculture. This is also the historical experience of most of the developed countries where only a very small proportion of the work force is engaged in agriculture. In countries such as Japan, United States and those in the European Union, the high level of financial and other support to agriculture basically comes from the capacity of the non-agricultural sector that is chanalized by the governments in a variety of ways.

A second favourable factor in my view is the relatively high level of educational attainment of farmers as well as agricultural labourers. This is a necessary condition for absorption of modern technological practices in agriculture. Whenever innovative technology and practices are introduced the learning curve for the educated agricultural work force is likely to be much shorter than a less educated one. This perhaps explains why Kerala

farmers usually respond more positively to new crops, new practices and related modern technological advances.

A third favourable factor relates to the high density of organizations among farmers. As we can see in Table 4, the *Situation Assessment Survey of Farmers* carried out in 2003 by the National Sample Survey Organization revealed that nearly 60 percent of the farmers had membership in co-operative societies compared to just 30 percent in all India. Nearly 20 percent of the farmers were members of registered organisations of farmers; my own impression is that there are also innumerable unregistered associational organisations such as *Padasekhara Samitis.*

A fourth favourable factor is the existence of a vast network of primary agricultural credit societies, primary co-operative agricultural and rural development banks supported by Central and apex co-operative banks. This is in addition to the regional rural banks as well as the wide network of commercial banks which also disburse loans for the agricultural purposes. Also co-operative credit societies in Kerala have a much better record of functioning compared to the rest of India. There is no doubt that they have to go a long way in terms of strengthening their activities and playing a more supportive role in increasing agricultural production and productivity.

A fifth favourable factor is the existence of a well spread out network of research, development and extension agencies in agriculture including veterinary, diary, fishery and other services. Of course, there is need to assess possible gaps between research and extension on the one hand and extension and absorption by farmers on the other. Based on my limited interaction with agricultural scientists, extension personnel and farmers, I would venture to hypothesize that the extension activities as well as the absorptive capacity of farmers and agricultural workers have not yet acquired a critical threshold as to make a perceptible difference in agricultural productivity. Had this been the case, the growth rate in agriculture sector during the last ten years would not have been as dismal as it has been.

A sixth favourable factor is the introduction and gradual institutionalization of the Panchayati Raj at the village, block and district levels to whom nearly 35 percent of the plan funds are handed over. I think strengthening this system will go a long way in changing the face of agriculture and related primary sector activities to a higher level of productivity facilitated by modern technology and introduction of innovative organization. The potential of the Panchayat Raj in Kerala has greatly been strengthened by the existence of such new organizations of women from poorer households as Kudumbasree who are now active in reviving a variety of agricultural activities through new forms of organizational interventions.

Unfavourable Factors

The importance of the favourable factors cited above should not be minimized especially against the background of the situation in a majority of other states in the country. In fact a majority of states in India are yet to attain these favourable factors. However, Kerala has a few but quite critical unfavourable factors that need to be addressed as quickly as possible.

One is the failure of public irrigation systems in fulfilling its basic responsibility in water control measures especially irrigation. In fact only around 16 percent of the gross cropped area is irrigated with Government canals accounting for only less than 30 percent of this area. New methods of irrigation especially based on a decentralized framework involving efficient use of available water is yet to catch up on a significant scale. Kerala has paid a very high cost in terms of public irrigation facilities most of which have either not yet been completed or completed only partially with enormous time and cost over runs.

A second unfavourable factor from the point of view of farmers is the high cost of labour. The increase in wages for agricultural work has been much faster than the increase in labour productivity. This is because agricultural wages are largely set exogenously; first by trade union bargaining and then by shortage of labourers arising out of the pull of such high wage activities as construction. However, from the general point of view, high wages in agricultural sector also mean correspondingly higher income for the agricultural labour households contributing to a reduction in poverty. The only way to retain the farmers'

profitability or even enhance it is to go for labour saving technologies that will raise labour productivity while enabling payment of higher wags. But this could also lead to crop selection away from more labour absorbing crops such as rice to less labour absorbing crops such as coconut and rubber. This is what has been happening during the last three decades.

A third unfavourable factor is the low level of skill and specialized knowledge of those who remain and work in agriculture. It goes without saying that the challenge of introducing modern and environmentally sustainable technological packages in agriculture is also dependent on the availability of a skilled and trained work force.

A fourth unfavourable factor is the absence of an institutional mechanism to take care of the risks associated with agriculture (e.g.: crop failure) and the absence of an adequate social security cover to those who work in agriculture. In recent times these two concerns are being addressed but it has to go a long way in terms of coverage.

A last unfavourable factor perceived by many is the highly fragmented and small size of agricultural holdings. Eighty seven percent of the holdings in Kerala are Marginal with less than one hectare in size and another 8.5 percent are Small holdings with less than 2 hectares making a total of 95 percent accounting for 78 percent of output. For India as a whole the percentage of Small and Marginal holdings is around 84 percent accounting for only 46 percent of output (see Table 5). I must however point out here that the small size of holdings need not necessarily be a deterrent in realizing high productivity. This has been amply demonstrated by the historical experiences of such Asian countries as Japan, China and Vietnam. For example while the productivity of rice cultivation in Kerala is around 2.5 tonnes per hectare it is well over 5 tonnes in these countries with Japan close to 7 tonnes.

The Future of Rice Cultivation

I must digress here to make a short detour to the situation of rice cultivation in Kerala which continues to attract considerable public interest and even concern. At the current level of rice productivity it is extremely difficult to sustain rice cultivation for the farmers given the high cost of labour. In those rice growing states/regions where the productivity is higher

than Kerala (e.g. Punjab, Haryana and coastal Andhra) but without a corresponding high wage rate, rice cultivation is a much more profitable venture. In many other states, even if productivity is low, the labour cost is considerably lower and that also makes rice cultivation a more profitable one than in Kerala.

In the context of Kerala there is the additional factor in the form of stiff competition from substitutable crops such as coconut and banana and a variety of mixed crops. This is because the agro-climatic conditions in Kerala allow for the cultivation of a variety of crops in most parts of the state. In fact there is no other state where there is such high density of different crops as in Kerala. This is especially so when a large part of the cultivable rice lands can be put under mixed cropping systems as against the mono-cropping system in most parts of India. In addition, crops such as rubber were given special treatment through institutional support and it also happens to be a raw material for a number of growing industries. This has resulted in a continuous expansion in area under rubber and also in productivity. The expansion of area under rubber was mostly at the expense of coconut; but this in turn has led to the spread of area under coconut which was previously under rice. Of late the economics of banana cultivation has also posed a serious challenge to rice cultivation by taking away the area under rice.

To this one must also add problems associated with management of labour in terms of timely availability, supervision and related aspects. For farmers who are less inclined to devote time and effort for management of labour – and there are many especially in those households with significant share of non-agricultural income - there is also this additional factor in inducing them to shift to less labour absorbing crops which also happen to be more remunerative.

It is therefore not surprising to see that there has been as secular decline in the area under rice cultivation since the mid seventies (see Graphs 5 and 6). In fact the rate of decline has been much faster during the last fifteen years compared to the previous twenty years. The expert committee on paddy cultivation that I mentioned in the beginning, and which submitted its report in July 1999, had examined the issue in great detail and made a number

of recommendations that basically focused on increasing productivity as well as income through integrating rice cultivation with other linked activities. The instrumentalities for realizing these two objectives included setting up of institutions and organizations for introduction of modern technology (not just mechanization) thereby retaining around three lakh hectares (net) of land under paddy with a cropping intensity of two making it possible to reach six lakh of gross cropped area under rice with an average productivity of 3.5 tonnes per hectare. But this was to be achieved by identifying Community Development Blocks (now known as Block Panchayats) which are most suitable and relatively high yielding for paddy cultivation. In fact such Blocks were identified and listed in the report. I am not sure whether the then Government or the one which came power subsequently had given serious attention to the examination of this report while formulating policies. I can only say that given the economic logic and the management constraints under which the farmers are operating, it is no wonder that the area under paddy has shrunk to just 8 to 9 percent of the gross cropped area compared to 28 to 32 percent during the seventies and sixties respectively.

While the economics of farming from the farmers' point of view may not favour rice cultivation, I suppose there are powerful larger considerations that call for efforts in protecting paddy cultivation. Central to this perspective is the environmental dimension because the ecology of rice cultivation serves as a medium for water retention, seepage and consequent recharging of ground water and also as a natural drainage. Ecological and environmental scientists are of the view that filling up of such natural drainage systems for growing other crops or for purposes of non-agricultural use would seriously damage the ecosystem with adverse consequences to the society at large. If the Kerala society recognizes this larger and fundamental role of rice cultivation, then there is a strong case to pay an extra price for the preservation of rice cultivation in Kerala. I shall come to this later in a few minutes.

Elements of a Strategy for Enhancing Agricultural Productivity

I have already referred to the historical experiences of such countries as Japan, China and Vietnam to emphasize the fact that small size of holdings need not be a barrier for

agricultural development. What these historical experiences suggest is the need for a 'group approach' given the fact that several operational decisions have to be taken jointly. Given the existence of associational organizations of farmers (e.g.: Padasekhara Samitis) it is not difficult in the Kerala context to bring about a group approach in agricultural operations. A 'group farming' approach was tried and tested for a brief period in the late eighties and early nineties but such an official policy later got relegated to the background. However, it is my understanding that farmers continue to practice such an approach arising out of objective conditions and what is needed is a policy to strengthen them through appropriate incentives. The central challenge seems to be to overcome the current – and the second during the last four decades - phase of stagnation in agricultural productivity. While technological solutions are often given due recognition and importance, an equal weightage to organizational and institutional issues is often not accorded. It is therefore important to focus not only on 'farming' but also the 'farmers' emphasizing the two sides of technology and organization in the transition to a modern agriculture. The concept of modern agriculture has also undergone a change in its connotation. Today it is no longer considered desirable to encourage chemical fertilizers and pesticides given the long term damage that it might bring in to the soil condition as well as human health. Therefore alternatives in the form of bio-fertilisers and pesticides are being actively encouraged the world over. In many parts of Kerala, a beginning has already been made in this direction if one goes by the reports coming from the Village Panchayats. The challenge is to not only maintain existing levels of productivity but also to enhance it to meet the growing demand for agricultural products.

I must also mention here that when one talks about introduction of modern technology it is often confused with mechanization. Although experts in the field do understand the many sided nature of modern technology this has to be emphasized in public policy and popular understanding. In fact technological changes based on hydrology (for water resource management) and biology (such as high yielding varieties of seeds, tissue culture, bio fertilizers and pesticides) are more powerful than mere introduction of mechanical technology in enhancing agricultural productivity. However, the challenge here is not just the generation of modern technological solutions and their innovation but its diffusion resulting in absorption by those engaged in agriculture for increasing productivity.

This calls for appropriate innovations in organizations and institutional arrangements. An active and vibrant extension network is a necessary condition here. The existing organizational arrangements for land and water management have, as I mentioned earlier, has a dismal record. An alternative such as a decentralized system has only begun to emerge. Moreover the use of water in a more efficient way such as through precision agriculture, drip irrigation and so on are still in their infancy. The basic unit of planning for land and water management is the watershed which has made some headway in terms of mapping but a long way from tapping the potential and its appropriate distribution.

Here I see a great window of opportunity for taking advantage of the National Rural Employment Guarantee Scheme (NREGS). Although it is a social security scheme to provide some income through the provision of employment to needy rural households, it has demonstrated its capacity to create 'natural capital' through land and water resource development. In the Kerala context, as well as in the larger Indian context, this scheme could be combined, wherever feasible, with other schemes and projects relating to land and water management such as soil conservation, minor irrigation, schemes under the Rashtriya Krishi Vikas Yojana (RKVY) and so on. The synergy thus created could well exceed the sum of the benefits of such projects when taken up individually.

I would also like to flag an important gap that exists between research, extension and absorption of modern technology (see Table 6). This relates to the absence of a well trained and skilled work force engaged in agriculture and who could help apply modern practices. The existing system in my view is top heavy with highly skilled researchers and other professionals but it lacks a well trained army of technicians who could work with the farmers and agricultural workers in the field. In the health care system the medical doctors are supported by an army of paramedical personnel starting with nurses to lab technicians, health inspectors and health workers. Similarly in the engineering services engineers are supported by an army of diploma holders and technicians coming out of industrial training and similar institutions. I am not sure such a gradation of an army of agricultural professionals and technicians exist in the system perhaps due to the absence of a policy framework resulting in

the absence of training institutions for different levels of skills and technical expertise. This is something I think the planning process in Kerala should address itself to.

As already mentioned there is a scarcity of workers willing to work in agriculture. But such scarcity is often not felt when new technologies are introduced and new ways of performing the tasks are carried out such as mechanized transplanting and technology. This has to do with the notion of labour status and also the need for regular and secure employment. It is heartening to find that some Village Panchayats in Kerala have tried to overcome this constraint by encouraging and promoting the setting up of Labour Banks. On the other side, there is also the phenomenon of keeping the land fallow especially those under seasonal crops such as rice. In recent times and in many Panchayats the organization of women from poorer households called the Kudumbasree groups have come forward to lease in such fallow land for cultivation thereby enabling them to earn some income while contributing to agricultural production. The owners are given a sum of money that could be construed as a form of 'rent'. With some imaginative planning and promotional support along with innovative organizational interventions can contribute to the twin objectives of increasing agricultural production in the economy and employment and income to the workers. I would therefore propose here the promotion of what may be called, Land-cum-Labour Banks (LLBs) in Panchayats where owners of idle land could deposit their land and the people who are willing to work in agriculture could deposit their surplus labour. By matching these two the LLBs could function in such a manner as to reward both the parties. Such an arrangement can ensure a degree of regularity of employment as well as social security as has already been demonstrated in some of the Village Panchayats where only the labour bank part has been attempted. They could also be the custodians of agricultural machinery and other tangible assets bought with the support of Government and its agencies. This will also overcome the constraints of introducing new machinery by the innumerable small farmers on an individual basis.

Ideally such LLBs can also function as agents of technological change by going for innovative methods in farming, livestock rearing, fish culture and similar activities. They can also deal with the banking system for accessing credit.

While such alternative organizational interventions could be pursued actively as a matter of policy, farming and related activities are likely to remain as private operations carried out by the households. The thrust of a new strategy therefore should be in the form of encouraging a 'group approach' whether in the matter of buying inputs, hiring mechanical equipments, carrying out agricultural operations or even the marketing of agricultural products. There are many examples of such group-based activities that need to be disseminated throughout the state to make a perceptible impact.

The basic objective of a new strategy in Kerala context should be to maximize the value per unit of land as well as per unit of labour given the fact both these are in short supply. There is no doubt that this calls for a much higher level of public investment but also imaginative planning for inducing innovation and its adoption by farmers.

While there are several encouraging developments in a few Panchayats along the lines that I have indicated here, it is my firm understanding that Kerala has not yet reached a critical threshold in modernizing its agriculture that will assure a decent livelihood to those families who are engaged in it especially the Small and Marginal farmer households. From this point of view the objective of livelihood security and the attainment of a level of income to retain a critical minimum of population in agriculture should take an integrated view that will combine both farming and non-farming activities within the primary sector. Some of the well known examples that are already talked about are rice cultivation, fish culture and livestock rearing or strengthening mixed cropping to reduce the risks associated with particular crops along with agro processing based on such crops and so on. However, from the basic livelihood security point of view public policy has to provide for crop insurance as well as a minimum of social security to take care of contingencies such as sickness and old age.

The Special Case of Rice Cultivation

It is in this larger perspective of a new strategy for agricultural development that we need to examine the prospects of rice cultivation as a special case. At the current level of

productivity of around 2.5 tonnes per hectare it does not seem to be an economically viable proposition. Currently area under rice is largely, if not only, concentrated in three regions where the agro-climatic conditions as well as the critical factor of land and water management are in favour of rice cultivation. These are the Kuttanad region, the Alathur-Chittur taluks of Palakkad and the Kole land region in Thrissur where the reported yield is between four to five tonnes per hectare. At this level of yield the farmers have reported that rice cultivation is economically viable. Of course, a part of the cost is now borne by the rest of the society in the form of subsidies for various purposes. The challenge therefore is to raise the productivity of rice cultivation to around five tonnes per hectare per crop for a large area under rice. In fact a more focused approach targeting the Block Panchayats (and Village Panchayats within it) with favourable conditions for attaining this yield is worth pursuing as a matter of priority. If at least 3.5 lakh hectares can thus be retained under paddy cultivation and attain an average yield of at least four tonnes per hectare in the short run that would exceed the maximum production in Kerala that was attained in the latter half of seventies. It is with this objective that the planning process has to help introduce appropriate technological and organizational solutions. We need to remember that the current area under rice is only 2.34 lakh hectares and the proposed initiative will have to restore at least 1.16 lakh hectares under rice cultivation.

Public expenditure will have to primarily be directed at supporting production oriented activities because the constraints in enhancing productivity continue to be technological and organizational in nature. Price support and untied cash subsidies may be attractive in the short run but it will have to be kept to a minimum.

The question of the effectiveness of public investment for land and water management and development continues to be a critical one for rice cultivation. Alternatives to the currently wasteful expenditure in large irrigation systems will have to be increasingly replaced by a decentralized system based on the development of watersheds.

The idea of LLBs can be easily applied to the restoration of rice cultivation with appropriate policy support and package of incentives within the framework of Panchayati

Raj. Here I would also emphasize the urgent need for creation of a skilled army of agricultural technicians. Innovative rice farming methods such as single or double sapling farming, selection of seeds, application and control of water and a variety of similar practices will have to be explored and adapted through trial and error for wider dissemination. I have been told a few days ago that a breakthrough in rice productivity with a yield of five to six tonnes per hectare per crop has recently been attained in the Wadakkanchery Block Panchayat in Thrissur district. If that is the case, it calls for a detailed study of the technological, organizational and social processes by which such a result has been achieved for a Block Panchayat as a whole. It is such actually existing examples that need to be replicated in other suitable areas with appropriate adaptations.

If the Kerala society recognizes and accepts the ecological functions of rice cultivation, then an extra price will have to be paid for retaining as well as developing rice cultivation. This could be deemed an environmental tax or subsidy that the society is prepared to bear. Despite the various implicit and explicit subsidies that are now given to rice cultivation the decline in area under rice has been quite sharp as I mentioned earlier. What this points out is that all these subsidies put together are not sufficient to deter the farmers moving away from rice cultivation. Whether such decline is due to competition from other more profitable crops or the attraction of real estate value of land (despite a ban on such conversion) are important factors that call for detailed empirical investigation.

Some Tentative Conclusions

After a period of impressive growth in agriculture from the mid eighties to mid nineties Kerala seems to have got into yet another phase of stagnation since the late nineteen nineties. Unlike the earlier phase of stagnation, this one is characterized by a loss of 3,19,00 hectares of gross cropped area (between 1996-97 and 2008-09) compared to the 1,58,000 hectares earlier (1974-75 to 1986-87). The loss in the earlier period was restored during the period of growth (1987-88 to 1995-96); whether a similar restoration will take place this time would very much depend on the shape of policies and programmes. While Kerala's agriculture continues to be a high value one in terms of value generated per unit of land, it has to successfully confront this new impasse keeping in mind the fast-growing nature of the

non-agricultural sector of the economy. In that respect, the current challenge is qualitatively of a different kind in Kerala's developmental history.

Given the favourable factors and the possibility of converting some of the unfavourable ones to favourable ones, Kerala is well equipped to move to a higher level of agricultural technology to realize its potential productivity. There are already many scattered examples of new technological and organizational solutions but they have not yet reached a critical threshold as to push agriculture to another phase of sustained growth. The role of Kudumbasree in restoring (since 2003) nearly 31 thousand hectares of fallow land to cultivation points to the possibility of overcoming this impasse.

The planning mechanism now in vogue in the state has to take a hard look at this state of agriculture especially with a view to identify its strengths and weaknesses and chalk out alternatives for further development. In such an exercise two issues need to be addressed explicitly; one is the environmental dimension and the other is the need to create a skilled work force.

Public investment in agriculture and related activities call for careful planning and co-ordination so that synergies can be generated by combining several schemes and projects. It is high time to move out of the wasteful nature of public investment in water control (especially irrigation) and create appropriate alternative organizational mechanisms for a decentralized system in a multi-level planning and implementation framework.

Since the basic constraint is both land and labour, solutions will have to focus on raising agricultural productivity - since there is hardly any extensive margin in agriculture - and income of farming households through a combination of farming and non-farming activities.

Measures for covering risks in agricultural and related activities and providing adequate social security to those engaged in agriculture should form part of any new strategy.

Perhaps the time has come for a stock-taking of the entire gamut of issues for meeting this challenge of agricultural development in a fast growing Kerala economy and a concomitantly fast transforming Kerala society.

Growth Trend in Kerala Economy, 1970-71 to 2007-08 (Rs. Crore, at 1993-94 Prices)

Figure 1: Growth in State Income (NSDP)

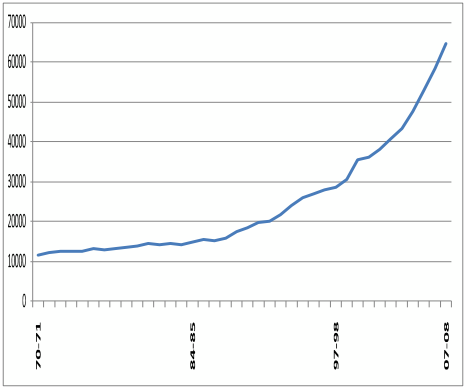


Figure 2: Growth in Primary Sector

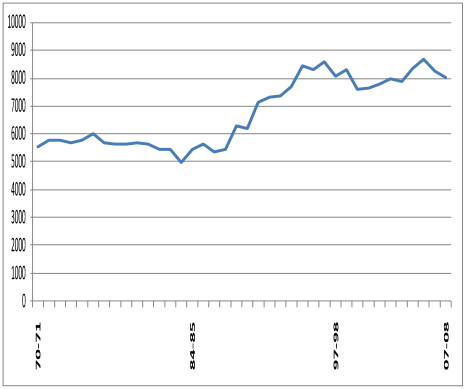


Figure 3: Growth in Agriculture (Crop

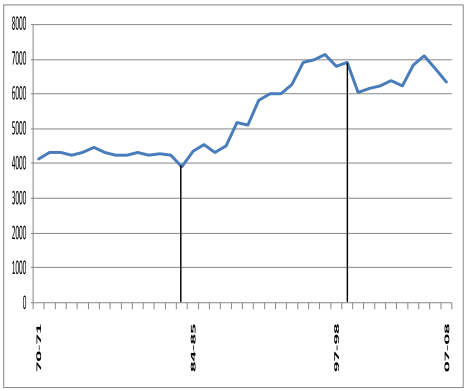
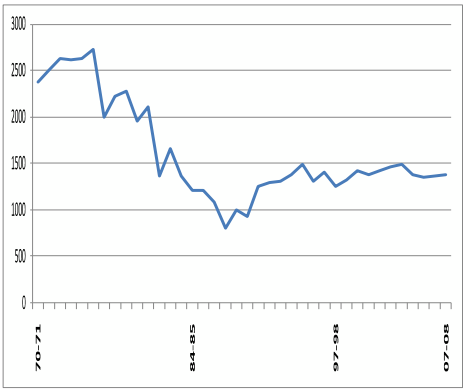
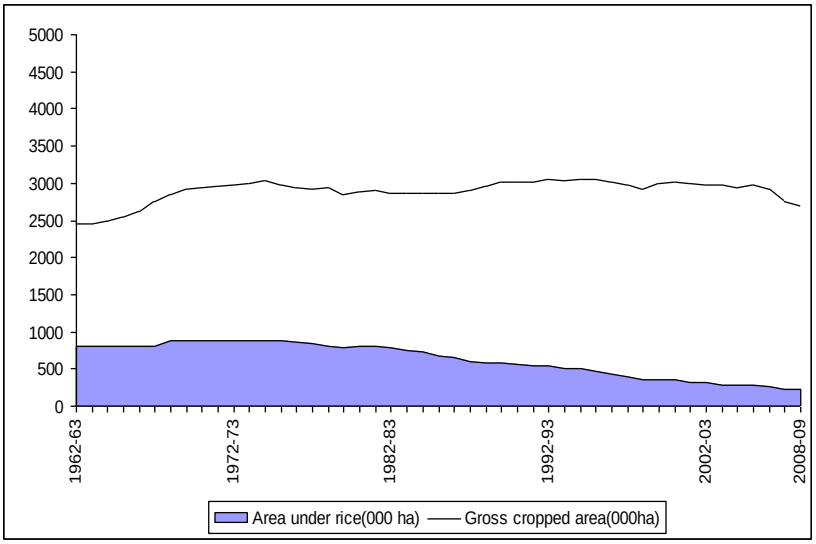


Figure 4: Growth in Primary Non-Agriculture (Livestock, Fishing, Forestry & Logging)



Source: Based on CSO's NSDP database, accessed from EPWRF (2003) and http://mospi.nic.in

Figure 5: Trend in Paddy Cultivation in Kerala for the period 1962-63 to 2008-09



Source: Kerala Economic Review. Various years

Figure 6: Area under rice in Kerala as percentage of Gross Cropped Area

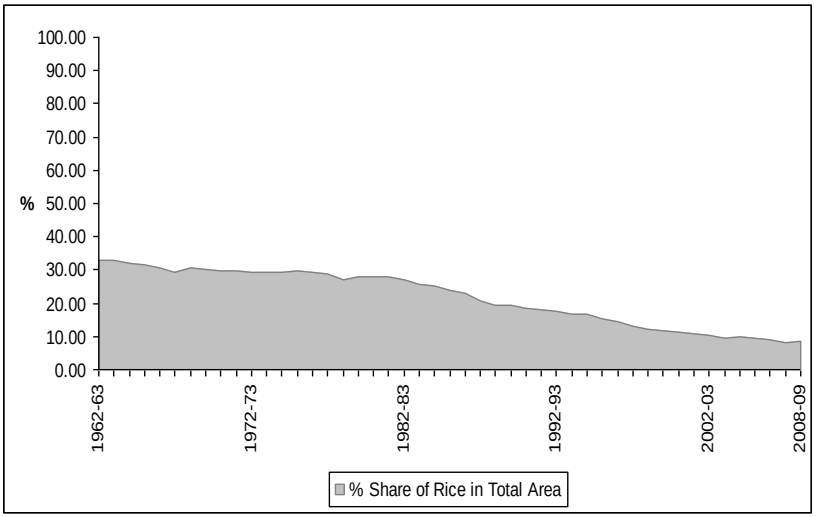


Table 1: Sectoral shares in income and employment and sectoral product: Kerala and All India

Indicator	Primary	Secondary	Tertiary
1993-94			
Income	32 (33)	20 (24)	48 (43)
Employment	49 (65)	21 (14)	30 (21)
Sectoral product	0.65 (0.51)	0.95 (1.71)	1.6 (2.05)
2004-05			
Income	23 (22)	21 (25)	48 (43)
Employment	37 (57)	25 (18)	38 (25)
Sectoral product	0.62 (0.39)	0.84 (1.39)	1.26 (1.72)

Note: Figures in brackets stand for all India.

Table 2: Sectoral Growth Rate (%) of Kerala Economy, 1970-71 to 2007-08

	Sector	1970-71 to 83-84	1984-85 to 96-97	1997-98 to 07-08	1970-71 to 07-08
1	Primary: Agriculture	-0.24	4.64	0.21	1.67
2	Primary: Non-Agricultu	-1.88	3.52	1.75	0.48
3	Primary Sector (1+2)	-0.62	4.43	0.49	1.41
4	Secondary Sector	3.49	7.25	9.08	5.20
5	Tertiary Sector	3.35	6.15	9.78	6.07
6	All Sectors (3+4+5)	1.64	5.84	7.79	4.46

Source: Based on CSO's NSDP Database, accessed from EPWRF (2003) and http://mospi.nic.in

Table 3: Value of Output, Cost and Net Income, 2003 (Rs per hectare)

	Output	Cost	Net income
Kerala	27,197 [2]	10,276	16,921 [3]
Punjab	28623 [1]	11,991	16,632 [4]
Uttaranchal	25,536 [3]	4,178	21,358 [1]
J & K	23,214 [4]	5,147	18,067 [2]
All India	12,535	5,841	6,694

Source: NCEUS (2008), A Special Programme for Marginal and Small Farmers. Figures computed using NSS unit level data 59th Round on Situation Assessment Survey of Farmers, 2003.

Table 4: Organizational density and access to information on Modern technology (Percentage of farmer households, 2003)

Indicator	Kerala	All India
Membership in coop society	59.7	30.0
Membership in regd farmers orgns	19.9	4.8
Access to any govt agency as a source of information on modern technology	18.3	7.2

Source: Same as Table 3.

Table 5: Percentage shares of Small and Marginal Cultivation, 2003

	Kerala	All India
Holdings	95	84
Land possessed	80	46
Output	78	51

Source: Same as Table 3.

Table 6: Knowledge acquired for modern farming through

Indicator	Kerala	India
Training Programmes	2.8	0.9
Krishi Vigyan Kendra	8.4	0.7
Govt demonstration	3.0	2.0

Source: Same as Table 3.

Transformation knowledge for gender-eqitable and sustainable use of agrobiodiversity

The case of rice in Wayanad

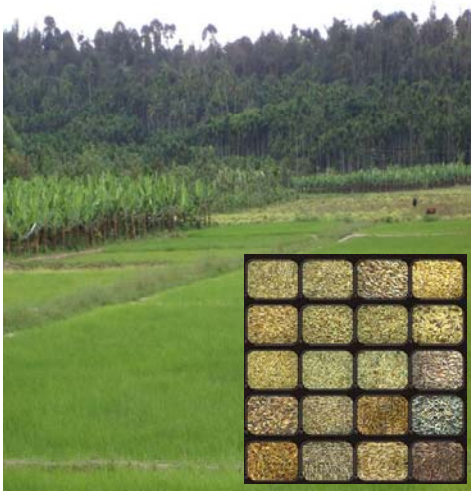
Martina Padmanabhan, N. Anil Kumar
Melvin Lippe, Monish Jose, Girigan Gopi
Lydia Betz, Prajeesh Parameswaran, Isabelle Kunze
Hannah Arpke, N. Gopalakrishnan

Problems observed: Fewer paddy fields

- **Shrinking** area under paddy cultivation
- **Conversion** to banana plantations
- **Fragmentation** of agricultural land
- **Unknown consequences** for the overall rice-system landscape
- Changing **rainfall** patterns
- Reduced **capacity** of the landscape to store water
- Less accompanying **diversity** like frogs and crabs available

Problems observed: Less agrobiodiversity

- **Less diversity** of paddy varieties in the fields
- **Seed material** of traditional varieties not readily available
- Increase in **pests** and **diseases**
- **Knowledge** on cultivation practices by farmers and labourer fading
- Policies such as the Indian Biodiversity Act 2004 are **contradicted** by other policy measures e.g. supporting banana cultivation



Problems observed: Fewer people in paddy

- Tribal labourers like **Paniya**, esp. the women do not find enough work in paddy fields
- Banana plantations **only hire** men
- Young women not willing to take up the **hard work** in the paddy field
- **Skilled labourers** with knowledge in paddy not available
- Tribal landed communities like **Kurichiyas** and **Kuruma** maintain traditional varieties for consumption
- Younger generation will splitting joint land holding for **cash crop** cultivation

How BioDIVA came about

- First **awareness raised** in 2003 by Mina Swaminathan
  Introduction to Dr. Anil Kumar
- 1st (2004) and 2nd (2006) proposal for **small cooperative project**
- **BioDIVA** research group **funded** (2007)
- **Preparatory workshop** (2008)
  Community Agrobiodiversity Centre, Kalpetta
- David (2009)
- **BioDIVA start** 2010
  - Explorative study April/May 2010, Kalpetta
  - Capacity building September/November, Hannover
  - Stakeholder workshop 14.02.2011

MSSRF

Social-Ecological Research

- Concerned with “Societal Relations with Nature” (Jahn 2004)

- Dynamic interaction
- Environmental factors < > social aspects

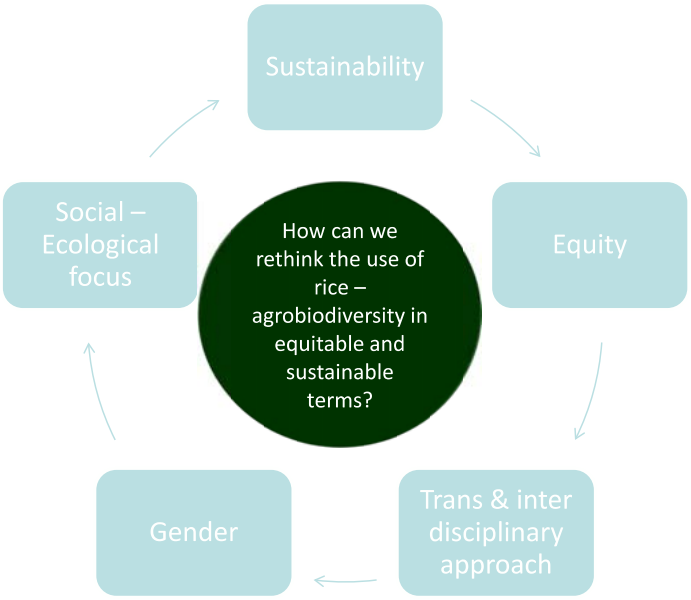
- Seeks to understand social transformation processes

- Generates knowledge required to steer such processes in a sustainable direction
- Sponsored by German Federal Ministry for Research and Education
- To expose Social-Ecological Research to an international audience

Bundesministerium für Bildung und Forschung

SÖF Sozial-ökologische Forschung

What are BioDIVA‘s aims



Sustainability in paddy cultivation

- **Intergenerational justice**
  Future generations shall be in the position to reap the same benefits as today‘s population
- **Sustainability is a normative idea** to be translated into the specific context of paddy cultivation in Wayanad
- **Challenge** of taking into account
  - conflicting attitudes and interests
  - different persons and groups within Wayanad

- **Integrate experts‘ knowledge** and normative aspects into the research process

Gender equity in paddy cultivation

- **Intra-generational equity**
  - between men and women
  - between mainstream society and tribal groups
  - in a rapidly changing rural society
  - according to the local context

- Who **bears** the **costs** and who **reaps** the **benefits** of conserving and using agrobiodiversity of rice?
- What would an **equitable solution** to the paddy dilemma look like?

Transdisciplinarity

- Pure academic approaches are often **too detached** to bring about change (IAASTD 2009)
- We focus on **life-world** problems: *Lebenswelt* – real world
- We realize the various kinds of **expertise** among practioners (Farmers, administrators, politicians, NGOs etc.)
- We believe that a solution of the problem can only be achieved through a **joint approach**

- Nevertheless, it might serve to understand the situation better through providing additional **information**
- Stakeholder workshops and **dialogue**

We need to learn from each other !

Transformation knowledge

- Transdisciplinarity is concerned with 3 types of knowledge

System knowledge:

Analyses complex empirical questions

Transformation knowledge

- Transdisciplinarity is concerned with 3 types of knowledge

System knowledge:

Analyses complex empirical questions

Target knowledge:

Aims at finding solutions to life world problems

Transformation knowledge

- Transdisciplinarity is concerned with 3 types of knowledge

System knowledge:

Analyses complex empirical questions

Transformation knowledge: Investigates how existing practices can be changed

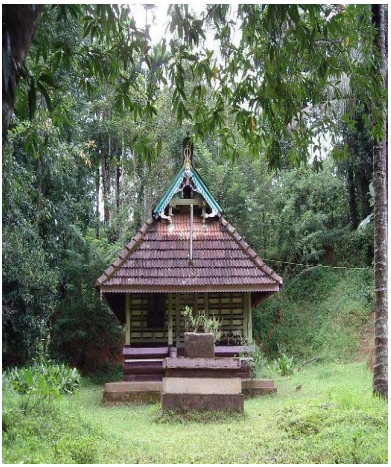
Target knowledge:

Aims at finding solutions to life world problems

Interdisciplinary

- Integrating disciplinary paradigms
- Participatory research
- Search for unity of knowledge beyond disciplines

- Disciplines
  - Economics
  - Ecology
  - Sociology
  - Institutional analysis
  - Land use change modeling

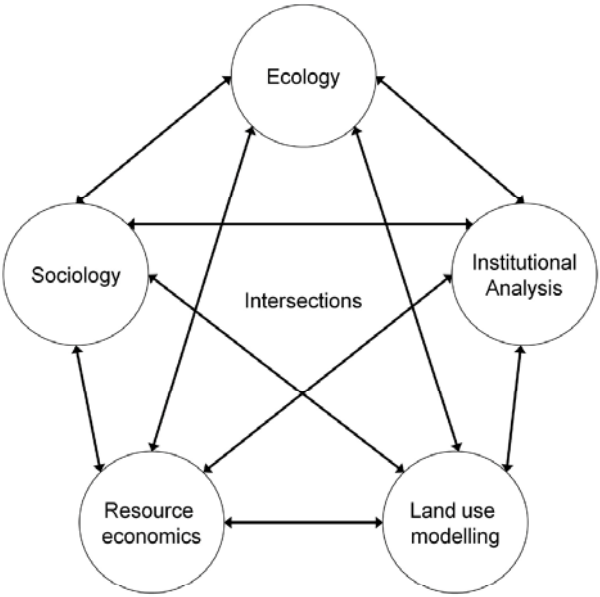


Intersection: Intraface

- Analytical concept to analyse gender issues in natural resource management
  - Concerned with the **negotiations** between women and men
  - over **material circumstances** like natural resources
  - on the grounds of their **social interpretation**
  - - in this case agrobiodiversity -
  - with an emphasis on the **dynamic aspects**

- The intraface approach
  - helps to **synthesise** different disciplinary approaches
  - secures their contribution to **understand** gendered negotiations
  - may allow for **comparison** across cases

Interdisciplinarity and intersections



Cooperation partners

- **M.S. Swaminathan Foundation,** India
- Pro-poor, pro-nature Pro-women, Pro-tribal
- Community Agrobiodiversity Center
  - Exquisite knowledge on ecological and social situation
  - Established trustful working relationship with tribal people
  - Extensive experience of intervention in Wayanad

- **Leibniz University Hannover**, Germany
- Institute of Environmental Planning
- BioDIVA: Social-Ecological Research Group
  - Transdisciplinary
  - Interdisciplinary
  - International
  - Intercultural

Agricultural Economics tandem

- **Monish Jose**
- M.Sc (IMRD) Ghent University, Belgium
- M.Sc (Agri. Economics) UAS, Bangalore, India
- Ph.D topic:
  Impact of land use change on income and employment of agricultural households in Wayanad district of Kerala

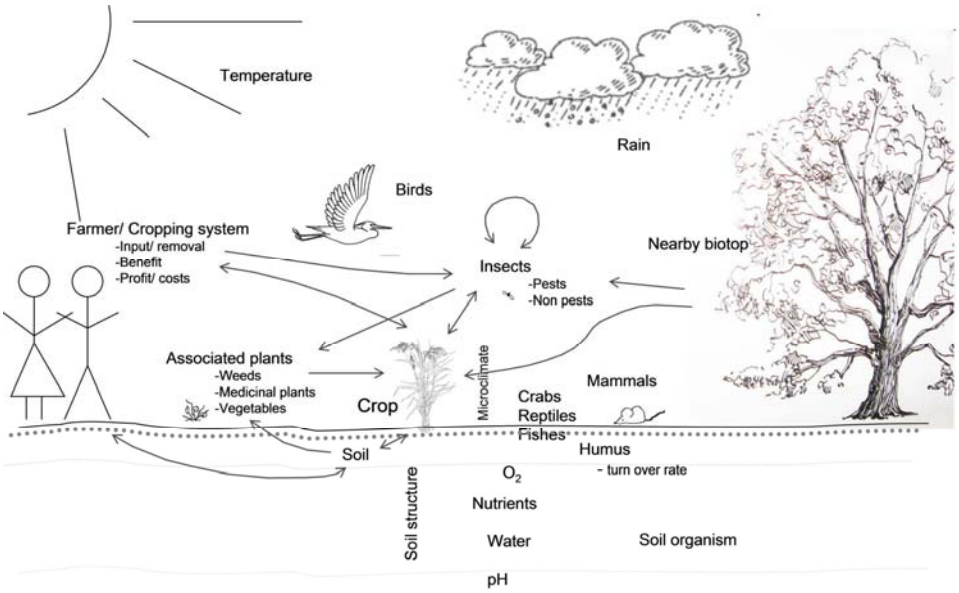
- **Girigan Gopi**
- M.Phil Economics
  Kerala University, India
- For 11 years MSSRF staff
- Ph.D. topic:
  Economic valuation of ecosystem services: A comparative study of rice and banana cultivation

Ecology tandem

- **Lydia Betz**
- Dipl. Biol.
- University of Göttingen, Germany
- Ph D topic:
  Ecological effects of land-use change and possibilities of agrobiodiversity conservation in rice cultivation areas in Wayanad

- **Prajeesh Parameswaran**
- M.Sc. Botany
- Mahatma Gandhi University, Kottayam, India
- For 4 years MSSRF staff
- Ph D topic:
  The composition of the plant diversity associated with the rice ecosystem and its variation along the gradient of agricultural intensification

Social-ecological complexities



Rural Sociology

- **Isabelle Kunze**
- Masters of Social Sciences (M.Soc.Sc), University of Waikato, New Zealand
- Ph D topic: The social organisation of values, knowledge and interests in agrobiodiversity

- **N.N.**
- Social scientist from Kerala
-
- Topic: Changing agrarian relations of landless labourers at the case of the Paniya tribal community

Land use modelling

- **Melvin Lippe**
- Ph D Hohenheim University, Germany
- Post-doc topic:
- Land use change modeling in Wayanad District

- Disciplinary areas:
  - Agroecology
  - GIS and remote sensing
  - Biophysical habitat analysis

- Develop a social-ecological system description of local rice based farming systems

- Identify the driving factors of land use change from a scientific and stakeholder point of view

- Employ scenario analysis to test sustainable agrobiodiversity development strategies for selected sites of Wayanad District

Rural Development

- **Martina Padmanabhan**
- Dr. habil.
  Humboldt University Berlin, Germany
- Dr. sc. agr.
  Göttingen University, Germany

- Topic: Gender and Institutional analysis of agrobiodiversity governance
- To study the formal and informal institutions as regulatory mechanisms between social and ecological systems
- To lead the BioDIVA team

- **N. Anil Kumar**
- Ph D Botany
  University of Madras
- Director of Community Agrobiodiversity Centre
- For 11 years

- Team leader BioDIVA India
- Ph D guide Prajeesh
- To share experience of intervention and policy dialogue
- To facilitate the international, intercultural cooperation
- To advise on sensitive issues

Project administration

- **Hannah Arpke**
- M.Sc. Overseas Rural Development, Bangor UK
- B.Sc. Agroforestry, Bangor UK

- International research project management
  - Science management
  - Communication
  - Organisational learning and development

- **N. Gopalakrishnan**
- MBA , University of Madras, India

- Enable international scientific cooperation
- Facilitate intercultural communication and networking
- Disseminate research findings to public and press

Outcome and outputs

- **Outcomes**

- Platform for dialogue on land use change established
- Scientific analysis of the land use change taking place in Wayanad delivered to practicioners and policy makers
- Strategies and possible solutions developed together with stakeholders
- Policy recommendations formulated
- Follow up actions with MSSRF agreed

- **Outputs**

- Handbook "Developing Agrobiodiversity"
- Documentation of process in word and picture
- Disciplinary, interdisciplinary and transdisciplinary publications in
  - English
  - German
  - Malayalam

Invitation

- To bring together different worlds through engaging in a dialogue
  - Farmer – Academia
  - Germany – India
  - Natural science – Social sciences
  - Men – Women
  - Researchers – Policy makers
  - Research – Intervention

- Let us embark on this journey
- Let us develop a shared vision
- Let us work on viable solutions
- On **the future of rice** in Wayanad

Intersections 2011

- Social-Ecology:
  Farmers knowledge of ecological parameters
- Modelling land use change
  ecologic and social indicators
- Institutional environment and economic decisions

GENDER AND AGROBIODIVERSITY

Janet Henshall Momsen
University of California, Davis and
IGS, University of Oxford

Biodiversity

- ‘Biodiversity is one of the most significant and elaborate notions to be added to conservation and development discourses during the last ten years’

Piers Blaikie, 1996. Paper presented at RGS/IBG Annual Conference, Strathclyde.

- The variety and variability of genes, species and ecosystems is a global capital asset with great potential for yielding sustainable benefits.
- Biodiversity has declined due to habitat destruction, over-harvesting, pollution and the inappropriate introduction of exotic species.

Approaches to Biodiversity

- Classic: focuses on environmental remedies for environmental problems. Associated with colonial roots of conservation and ambivalent attitudes to local people. Top down approach.
- Neo-liberal economic: focuses on the economic benefits of biodiversity and the costs of its erosion and management. **USAID(2001)calculated that the net economic benefits of biodiversity were at least US$3trillion per year or 11% of the annual world output**.

i. Loss of a commodity and the related income stream-or

ii. Consumptive use values and option values

BUT species have intrinsic value and valuation is anthropocentric. In developing countries, poor people's and especially women's views tend to be overlooked. So need more bottom-up approaches.

Biodiversity history

- First mentioned in 1988 in a US National Academy of Sciences publication
- Rio de Janeiro 1992 Earth Summit: Biodiversity Convention signed. Political issues concerning sovereign rights of genetic resources.
- One of the objectives of the 1992 Summit was to '[r]ecognize and foster the traditional methods and the knowledge of indigenous people and communities, emphasizing the particular role of women, relevant to the conservation of biodiversity and the sustainable use of biological resources.' (Quarrie, 1992).
- Johannesburg World Summit on Sustainable Development 2002, reiterated that there would be no sustainable development without gendered analysis.
- 2010 United Nations Year of Biodiversity.
- 2011 start of United Nations Biodiversity Decade

Agrobiodiversity and the environment

- Need to maintain the diversity of agricultural crops to protect food supplies
- May also include some wild plants used for food or medicinal purposes and either *in situ* (wildlands, forests) or *ex situ* (botanic gardens, home gardens) conservation
- Need to consider how biodiversity impinges on stakeholders' daily lives- especially in terms of agrobiodiversity.

Do women and men have different relationships with the natural world?

- Who is familiar with local plants, birds, waterways, nature reserves?
- Who is aware of local, regional and global environmental issues?
- Who joins nature/conservation/ environmental organizations?
- Who takes on leadership roles in these organizations and in protests?

Women farmers selling their own produce in northwest Burkina Faso

Gender and Environmental/Ecological Knowledge

What sort of gender distinctions exist?

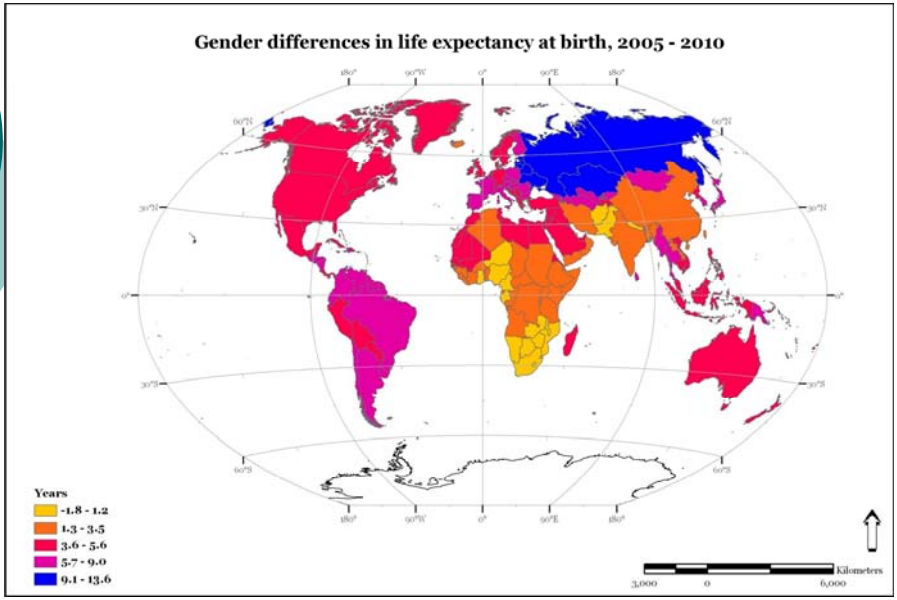
- In forested areas men often know more about primary forests, women about secondary forests
- In coastal areas, men go deep sea fishing while women collect inshore shellfish and dive for fish and pearls.
- In arid regions men are primarily responsible for livestock while women collect wild foods. In the Kalahari desert fruits, gums, berries, roots and bulbs gathered by Kung women provide 60% of the daily calorie intake. In central Australia Aboriginal women catch witchetty grubs as well as collecting plants.

Gender differences continued

- In most areas women are responsible for water and fuelwood collection.
- Women often know more about areas close to the home and may domesticate wild plants in their home gardens. They may also know more than men about collection areas for wild plants. In Laos women gather 141 different types of forest products, including bamboo shoots, rattan, mushrooms and sarsaparilla.
- Older women often know most about medicinal uses of plants and also are usually the most knowledgeable seed savers.
- Male farmers are often less accurate than women when naming species and recognizing unusual plants.

Gendered knowledge of medicinal plants in NE Brazil

- Vernacular names 48.2% women; 37.6% men
- Medicinal uses 27.4% women; 17.7% men
- Men and women occupy different ethnobotanical spaces and have different life experiences so have different plant knowledge. Sometimes they use plants in different ways.
- Source: Voeks 2007.



Yunnan, China

- Rice drying on road with passing traffic used to winnow it. Women returning home from the fields.

Chinese woman farmer

- Returning from working in the fields carrying vegetables in a basket on her back.

Woman using improved stove to brew sorghum beer, Burkina Faso

Productive work

Adding value to crops grown

Women select a specific variety of sorghum for beer

Climate Change: Repairing house foundation in Bangladesh to protect it from floods. Saved seeds are stored in the house so must be kept above flood level

Percentage of seed management activities exclusively involving women in Bangladesh

- Seed Selection: Field crops 33%;gardens 100%
- Seed drying: Field crops 100%; gardens 100%
- Seed storage: Field crops 100%;gardens 100%
- Seed exchange: Field crops 95%; gardens 100%

Source:Oakley and Momsen 2007

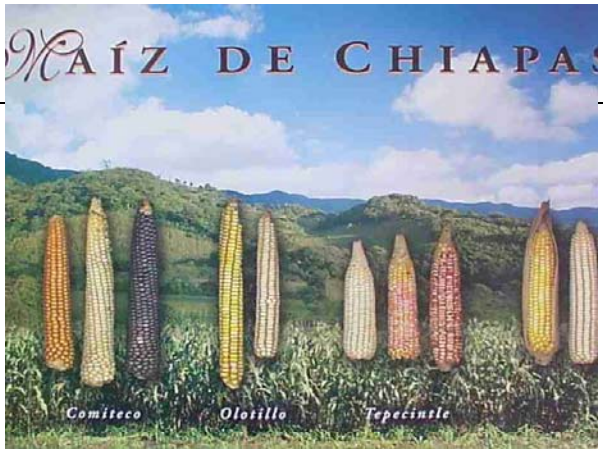
Bangladesh

Woman displaying seeds she has selected for storage. Note bottle and tin used for storage.

Photo: Emily Oakley

Mexico: maize festival in highland Chiapas

Photo Hugo Perales



Maize in relation to elevation in Mexico

Gendered Perceptions of the Number of Maize Varieties Grown by families in the Mexican Bajío

Type	Mountain		Valley		Mesa		Plains	
	M	W	M	W	M	W	M	W
Hybrid Maize	0	0	32	30	4	1	13	11
White *criollo*	35	35	3	5	25	31	31	29
Black *criollo*	11	8	0	3	12	9	2	3
Red *criollo*	7	7	2	3	8	14	3	3

Adapted from Chambers and Momsen 2007

Mexico: Chiapas maize farmer

photo Hugo Perales

Women and agrobiodiversity

- Women use, manage and conserve a wide diversity of crops.
- Women are active in seed exchange networks.
- Women participate in and maintain local seed banks that store and preserve rare crop varieties.
- Women often select the seeds to be saved by the family taking into account food tastes, culinary requirements, ceremonial and medicinal needs and traditions.

Pesticide impacts

1. Environmental Impacts
   - Water contamination
   - Soil pollution
   - Mammal and insect toxicity
   - Toxic residues on plants
2. Human Interaction
   - Pesticide handling and application
   - Handling of containers and clothes
   - Food and water consumption
3. Health Effects
   - Carcinogens
   - Reproductive disorders
   - Respiratory problems

Gender and agroexports

- Women provide most of the labour for producing beans in Kenya, early strawberries and tomatoes in Mexico.
- Ecuador is now the fourth largest producer of roses in the world and employs over 50,000 workers of whom 70% are women. Recent studies have shown that these women have an above-average number of miscarriages, and that more than 60% suffer from headaches, nausea, blurred vision, fatigue and loss of appetite and hair resulting from the use of toxic pesticides with little provision of protective clothing. Pesticide damage is exacerbated by the stress of working at high speed cutting, wrapping and boxing the flowers.

China. Marketing, Intergenerational exchange of foodstuffs

- Market in Yunnan

Why is it important to recognize gendered knowledge of agrobiodiversity?

- Development projects which underestimate women's knowledge and roles may tend to increase rather than alleviate women's workload vis à vis men's and marginalize women while increasing male power.
- Ignoring women's knowledge may lead to a mistaken understanding of a particular area or ecosystem.
- New high yielding varieties of plants may give greater yields but may not meet the full range of foods required nor the palatability, nor the byproducts often used by women such as straw for mat-making and fodder and leaves for relishes.
- Genetic erosion is tantamount to a form of cultural erosion and means loss of social status for women.

Moving towards equitable and sustainable landscapes:

Participatory land use analysis in Wayanad

A BioDIVA PostDoctoral study by Melvin Lippe

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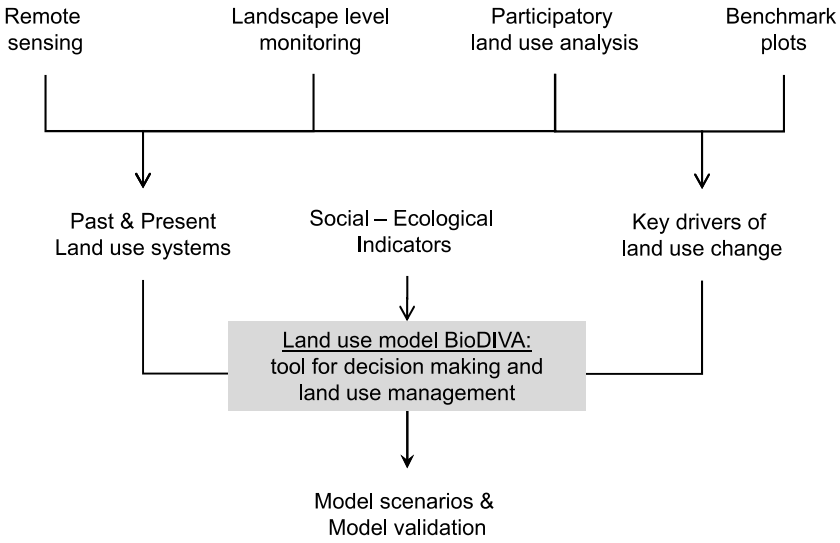
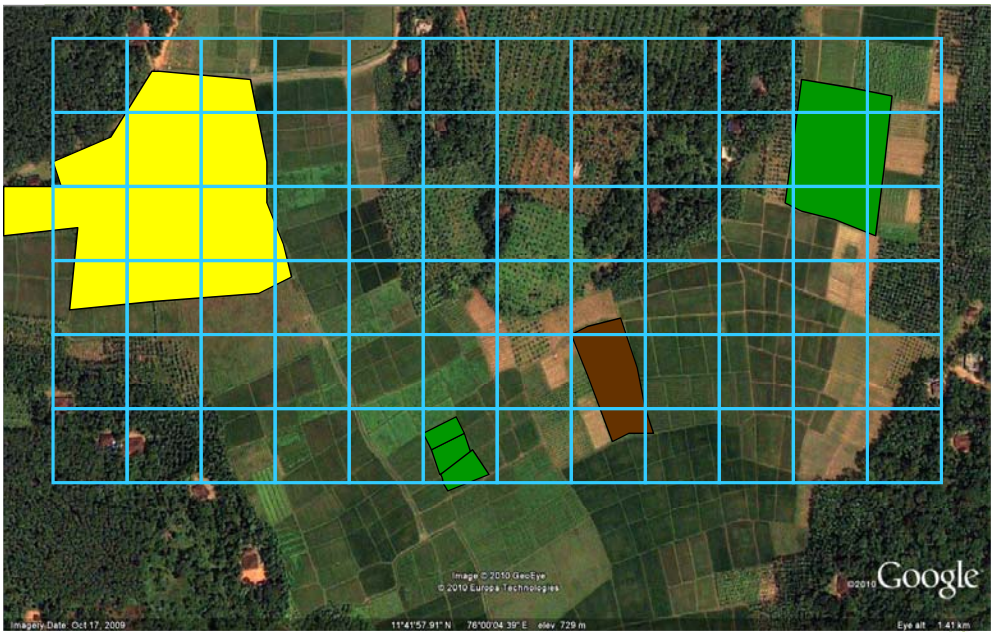
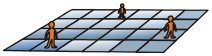


Synthesis through spatial modeling



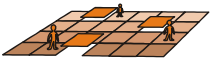
Possible maps



Human actors

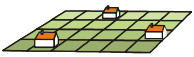
Ethnicity

Landuse/cover



Markets/ Infrastructure

Ownership



Farmsteads

Water flow

Soil quality

Adapted from: Berger/Ringler (2002)

Dialogue 1: Personal introduction

Rice Farmer:

"Good morning, I am a rice farmer of Wayanad. Please also meet my wife."

"Oh rice farming! Hmm, since many farmers in Wayanad changed to banana cultivation, rice landscapes are vanishing at an alarming rate."

Researcher:

"Good morning. I am a 'land use' researcher from Germany."

"Good morning Mam. I came to Wayand to understand more about your rice farming systems."

Dialogue 2: The scientist perception

Rice Farmer:

"May I ask, what is so exciting about land use, can we not say agriculture?"

"Okay?!"
(*Farmer look confused. Instead he smiles, because he is afraid to ask.*)

Researcher:

"Yes you are right. Though, scientist understand agriculture as part of a specific land use system in the sense that:

1. it provides goods and services for the needs of people
2. people simply exploit landscapes
3. people take action in a landscape to produce, change or maintain it. "

Dialogue 3: The farmer perception

Sister of rice Farmer 1:

"What is it brother?"

"Land use thingi ??"

"Really! But that's the same grandmother and grandfather used to say: "We have to conserve our traditional farming to maintain a good future for our children.. .

It would be good if we could explain her our culture and perception of nature in more detail."

Rice Farmer 1:

"Well, I meet this researcher, and he talked about the "land use thingi"..

"Yes, he said that we have to conserve our rice landscapes because everything is depending on each other, e.g. soil, water, plants and animals to keep our landscapes in balance."

Dialogue 4: Return to the office

Researcher 1:

Yes, very good. I had some nice chats with farmers. We discussed about the rice landscapes. Although, I was a bit disappointed that I could not talk to any women.. .

Yes, probably true. Still, I believe it is important that I also have more talks and exchange with women too.

Researcher 2:

Ah, you are back, how was it?

Hmm… maybe they were shy or busy with some other work. Don't you think?

Good point! Some colleagues mentioned participatory land use analysis as a possible approach?!

Dialogue summary

If research will not understand the perceptions of people involved in using rice landscapes in Wayanad, we will not be able to derive recommendations for:

Land management & decision making

Land use analysis within the research paradigm

- Environment approaches, i.e. *Geography* or *Ecology*:
  - Vegetation mapping, habitat assessment, soil analysis
- Farm systems approaches, i.e. *Agronomy* or *Forestry*
  - Cropping trials, Phenological appraisals
- Socio-economic approaches, i.e. *Agricultural Economics* or *Rural Sociology*
  - Questionaire based, focus group discussions, narratives
- Cross-cutting approaches, i.e. *Land use Change* or *Gender*

Why participatory land use analysis?

Perception differ among stakeholders involved in land management processes .

Integrating local knowledge into research and decision processes increases the chance for sustainable solutions .

It creates a baseline for further indepth studies and helps to reduce uncertainty during the research process .

What has to be considered?

- „Participatory“ and participation:
  - Bottom-up / consensus or enforced
- Local knowledge and local bias:
  - Participants randomly chosen / suggested / selected
- Gender and life experience:
  - Perception of man and women
  - Youth and elderly
- Formal and informal background of participants:
  - Culture, religion, status, decision-maker or decision-taker

Despite the apparent potential of participatory research, drawbacks need to be considered

as the use of proxy and qualitative indicators

may show weak relationships with

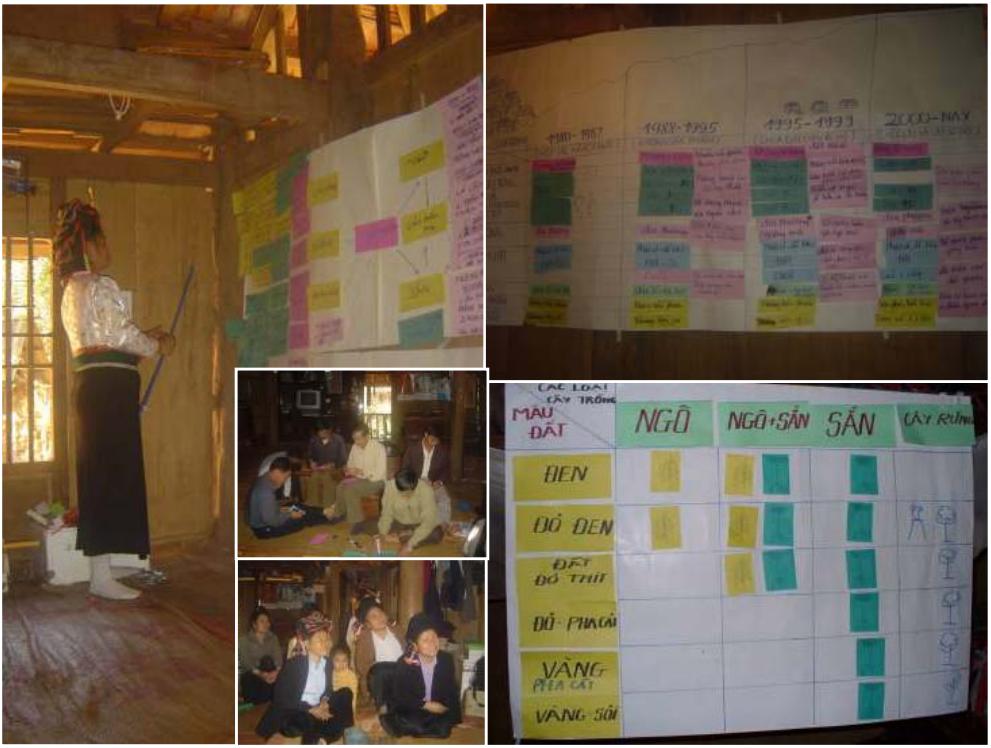
biophysical land use functions.

Possible methods and tools

1. Drawing of mental or spatial maps:
   - Land use history, i.e. changes and innovation
   - Seasonal calendar, i.e. farm management, labour availability

2. Freelisting and preference ranking:
   - No. of rice varieties grown
   - Requirements to conserve rice variety

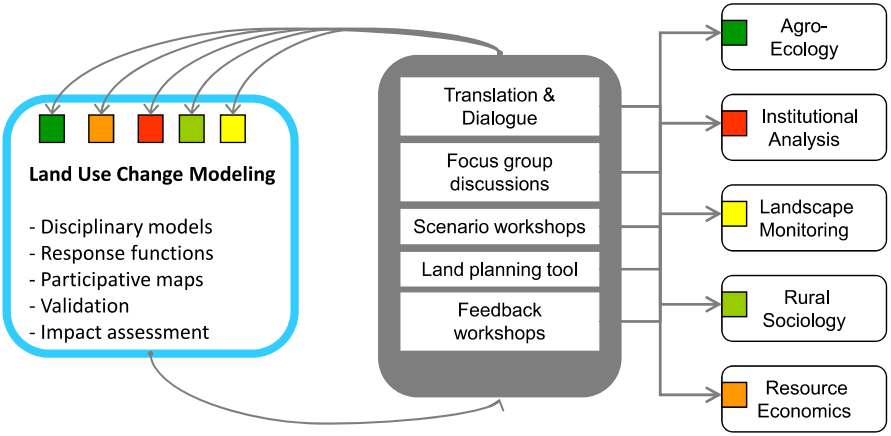
3. Causes and consequences diagramm
   - Land use change results in land fragmentation
   - Reduction of rice cultivation results in reduction of varieties



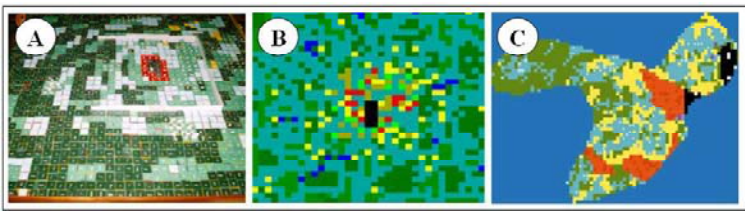
Moving forward

- Discussion with Dr. Anil Kumar:
  "Bridging politics, landscape and people: How can research and regulation join hands?"
- Lessons learned from stakeholder workshop
- Insights and experiences from inception workshop participants
- Participatory land use analysis in Wayanad: Let's get started… .

System analysis



Synthesis through planning board



(Castella et al., 2006)

Field visit
17/2/2011

BioDIVA
Inception Workshop

Girigan Gopi

Objectives of field visit

- To understand the changes in rice cultivation observed by local community
  - Changes in terms of area under cultivation
  - In terms of cultivation practices
  - In terms of varieties etc
- To understand the drivers of change
- To understand the implications of such changes in the life of local community

Site 1: Kanancheri

- Kuruma Tribal settlements
- Three hamlets (Kananchery, Kolipeta, Athikuni)
- Uni-ethnic tribal settlement
- Kurumas are settled agriculture tribal community
- They own land and cultivate rice
- Traditional and modern varieties
- Gender division of labour is visible
- Women work as unpaid family labour
- Culture and rituals are closely linked to rice farming

Site 2: Palliyara

- Kurichiya tribal hamlet
- Kurichiya are settled tribal community
- Head of the family controls property under joint family system
- 'Joint family' system is getting vanished
- Lowland is used for rice cultivation
- Both traditional and modern varieties
- Rice is cultivated for own consumption
- Organic or less external input agriculture
- Livestock rearing is subsidiary source of income
- Rice is closely linked to culture and rituals

Site 3: Anoth

- Mixed group of farmers belonging to different religions and castes
- Rice and banana farmers
- We can visit Paniya tribal hamlet (?)
- Interact with different groups of people

Site 4: Koovapali

- Kurichiya tribal hamlet
- In the process of change from joint family to nuclear families
- Increased pressure on land
- Conversion to banana is also visible

Do's and Dont's

- Respect the respondents/ local community
- Respect their traditions and customs
- Don't ask sensitive questions
- Enter in house only with their permission
- Entry to temple/ sacred groves only if they permit

Field sites and coordinators

- FIELD TEAM 1: Kaniyambetta (Palliyara)
  - **Prajeesh Parameswaran** / Palliyara Raman
- FIELD TEAM 2: Kanancheri, Kaniyampatta
  - **Girigan Gopi**/ Devaki
- FIELD TEAM 3: Pozhuthana (Anoth)
  - **T. Raveendran** / Divakaran
- FIELD TEAM 4: Vengappally (Koovapalli)
  - **Monish Jose** / P. A. Rasheed