The social organisation of land use change in Kerala, South India

Von der Fakultät für Architektur und Landschaft

der Gottfried Wilhelm Leibniz Universität Hannover

zur Erlangung des akademischen Grades

DOKTORIN DER INGENIEURWISSENSCHAFTEN

Dr.-Ing. -

genehmigte Dissertation

von

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geboren am 22.01.1982, in Ludwigsburg

2016

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Tag der Promotion: 21.07.2015

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Summary

Understanding the social organisation of land use change in South India is a complex undertaking. In rural South India, agriculture is one of the most important livelihood strategy embedded in the social organisation of most indigenous communities. However, changes in the rural agricultural landscape associated with crop and land use conversion result in social-ecological transformations.

Using theoretical and methodological concepts from rural development, gender studies, human geography concerned with the management of natural resources, the theoretical framework of this cumulative thesis is located within the broad research area on gender and the environment. The empirical research is informed by using qualitative research methods and rests on inter-and transdisciplinary research approaches.

This piece of work presents the results of the doctoral research (2010-2014) that aims at a better understanding of the social organisation of land use change. Overall, I investigate the complex change-driven situation in Wayanad, Kerala, South India by exploring social and ecological transformation processes within indigenous communities, using a feminist perspective. Thereby, I look at the relationship between land use change and shifting gender roles and identities by identifying local adaptation strategies to agricultural transformations as well as to social changes. The main objectives of this research are to examine socio-ecological changes in gender relations amongst indigenous communities on one hand and to identify the social impacts of decreasing paddy cultivation on the other.

Three trends describe agrarian change and rural diversification: firstly, changing cropping patterns from food to cash crops; secondly, changes in the social organisation and finally the conversion of agricultural fields to land for housing. As such, agrarian change in Wayanad is the result of socio-economic and ecological changes that are linked to the phenomena of deagrarianization. Moreover, the shift in the social organisation from the joint to the nuclear family structure amongst indigenous communities is a main driver for agrarian change and results in a reorganisation of property rights from collective to individual ownership of land. Both agrarian change and the social reorganisation determine land use change in Wayanad.

Furthermore, the research findings expose that changes in agrarian and gender relations are interrelated. Particularly the feminist analysis of governmental programmes such as the off-farm employment programme entitled, the Mahatma Ghandi National Rural Employment Guarantee Act (MGNREGA) and the women-orientated poverty-eradication programme called Women Self Helps Groups (Kudumbashree) is crucial for deconstructing gender relations on a household level. I show that the off-farm employment programme reinforces the social hierarchies amongst gender. Furthermore, the study of the Women Self Help Groups is a useful example towards a better understanding of the gendered impacts of agrarian change. These groups offer women space to manage agrobiodiversity through

collective farming on the one hand but fail to address concerns associated with gender equity while reproducing traditional gender norms on the other.

Overall, this thesis aims to enrich inter-and transdisciplinary research and highlights the need to contextualise the gendered hierarchisation of knowledge production. Understanding the social organisation of land use change requires a distinct analysis of participants´ and researchers gendered values and meanings on the interrelations between agrarian change and social reorganisation.

This cumulative thesis is divided into six chapters that form five research papers (chapter two-six). In chapters two, three and four I show how agrarian change in Wayanad is influenced by changes in land use and social-ecological transformation processes. Chapter two looks at the relationship between gender (equity) and agrobiodiversity. In Chapter 3, I uncover the dualisms of human-nature relations in regard to social-ecological change. Chapter four examines gendered rural spaces of agrobiodiversity management. Chapters five and six critically engage with the very idea of doing inter-and transdisciplinary research. Chapter five focuses on the challenges of working in a cross-cultural research setting and offers an original contribution to feminist methodology, using a transdisciplinary viewpoint. Chapter six suggests an innovative tool for interdisciplinary integration and participatory research which is called the social-ecological web.

Key words: Agrarian relations, social-ecological change, gender relations, inter- and transdisciplinarity, India

Kurzzusammenfassung

Die soziale Organisation von Landnutzungswandel in Südindien basiert auf vielschichtigen Zusammenhängen, welche es zu erörtern gilt. Für viele indigene Bevölkerungsgruppen im ländlichen Südindien ist die Landwirtschaft, welche stark in die soziale Organisation eingebunden ist, der wichtigste Lebensunterhalt. Jedoch, Veränderungen in der Agrarlandschaft im Zusammenhang mit Umstrukturierungen in der Landnutzung und Anbaupraktiken tragen zum sozial-ökologischen Wandel bei.

Diese kumulierte Dissertation leistet einen empirischen Beitrag zum Forschungsfeld *gender and environment* und beschäftigt sich mit unterschiedlichen theoretischen und methodischen Erkenntnissen aus den Disziplinen der ländlichen Entwicklung, Gender Studies und der Humangeographie. Der Forschung (2010-2014) liegt qualitative sowie inter-und transdisziplinären Methoden zugrunde und trägt zu einem besseren Verständnis der sozialen Organisation von Landnutzungswandel bei.

Das übergeordnete Ziel ist es, die komplexe Situation in Hinblick auf sozial-ökologische Transformationsprozesse innerhalb indigener Bevölkerungsgruppen in Wayanad, Südindien zu begreifen. Das Hauptziel ist die Erforschung des sozial-ökologischen Wandels in Bezug auf Geschlechterbeziehungen auf der einen Seite und der sozialen Auswirkungen des schwindenden Reisanbaus auf der anderen.

Der Agrarwandel ist von drei Faktoren geprägt: 1) sich verändernde Anbaupraktiken von „food“ zu „cash crops“; 2) der sozialen Reorganisation und 3) der Umwandlung von Agrarland zu Bebauungsland. Demzufolge ist der Agrarwandel in Wayanad das Resultat sozial-ökonomischer sowie ökologischer Veränderungen, verbunden mit dem Phänomen der Deagrarisierung. Des Weiteren gehen Veränderungen innerhalb der sozialen Organisation indigener Gruppen weg von der Großfamilie hin zur nuklearen Familienstruktur einher mit Veränderungen von kollektiven zu individuellen Landnutzungsrechten, welche den landwirtschaftlichen Wandel stark beeinflussen. Folglich ist der Landnutzungswandel in Wayanad durch das Zusammenwirken von landwirtschaftlichen Veränderungen und sozialer Reorganisation zu begreifen.

Weitere Forschungsergebnisse betonen den Zusammenhang von Agrarwandel und sich verändernden Geschlechterbeziehungen. Die feministische Untersuchung des Mahatma Ghandi National Rural Employment Guarantee Act (MGNREGA) sowie eines für indische Frauen geschaffenes Armutsbekämpfungprogramms (Kudumbashree) zielt darauf ab, Geschlechterverhältnisse auf Haushaltsebene zu analysieren. Das Ergebnis zeigt, dass das MGNREGA die sozialen Hierarchien zwischen den Geschlechtern verstärkt. Die Analyse der Kudumbashrees dient einem besseren Verständnis von den geschlechterspezifischen Auswirkungen von Agrarwandel in Hinblick auf Agrarbiodiversitätsmanagement. Am Beispiel von kollektiv betriebener Landwirtschaft bieten die Kudumbashrees Frauen Raum

Agrarbiodiversität zu erhalten, jedoch steht die Reproduktion traditioneller Geschlechternormen dem Ziel der Geschlechtergerechtigkeit entgegen.

Diese Dissertationsschrift leistet einen Beitrag zu inter-und transdisziplinärer Forschung und betont die Notwendigkeit der geschlechterspezifischen Kontextualisierung von Wissensproduktion. Folglich erfordert das Verständnis der sozialen Organisation von Landnutzungswandel eine differenzierte Analyse von Sichtweisen der Akteure und Forschenden um den Zusammenhang zwischen Agrarwandel und sozialer Reorganisation aus geschlechterspezifischer Perspektive zu begreifen.

Diese Dissertationsschrift ist in sechs Kapitel unterteilt. Kapitel zwei, drei und vier setzt sich mit Agrarwandel in Hinblick auf Landnutzungsveränderungen und sozial-ökologische Transformationsprozesse auseinander. Kapitel zwei stellt Geschlechtergerechtigkeit in Zusammenhang mit Agrarbiodiversität. Kapitel drei erforscht die ambivalenten Dualismen des Mensch - Natur Verhältnisses in Hinblick auf den sozial-ökologischen Wandel in Wayanad. Kapitel vier erkundet Agrarbiodiversitätsmanagement in geschlechterspezifischen ländlichen Räumen. Kapitel fünf und sechs beschäftigt sich mit methodischen Grundsatzfragen im Rahmen von Inter-und Transdiziplinarität. Das fünfte Kapitel fokussiert die Herausforderungen von interkultureller Forschungszusammenarbeit und setzt sich kritisch mit Objektivität, Subjektivität und Reflexivität auseinander. Das sechste Kapitel präsentiert ein innovatives Werkzeug für interdisziplinäre Integration, das sozial-ökologische Web, basierend auf einem partizipativen Forschungsansatz.

Schlagwörter: Agrarwandel, Sozial-ökologischer Wandel, Geschlechterverhältnisse, Inter- und Transdisziplinarität, Indien

Acknowledgements

First, I would like to thank all participants in the Kuruma communities in Wayanad for taking part in this research. I highly appreciate people's openness and willingness to talk to me and the translator – providing tea and snacks also helped to get through very hot days. Special thanks go to the research assistants Devoo and Cibina who made this research and data collection possible!

Second, my greatest thanks to the three supervisors Martina Padmanabhan, Janet Momsen and Tanja Mölders for supporting me throughout this journey of being a PhD student. Thank you Martina for providing a number of travel opportunities that helped to grow academically. Attending a number of national and international conferences as well as the summer school in Munich appeared to be great experiences that encouraged me to think outside the box. I am very pleased to have met you Janet during the first workshop in Wayanad in 2010 as this meeting was the beginning of a wonderful collaboration. I highly appreciate your constant academic and emotional support over the last 5 years! Thank you for inviting me to the IGS Oxford and for our joint paper. It was a pleasure meeting you in London, Hamburg and Los Angeles where I could encounter with feminist geographers as this helped me to stay in touch with my home discipline. I am very grateful to Tanja for giving directions to sort things out in the last year!

Third, I would like to thank the whole BioDIVA Germany & India team for sharing the four-year research and teamwork experience which appeared to be very interesting indeed. Thanks to Prajeesh, Gopal and Suma for making the field research work! My special thanks go to Hannah for not only administrative help, to the social-ecological intersection team for the fruitful cooperation during field entry and afterwards, to Lydia and Monish for being in good company and to Nidhi for mentoring. Furthermore, I thank a number of people for commenting on the research papers: Carolin Schurr, Bettina Bruns, Tanja Mölders, Daniela Gottschlich, Annemarie Burandt, Andrew Halliday, Chris Hank and of course the members of the BioDIVA team. I also thank Mr Reich from the Institute of Environmental Planning at LUH for support on enrolment and organisational matters.

Fourth, I am very thankful to my family and friends for being good listeners to all sorts of issues that were somehow related to work. Frank – a big thanks for your emotional support and extraordinary patience as well as for motivating me to get on with it. Last but not least, thanks to my children Kaia Rose and Julie Merle for pulling myself together to close this chapter of becoming a PhD.

Finally, the funding of BioDIVA research group by FONA – Social Ecological Research by the Ministry of Education and Research (BMBF) is duly acknowledged.

1 Introduction

1.1 Background

Understanding the social-ecological dimensions of land use change in South India is a complex undertaking. This research presents one outcome of the BioDIVA research group (2010-2014) that aims to explore these complexities while generating transformative knowledge towards the sustainable and gender-equitable use of agrobiodiversity of paddy cultivation systems in Wayanad, Kerala, India. Three research sub groups from the disciplinary fields of ecology, rural development and agricultural economics form the core of this research group whose research approach is based on the inter-and transdisciplinary integration of knowledge.

According to Hirsch Hadorn et al. (2008), interdisciplinary research refers to coordinated and integration-oriented collaboration between researchers from different disciplines. Transdisciplinary research seeks to integrate academic with non-academic knowledge in order to overcome uncertainties associated with societally relevant problem fields (Pohl & Hirsch Hadorn, 2008). Padmanabhan et al. (2010) describe transdisciplinarity as the art of discovering bridges between knowledge areas by emphasising intersections away from disciplines. Overall, transdisciplinary research compromises three forms of knowledge:

1. System knowledge: to analyse complex empirical questions
2. Target knowledge: aims at finding solutions to life world problems
3. Transformation knowledge: investigates how existing practices can be changed

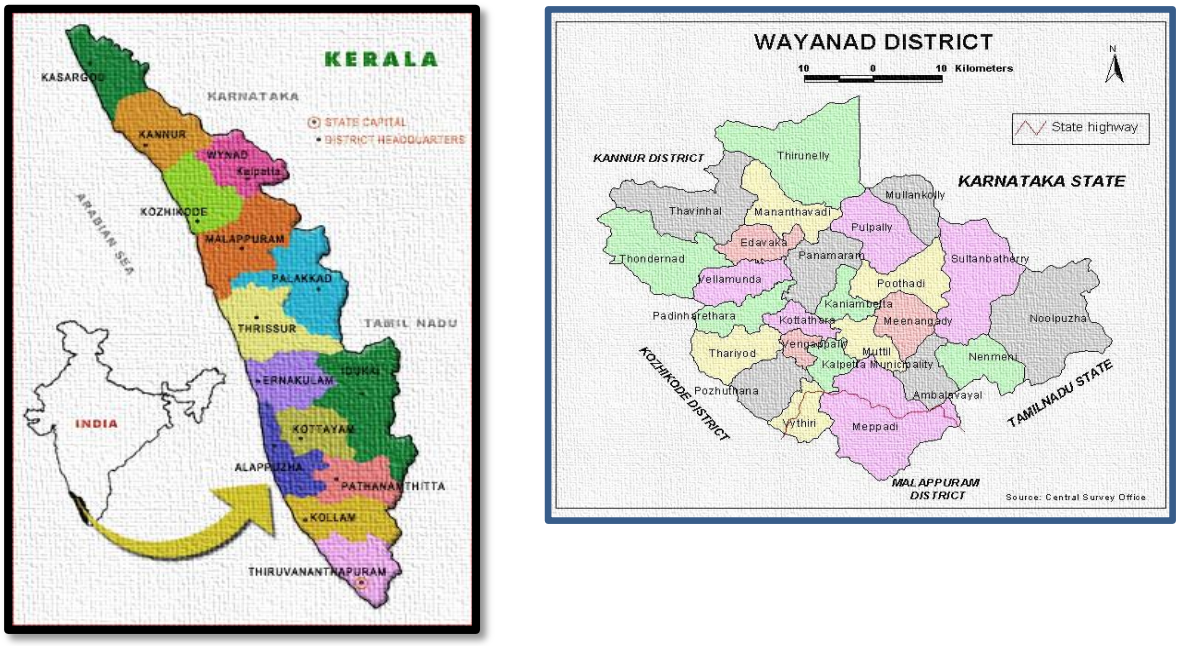
This thesis particularly aims to generate system knowledge that describes the social organisation of land-use change at the case of an indigenous agricultural community in Wayanad, South India.

The BioDIVA research group addresses the following domains of transdisciplinary research: it firstly, concentrates on life-world problems; secondly; integrates disciplinary paradigms; thirdly, applies participatory research methods and finally, searches for the unity of knowledge beyond disciplines (Padmanabhan et al., 2010). Another key characteristic of doing transdisciplinary research is the close collaboration between academic and praxis-oriented actors involved in research processes. Hofmeister, Katz, & Mölders (2013) view transdiciplinarity as a useful way of doing research based on a self-reflexive approach while stressing the hierarchisation of knowledge. Crucial in this regard is the consideration of actors´ and researchers´ interactions with the subjects to be researched using a gender-sensitive perspective.
Being embedded within the social-ecological research programme (SÖF/FONA[1]), this thesis engages with the concept of "societal relations with nature" (gesellschaftliche Naturverhältnisse). Inspired by social ecology, this concept refers to the dynamic and constitutively interrelated relationship between society and nature (Becker & Jahn, 2006;

[1] See also: www.fona.de, accessed on 16.03.2015

Görg, 1999; Mölders, 2010). Incorporating the category gender as an analytical concept is a key characteristic of examining societal relations with nature in social-ecological research which also leads into the overall field of inquiry that critically engages with discourses on gender and environment (Hofmeister & Mölders, 2006; Mölders, 2013; Schäfer, Schultz, & Wendorf, 2006).

This piece of work presents the results of the doctoral research that is concerned with the social impacts of agrarian change in Wayanad, Kerala, South India. Overall, this research investigates the complex change-driven situation in Wayanad by exploring the relationship between social and ecological transformation processes within indigenous communities, using a gender-sensitive viewpoint. Thereby, I aim to identify local adaptation strategies and existing knowledge to environmental and social changes that affect people`s everyday life in Wayanad district.



Source: Kerala map: www.kcfmn.com;
Source: Wayanad map: www.wayanad.nic.in/election/ scripts/wydmap.jpg

Figure 1 Maps of Kerala and Wayanad

In rural South India, agriculture is the most important livelihood strategy embedded in the social organization of most indigenous communities. However, the ongoing agrarian crisis in India (Lerche, 2011) can be viewed as the result of the low profitability of agriculture, meaning the income derived from agricultural activities is insufficient to generate sustainable income for the farmers (Dhas, 2009). This also applies to Wayanad district, a mountain plateau district of Kerala state, located at the margins of the Western Ghats in South India with an altitude range from 750 to 2100 metres a.s.l. The area is characterised by a small geographical relief covering 113,000 hectares of agricultural land of which 1853

hectares are uncultivable. Subsistence crops cover 16,756 hectares and cash crops 65,469. The district contributes to the foreign exchange income of the state through cash cropping including pepper, cardamom, coffee, tea, ginger, turmeric, rubber and arecanut (Kumar, Gopi, & Parameswaran, 2010). Around 10 different *adivasi* or tribal population groups form around 17 per cent of the total population. Adivasi have traditionally been involved in agriculture and paddy cultivation in particular (Rath, 2006). Overall, Wayanad has the largest tribal concentration in Kerala but also the highest level of poverty amongst tribals at 60.38 per cent (Chathukulam & John, 2006).

One local meaning of Wayanad derives from "the land of paddy fields" which indicates a strong cultural association with paddy systems in the region. Furthermore, rice is the main staple crop and forms an integral part of South Indian consumption habits and, therefore, is the most important crop for Keralites. Economically, the district significantly contributes to the foreign exchange through cash crops such as pepper, cardamom, coffee, tea, ginger, turmeric, rubber and areca nut. However, Wayanad is undergoing major changes in land use associated with the conversion of food crops (such as paddy) to cash (banana, ginger) crops. Nagabhatla & Kumar (2013) describe land-use change as a main driver of agrobiodiversity loss. In addition, the region faces another challenge: declining biodiversity of rice landraces due to land conversion (Kumar et al., 2010). As a result, rice cultivation is diminishing due to its non-profitability on the market as well as labour shortage.

In addition, social transformation processes pose a challenge to everyday people's lives. These include shifting social values amongst adivasi communities, labour migration and the desire of the younger generation to step out of agriculture. A major social change is the shift from joint to nuclear family systems related to collective vs. individual ownership of land which also influences the ways in which agricultural work is socially organised.

1.2 Key terms

How does this research contribute towards a better understanding of the social organisation of land-use change? In order to tackle this research question, it is crucial to shortly introduce and define the key terms I used throughout the research process.

The term **gender** refers to the socially and culturally constructed feminine and masculine roles in society. Gender roles are neither fixed nor stable but fluid as they are always shaped by cultural habits, space, religion (for example the Indian caste system and other religious beliefs) etc. and changing over time. For example gendered knowledge needs to be contextualised to locality (Wayanad district). This research project is particularly concerned with questions around gendered agricultural knowledge, decision-making processes in the area of agrobiodiversity management and gendered division of labour linked to changing land use and agricultural practices.

Agrobiodiversity is understood as the part of biodiversity involved in agriculture and food production (Momsen, 2007). According to the Food and Agriculture Organisation of the United Nations (FAO, 2004), agrobiodiversity can be seen as a vital sub-set of biodiversity which relates to the interaction between the environment, genetic resources and management systems and practices used by culturally diverse people. Local knowledge and culture are essential parts of agrobiodiversity as human activity of agriculture shape and conserve biodiversity. Moreover, agrobiodiversity refers to human-nature interactions at the most fundamental level with peoples´ values, needs and activities being an integral part of it (Padmanabhan, Christinck, & Arpke, 2013). In this thesis, refer to the use and management of agrobiodiversity while examining the ways in which these practices are gendered.

Linking gender and agrobiodiversity - Globally, mainly women are the ones who manage and use agrobiodiversity (Howard, 2003). Furthermore, the interplay of changing gender relations as well as women´s incentives and management practices affect biodiversity management (Howard, 2015). However, Momsen (2007) critiques that " in agrobiodiversity research gendered knowledge is often still considered to be abstract, uninfluenced by relations of power, cultural and context". Using a gender analysis emphasises the need to include women's knowledge on and use of agrobiodiversity management with focus on gendered spaces in which agrobiodiversity is managed.

1.3 Conceptual framework

A useful introduction into theoretical strands that aim towards a better understanding of the gender-environment nexus is ecofeminism and feminist political ecologies. Ecofeminism as a feminist and political movement is embedded within the large field of inquiry that focuses on gender, environment and development. The transformatory potential of Third World women being active agents for social change is at the centre of ecofeminist debates (Bryant, 2001). Most feminist scholars describe 'ecofeminism' as an umbrella term that links different approaches to environmental analysis by integrating feminist (e.g. liberal, radical, Marxist and socialist feminisms including black and third world feminism) and environmental perspectives (Mies & Shiva, 1998; Plumwood, 1993; Seager, 1993; Shiva, 1988). Similar to all ecofeminist approaches is the idea that the suppression of nature and women are mutually related and based on dualisms which are being constantly reproduced (Katz, 2013). In India, ecofeminist discourses are strongly influenced by Vandana (Shiva, 1988) who highlights the natural connection between women and environmental resources in which rural, indigenous women are often portrayed as rightful caretakers of nature. As a result, the oppression and subordination of women is directly linked to the degradation of nature. However, the constructed "feminine principle" in human-nature relationships has been strongly critiqued by various feminist scholars as it not only essentialises but reinforces dualisms between men/women, culture/nature, indigenous/non-indigenous, body/mind (Agarwal, 1992; Jewitt, 2000; Krishna, 1998; Rometsch & Padmanabhan, 2013).

Political ecology provides a fruitful theoretical framework that helps to better understand the complex relations between nature and society based on the analysis of access and control over resources and their impact for environmental health and sustainable livelihoods (Escobar, 1998; Peet, Robbins, & Watts, 2011; Peet & Watts, 2004; Robbins, 2012; Watts, 2000). Feminist political ecology takes the analysis of human-nature relationships even further and looks at environmental change through the lens of gender while contextualising local realities (Rocheleau, Thomas-Slayer, & Wangari, 1996). As response to the reproduction of essentialist views of men's and women's engagement with environmental concerns in the 1990s, a number of scholars argued for the need to put emphasise on dynamic social and political relations between genders. Therefore, the feminist political ecology framework provides a useful way to examine issues of resource access control as well as gendered constructions of knowledge (Bhavnani, Foran, & Kurian, 2003; Elmhirst & Resurreccion, 2008; Momsen, 2009; Rocheleau et al., 1996).

Research inspired by new feminist political ecologies focus on co-constructions of both gender and nature and the ways which both are socially constructed (Bauriedl, 2010). Nature refers to a social concept which is culturally and historically defined. Subjectivity refers to the conception of the subject as opposed to identity and is understood as how people embrace and enact (Nightingale, 2012). Gender relations can be best described as socially constructed forms of relations between women and men. The category gender is understood as a critical variable in shaping processes of environmental change, livelihoods and the visions for sustainable development (Elmhirst & Resurreccion, 2008). Furthermore, gender refers to the socially constructed roles associated with feminity and masculinity by which women and men are identified. However, building upon social feminist theory and feminist political ecology, (Elmhirst & Resurreccion, 2008) state that "gender has lost its critical and politicized edge, having been institutionalized into a series of tools and techniques that are far removed from the transformatory potential of gender as a feminist concept" (3). Similarly, Momsen (2009) proposes that the term 'gender' is widely used but misunderstood due to the women-centred meanings associated with it.

Influenced by poststructuralist theories of subjectivity, new feminist political ecologies explore performances of masculinities and feminities and how these form gendered subjects through peoples´ everyday practices (Elmhirst, forthcoming). Viewing gendered performances as a process and gendered subjectivities as social constructions not only challenges essentialist and binary views of gender relations but also highlights other kinds of gender relations such as seniority and social status which refers to the concept of intersectionality. As stated by Elmhirst (forthcoming), including an intersectional viewpoint is helpful to explore how *"subjectivities (peoples' subject positions) are produced through the way axes of power (gender, race, ethnicity, class, sexual orientation, age, ability) intersect and emerge in relation to one another, rather than being based on stable or given understandings of social difference".* This has also implications for studying gender-nature relations as well as the management of natural resources because changing environmental

condition also redefine categories of social difference such as gender. For example a study on the impacts of changes in land use and cultivation practices amongst indigenous groups in South India reveals how land use change, transformations of the social organisation and gender equity all contribute to agrarian change (Momsen, Kunze, & Oakley, 2013).

1.4 Research aim and approach

This PhD research is based on various disciplines from the social sciences using theoretical and methodological concepts from rural development, gender studies and human geography concerned with the management of natural resources and/or agrobiodiversity. It is widely acknowledged that the integration of gendered knowledge and practices is essential for enhancing sustainable development (Bhavnani, Foran, & Kurian, 2003; Elmhirst & Resurreccion 2008; Momsen, 2007, 2009; Padmanabhan, 2005, 2008). However, little work linking environmental research with gender sensitive perspectives on agrobiodiversity stresses the need to foster more interdisciplinary research in this field (Agarwal, 1992, 2001, 2003). The major gap in research is the missing analytical category of gender in agricultural research (Gururani, 2002; Gopi & Kumar 2001; Howard, 2003; Krishna, 2007; Rege, 2005; Momsen, 2009).

Research aim

This research aims to investigate the social impacts of decreasing paddy cultivation at the case of indigenous small-scale farming communities from the Kuruma tribe in Wayanad district in Kerala, India. Overall, the research focuses on social-ecological transformation processes using a feminist perspective. Thereby, I explore the relationship between land use change and shifting gender roles and identities by identifying local adaptation strategies to environmental and social changes. These adaptation strategies are not gender neutral but influenced by gender roles and responsibilities which are not fixed but fluid as well as shaped by local contexts. This thesis builds upon the overarching research questions *of how social-ecological transformation processes can be understood through the lens of gender equity and the sustainability framework?* I use the term gender equity to describe the socially constructed roles of women and men and existing power relations between them. Furthermore, I argue that gender equity needs to be viewed as a socially constructed term which meanings vary in different cultural and social settings. In this research, the sustainability framework does not only refer to environmental, social and economic sustainability but incorporates a gendered perspective that raises questions concerned with gender equity. However, I acknowledge that the very idea of sustainability as an academic research area is highly normative and political.

The overall objective of this research is to examine socio-ecological changes in gender relations amongst adivasi communities on one hand and to explore the social impacts of decreasing paddy cultivation on the other.

This thesis seeks to address three main research questions:

1) How do adivasi explain changes in agriculture and what are the reasons for declining paddy cultivation?
2) What are the gendered implications of agrarian change amongst Adivasi groups?

In addition, this work also addresses methodological issues concerned with challenges of doing inter-and transdiciplinary research in an intercultural team and of using feminist methodology concerned with our own positionality as a researcher. The key methodological question to be tackled is:

3) How do inter-and transdisciplinary methods reflect a better understanding of social-ecological transformation processes?

1.5 The use of qualitative research methods

This research is informed by qualitative research methods commonly used in social science (Bryman, 2008). Two main phases of data collection and a field phase define this PhD project (2011-2012). As stated by many social sciences researchers, qualitative research methods require multiple conceptual approaches and methods of inquiry that focus on social processes, individual experiences and human environment (Bryman, 2008; Crang, 2003; Moss, 2002; Winchester, 2000).

1.5.1 Field site selection criteria

The unit of analysis is the household level within Kuruma indigenous communities in Wayanad district. Distinctive features are mobility, level of conversion from subsistence to cash crops, impact of social change and values, changing gender roles, accessibility (infrastructure) and their relationship with agricultural labourers from other landless tribal communities.

1.5.2 Methods used

The use of qualitative methods seemed to be the most appropriate to inform this research. Both interview techniques and participatory methods help to gather data in the field. Data are mainly gathered through semi-structured and open ended interviews. This allows for an open and flexible interview process; sometimes, an interview flow might change or turn out to be inappropriate. Instead of sticking to a very strict interview schedule or questionnaire, it is more useful to use semi-structured interviews because both parts involved in the interview process are able to change the interview direction /topics if required (Crang, 2003).

The techniques used to gather data during focus group discussion will also be based upon participatory research approaches used in qualitative research. According to Chambers (1994), the originator of Rural Participatory Appraisal (PRA), this method is the key to reversing the hierarchies of power in development cooperation. PRA is ‘pro-poor’, inclusive

and seeks to counterbalance top-down approaches. Today, participatory and action research have become a leading paradigm within social and environmental sciences (Pain & Kindon, 2007). However, Cooke and Kothari (2001) argue that using participatory methods demands a profound reflection because they also bear the risk of treating communities as a "homogenous, static and harmonious units within which people share common interests and needs" (6). Likewise, Cleaver (2001)critiques that 'participation has become an act of faith of development, something we believe in and rarely question (36). Darell (2002) links this viewpoint to the very idea of traditional knowledge and states that 'traditional knowledge is not local knowledge at all, but rather an expression of universal knowledge as expressed through the local' (29). Pain and Kindon (2007) enrich contemporary debates on Participatory Action Research (PAR) approaches and make a good point in arguing, ´while participatory approaches seek socially and environmentally just processes and outcomes, they nevertheless constitute a form of power and can reproduce the very inequalities they seek to challenge´ (2). These views underline that any kind of knowledge is socially constructed and shaped through social contexts.

1.5.3 Triangulation

Given the complexity of the impacts of land use change, triangulation is an effective way for conducting data because it allows for a critical engagement with the research topic. Consequently, mixing methods is a useful way to compare results of one qualitative method such as interviews with observation, focus group discussions, participatory methods (Bryman, 2008; Nightingale, 2003). Parpart (2006) views triangulation as a fruitful method to cross check various sources gained through participatory tools.

1.5.4 Data analysis

The data will be analysed with the help of two different analytical tools: Atlas.ti and critical discourse analysis (Fairclough, 1992; Lazar, 2004). Atlas.ti is a computer-based qualitative data analysis software used to analyse the data generated by interviews. The software structures and organises data in form of txt-files based on codes, memos and notes. Furthermore, hyperlinks between the documents and codes can be made in order to examine relationships between dominant themes. In addition, text will be deconstructed by employing critical discourse analysis. Secondly, critical discourse analysis will be useful to deconstruct the multiple meanings of nature, social constructions and of gender and the ways knowledge is gendered and influenced by power relations. Deconstruction means to critically reflect on, question and unsettle existing assumptions, meanings and methods (Ramazanoglu & Holland, 2002). As this research is concerned with shifting gender roles and constructions, using feminist methods offers fruitful ways to engage with the gender dynamics in the broad realm of agrobiodiversity. Special attention should be given to feminist thought which critically reflects upon the notion of objectivity, subjectivity and reflexivity (England, 1994; Jackson, 2006; Rose, 1997).

1.6 Thesis outline

In this introductory chapter I have provided relevant background information on the Wayanad and the Kuruma and how changes in land use result in social-ecological transformation processes. I have also offered insights into theoretical approaches to the gender-nature nexus, on the research aim and methodologies used to inform this research. The next chapters will offer the results and form the core part of this thesis.

Chapter two presents a published book chapter of a Cultivate Diversity! A handbook on transdisciplinary approaches to agrobiodiversity research edited by Anja Christinck and Martina Padmanabhan. The edited book is the result of cooperation between the BioDIVA Junior Research Group funded by the German Federal Ministry of Education and Research (BMBF) under its Framework Programme "Research for Sustainable Development" (FONA) and its partner of practice, the M.S. Swaminathan Research Foundation (MSSRF) in Chennai, India and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Eschborn, Germany. This chapter on *"Agrobiodiversity and gender equity: Addressing gender in transdisciplinary research"* by Janet Momsen, Isabelle Kunze and Emily Oakley covers the general global debates on the conceptual links between biodiversity, agriculture and gender in regard to the sustainability framework. An overview of the impacts of agrarian change on the livelihood strategies of the Kuruma in Wayanad is offered in the analytical part. The book chapter not only focuses on a framework and analytical part but seeks to provide incentives for developing a transdisciplinary and gender-sensitive approach to agrobiodiversity research. Overall, chapter two particularly addresses the overarching research question of how social-ecological transformation processes can be understood through the notion of gender equity and the sustainability framework and offers a useful basis for the discussion of results presented in chapter seven.

Chapter three and four reveal the main results of the empirical research.

Chapter three entitled, *"Dualisms shaping human-nature relations: Discovering the multiple meanings of social-ecological change in Wayanad"* represents a single author paper proposed by Isabelle Kunze for a *Symposium on Feminist Perspectives on Human-Nature Relations* in the Journal of *Agriculture and Human Values*, edited by Daniela Gottschlich, Tanja Mölders and Martina Padmanabhan. This paper seeks to find answers to the research question 1) of how the Kuruma describe changes in agriculture and what are the driving mechanisms to move away from food to cash crops and question 2) that looks at the gendered implication of agrarian change. Using the feminist political ecology framework, the research paper zooms into Wayanad as a research site and analyses the impacts of agrarian change and the social reorganisation on gender-nature relations through the lenses of the Kuruma in regard to gender subjectivities, rural off-farm employment and the human-nature nexus.

Chapter four entitled, *"Exploring gendered rural spaces of agrobiodiversity management – a case study from Kerala, India"* by Isabelle Kunze and Janet Momsen is the result of a two-month research stay at the International Gender Studies (IGS) Centre at the University of Oxford in close cooperation with Janet Momsen. This work forms a book chapter of the Routledge Handbook on Gender and Development (Coles, Gray, & Momsen, 2015). It focuses on a better understanding of the gendered implication of agrarian change (research question 2). Building upon feminist geographies, this piece of work analyses the gendered dimensions of land use change at the case of the Kuruma in regard to micro development programmes and shows how these potentially provide new space for agrobiodiversity management. Special analytical emphasis is also given on the "gender paradox" in Kerala.

Chapter five is a joint research paper by Isabelle Kunze and Martina Padmanabhan and describes methodological considerations on our positionalities as researchers, published in the ERDKUNDE journal. Building upon Indian perspectives on feminism and gendered geographies, this paper entitled, *"Discovering positionalities in the countryside: methodological reflections on doing field work in South India"* critically engages with the challenges of working in a cross-cultural research setting and aims to offer an original contribution to feminist methodology.

Chapter six is the outcome of an interdisciplinary baseline study conducted by six BioDIVA doctoral researchers in 2010 and is published in Current Science. Entitled "*The social-ecological web: a bridging concept for transdisciplinary research"*, this paper tackles issues concerned with doing interdisciplinary research and how qualitative social-ecological data can be integrated through the development of a bridging concept, the social-ecological web. This paper deals with the question of what inter-and transdisciplinary methods can be developed to better understand social-ecological transformation processes.

Chapter seven discusses the synthesis of the results and provides answers to the three research question on the one hand and discusses the results in relation to the overarching research question of this thesis on the other. Chapter eight brings this thesis to close and suggests future research prospects.

1.7 Overview of publications to date

Chapter 2

Momsen, Janet, Isabelle Kunze, and Emily Oakley. 2013. Agrobiodiversity and equity: adressing gender in agrobiodiversity research. In Cultivate Diversity!: A Handbook on Transdisciplinary Approaches to Agrobiodiversity Research, ed. Anja Christinck and M. Padmanabhan, 71–92. Weikersheim: Margraf Publishers.

Authors´ contribution: Isabelle Kunze wrote the framework part, page 72-81 and case 2 in the analytical part (gender equity in agrobiodiversity management in Wayanad) page 84-87. Janet Momsen, Isabelle Kunze and Emily Oakley summarized the essential points of the case studies, page 87-88 and the summary of key points on page 91.

Publication status: published

Chapter 3

Paper title: "Dualisms shaping human-nature relations: Discovering the multiple meanings of social-ecological change in Wayanad" represents a single author paper proposed by Isabelle Kunze for a *Symposium on Feminist Perspectives on Human-Nature Relations* in the Journal of *Agriculture and Human Values*, edited by Daniela Gottschlich, Tanja Mölders and Martina Padmanabhan.

Author´s contribution: Isabelle Kunze is single author, Daniela Gottschlich, Tanja Mölders and Martina Padmanabhan all commented on the paper.

An earlier version of the paper entitled, *"Are indigenous women romanticized as protectors of agrobiodiversity? A feminist political ecology analysis "*, has been presented at the XIII World Congress of Rural Sociology in July 29th - August 4th 2012 in Lisbon, Portugal.

Publication status: submitted (under review)

Chapter 4

Kunze, Isabelle, and Janet Momsen. 2015. Exploring gendered rural spaces of agrobiodiversity management – a case study from Kerala, India. In The Routledge handbook of gender and development, ed. Anne Coles, Leslie Gray and Janet Henshall Momsen, 106–116. Routledge handbooks. Abingdon, Oxon: Routledge.

Authors´ contribution: Isabelle Kunze mostly wrote the paper based on her empirical data; Janet Momsen provided theoretical and methodological supervision and commented on the paper.

Publication status: published

The paper has been presented in the session on Gendered Rural Geographies at the Annual Meeting of the Association of American Geographers (AAG) from 9.-13. April 2013, Los Angeles, USA.

Chapter 5

Kunze, Isabelle and Martina Padmanabhan. 2014. Discovering positionalities in the countryside: methodological reflections on doing fieldwork in South India. Erdkunde 68 (4): 277–288.

Authors´ contribution: Isabelle Kunze and Martina Padmanabhan jointly wrote the summary/Kurzzusammenfassung, Introduction (1) and Conclusion (4); Isabelle Kunze wrote the section on Indian perspectives on feminisms and gendered geographies (2) and all sections in part 3 on methodological reflections which are indicated as Isabelle Kunze´s reflections on her positionality as a researcher. Martina Padmanabhan wrote segments as indicated as her individual methodological experiences in section 3 and also commented on the paper.

Publication status: published

Chapter 6

Betz, L., Kunze, I., Parameswaran, P., Suma, T.R. and Padmanabhan, M. 2014. The social–ecological web: a bridging concept for transdisciplinary research. *Current Science.* 10(4): 572-579. http://www.currentscience.ac.in/Volumes/107/04/0572.pdf.

Authors' contribution: LB and IK designed the research; IK, LB, PP, and STR performed data collection and analysis; LB developed the social-ecological web; IK and LB wrote the manuscript; MP, PP, and STR commented on the manuscript.

IK and LB contributed equally to research design and implementation, analysis as well as the writing process.

Publication status: published

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2 Agrobiodiversity and equity: addressing gender in transdisciplinary research

Abstract

In spite of the role of women in creating and maintaining agricultural biodiversity having been acknowledged in a number of international policy documents, an implementation gap continues to exist once we come closer to the ground.

Moreover, changes in agricultural systems, as well as in societies in general, challenge traditional gender roles and social obligations relating to collective agrobiodiversity management. To fulfil the promise of creating applicable knowledge for change, transdisciplinary research teams need to look closely into the gender and equity dimensions of agricultural biodiversity, and create spaces for women and men − to contribute their needs, knowledge and visions to the research, and to develop new forms of cooperation.

Keywords: Gender quity, agrobiodiversity, transdisciplinary research, development,

2.1 Framework

2.1.1 Exploring the linkages between biodiversity, agriculture and gender on a global scale

The contribution of women to creating and conserving agricultural biodiversity has been acknowledged in various international policy agreements of the last decades, particularly the Convention on Biological Diversity (CBD), and the Global Plan of Action (GPA)[2]. Gender issues are also included in more general global development debates and strategies, such as Human Rights-based approaches and the Millennium Development Goals (MDGs). At the same time, when coming closer to the ground and looking at agricultural research and development, as well as related policy instruments, we find that a gender bias appears to be far from overcome. Thus, we will explore this field before moving to the more practical implementation of a gender perspective in transdisciplinary agrobiodiversity research.

Sustainability and equity

The Human Development Report 2011 (UNDP, 2011) clearly states that "*inequitable development can never be sustainable human development*". Inter-generational equity refers to fairness between current and future members of a community whereas intragenerational equity applies to justice amongst the present population. Considering the three dimensions of sustainable development, which are social, economic and ecological sustainability, intra-generational equity is one component of social sustainability.

Furthermore, the Human Development Report offers an important contribution to this chapter as it emphasizes the ways in which sustainability and equity are mutually linked. Furthermore, issues concerned with fairness, social justice and with equal access to a better quality of life cannot be seen in isolation from gender equity. The Human Development Report reveals how power imbalances and gender inequities often relate to reduced access to basic needs, including the right to water, sanitation and land.

Crucial for a better understanding of the very idea of equity is Amartya Sen´s 'capability' approach (see Nussbaum 2000). In practice, it means that inequalities are mainly the product of unequal access to (or deprivation of) functional capabilities, such as living to old age or engaging in economic and political activities.

2.1.2 Gender perspectives in international policy agreements and strategies relating to agricultural biodiversity

In the preamble of the CBD, "the vital role that women play in the conservation and sustainable use of biological diversity" is recognized, and the "need for the full participation of women at all levels of policy-making and implementation for biological diversity

[2] Global Plan of Action (GPA) for the Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture, agreed in
1996 and updated in 2011 as Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture (FAO, 2011).

conservation“ affirmed (UN, 1992). Overall, the CBD has three main objectives: the conservation of biological diversity; the sustainable use of its components; and the fair and equitable sharing of benefits arising out of the utilization of genetic resources.

Gender and the environment

The ‘Earth Summit’ in Rio de Janeiro, Brazil (1992) was the first to talk about women and biodiversity in an international policy setting. After this conference, growing numbers of women became involved in issues of environmental sustainability, biodiversity, climate change and protection of natural resources. The result was a more critical engagement with a gender analysis and a human rights framework.

The Johannesburg meeting 2002 saw biodiversity as one of the five areas on which to concentrate to relieve poverty, but did not consider gender.

Source: Momsen (2010: 110,151)

The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)[3] as a legally binding instrument in harmony with the CBD was adopted in 2001 and came into force in 2004. The ITPGRFA, in its preamble, again acknowledges the role of farmers for conserving, improving and making available plant genetic resources and calls (in Article 6) for measures that ensure participation and benefits for farmers through promoting the sustainable use of these resources. Even though statements referring to gendered dimensions of agrobiodiversity are lacking here, the treaty refers to the GPA, which had already been adopted in 1996, and which specifies the priority areas of actions to be taken to implement the CBD.

The GPA and the Leipzig Declaration (which is a sort of forerunner to it) emphasize the role of “generations of men and women farmers and plant breeders”, along with indigenous and local communities, in conserving and improving plant genetic resources in the past and present. Moreover, the GPA takes into account that rural women in general play an important role in agricultural production, particularly in developing countries. As a conclusion, in its planning objectives the need “to focus greater public and scientific attention on the diverse roles that women play in production and resource management in rural households” is stated. Also, training programmes should not neglect the central role women play in directing evolution of crop plants, and address needs and requirements of both genders relating to crops and their multiple uses. Throughout the document, women are explicitly mentioned in their role of knowledge holders, including agricultural production, seed and post-harvest management, and in conducting economic activities based on crops and wild plants. Furthermore, it is stated that women farmers’ needs should be specifically considered, for instance in designing supportive incentives, interventions and training, and similarly the needs of vulnerable and marginalized groups (FAO, 1997).

[3] www.planttreaty.org

However, despite the efforts of the CBD to acknowledge the link between gender and agricultural biodiversity, the Strategic Plan for Biodiversity for the period 2011–2020, of which the United Nations Decade on Biodiversity (2011–2020) forms an important element, does not explicitly address gender relevant issues relating to agrobiodiversity. Yet, a statement by Braulio Ferreira de Souzas Dias, the Executive Secretary of the CBD on the occasion of the International World Women´s Day "Empower Rural Women – End Hunger and Poverty" in March 2012, re-assures us that

> *"The Convention is strongly committed to recognizing and promoting the integral yet distinct roles that women and men play in conserving, sustainably using, and sharing biodiversity. For example, the Convention has recognized the vital role of women in its preamble, and the Conference of the Parties has adopted the Gender Action Plan, that included women's needs into the Aichi Biodiversity Targets, emphasized the importance of mainstreaming gender into all the programmes of work under the Convention, and called for the full support of women in the implementation of the Strategic Plan for Biodiversity 2011-2020."*[4]

Therefore, it is important to recall for greater consideration the inclusion of gender-sensitive approaches to (agro)biodiversity in the overall aim and objectives of the UN Decade on Biodiversity. Building upon this thought, Mata and Quesada-Aguilar (2010), gender advisors from the International Union for Conservation of Nature (IUCN), underline the need to foster more research on the linkages between gender, agrobiodiversity, agriculture and poverty reduction, as well as to conduct more gender-disaggregated data that highlight women´s contribution to agriculture. In addition, agricultural extension services and new technologies should address the needs of both men and women from local communities.

2.1.3 Gender perspectives in sustainable development strategies

The gender relevance of environmental, economic and social sustainability was first mentioned in the Brundtland Report 'Our common future' published in 1987 (WECD, 1987). Since then, the political need to include a gender-sensitive viewpoint and intra-household equity into development policies and practice became crucial for the debate on sustainability.

Important in this regard is the concept of mainstreaming gender, understood as a "strategy for making women's as well as men's concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of projects. The ultimate goal is gender equality" (UN, 2000). Since the Beijing Fourth World Conference on Women in 1995, gender main-streaming has been seen as the solution to advance gender equality at the organisation level.

Unlike literature from the development sector focusing on gender and environmental issues in a rural context, such as from the World Bank and FAO (World Bank et al., 2008), some feminist researchers critically engage with the risks associated with gender mainstreaming.

[4] http://www.cbd.int/doc/speech/2012/sp-2012-03-08-iwd-en.pdf; accessed May 15, 2013

Though acknowledging the importance of including practical gender needs and interests into natural resource management policies, the underlying assumption of gender mainstreaming being the universal remedy for achieving gender justice and equity is challenged. The main critique is that the concept of gender mainstreaming is based on essentialist and naturalized assumptions about men, women and power. This thought is in line with the new wave of feminist research; for instance, Momsen (2010: 236) states that "by seeing women and men as oppositional categories we are ignoring the complexities of gender relations and undermining the potential benefits of gender mainstreaming".

It is widely acknowledged that the integration of gendered environmental knowledge and practices is essential, not only for enhancing sustainable development in general, but also for achieving progress towards reducing poverty and reinforcing basic human rights, particularly the Right to Food. The human rights-based approach to development has gained importance in the first decade of our century, and marked an important shift away from a mere welfare and charity-based approach. It regards people affected by poverty as rights-holders, rather than beneficiaries, and emphasizes the role of states as duty-bearers to respect, protect and fulfil the human rights for all their citizens. In order to achieve this, emphasis is put on so-called vulnerable groups, who, for various reasons, are in danger or have traditionally been victims of human rights violations. These are groups that are often structurally discriminated against and/or have difficulties defending themselves, and are therefore in need of special protection. On a global scale, women, children and indigenous people are considered to be three out of twelve vulnerable groups[5].

Essentialism and gender

Essentializing means reducing men and women to their supposed biological essence. Thus because women are able to bear children they do not have the ability to work in scientific or technical fields, etc. Some feminists use that term to question and analyze socially constructed gender roles.

Source: Momsen (2010: 110,151)

These ideas also underlie the United Nations' Millennium Development Goals (MDGs) for the period 2000–2015, all of which relate directly or indirectly to specific human rights[6]5, and also stress the relationship between gender equality, poverty alleviation, and sustainable development. The importance of linking agrobiodiversity conservation and sustainable use to the MDGs, particularly the goal to reduce the number of people suffering from hunger and poverty, has been emphasized and resulted in an action plan in an international multistakeholder conference in Chennai (MSSRF, 2005). Currently, there is an on-going process of envisioning new 'Sustainable Development Goals' (SDGs) for the period after

[5] http://www.humanrights.is/the-human-rights-project/humanrightscasesandmaterials/humanrightsconceptsideasandfora; accessed 7th July 2013
[6] http://www.ohchr.org/EN/Issues/MDG/Pages/MDGsStandards.aspx; accessed 7th July 2013

2015 that build on the MDGs and underline the close link between environment and human well-being, including between agrobiodiversity and human nutrition and health (Langlois et al., 2012).

2.1.4 Addressing gender gaps in agricultural research, development and policy design

Work published by international donor agencies and other development institutions aspire to advance gender equity in their project implementation. Literature derived from both the development sector and from agricultural research describes two major concerns: first, the lack of women's access to land, resources and agricultural markets; and second, the lack of sufficient data and statistical evidence available on gender roles in agriculture (World Bank et al., 2008; GTZ, 2006b; Momsen, 2007, 2010). Furthermore, women are often excluded from agricultural decision-making processes and, as stated by GTZ (2006a), 'benefits that accrue from the conservation and sustainable use of genetic resources are unevenly distributed between men and women and do not correspond to their respective inputs' (para. 2). Also the World Bank et al. (2008) focused on the uneven distribution of the benefits of the Green Revolution, and explain that whereas men are associated with large-scale farming for global markets, women profited from surplus being sold on local food and seed markets. This relates to Momsen (2010) who refers to the gendered division of labour in agriculture and a gender bias regarding property rights to natural resources such as land, access to training and to modern technologies. She offers some very strong arguments regarding agricultural knowledge production, claiming that women's knowledge is influenced by local social and ecological transformation processes. Furthermore, gendered knowledge, the local environment and gender roles are inter-related. Access to land, property rights and the loss of social status for women are closely linked to genetic and cultural erosion (Momsen, 2007).

Feminist perspectives on agrobiodiversity seek to challenge binary thinking and dualism between socially constructed norms and roles of gender. Whereas women are often associated with the 'home' (i.e. home gardens and local markets), men seem to be linked to large-scale farming and decision-making processes. Momsen (2010: 148) disagrees with the women¬centred approach and claims there is no such thing as a single concept of women and men. In this regard, she also argues for the importance of considering that "gender differences in knowledge of uses of plants are also related to gender divisions of labour and gendered spatial use of different ecosystems". The gender bias in development has often been portrayed as a failure to include women. In addition, meanings behind femininity and masculinity need to be carefully examined because nations worldwide construct distinct models of these. Also, gender roles, identities and dynamics are neither fixed nor stable, but influenced by localities and spatial settings and therefore changing over time. This thought links to the intersectional approach, which refers to the ways in which racism, patriarchy, class oppression and other discriminatory systems produce inequalities that structure the relative positions of women, races, ethnicities, classes and the like (UN, 2001).

Intersectionality and gender

"Intersectionality refers to the interaction between gender, race, and other categories of difference in individual lives, social practices, institutional arrangement, and collec¬tive ideologies and the outcomes of these interactions in terms of power."

Source: Davis (2008: 68)

Bina Agarwal's (Agarwal, 1992, 1998, 2001, 2003, 2010) work is influential for examining gender relations in the context of environmental concerns and the use of natural resources in India. Furthermore, she examines the gendered dimensions of land rights and suggests new possibilities for enhancing women's access to land, while describing a gendered path of agrarian transition in India. Agarwal's work nicely illustrates three factors underlying the gender bias. First, men are perceived as 'breadwinners' and women as 'dependents'. Second, there is an essentializing tendency and social perception about women's limited capabilities, roles and responsibilities. Third, the mainstream economic theory of households in which it is defined as a unitary entity is inadequate.

Bina Agarwal´s work also focuses on a better understanding of the 'feminization' of agriculture in India and worldwide. She argues that although farmers are increasingly female, few of them have direct access to land. In response to this gender inequity in rural farming systems, she poses a significant question: "By what institutional arrangement will it be ensured that small and marginal, increasingly female, farmers, have access to infrastructure?" (Agarwal, 2010: 67). In her view, group approaches such as skill pooling and farming collectivities could provide possible solutions to the uneven use of agricultural land between women and men farmers. 'Collectivities' encompasses all forms of joint farm enterprises while focusing on issues of equity, accountability and the empowerment of vulnerable groups. She explains that skill pooling is one way to share the diversity of knowledge, skills and capacities that could improve productivity and social empowerment. However, even though Agarwal (2010) provides some interesting insights into the feminisation of agriculture from an institutional point of view, she does not adequately address the question of how collectivities are gendered and shaped by uneven power structures amongst different ethnicities.

Through the feminization of agricultural development, women´s roles and responsibilities in agrobiodiversity management have been brought to the fore (Oakley and Momsen, in press 2013). Rural-urban migration strongly affects the feminization of agriculture. Whereas the younger generation of women prefers to work in manufacturing or service-related jobs in urban environments, older women tend to stay in the villages. This situation poses many difficulties for gender roles in rural areas. One huge gap in research is the lack of data available on gender in agriculture. However, what is well known is that twice as many women as men are involved in agriculture-related activities and the female agricultural workforce is increasing in most developing countries. The proportion has grown from 39 % in

1950 to 43 % in 2000. In 2010, the percentage is expected to be 44% (Momsen, 2010; World Bank et al., 2008).

Gender and agrobiodiversity

"Agricultural biodiversity is largely shaped by human activities and management practices, and large numbers of people depend on it for sustainable livelihoods.

However, gender analyses have made clear that men and women often manage, use and control natural and agricultural resources differently. Moreover, agricultural sys¬tems, and the roles, rights and responsibilities of men and women who farm, differ according to geographic and cultural context."

Source: Mata and Quesada-Aguilar (2010: 5)

Pionetti (2006) argues for fostering more future research concerning the feminization of agriculture. In examining women and farming in South India, she explains that climate change, new agricultural policies, socio-economic transformations and institutional incentives for the expansion of cash crops may change women's seed-saving practices due to the environmental and economic consequences associated with these changes. In order to put women's agricultural knowledge on the record, Pionetti suggests documenting local practices that advance agrobiodiversity on farmlands. This gap in research has been addressed by the case study by Gopi and Kumar (2001; see also Kumar et al., 2010) on gender relations in traditional paddy cultivation.

2.1.5 Linking gender equity with agrobiodiversity

Reflecting upon the relationship between gender equity, biodiversity and agriculture, the sustainability of biological resources is greatly dependent on ensuring livelihood security for men and women (Krishna, 1998). Consequently, lack of gender equity undermines both livelihood security and conservation of diversity. Women's mobility, rights to land, access to markets, value addition and skills training are important dimensions of biodiversity management.

Agarwal's work (1992, 2010) has a strong interest in challenging gender (in)equity in relation to the use and management of natural resources. Her group farming approach that seeks to explore a wide range of institutional arrangements for farming, also understood as collectivities, addresses issues of equity, accountability, participation and empowerment of vulnerable groups. Thereby, she calls for a critical consideration of gender in relation to caste, race and ethnicity.

Building upon the idea of collectivity, Padmanabhan (2005) explores gender equity in agrobiodiversity while examining collective action and institutional innovations. She looks at the ways in which the use of natural resources and agrobiodiversity is linked to matters of equity. Her case study on the Kurichya, an indigenous traditional farming community in Wayanad, southern India, demonstrates a close link between diversity in agriculture and

women's status, access and control through common land holding. The study reveals that agricultural transition from rice to banana has a strong impact on women as these are "deprived of their tasks, and their agricultural knowledge of local paddy varieties becomes redundant". Instead of protecting agrobiodiversity, especially in the area of paddy cultivation, women's voices are excluded in agricultural decision-making processes and therefore women's status in their communities will probably be reduced. In conclusion, as further research by Padmanabhan (2008) has shown, the social category of gender is crucial for collective seed management. Additionally, shrinking demand for agrobiodiversity decreases the social status of women and erodes agricultural knowledge.

Having looked at the ways in which gender and agrobiodiversity are approached in international policy agreements, sustainable development strategies and on the ground, we conclude that current conventions and agreements offer useful incentives for addressing practical gender needs, but fail to successfully include strategic gender needs. Practical gender needs are those that do not generally challenge a women's position in a particular cultural setting, whereas strategic gender needs may do; the latter include for example equal access of women and men to land or capacity building.

Research on agrobiodiversity and (gender) equity needs to acknowledge the multiple gender roles and responsibilities of both women and men in different environmental, economic and social contexts. In order to overcome a gender bias in agricultural research, an equal involvement of women and men farmers from the very beginning of the research planning and application would offer fruitful avenues for research on the ground. Therefore, viewing gen-der through the lenses of the intersectional approach would further enrich transdisciplinary agrobiodiversity research as it particularly focuses on issues concerned with the exclusion and subordination of marginalized women and men.

2.2 Analytical part

In order to outline a route towards a gender-sensitive transdisciplinary research approach on agricultural biodiversity, we will present two case studies from Bangladesh and from southern India. Instead of focusing on the socially and culturally defined gender roles, we looked at the complexities of gender performances in the management of agrobiodiversity. Starting from this point, we can identify issues of relevance that can then be 'fed' into a transdisciplinary research approach, as will be presented in Chapter 6. En route, the social distribution of local knowledge relating to agrobiodiversity issues will be looked at in more detail in Chapter 5.

2.2.1 Case 1: The relationship between gender, agrobiodiversity and seed management in Bangladesh

Emily Oakley and Janet Momsen´s (2007; in press 2013) empirical research on seed management in Bangladesh is an example that portrays women's role in seed management in two villages in Bangladesh, while examining the interaction between agrobiodiversity and post-harvesting processing, seed management and knowledge, including associated gender roles. Investigating gender divisions of labour in seed selection, processing and storage is crucial for understanding women's roles and their related contribution to agrobiodiversity management.

Previous gender-based research in Bangladesh has given surprising little attention to women and seeds in comparison with studies in other countries. This can be attributed to the particular combination of social norms that keep much of women's work confined to the household compound and to the large amount of research which has explored their family labour. Many researchers conclude that cultural and religious ideologies of women's seclusion, or purdah, have added to the 'invisibility' of women's productive labour in Bangladesh, encouraging researchers to examine agricultural and home-based labour in greater detail.

For example, research has highlighted that women's home gardens are smaller and within the family compound, where women can practice purdah. They tend to cultivate a diversity of traditional crops, whereas men grow fewer crops overall and prefer introduced varieties. In addition, women prefer indigenous varieties because they cook quickly and supply important vitamins. As such, women's home gardens maintain plant genetic diversity and perpetuate cultural identity (Wilson, 2003).

Thus, there is a logical link between women's post-harvest processing and seed management. And yet few studies have been done on the relationship between women's work in post-harvest processing, seed management and agrobiodiversity. A 2001 study of two rural villages in Tangail district, Bangladesh, considers the various factors influencing seed management and agrobiodiversity in relation to the roles of rural women (Oakley, 2004; Oakley and Momsen, 2005, 2007). The research took a broad-based approach in assessing women's relationship to agrobiodiversity through an examination of their activities in seed decision-making, selection, processing, storage, and exchange, using a comparison of field crops and home gardens and the factors affecting choice of varieties grown.

A total of seventy-five random sample surveys of female-heads of household, eleven in-depth interviews, and four gender-divided focus groups were used in the villages of Bishnapur and Baushite. Pervasiveness of seed saving among the survey respondents was high. The vast majority of the seeds sown are saved on-farm by women. Most respondents in both villages saved all of the seeds they use, and most of the seeds saved were for home use. Seeds were originally obtained from local markets, or through inheritance, or exchange with relatives and neighbours.

Household decision-making authority over the types of crops grown and seeds used was divided by location, i.e. field versus home garden. The survey results show that for field crops, men generally make the decisions about crop and variety choices, though one third of the time women are involved. For home gardens, women make all of the decisions and perform all of the tasks. Men are active in selecting the areas of the field from which seed will be saved, whereas women are exclusively responsible for processing, storing and exchanging those seeds at home. Seed saving is considered to be 'women's work' by both men and women.

The respondents were not technology averse, and in fact rapidly adopted new seed technologies, with 94% of all respondents cultivating one or more improved rice varieties, though they were used very little in home gardens. Almost all home garden crops grown were local varieties (LVs), as were other field crops (pulses, oilseeds and minor grains). Two-thirds of the respondents also cultivated one or more local rice varieties (Oakley and Momsen, 2005).

Women described complex, sophisticated methods of seed selection, processing, and storage (Oakley and Momsen, 2007). They were taught to save seeds largely by their mothers and mothers-in-law, and most taught or would teach their daughters and daughters-in-law. Few respondents participated in formal seed saving organizations, relying instead on informal exchange networks.

The respondents in both villages repeatedly stated that LVs of rice taste better than improved variety (IV) rice; however, yield was the determining factor in both villages in the decision to grow IV rice. Neither village had room to expand the area under agricultural production; therefore, IV rice cultivation is the only means of increasing yields. Taste was the major reason for saving LV rice; the women far preferred the flavours of LVs. Women's role as the preparers of food undoubtedly influenced the continued use of LV rice in both villages. They preferred LV rice for use in special dishes and for festivals.

Home gardens were the sole responsibility of women in both villages. Women's authority in deciding which crops and varieties to plant was extremely significant for agrobiodiversity conservation, especially since women overwhelmingly used and preferred LVs for fruit and vegetable production. Taste was by far the most significant reason for cultivating LV home garden crops. LVs were also grown for their suitability to local soil conditions and survival in floods, for their multiple culinary uses and nutritional value, and for their good yields and long harvest seasons. Seeds brought into marriage and seed sharing within and between communities increased diversity (Oakley, 2004). Women relied on seed networks more heavily for home gardens than for rice and other field crops.

Women performed all preparation and management activities for the home gardens. The only exceptions involving participation of men were large home gardens located outside of the family compound, as noted in previous research (Wilson, 2003). Women were responsible for all seed management tasks in the home gardens, including selection,

processing, storage and exchange. Women were the dominant, if not exclusive, family members concerned with the drying and cleaning of home garden crop seeds.

Home-based seed selection, processing, storage and exchange for field crops were almost always women's tasks in both villages. Where women had minimal participation in field production, their work in seed selection had been assumed to be negligible; however, researchers are increasingly finding that their contribution is often greater than previously perceived (Rice et al., 1998). The majority of the women in each village participated in field and home-based selection of rice and other field crops, either alone or with male family members.

Women were responsible for seed management because these activities were considered an extension of their domestic chores. The women in this study described a complex series of techniques used to manage rice and home garden seeds. Seed processing and storage were especially significant activities, and demanded a considerable amount of time and skill. Rural Bangladeshi women maintain household seed 'banks' that store and preserve unique crop varieties. There are two seed systems operating simultaneously in Bangladesh: one that is promoted by commercial breeders, and one that is sustained by women as seed savers and managers (Song and Jiggins, 2003).

The results of the interviews indicate that the women use a multiplicity of storage preservation techniques. Some women use sand, ash or leaves of the neem tree (Azadirachta indica) as traditional seed storage preservatives. Women employ several indigenous technologies for preservation, including sun drying seeds for processing, storing seeds in clay pots, and sealing containers with a cow dung and mud mixture, with or without inclusion of neem leaves in storage containers for pest protection.

Through gendered divisions of labour, men and women have developed distinctive relationships to crops and seeds. Women's particular roles in and interactions with crop diversity can be seen as agro-social processes of maintaining and preserving seeds. After initially being hidden within larger studies, references to women's participation in seed selection, processing, storage and exchange have become increasingly detailed, and eventually inspired a new genre of scholarly work focused on gender and agrobiodiversity. However, there is a still a need for more peer-reviewed publications. International institutions have helped promote frameworks for analysis of gender and crop genetic resource conservation. Documentation of women's seed management in Bangladesh is particularly rich and provides an opportunity to explore in greater depth the roles women perform in agrobiodiversity conservation.

2.2.2 Case 2: Gender equity in agrobiodiversity management in Wayanad

This case study focused on the impacts of changes in land use and cultivation practices on indigenous farming communities in Wayanad, a district of Kerala state in southern India. Experiences from the field mainly explore the impacts of agrarian change on indigenous women involved in agriculture. Two major trends in particular influenced the livelihood

strategies of indigenous communities: change in land use, and in social organization. Changes in land use are linked to conversion of agricultural land, including the shift from food (rice) to cash crops (areca nut, ginger and banana/plantain). Changes in the social organization are related to a re-organization of the family structure, based on a shift from collective to individual ownership of land.

This case study looked at the ways in which changes in land use and in the social system of the Kuruma ethnic group influenced gender relations in agrobiodiversity management. It reflects on results of qualitative research, such as semi-structured interviews with Kuruma men and women from two different communities in two distinct geographical areas, with 21 interviews conducted in one Kuruma community in Panamaram (Mananthavady subdistrict of Wayanad) and another 32 semi-structured interviews in Kaniyambetta (Kalpetta subdistrict). For an overview of Wayanad as a research area, see the description in Chapter 2.

We will thus concentrate here on the issue of how changes in land use and in the social organization are linked with gender equity. Central is a critical consideration of land ownership, both uneven distribution and women´s lack of access, and how decision-making processes on cultivation are gendered. Furthermore, this study looked at how changes in the family system have influenced women´s everyday life in the home and the field, while focusing on the role of education, participation in public life and mobility.

Land use change, transformations of the social organization and gender equity all contribute to agrarian change in Wayanad .The reasons and consequences of the agrarian crisis in India are being widely discussed by the media, in government reports and academic research, all seeking changes in neoliberal policies towards agriculture (Lerche, 2011). However, the main reason for the crisis is the low profitability of agriculture, so that the income derived from agricultural activities is insufficient to generate sustainable income for the farmers (Dhas, 2009). In response to the economic loss of paddy cultivation, indigenous farming communities such as the Kuruma grow paddy mainly for their own consumption. Household work, including food preparation, is the responsibility of the women, who strongly emphasized the need to continue with subsistence agriculture in the future in order to sustain family food security. A study from January to July 2011 and from January to March 2012 showed that paddy cultivation is gendered in the sense that women consider paddy as the most important crop to feed the family. However, given its low market price, rice is being replaced by vegetables, such as beans, as well as ginger, arecanut and banana. From a Kuruma perspective, the changing land use patterns naturally reduce agriculture. The loss of agrobiodiversity is caused by a lack of interest in growing traditional varieties of crops and vegetables on the one hand, and on the absence of a market on the other. Furthermore, agricultural land is lost to building of new roads and homes needed for the growing number of nuclear families.

These conversion practices affect the gendered division of labour. Traditionally, women were responsible for naatti, meaning the re-planting of seeds. However, due to low profitability and shifting interests, as well as water shortage, rice is today only being cultivated in one season instead of two as in the past. That means agricultural work related to paddy has decreased, but at the same time the cultivation of vegetables such as beans has increased. Furthermore, the increased use of machinery has simplified women´s work because instead of hand threshing the harvested rice, it is nowadays threshed mechanically. However, advanced technology used for cultivation purposes has a gender dimension because, as stated by many Kuruma men and women farmers, using technical equipment excludes women from agricultural work because of a lack of knowledge. Training is usually offered to men only, and it is generally believed that women are incapable of using machinery.

Another trend that shapes agrarian change is daily wage labour. As time-consuming paddy cultivation has declined over the last 15 years, both women and men regard daily wage labour as a useful livelihood strategy to generate regular income. However, this limits their availability for work on their own fields. The main reason for this shift in work structures is the greater demand for cash needed to lead a better life on the one hand, and to survive the agricultural crisis (Lerche, 2011) on the other.

Minor trends of rural-urban migration amongst tribal communities in Wayanad do not result in a feminization of agriculture in the case of Kuruma communities in Wayanad. If land is available, both women and men grow mostly paddy rice, but also beans, banana, arecanut and ginger. Unlike men, young women show little interest in agriculture. They opt for jobs outside agriculture because in their view, farm income is insufficient to lead a 'good life'. Agriculture is mainly a subsistence level activity. Given rising living standards (housing, clothing, education and shifting consumption habits), agriculture fails to fulfil people's needs.

Social transformation processes affect gender relations in agriculture in Wayanad. A major social change is the shift from the joint to the nuclear family system, which has strongly influenced Kuruma social organization. The joint family system was characterized by collective landholding, and decision-making power was assigned to the village chief and senior men based on patriarchal lineage. In today's nuclear households, agricultural land is individually partitioned amongst men and each part belongs to the nuclear family, which usually consists of the married couple and their children. As a result, in a nuclear family system, each family takes their own decisions and cultivates their own land.

The inheritance system is related to the ways in which marriages are socially organized. Traditionally, sons stay in the village where they have been born and brought up, whereas daughters marry into their husband's village. Customarily, family members arrange marriages. Once daughters are married, they become a family member of their husband's family, which means they may cultivate his agricultural land. Overall, this case study

revealed the uneven distribution of land amongst women and men due to women's lack of land ownership amongst Kuruma communities.

However, according to many women, the shift from the joint to the nuclear family system has also had positive impacts on gender relations, particularly in regard to decision-making processes at a household level. For example, in the past, women were excluded from any agricultural decision-making. Rather, women were supposed to 'obey' the men, while being restricted to the domestic domain only. With the change in the social organization, power relations between men and women have been challenged. Instead of discussing agricultural matters in the (male) community, married couples today talk over the choice of crops to be cultivated in a nuclear family setting in which women also have a voice in agrobiodiversity management. Overall, from the women's point of view, this has improved women´s social status and, therefore, contributes towards gender equality.

Many women farmers are active members of the Women Self-Help Groups (Kudumbashree)[7]6, a women's development programme initiated by the Government of Kerala to re-structure "women´s work participation concerns as a matter of rights and equity". Being a member of a Kudumbashree group may offer women space for group farming, where the harvest can be sold and add to women´s income. Cooperative farming group (Agarwal, 2010) opportunities are often accompanied by social changes such as improved education, starting from an early age. Moreover, women's increasing opportunities to work outside the home are also related to demographic changes because the family size has radically decreased over time, from seven or more to four nuclear family members. Today, the nuclear families usually have two children whereas in the past five or more children were common.

2.2.3 Summarizing essential points from the case studies

Based on the presented case studies we highlight some points of view that are particularly interesting for developing a transdisciplinary and gender-sensitive approach to agrobiodiversity research.

One of the guiding questions could be to expose the different goals, priorities and needs of women and men that underlie their management decisions, and work on how they could be addressed or reconciled in a joint research process. In many parts of the world, women and men grow different crops, often in separate fields. But even if the same food crops are grown, there are often clear differences with regard to the preferred varieties and traits. Breeding institutions for instance should take into account the gendered distribution of preferences and needs for specific traits, and integrate them into their selection schemes in order to develop relevant varieties for women and for men.

[7] See www.kudumbashree.org

In many cases, conflicting goals may exist and need to be reconciled. For example, crop yields are important to sustain food security of the family; however, some local traditional varieties give lower yields, but are used for special dishes or fetch a high price in local markets. Thus, a deeper look may be needed into the different values and goals that have to be reconciled, and how certain research activities (i.e. value chain development) would affect women and men differently, even if considered 'beneficial' in general.

The multiple responsibilities and practical activities of women in seed management could provide key insights into the underlying goals, and similarly this could be observed for activities performed by men. Disregarding either women's or men's contributions to seed and agrobiodiversity management and the knowledge and decision-making processes involved, carries the risk that local knowledge is not adequately traced, and can, unknowingly, lead to marginalization and loss of certain components of agrobiodiversity.

A further guiding question could be: which particular skills men and women could contribute to the research process? Investigating gender divisions of labour in farming, seed selection, processing and storage is crucial for understanding women's and men's roles and contributions to agrobiodiversity management (Oakley and Momsen, 2007), and accordingly the practical and theoretical skills they posess. Women´s multiple skills in seed management, for instance, include the understanding of a complex set of techniques used to manage field and home garden seeds under local conditions.

Moreover, questions may arise with regard to how social institutions could be designed in order to strengthen agrobiodiversity management and use. This refers not only to the institutionalization of the research activities (i.e. via stakeholder platforms), but also to the design and implementation of local institutions that could exist and function beyond the research period. It could be important in this context to study how women and men learn differently, and how they use different means and resources for getting new information. Women often maintain extensive social networks with other women, whereby they share and introduce new foods, recipes and seeds. These networks can form an informal social institution to strengthen agrobiodiversity management and use in practise, while men more frequently use public meeting places (such as tea or coffee shops, agricultural shops and fairs) to acquire new information on varieties and farming practices. Men also have easier access to agricultural extension services and training in most countries, whereas women are commonly seen as the main target group for nutrition and health-related topics. Agrarian change, however, may demand the use of advanced technologies in several farm and post-harvest activities, including those performed by women.

Last, but not least, research projects can address strategic gender issues that lead to exclusion of women (or men), and try to develop more equitable and sustainable solutions. Land ownership and distribution of landholdings, decision-making processes in the home and the field, and access to education and services could be such issues. Collective forms of

land ownership, such as the Kudumbashree group farming approach described above, could pave the way forward in this context.

2.3 Practical example

Participatory plant breeding plays a key role in developing further the existing diversity of crop landraces based on the farmers' own criteria and needs, and overcome existing constraints of these varieties. It is thus an important building block in developing dynamic strategies for agrobiodiversity conservation and use. In participatory plant breeding projects, farmers and researchers, and sometimes other stakeholders, usually work closely together to jointly redefine selection criteria and co-operate throughout the entire breeding cycle (Weltzien/Smith et al., 2000). The resulting varieties are usually more in number, address various purposes and needs, and are more diverse, compared with the products of formal breeding programmes.

The example given below shows how exposing and integrating the different criteria that women and men farmers in West Africa relate to the term 'productivity' initially challenged the scientists' understanding. However, they understood that women included post-harvest losses in their assessment of productivity, whereas men (and scientists) usually refer solely to the amount of grain harvested in the field. This learning process resulted in new varieties that fulfil the criteria and needs of both women and men farmers, and led to the institutionalization of a gender-sensitive approach in several breeding programmes in West Africa.

Women and men farmers in Burkina Faso help breeders to redefine selection criteria in sorghum

Contributed by Kirsten vom Brocke, CIRAD, Montpellier, France

Adding value to local varieties and using them as breeding parents in plant breeding programmes are important strategic elements for conservation and use of traditional crop varieties. In Burkina Faso, collaboration between breeders and farmer organizations has been initiated in order to identify relevant farmer selection criteria, including differentiation by gender, for the development of new productive and preferred sorghum varieties. This participatory and gender-sensitive approach was hoped to shed light on the failure of past breeding programmes to diffuse 'modern' varieties based on high-yield potential genotypes from sorghum races that are not original to West Africa, such as the kaffir and caudatum groups. Different on-farm tests, however, confirmed (1) the positive yield potential of the 'modern' varieties compared with local Guinea landraces; (2) that productivity was identified as a major selection criterion for both men and women; and (3) that the visual productivity assessment of male farmers and breeders correlated with grain yield, in contrast to women's assessment. At the same time, it was the women's specific knowledge of grain quality that enabled the researchers to better understand why local germplasm remained superior for

farmers' needs in the region. Listening to the way the women farmers evaluate varieties, it became evident that they placed special importance on the hardness of the grains, judged by biting the grains at maturity. This feature was thus included in participatory variety assessments in order to better judge grain quality. In rural areas of Burkina Faso, women are responsible for household food preparation and so they are considered experts for the evaluation of grain quality traits, especially in view of the fact that there was no statistical concordance between women and men's perceptions of grain hardness when assessing various sorghum progenies. However, it became clear that according to the women, the trait 'grain hardness' is not only an indicator of a good texture and conservation of the traditional porridge (tô), but more importantly it is an indicator for flour yield. In the view of the women, since hard grains do not easily break while removing the husk, there will be less loss and flour yield will be higher compared with the softer grains more typical of modern varieties. This might explain the relatively low concordance of productivity assessment of women with grain yield previously observed, as well as a generally stronger preference for the local variety types. On this basis, breeders studied decortication properties and flour yield in a range of different types, including local Guinea and caudatum groups and intermediates. This study confirmed that, indeed, some modern caudatum varieties that showed otherwise superior grain yield lost up to 45% yield after decortication and cleaning, not to mention revealing inferior culinary quality when it came to tô preparation. Guinea×caudatum intermediates and Guinea types, in contrast, had markedly improved flour yields (in some of the pure Guinea landraces, >80% of harvested grain weight was flour). These observations bring into question the very definition of the selection criteria for productivity, i.e. measured as weight of the grains, versus a variety's 'true' yield potential, i.e. the estimated amount of food deriving from it. The close collaboration with farmer groups, in this case particularly with women, enabled breeders to redefine selection criteria and objectives in breeding programmes. Breeders in Mali have reached similar conclusions after collaborating with farmer groups, women and men, during variety evaluations. This type of collaboration with farmer organizations is now fully integrated in several West African breeding programmes.

2.4 Summary of key points

- International agreements highlight the role of women as knowledge bearers and custodians of agricultural biodiversity.
- Women and men have access to different spaces and environments, and fulfill different tasks, giving them distinctive information and practical knowledge about local agricultural biodiversity.
- Women's and men's knowledge of biodiversity is not unaffected by social and ecological transformations. Just as gender roles, identities and dynamics in general, they are influenced by socio-cultural and economic change processes. Researchers should thus be careful not to simply assume what women and men do, know or need, but base the development of their transdisciplinary research methodology on

well-founded studies on gender roles relating to agrobiodiversity, and the dynamics thereof.

- Exposing the differences and complementarities that exist between women´s and men´s agricultural knowledge, priorities and practices can enrich a transdisciplinary research process, support social learning and lead to more relevant research outcomes.

2.5 Links

IIED Gatekeeper Series No. 112: “The Major Importance of Minor Resources: Women and Plant Biodiversity”, by Patricia Howard (2003)

http://www.frameweb.org/adl/en-US/2430/file/277/Women_and_Plant_Biodiversity_NP.pdf

FAO Training Manual: “Building on Gender, Biodiversity and Local Knowledge”(2003)

http://www.fao.org/sd/LINKS/documents_download/Manual.pdf.

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3 Dualisms shaping human-nature relations: discovering the multiple meanings of social-ecological change in Wayanad

Abstract

This paper reflects on the impacts of agrarian change and social reorganisation on gender–nature relations through the lens of an indigenous group named the Kuruma in South India. Building upon recent work of feminist political ecology, I uncover a number of dualisms attached to the gender–nature nexus and put forward that gender roles are constituted by social relations which need to be analysed with regard to the transformative potential of gender–nature relations.

Three main themes are at the centre of the empirical inquiry: gender subjectivities, rural off-farm employment and the human–nature nexus. I seek to show that, first, the production of gendered subjectivities cannot be simplified through essentialist assumptions that romanticise women's relationships with nature; second, off-farm employment strategies both reinforce the social hierarchy in gender and contradict the Kuruma's moral economies; and, finally, environmental and agrarian change redefine the use of agrobiodiversity and are related to ideas on progressive versus non-progressive cultivation practices.

The research is informed by qualitative research methods and offers a conceptual approach to the deconstruction of gender–nature relations from a poststructuralist feminist perspective.

Keywords: Agrarian change, gender, The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), feminist political ecology, India

3.1 Introduction

Dualisms attached to the gender–nature relationship often produce an image of women being closer to nature than men. When I worked with an Indian Non-Governmental Organization (NGO) in 2010, the catchphrase "pro nature – pro women – pro poor" offered me inspiration for critical engagement with the gender-nature nexus in South India. Since 1998, the M.S. Swaminathan Research Foundation's Community Agrobiodiversity Centre in Wayanad, Kerala has been promoting biodiversity conservation in agriculture by saving endangered rice varieties in the region. Researchers and environmental activists working for the NGO claim that loss of agrobiodiversity in rice systems is directly related to loss of women's social status as well, which negatively affects indigenous female farmers in particular. Consequently, under the assumption that loss of agrobiodiversity and loss of women's social status are intertwined, the NGO's sustainable community development agenda now aims to implement more gender-sensitive use and management of agrobiodiversity (MSSRF 2003).

In this paper, I use the "pro nature – pro women – pro poor" catchphrase as a point of departure for exploring the ways in which social reorganization and agrarian change amongst the Kuruma in Wayanad impact gender–nature relations. I put forth the argument that this catchphrase discursively produces a relationship between women and nature that needs to be examined critically as, through it, poor women are seen as victims of changing environmental conditions, indicating that women's agricultural knowledge and agrobiodiversity need to be protected in order to sustain nature. This idea not only reinforces an essentialist assumption of women as being closer to nature but also portrays marginalised, poor women as protectors of agrobiodiversity. I suggest that these viewpoints require a feminist analysis that critically engages the complexities of gender–nature relations.

The danger of romanticizing indigenous knowledge in India is a key issue raised by a number of feminist thinkers whose work aims to contextualise local knowledge and the management of natural resources (Agarwal 1992; Gururani 2002; Jewitt 2000; Kelkar 2007; Krishna 2007). Jewitt (2000), for example, focuses on examining naturalised assumptions regarding gendered knowledge formation while de-romanticising women's agroecological expertise in Jharkand, India. Other work is concerned with the essentializing nature of engendering environmental knowledge fostered by Women, Environment and Development (WED) approaches. Kelkar (2007) points towards the interrelations of caste, class, religion and gender which are crucial for identifying "situated gendered actors". In Gururani's (2002) view, gender dynamics are culturally defined via sets of ideas and values regarding women and men, especially as they differ in age, class, and ethnicity. In these studies, the notion of situated knowledge is a crucial element for assessing women's knowledge as embedded in sets of relations produced and based on uneven power dynamics. However, the deconstruction of gender as an analytical category in India "has been located at the bottom

of the hierarchy and marginalised" (Krishna 2007), consequently remaining a field of inquiry which has been rarely addressed from a feminist viewpoint.

In the present paper, I seek to address this research gap while exploring gender–nature relations from an intersectional feminist political ecology viewpoint. Here I specifically ask how agrarian change and social reorganization are reshaping human-nature-relations amongst the Kuruma people, an indigenous population group in Wayanad, Kerala, India. My findings are based on empirical fieldwork informed by qualitative research methods and conducted from 2010 to 2012 in two indigenous agricultural communities in Wayanad. Crucial in this regard is the notion of *doing gender while doing nature* (see editor's introduction), which builds upon a deconstructionist approach in which gender and nature are taken as socially constructed analytical categories. In order to understand the complex dynamics of gender–nature relations, an analysis of the interrelations between power, women's agency and subjectivities is needed. In doing this, I aim to highlight the often ambivalent and contradictory meanings of gender–nature relations in the case of the Kuruma.

The paper is divided into four parts. The first part offers some theoretical insights into work that critically engages the concept of gender–nature relationships. The second part introduces the case study on the Kuruma and explains how changes in agriculture and social organization are currently reshaping agrarian relations on a household level in Kerala. In the third part, I briefly explain the methods used for data collection. Meanwhile, the fourth part discusses and analyses the main research findings and focuses on gender–nature relations while looking at three central themes: gender subjectivities, off-farm agricultural employment and the gender–nature nexus.

3.2 Theorizing gender–nature relations

Understanding gender–nature relations from a feminist point of view requires the aid of three distinct theoretical strands: ecofeminism, new feminist political ecologies and the moral economy of the peasant.

3.2.1 Ecofeminism

Most feminist scholars describe ecofeminism as an umbrella term linking different approaches to environmental analysis by integrating a number of environmental perspectives (Mies and Shiva 1998; Shiva 1988; Plumwood 1993; Seager 1993). In India, ecofeminism is strongly influenced by Vandana Shiva (1988), who proposes a natural connection between women and environmental resources through which rural, indigenous women are often portrayed as the rightful caretakers of nature. However, the taken-as-a-given but actually socially constructed "feminine principle" in gender–nature relationships that Shiva relies on has been strongly critiqued by various feminist scholars, as it not only essentializes but reinforces dualisms between men/women, culture/nature, indigenous/non-

indigenous, body/mind (Agarwal 1992; Jewitt 2000; Krishna 1998; Rometsch and Padmanabhan 2013).

3.2.2 New Feminist Political Ecologies

The feminist political ecology framework provides useful ways for examining issues of resource-access control as well as gendered constructions of knowledge (Bhavnani et al. 2003; Elmhirst and Resurreccion 2008; Momsen 2009; Rocheleau et al. 1996). However, a more specific understanding of Indian contributions to political ecology is offered by Williams and Mawdsley (2006), which presents a useful example of how the traditional/modern binary is reproduced in India from a postcolonial political ecology perspective. Their work deconstructs the division posited by environmental discourses in India between the unsustainable resource usage of elites and threatened livelihoods of ecosystem people due to conflicts over natural resources. In their view, the ecosystem approach to indigenous peoples bears the danger of essentialism, as it embraces the indigenous as the traditional and ends up supporting the traditional/modern binary, which itself has been put into question.

Research inspired by new feminist political ecologies focus on co-constructions of both gender and nature and the ways in which both are socially constructed (Bauriedl 2010). Thus, nature is understood as a socially posited concept which is culturally and historically defined, whereas subjectivity refers to the idea of how people embrace and enact their roles in society (Nightingale 2012). Gender relations can be described as socially constructed forms of relations between women and men. From this perspective, the category of gender is understood as a critical variable in shaping processes of environmental change, livelihoods and visions for sustainable development (Elmhirst and Resurreccion 2008). Furthermore, influenced by poststructuralist theories of subjectivity, new feminist political ecologies explore performance of masculinities and femininities and how these shape gendered subjects through peoples' everyday practices (Elmhirst 2011, 2015). Viewing gendered performance as a process and gendered subjectivities as social constructions challenges essentialist and binary views of gender relations.

3.2.3 The moral economy of the peasant

The moral economy of the peasant provides a useful theoretical understanding into what is considered to be morally unreasonable or unacceptable economic behaviour from a peasant perspective (Scott 1976; Evers and Schrader 1994; Brocheux 1983). Key to the economics of subsistence that guides peasant life is the safety-first principle, which is tied to the risk-avoidance principle, as peasants focus on the need for reliable forms of subsistence. Crucial in this regard is consideration of the relationships peasants have with their neighbours, elites and the state, looked at in terms of whether these networks aid or hinder them.

Taking into consideration insights from ecofeminism and new feminist political ecologies provides a perspective from which to analyse gender–nature relations; also including ideas derived from the moral economy of the peasantry approach further enriches the analytical

approach used in this paper to better understand commodification of off-farm agricultural employment from a peasant standpoint. The next section provides background information about the research area: geographical location, research participants and current social-ecological changes that it is undergoing.

3.3 Background

3.3.1 Research area

India is currently facing an agricultural crisis that demands new policies (Lerche 2011, Narasimha Reddy and Mishra 2009, 2009) in order to overcome the low profitability of agriculture (Dhas 2009) which is negatively affecting rural population groups. In Kerala, the agricultural crisis can also be seen as being tied to a political-ecological crisis, leading to increased rural diversification (Arun 2012; Narasimha Reddy and Mishra 2009) and a higher incidence of farmer suicide[8], which can be interpreted as a failure of the Indian state to look after its peasants in a globalised world (Muenster 2012).

The interrelations between the agricultural and political-ecological crises taking place in India are also affecting Wayanad, a mountain plateau district of Kerala state, bordering the Western Ghats in South India. The area is characterised by low geographical relief, with 113,000 hectares of agricultural land, of which 1,853 hectares are uncultivable. Subsistence crops cover 16,756 hectares and cash crops 65,469. Wayanad district contributes overproportionally to the foreign exchange rates of the state through cash cropping, including pepper, cardamom, coffee, tea, ginger, turmeric, rubber and areca nut (Anil Kumar et al. 2010). Regarding the peoples inhabiting the region, *Adivasi* is an umbrella term used to refer to indigenous groups, who are also referred to as *tribals* in India (Rath 2006). The Adivasi have traditionally been involved in small-scale agriculture, mainly paddy cultivation (see Schöley and Padmanabhan and Suma and Grossmann in this volume).

Wayanad is undergoing the kinds of major changes in land use associated with changing agricultural practices from crop to cash farming. Furthermore, due to the low economic profitability of agriculture and increasing demand for agricultural land for real estate and infrastructural development, the cultivation of rice in the region is constantly declining (Nagabhatla and Anil Kumar 2013). Socially, these changes as well as out-migration, thwarted personal aspirations, indebtedness, weakened family relations and alcoholism have been linked to an increasing rate of farmer suicides (Muenster 2012). Ecologically, the region faces another challenge: declining biodiversity of rice landraces due to conversion to other sorts (Anil Kumar et al. 2010). According to Kuruma farmers in Wayanad, irregular rainfall patterns and water scarcity are also exacerbating the problems facing small-scale agriculture in the region (Kunze and Momsen 2015).

[8] Muenster's (2012) ethnographic study on the political ecology of farmer suicides in the agrarian district of Wayanad reveals that they are linked to two trends: firstly, to specific practices of cash crop farming and to the regional history of the political-ecological crisis and, secondly, to biographies of migration, personal aspirations, choking debts, problematic family relations and possibly to diseases and alcoholism.

The present paper mainly seeks to reflect on the impacts of such agrarian change and social reorganization on gender–nature relations, as seen from the Kuruma perspective. I take the example of a rural off-farm employment program – the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) – to examine the ways in which this ongoing change is not only gendered but is reshaping gender–nature relations among the Kuruma. As the Kuruma belong to the land-owning Adivasi[9] groups in Wayanad whose sources of subsistence are rice and vegetables, paddy cultivation thus has an especially strong cultural meaning for them, because rice is their main staple food and is essential to maintaining food security (Kunze and Momsen 2015). As landholders, they still grow and seek to conserve traditional rice varieties, such as Gandhakasala, which are seen as being central to sustaining Kuruma culture, traditions and consumption habits. However, as I have been describing, ongoing changes in land use and cultivation practices, including conversion of agricultural fields to land for housing and infrastructural development, are redefining gender–nature relations among the Kuruma.

3.3.2 The social organization of the Kuruma people

Exploring the changing gender–nature relations amongst the Kuruma, which have been strongly shaped and redefined by changes in social organization that have been taking place over the last 20 years, demands a closer examination of social roles and their meanings. Here, social organization refers to the family structures existing in the two distinct Kuruma settlements in the subdistricts of Panamaram and Kanjambetta, with a focus on how these have changed from joint to nuclear family structures over time (Betz et al. 2014). Family systems are closely related to social roles, here being defined as structurally given conditions, such as the norms, taboos, expectations, and responsibilities, linked to a given social position in a community. A joint family system in India is almost always dominated by male members, which means that women usually play a subordinate role (Chakrapani and Vijaya Kumar 1994). The relatively recent shift in family system structure amongst the Kuruma has led to a reorganization of property rights, from collective to individual ownership of land. Furthermore, unlike a joint family system, a nuclear family household is often characterised by a more balanced relationship between men and women (see Suma and Grossmann in this volume). This shift in property rights is reshaping gender relations among Kuruma married couples today, as they now tend to both decide over which crops and vegetables are to be cultivated. Thus, the transition from joint to nuclear family systems over the past 20 years has also changed the ways in which gender and related social roles constitute each other.

My conducted fieldwork in the two Kuruma communities in Panamaram and Kanjambetta has revealed how such social and agrarian transformations are mutually linked and are directly influencing social organization at the community level. The social reorganization

[9] My fieldwork from 2010 to 2012 has revealed that is usually Kuruma men who own and inherit agricultural land. Once a woman is married, she usually uses her husband's fields for cultivation. Meanwhile, unmarried women work on the fields of their parents or extended family members.

discussed in this paper refers to changes in education, labour structure and mobility. All these factors, particularly changing labour structures, are affecting cultivation trends because, with growing involvement in off-farm labour, women's capacities for engaging in family agriculture and performing their normal domestic duties are becoming more limited.

3.4 Methods

Qualitative research methods require multiple conceptual approaches and methods of inquiry focused on social processes, individual experiences and human environments (Crang 2003; Bryman 2008; Moss 2002; Winchester 2000). For the present research, two main phases of data collection were conducted in 2011 and 2012, with the unit of analysis being the household level within two Kuruma communities from two different subdistricts: the Kalluvayal and Kanjambetta settlements. Field site collection was based on random choice; my criteria for selecting participants included approachability, accessibility, openness and willingness to take part in the research along with the presence of ongoing social reorganization within their community. The latter was explored by asking both female and male farmers about significant changes in their family systems, gender relations, employment structures, cultivation practices and land use. They were usually interviewed separated by gender, in order to support female participation in the research.

The applied qualitative research methods were similar to those commonly used in other areas of the social sciences (Bryman 2008). Data was mainly gathered through semi-structured and open-ended interviews, which allowed for a flexible interview process. The analysis being presented here draws upon 57 transcribed interviews, including four small-group informant interviews (one female farmer, one male NGO activist and two female tribal promoters), 40 in-depth semi-structured interviews (15 married couples, 20 single women, four single men and one interview with a mother and her son) and 13 focus-group discussions, of which nine were among women and four among men. Recruitment was based on a snowballing sampling, with informed consent being obtained from all participants. Overall, 47 out of 93 households living in the selected communities were sampled. Interviews were conducted with the help of two female research assistants, who transcribed and translated the raw linguistic material into English. Atlas.ti was used to categorize the text into key codes used for analysis.

Having introduced the theories and methods used to inform this case study, the following section lays out the empirical findings. Three main themes are at the centre of the analysis: gender subjectivities, rural off-farm employment and the gender–nature nexus.

3.5 Findings regarding gender–nature relations of the Kuruma

3.5.1 Gendered subjectivities

In this subsection, I put forward that changing agrarian relations and social transformation processes are reshaping gender–nature relations in Wayanad by redefining gender relations at the household level. In the following, I separately discuss the ways in which these process

have differently affected women's and men's subjectivities in the Kuruma communities studied, though there are unavoidable areas of overlap as well.

3.5.2 Women's subjectivities

The portrait of women's subjectivities in the study area developed primarily through the interviews and reveals interrelations between education, mobility, perceptions of nature and employment. Crossing domestic boundaries is seen by the women interviewed as a positive change towards women's emancipation. Compared to the joint family system, most Kuruma female participants explained that greater mobility today enables women to move beyond the domestic sphere, and the shift from joint to nuclear family settings appears to be favouring such social change. Women from both Kuruma communities stressed a link between education, off-farm labour and mobility, as all influence each other. Improved education is helping tribal women to overcome their inferiority complex and, therefore, has led to them having greater confidence and willingness to participate in public life. Crossing beyond the confines of the domestic domain has also offered tribal women more freedom to socialise with people outside their communities. One reason for the increasing mobility of both women and men in the area is greater accessibility to improved infrastructure, such as newly constructed roads.

As improved education allows women to take part in public life and to generate additional income outside the domestic sphere, most participants consider education to be the main driver for positive change towards empowerment of women within the newly emerging social organization of the Kuruma. Mostly elderly women offered a historical comparison of women's roles in Kuruma society in the past and present. Whereas the past was characterised by social isolation of tribal communities in Wayanad, Kuruma people do currently interact with people from different caste groups. Earlier, women's space was restricted to the home and agricultural fields, whereas today many women have crossed out of the domestic domain and are participating in the MGNREGA employment scheme and in women's self-help groups (Devika and Thampi 2007). In their view, these governmental programmes have increased the variety and status of women's responsibilities in the tribal household and at the community level. A senior widow stated that, in the past, women usually obeyed what men said but, today, "most of them [the women] are educated" and, therefore, "are engaged in many things and they are learning new things". This change in gender performance is seen as a positive one by most of the women participants, because it is associated with increased power and independence in decision-making on the household level. The following quotation from a female farmer highlights the changing interrelations within the social reorganization of the Kuruma:

> *"In the past, when it was the joint family system, it was the men who did everything, took all the decisions and mingled with the rest of society. The women at that time were denied all this. But now everything has changed: everyone is educated, so even the women are having jobs and, since they are educated, they can understand what is happening around them without*

anybody's help. And also, they are now mingling with other people in the society. So all this has changed their lives."

Not only women are benefitting from improved education, however, as men are also recognising the new opportunities offered through the changes taking place in the social organization of Kuruma communities. As a result of improved education, women not only have greater authority in domestic decision-making processes but also a heightened responsibility to generate additional income for the family (Kunze and Momsen 2015). This new situation is redefining gendered roles and responsibilities among the Kuruma, and the women especially view education as the key towards their integration into the other society, meaning the wider sphere of non-Adivasi people. However, social networking and exchange among their own kind still appears to be particularly important for Kuruma women as well.

Kuruma women appear to be generally against a rigid and socially defined gendered division of labour in contemporary Kuruma society, due to recent changes resulting from what is known as the commodification of labour. Unlike in the past, when the Kuruma were able to trade in kind, more money is required to buy things today, so ensuring a constant income for their families has become crucial for maintaining their livelihoods. With the increasing involvement of women working outside the domestic realm, such as under the MGNREGA, men appear to feel less pressured to solely generate income for their families. Furthermore, farmer suicide rates have gone down, as women's incomes seem to be helping to take care of their families' financial needs, thus improving the outlook on life for their male members. This change in labour structure constitutes one major social change that has been resulting in greater gender equality among married couples. Because the MGNREGA offers equal payment for women and men, women feel fairly treated, which also results in greater confidence regarding their social status in the community. Furthermore, unlike the past, when Kuruma women usually did not cross domestic boundaries, participation in the MGNREGA also expands women's mobility, because work is now often offered outside their communities.

Further, community interaction and embodiment are redefining women's subjectivities among the Kuruma. Earlier, women used to wear traditional clothing, which is now being replaced by a contemporary mainstream dress code. This shift in embodied performance among Kuruma women is resulting in a feeling of social affiliation with women from other communities and is, consequently, challenging the dualism in bodily performance between Adivasi and non-Adivasi women in the Wayanad context. In addition, interaction between communities is also fostering greater social exchange, with Kuruma people, for example, attending religious functions and festivals taking place in other religious communities.

Yet, according to many Kuruma women, environmental knowledge and agricultural practices are still perceived to be men's responsibility, which reinforces the formal/informal knowledge binary, a dichotomy based on the idea that "women are not aware about the climate or the environment, because men are more involved in agriculture than women". In

addition, “it is the men who know the methods and techniques […] and about seeds, their maturity and when to plant and harvest” (also see Schöley and Padmanabhan in this volume). Such statements by Kuruma women illustrate that, for them, agriculture is still categorized as a masculine knowledge domain. From this perspective, women only *assist* men in cultivation, which is then taken as an explanation for why women are not able to claim knowledge in this area.

3.5.3 Men’s subjectivities

Unlike women, whose subjectivities are presently being redefined through increased mobility, education and ongoing social reorganization, men’s subjectivities are still shaped by the notion of being “traditional agriculturalists”. Men at the age of 40 to 50 are reinforcing the existing socially constructed image of the Kuruma being ecosystem people, while building upon the traditional/modern cultivation practices dualism. From an emic point of view, one male Kuruma farmer argues that, “our case is different, communities like the Kuruma […] are really doing paddy cultivation but other community people do cultivation for their benefits and they keep on changing crops according to their benefit”. This perspective can be said to reveal how masculine identity among the Kuruma is being reproduced as maintaining tradition and being associated with “good” farming practices. Another male farmer, who received an eco-farmer award from the local government, provides interesting insights into his understanding of the very idea of traditional farming:

> *“Traditional farmers know the soil well and they have a close relationship with soil. The traditional farming helps to protect the soil as well as the creatures in it. The modern farming is looking only for profit. […] Traditional farming is good.”*

This view portrays the dualism between traditional and modern cultivation practices. The traditional way of doing agriculture is constructed as good and environmentally friendly, whereas modern agricultural practices are considered to be only profit-oriented and, therefore, “bad” for the farmers and the environment. Furthermore, the good/bad dualism invoked here can also be linked to sustainability. Traditional farming is related to a sustainable farming approach, while modern farming is considered to be unsustainable. Another male Kuruma farmer describes the notion of traditional agriculture as follows:

> *“We are traditional agriculturalists and, if you observe, you will find people like us doing paddy cultivation. Other people cultivate crops which are only a benefit for them. But we are not like that and, since we are traditional paddy cultivators, we cultivate paddy for own consumption, and we don’t do it for business purposes. For business purposes, people use chemical fertilizers and look for higher yields, and they sell it, and this is their aim of cultivation. But our case is different.”*

This thought nicely demonstrates the Adivasi/other dualism which distinguishes the traditional Kuruma from other farmers who do agriculture based on economically driven values, leading them, unlike the Kuruma, to use agrochemicals for better yields. This view on traditional agriculture also stresses the cultural meaning and value of growing rice for family consumption needs in order to sustain food security. Additionally, traditional farming is

linked to the cultivation of old rice varieties crucial for maintaining the idea of consuming culture on special occasions and community events, such as festivals and weddings. These Kuruma farmers seem, then, to be constructing a "tribal" identity defined through being traditional agriculturalists who feel a need to protect their cultural heritage of cultivating rice – of traditional varieties and applying traditional methods – to meet the needs of their communities in the future.

Comparing women's and men's subjectivities with regard to the use and management of biodiversity in agriculture, the data presented from the interviews suggests that it is especially male farmers who want to maintain a traditional agricultural identify. Furthermore, Kuruma men's perceptions on traditional agriculture appear to be related to the notion of ecosystem people, which reinforces the traditional versus modern dualism (Williams and Mawdsley 2006). Yet, at the same time, the importance of upholding and reproducing a traditional farming subjectivity also seems to be in accord with Scott's (Scott 1976) safety-first principle, as continuance of rice cultivation also secures consumption needs which are based on rice being the most important staple food in Kerala.

3.6 Rural non-farm employment

3.6.1 The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)

As we have seen, reorganization of the Kuruma social system and changing environmental conditions have been impacting agricultural labour structures among them. Crucial in this regard is the MGNREGA, also commonly known as the NREGA, which was enacted by the Ministry of Rural Development of the Indian government in 2005 (Government of India 2013). Meant to improve livelihood security for people in rural areas by securing income for agricultural labourers outside peak seasons, the Act guarantees 100 days of payment for a daily wage rate of Rs. 120 for semi-skilled and unskilled laborers working in public works areas such as building road connectivity, flood control, water conservation and harvesting, drought proofing as well as micro-irrigation structures in villages (Jose and Padmanabhan 2015). In order to participate in the program, participants need to register officially and must have a bank account. In Wayanad, 66% of the total indigenous population is registered, some of whom also hold landed property, which in effect reduces the overall availability of labor for rice cultivation (Jose and Padmanabhan 2015).

Research has revealed that the introduction of MGNREGA has enhanced the socio-economic condition of socially disadvantaged groups, including landless laborers, scheduled castes/tribes and small marginalized farmers in rural areas. However, a lack of awareness-building campaigns regarding the program's entitlements, social inclusion and good governance, to name only a few important issues, remains an institutional weakness to be addressed in the future (Haque 2011). In addition, a gendered analysis of the Act indicates that the program has had virtually no impact on the social transformation of women's needs, though it potentially does support women's empowerment (Pellissery and Jalan 2011).

The impacts of the MGNREGA on gender relations among the Kuruma who have informed this study appear to be ambivalent. Participation in the program – which attracts mainly single and uneducated people between 30 and 50 years old – is clearly gendered as today, it is mostly women who join because it provides opportunities for generating income, involving both agricultural and non-agricultural work. In Wayanad, in fact, female participation constitutes 95 % of all MNREGA workers (Thadathil and Mohandas 2012). The main driver for women to participate in this rural employment program is the prospect of increased financial independence, given the guaranteed wage each month.

One can observe a shift towards greater appreciation of economic values in a nuclear-family setting, emphasising the need for both women and men to generate income. A male farmer, for example, explains that, through the MGNREGA

> *"[w]omen and men have equal responsibilities and there is no division of labour work. Women today do all kind of work that men do. […] Men and women get equal wages in MGNREGA, and if we go for work outside we will get more wages, so we prefer doing work outside than going for MGNREGA work. For women, that wage is enough. […] If we [men] don't have any other work outside, then we go for MGNREGA."*

This male perspective on the Act seems to not only reflect but also reinforce the existing gendered social hierarchy. Further, it stresses that, unlike women, men have better options for generating income with better conditions than those offered through the MGNREGA. Women are perceived as co-earners, though men continue to follow the breadwinner model of acting as the family member who earns the most and takes economic decisions. As the quoted farmer perceives men like himself to be higher in the social hierarchy than women, he also feels entitled to receive better pay when possible. Today, accepting MGNREGA work appears, then, to constitute a female livelihood strategy, as men usually do not aim for it, given the low payment of Rs. 150 a day under the Act compared to an average daily wage rate for male paddy laborers of Rs. 250 ((Thadathil and Mohandas 2012). This reveals existing gender differences in the labor market and shows that men have more opportunities to find better-paid daily wage work than women, particularly when the latter are less educated. Masculine work is also characterized by more physically strenuous tasks, such as carrying wood or stones used for construction and housing, a booming sector.

3.6.2 Kuruma moral economies

Aside from the positive impacts of the MGNREGA on the gendered division of labour – offering better income strategies for women and increasing their mobility – the program also needs to be subjected to critique, especially as the rules and regulations of the MGNREGA offer little long-term security towards fulfilling many of their everyday needs. Particularly for young mothers, the Act offers no options for generating additional household income, which might be a necessity for them due to logistical reasons, such as inability to undertake long commutes and lack of childcare possibilities during work hours. The program also conflicts with the Kuruma's moral economy in terms of strategies of timing and resource

pooling, because wages are only paid on a monthly basis, which makes it difficult to meet daily expenses for people who have not been used to having savings. Furthermore, given the limited work opportunities outside the agricultural season and a maximum of 100 working days, senior women critique how the Act fails to offer women economic stability.

Taking an activist feminist perspective, the NGO Women's Voices in Wayanad has critically reflected upon the MGNREGA, which is viewed as constituting a governmental programme that, in effect, further reinforces the uneven power relations between women and men in the region. According to the NGO, the standard minimum-wage policy of the programme rather exploits than empowers women's social and economic roles. Based on the NGO's experience, Adivasis do not have the habit of saving money for the future, because they tend to spend it the same day that they get it. Furthermore, landless Adivasis and those who have difficulties getting an identity card required for MGNREGA registration are excluded from the Act. Hence, instead of reducing the social and economic vulnerability of marginalised groups like the Adivasis, the employment act rather takes advantage of marginalised people because, in exchange for their low-paid and temporary labour, it offers them little in terms of long-term livelihood security, as also mentioned by the Kuruma women cited in the previous subsection. This standpoint offers an interesting perspective on the exploitative aspects of the MGNREGA as being associated with an on-going marginalization of tribal people in Indian society.

Criticism of this rural work programme is also relevant for understanding tribal politics and the ways in which social hierarchies define people's social status within Indian society. According to my Kuruma informants, participation in the MNGREGA differs according to class, caste and religion (Thadathil and Mohandas 2012). It is in fact middle-class people, mostly Christian women and older people, who tend to make use of this work opportunity. Particularly for seniors, the MGNREGA provides a strategy for generating additional income. From the Kuruma point of view, however, the Act might not necessarily provide the best future prospects for the poor, because when tribal people participate in the MNREGA, they are automatically re-categorized onto the Above Poverty Line (APL) list. Given the benefits offered by the government when registered on the Below Poverty Line (BPL) list – such as health insurance coverage or allowances for housing – tribal people often refrain from participating in the work programme, as it ultimately leads to a devaluation of their economic standing. This situation is a likely cause of the ambivalent opinions related to the MGNREGA and seems to undermine the government's idea of enhancing social protection through public works (Pellissery and Jalan 2011).

3.7 Gender–nature nexus

3.7.1 A changing environment

Overall, agrarian change and changing environmental conditions, including increasing temperatures, irregular rainfall and water scarcity, appear to be negatively affecting gender–nature relations in the study area. These factors have also been shaping a wider agrarian

crisis (Lerche 2011) which is characterised by the altering of cultivation practices from subsistence staples (rice) to cash crops (plantains, beans, ginger), due to the low economic profitability of rice today. Water is a key environmental concern in the region and is, naturally, closely related to agriculture.

A dominant theme for both male and female Kuruma farmers with regard to their knowledge of the agro-ecosystem is deforestation and lack of water. Deforestation has not only changed the physical landscape but also the ecosystem, resulting in increasing water scarcity. Lack of water is also strongly related to the current trend of conversion from food to cash crops, such as the introduction of areca nut (Jose and Padmanabhan 2015). Irregular rainfall poses a major challenge to paddy cultivation in particular because, unlike plantains and bananas, rice relies upon natural rainfall.

Male and female Kuruma farmers emphasise that water scarcity, irregular rainfall, infrastructural development as well as population growth are all negatively influencing the future of agriculture in their communities. Senior female farmers in particular stress the unpredictable patterns of rainfall that negatively affect the cultivation of rice in particular and the environment more generally. Despite the growing uncertainty of the future of agriculture, farmers of both genders all argue for a need to sustain paddy cultivation in order to maintain food security. This perspective reinforces the fact that agriculture is not only based on cultural but also on economic values, as being able to cultivate rice minimizes economic expenses and avoids financial risk according to the logic and ethics of subsistence production. One senior female farmer who works on her family's fields suggests that environmental issues and obstacles to agriculture such as drought, erosion and flooding need to be overcome, because the Kuruma still feel the need to continue with agriculture while adapting to the changing environmental conditions. Adaptation can thus be seen as one strategy for trying to ensure subsistence production (Scott 1976) and, thereby, sustaining food security in the community. Furthermore, despite the changing environmental conditions they are facing, female and male farmers all underline the cultural value of rice. For example, one female farmer points out that "whatever happens, we won't avoid cultivating paddy – at least for own consumption". A male farmer adds that rice "is the most important food item for the Kuruma, and it is important to cultivate what we consume". Buying rice from the outside would be too costly, contradicting the logic of the subsistence principle. Key for the continuance of paddy cultivation and home-grown rice is ownership or availability of agricultural land. However, some farmers reveal counter-tendencies to this perspective, complaining about the diminishing lack of interest shown by the young generation in agriculture, due to an increased orientation toward profitability. This lack of agreement within the farming community highlights a direct link between agrarian and social transformation processes taking place amongst the Kuruma farmers and in the Wayanad region in general. Furthermore, my fieldwork has revealed age to be an important factor for gaining a better understanding of the multiple dimensions of agrarian

change, because it is particularly young Kuruma women who now show little interest in agriculture in Wayanad.

Another crucial factor reshaping gender–nature relations among the Kuruma is tourism. A male Kuruma farmer, referring to the growing real estate and tourism industries, explains:

> *"Now tourism is spreading very fast, so the real estate business is thriving and so the value of land has gone up. This is a major problem for the tribal people. So, in these places, land use has drastically changed. One example is Kuruva Island nearby. Earlier it was all pristine forest and good water, but now there are so much anti-social elements. The water is very much polluted and the environment is not very safe. There are broken beer bottles everywhere. It is not safe to walk in the water anymore. […] We are not saying that tourism is bad and that tourists are unwelcome, but there should be a limit, and the rules and regulations should be strictly followed. (emphasis added)"*

Interesting is the dualism between social and anti-social relationships to nature, because it underlines the "ills of development" (Williams and Mawdsley 2006) and how they disturb the natural landscape while "exploiting nature". One solution, or possibly a more "social" approach, offered by the Kuruma to maintaining a sustainable balance with the environment would be state intervention based on legal agreements that would seek to protect the natural landscape. Furthermore, female informants emphasised the need for infrastructural development as being crucial for sustaining agriculture in Wayanad.

3.7.2 The contradictory values of agrobiodiversity

The decision-making process regarding the growing of traditional rice varieties versus hybrid ones appears to be marked by ambivalence. The old rice variety Gandhakasala, for example, has a strong cultural meaning for the Kuruma and is mainly used for weddings, religious ceremonies and festivals. According to male farmers, the main reasons for a decline in old rice variety cultivation include a growing focus on economic values, meaning here the attempt to achieve high economic benefits from agriculture at the lowest possible expense. One male farmer explains the link between crop maturity and economic profit. A new rice variety, for example, takes two to three months to grow, whereas an old variety requires six months. Therefore, another male farmer describes the old variety as being "not progressive", emphasising the need for agricultural progress. However, most Kuruma male farmers claim that, instead of only providing subsidies based on a profit-maximising orientation, financial support from the government should be given to maintain the cultural values of doing agriculture in a sustainable manner.

Female Kuruma farmers see the future of agriculture being dependent on environmental change and their capability as farmers to adapt to it. In this vein, it is worth noting that crop preferences are also related to the reliability of agricultural seasons and the availability of water for irrigation. For example, farmer of both genders from the Kanjambetta Kuruma settlement argue that the cultivation of old rice varieties should be seen as a gain because, unlike the new rice varieties, traditional ones are less vulnerable to pests and diseases.

Particularly with regard to increasing water scarcity and/or irregular rainfall patterns, the cultivation of traditional rice varieties appears to be more feasible, as these are also more resistant to lack of water. Yet, a farming couple from the Kalluvayal Kuruma settlement has challenged this perspective, clarifying that, due to irregular rainfall patterns and water scarcity, farmers today can only cultivate during one agricultural season as opposed to two in the past. This tends to lead to the selection of those crops that grow easily within one season and require less water. For example, plantains require less water than paddy, though the latter does not require any pesticides or fertilizers.

Overall, the attitude towards agrobiodiversity amongst the Kuruma is contradictory and has multiple meanings in terms of traditional vs. modern relations to nature. On the one hand, Kuruma female and male farmers underline the strong cultural importance of growing traditional rice varieties to sustain Kuruma culture and food traditions. On the other hand, the cultural significance of cultivating traditional rice varieties contradicts the increasingly economically driven nature of agriculture in Wayanad. Being a traditional farmer appears to stand in opposition to the idea of being a progressive one. In addition, changing rainfall patterns and the long cultivation period of traditional rice varieties challenge the basis of the Kuruma's subsistence needs. However, with regard to pest control, the cultivation of traditional rice varieties might actually be a better choice.

3.8 Conclusions

In this paper, I have looked at the ways in which agrarian change and social reorganization of two Kuruma communities in Wayanad, India, are reshaping gender–nature relations. In doing so. I have focused on the three main themes gendered subjectivities, rural off-farm employment and the gender–nature nexus and identified a number of contradictions revealing the complexities of gender–nature relations.

Taking a careful look at gendered subjectivities in the study area has put under pressure the socially constructed image of women being closer to nature or protectors of agrobiodiversity, which are aspects that actually seem to play an insignificant role in the everyday lives of Kuruma women. Instead, it is rather men who reinforce the dichotomy between traditional/modern agriculture by constructing a self-identity of Kuruma people as being "traditional agriculturalists" who cultivate sustainably in environmental and economic terms. Agriculture is categorized as a masculine domain which not only constitutes social relations of power and authority between female and male Kuruma farmers but also denies women the right to claim agricultural knowledge. Kuruma women's subjectivities are now, however, being strongly reshaped by social reorganization taking place at the community level, key determinants of which include access to education, mobility and increased employment opportunities.

Meanwhile, a governmental work program, the MGNREGA, is now contributing in a less than ideal manner towards increasing the transformative potential of shifting gender roles among

the Kuruma at the household level. On the one hand, the MGNREGA has altered women's social status in three important ways by, firstly, increasing women's geographical mobility, secondly, offering women the opportunity to generate additional income for their families and, finally, enlarging women's economic responsibility within the nuclear-family setting now becoming prevalent. Yet, on the other hand, the employment scheme seems to be reinforcing the traditionally gendered social hierarchy in which men are perceived as the "breadwinners" and women as mere co-earners. Furthermore, the MGNREGA appears to be in conflict with the Kuruma's moral economy and its related risk-reduction principle, because the program's 100-day work offer policy fails to offer long-term economic stability. In addition, the interplay of gender, age, ethnicity, social status, and caste are important intersectional categories of difference that might potentially reinforce gendered inequalities rather than support women's empowerment through the program.

Changing environmental conditions, such as irregular rainfall, water scarcity and land-use conversion practices as well as the tourism industry are resulting in an uncertain future for agriculture in the region. Nevertheless, both female and male Kuruma farmers stress the need to sustain old-variety rice cultivation in order to maintain food security and to minimize economic expenses. Some Kuruma farmers also consider tourism to be as an "anti-social" element that is exploiting nature in the region and, therefore, upsetting human–nature relations there.

Contradictory values also seem to be circulating within the Kuruma community regarding agrobiodiversity, specifically with regard to the cultivation of traditional versus modern rice varieties. Some informants in the study area do not consider old rice varieties to be progressive, whereas others argue for their continued cultivation, due to their resistance to pests, diseases and water scarcity. According to most female farmers, the availability of water through irrigation appears to be a crucial concern for sustaining agriculture in the future. Meanwhile, male farmers seem to be more concerned with the shift in values away from subsistence and towards profit-oriented farming. Instead, they argue for more financial support from the government to maintain the cultural values of doing agriculture sustainably, particularly with respect to paddy cultivation

Returning to the catchphrase with which I have tried to encapsulates the motivation underlying this paper, I conclude that, instead of simplifying gender–nature relations in terms of "pro nature – pro women – pro poor", it is rather the complex dualisms of traditional/modern agriculture, formal/informal agricultural knowledge, progressive/anti-progressive methods as well as social/anti-social practices that are shaping the Kuruma's relationships with their environment today.

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4 Exploring gendered rural spaces of agrobiodiversity management – a case study from Kerala, South India

Abstract

Feminist approaches to gender and development reveal the fluidity of gender identities which are shaped by shifting social and environmental contexts. Research on gender and the management of natural resources has shown that changes in the environment affect women and men differently. Overall, this case study of Wayanad, Kerala, South India seeks to examine the gendered dimensions of land use change. It particularly examines the role of micro development programmes on women´s everyday lives.

This research is informed by using qualitative research methods including focus group discussions and semi-structured interviews. Building upon feminist geographies, I analyse the gendered dimensions of land use change through the lens of indigenous female and male farmers who have traditionally been involved in paddy cultivation. I aim to explore the ways in which land use change influences women´s ability to sustain food security while considering the gendered roles and responsibilities amongst indigenous communities on a household level. Crucial in this regard is to look at the ways in which micro development programmes offer new space for women to manage agrobiodiversity.

Exploring the gendered dimensions of changes in land use does not only require a critical engagement with land ownership and the distribution of land. It also reflects on the construction of gendered spaces and how these are meaningful in relation to issues of power.

Keywords: Feminist geography, land use change, agrobiodiversity, mircro politics, Wayanad, India

4.1 Introduction

Rural women's mobilizing in various movements has been growing for the last four decades. Adivasi or indigenous people's movements initially occurred in India against class and gender inequality. Basu (1995) described the movements as women's indigenous feminism, whereby women became conscious of their role and strength in improving the lives of their households. These grassroots movements sought to transform their everyday spaces. Adivasis have only recently begun to make their presence felt as environmental change has eroded their livelihoods in many parts of India. They continue to be marginalized but have often been assisted by civil society, Self Help Groups and local NGOs. As their land is increasingly alienated they look for multi-local livelihoods and become more mobile (Panda 2013). Only recently have such activities begun to take place in Kerala in southern India. This chapter looks at indigenous women's activism in Kerala as a response to land use change and environmental degradation.

Wayanad is a hilly region in Kerala, South India, on the edge of the Western Ghats between 700-2100 meters above sea level. It has recently been designated as a UNESCO World Heritage Site due to its remarkably high level of biological diversity as a biological 'hotspot'. *The Hindu* newspaper described the region's new status as a "reflection of India's concerted efforts to inscribe the world's hottest hotspot on the World Heritage List" (12 July 2012). The ecological value of Wayanad´s natural landscape characterised by paddy fields and forest is also essential for the people living in the area. Unlike other parts of Kerala, Wayanad is largely "tribal" as 17.7% of the local population is made of Adivasi communities, as indigenous population groups are called (Rath 2006). Paddy cultivation has a strong cultural meaning for Adivasis in particular because rice is their main staple food and, therefore, essential to maintain food security. However, the current agrarian crisis in India (Reedy & Mishra 2009) as well as changes in land use and cultivation practices including the conversion from agricultural fields to land for housing and infrastructural development all contribute to rural diversification in farming households in India (Arun 2011). This trend influences current agrarian and gender relations amongst the Adivasis.

4.1.1 Determinants of changes in land use

Agricultural transition in Kerala is linked to changing cropping patterns such as the conversion from food to cash crops. In the past, Wayanad was mostly characterised by rice fields whereas today, agricultural fields are also used for plantain, ginger, arecanut and vegetable cultivation. Overall, paddy cultivation has decreased as it is no longer profitable. Changes in demand for labor, including rising labor costs and labor shortages,further challenge the future of paddy cultivation. In addition, increasing variability in rainfall patterns negatively affects agriculture and particularly paddy cultivation so that now high yielding varieties of rice can be cultivated in only one season instead of two as in the past. Another dominant driver of land use change is on-going deforestation due to growing demand for land required for housing because of rapid population growth, infrastructural development and the needs of the tourism industry in the region. The distribution of

agricultural land is also influenced by changes in the social organisation of indigenous communities in Wayanad. Increased education and migration has encouraged a shift from a joint to a nuclear family system which leading to a reorganisation of property rights from collective to individual ownership of land.

4.1.2 The Kuruma people

This case study focuses on the gendered dimension of land use change amongst the Kuruma tribe which is one of the land-owning communities of Wayanad. The Kuruma consider themselves as traditional agriculturalists that have always been involved in paddy cultivation. Therefore, cultivation practices are also strongly embedded in the social organisation of the Kuruma whose sources of subsistence are mainly paddy and vegetable cultivation. In the past, subsistence agriculture served as a protection against poverty and starvation whereas today, both Kuruma men and women are involved in work outside the agricultural sector to generate additional income. Social changes associated with the shift from the joint to the nuclear household structure as well as increased levels of education have altered the social status of the Kuruma women in particular. Elmhirst (2014) sees these changes as material feminisms linking nature and multi-local livelihoods. The introduction of community development programmes such as the "Kudumbashree" (Women's Self Help Groups) enlarges opportunities for empowerment of poor women. Women meet in Kudumbashree groups not only for discussions about health and education, but also for organising joint cultivation practices which offer a possibility for women to manage and use agrobiodiversity outside the masculine domain.

We explore how changes in land use influence women's ability to sustain food security while at the same time consider the gendered roles and responsibilities amongst indigenous communities on a household level. Crucial in this regard is to look at the ways in which community programmes such as the Kudumbashrees offer new space for women to manage agrobiodiversity. The next part presents a short overview of contemporary work on gendered geographies in India, the phenomena of the gender paradox in Kerala and the dynamics of the Kudumbashree movement in Kerala.

We used qualitative research methods including in-depth, semi-structured interviews and focus group discussions with Kuruma women and men farmers from two different Kuruma communities living in two distinct locations. Field work was carried out over seven months from February-July in 2011 and January-March 2012.

4.2 Gender, space and development

4.2.1 Gendered geographies in India

Recent work within feminist geographies in South Asia calls for analytical frameworks that conceptualise the social and conceptual formations of space and place (Raju 2011; Raju and Lahiri-Dutt 2011). These frameworks aim at a better understanding of the spatial embeddedness of social relations which are shaped and created by notions of femininity and

masculinity. Using a gendered geographical perspective means viewing gender as a social construct defined by behavioural norms for women and men. However, gender as a feminist concept is not fixed but fluid and changing over time. Crucial in this regard is sensitivity to difference amongst women from other subaltern locations. Thereby, the concept of intersectionality provides a useful approach to explore the ways in which gender is socially constructed in the South Indian context. It particularly considers differences in caste, class, gender, ethnicity and identity in relation to the construction of social hierarchies.

A central and much contested debate is the binary separation into public and private domains. Unlike Eurocentric notions of the public/private binary, the "fluidity of binaries" (Raju 2011:13) appears to be a unique feature in most Asian countries. Instead of reinforcing the private/public dualism, Raju & Lahiri-Dutt (2011) emphasise the socially constructed nature of space and place while arguing that the boundaries between both are rather fuzzier than simply sexually segregated geographical locations. Moreover, the organisation and meaning of space is a product of transformation and experience which differ among communities, caste and gender. For example, the spatial segregation between genders amongst Scheduled Caste and Tribal population groups appears to be less restrictive compared to women from high castes due to different social norms and hierarchies between the genders. According to Lahiri-Dutt (2011), doing gender refers to the idea of situating gender and, therefore, is closely linked to a critical engagement with inequalities and imbalance of power. She offers an important perspective for the Wayanad context and claims that the intersection of space, power and knowledge are experienced on an everyday basis. In addition, Raju (2011) explains that contemporary research on gendered geography in South India seeks to challenge patriarchy being manifested through formally and informally institutionalised structures in order to oppose women´s essentialized enclose within the paradigm of domesticity.

4.2.2 The "gender paradox" in Kerala

Unlike Northern Indian states, Kerala has a tradition of a matrilineal system of inheritance in which familial property is widely passed on through females (Devaki and Thampi 2007). It is one of the few states in India where the Gender Development Index (GDI) parallels the Human Development Index (HDI). As such, Kerala proves to have high indicators of social development referring to a high level of female literacy and women´s enrolment in higher education compared to men´s even with low per capita income (Sreekumar 2007). The North-South Indian controversies also form an interesting field of inquiry for gendered geographies. Women in Kerala have a longer life expectancy by as much as 18 years compared to women in Madhya Pradesh despite little difference in per capita income (Raju & Lahiri-Dutt 2011).

However, despite equal access to basic needs and material resources for women in the development planning process, research has identified two alarming trends that question the high development profile of women in Kerala: little participation of women in decision-making processes and increasing control over women´s bodies through domestic violence

(Erwér 2011; Mukhopadhyay 2007). This contradiction is interrelated with patriarchy established through formally and informally institutionalised structures (Raju 2011). Thereby, traditional gender norms are being reproduced and fail to challenge the uneven distribution of power in gender relations in Kerala. Some scholars see this in relation to the Kudumbashree movement in which conservative gender norms and the gendered separation of space remain powerful (Devika & Thampi 2007).

The gender paradox debates in Kerala call for a critical engagement with the ways in which the "paradox" of Kerala has been socially constructed through the media, politics and Keralite society itself. Shreekumar (2007) questions the mutual relationship between greater female literacy and women´s emancipation as the comparison is based on social indicators that do not necessarily reflect progress made in gender and development. She examines Kerala as utopia and as dystopia. Utopia is explored through a discourse analysis of the Kerala model of development and tourism advertisements; dystopia is evaluated through the discourses on AIDS and sexual violence. Whereas development discourses are often gender neutral, the tourism industry portrays the high status of women who enjoy a modern life in Kerala portrayed as God´s Own Country. The ideal woman of dystopia is vulnerable who does not fit into the traditional gender norms. In Shreekumar´s (2007: 49) view, utopia and dystopia are different but "equally hegemonic worlds". She critiques the gender paradox in Kerala as constituted by women who are marked by socio-economic privileges and excludes the consideration of gendered differences amongst women from marginalised population groups (Scheduled Caste/Tribes). This strongly relates to the hierarchical structure of Indian society as a whole in which those people belonging to Scheduled Tribes in particular are often left out.

4.2.3 The Kudumbashree: introducing Kerala´s poverty eradication programme for women

The Kudumbashree Mission is a women-oriented poverty eradication program based on micro-finance microenterprise launched by the Government of Kerala in 1998. According to the government´s programme website (http:www.kudumbashree.org), the program aims at the empowerment of women in households living below the poverty line (BPL) .Furthermore, it is considered to be one of the largest women-empowering projects in the country, having 4 054 000 members and covering more than 50% of the households in Kerala. As a response to current development concerns, the 11th 5 Year Plan of local state governments stresses agricultural production, local economic development, poverty eradication and social equity as primary objectives. The Kudumbashree Mission relies on participatory governance initiatives to support decentralisation processes.

Overall, the program is based on the framings of development concerns and addresses issues of gender equity, participation and poverty eradication (Williams et al. 2011). It encompasses three key organisational features: first, operationalization through women participants; second, self-organisation in neighbourhood groups (NHG) and third, the group´s relationship with the state. Men are generally not included in the Mission's overall

structure and objectives. The Mission covers three different levels: the community development society (CDS) on the panyachat level, the area development society (ADS) on a ward level and the neighbourhood groups (NHGs) on a community level. All these are significant areas of interface of the CDS with the local government. Using a feminist analytical perspective, Devaki and Thampi (2007) describe two historical reasons for successful implementation of the Kudumbashree in Kerala. First, it highlights the individualization of women in education. This includes employment on all levels with a relatively low domination of patriarchy. Second, the program builds upon domestic ideologies which favour unpaid labour. Instead of promoting gender equity, the Kudumbashree Mission rather fosters community development in which empowerment of the poor refers to the "creation of greater space and flexibility for the poor within the socio-political entrenched structures" (Devaki & Thampi 2007: 44). This view on empowerment appears to be a useful viewpoint from which to further examine the potential of the Kudumbashree's offering of new space for women to manage agrobiodiversity and, therefore, potentially agents of development (Devaki and Thampi 2007).

4.3 Gendered dimensions of land use change in Wayanad

4.3.1 Kudumbashrees – a space in which women become agents of development?

Recent critical assessments of the Kerala government´s poverty eradication programme, the Kudumbashree (Arun 2011; Devika & Thampi 2007; Williams et al. 2011), offer fruitful insights to this case study on gender and land use change in Wayanad. The Kudumbashree program is a useful means to explore the interactive nature between public and private spaces. I use the example of the Kudumbashrees to reveal the ways in which women cope with agrarian change while using this space to manage agrobiodiversity. The Wayanad case study on the gendered dimension in land use change stresses the importance of the Kudumbashree movement amongst the Kuruma. In three out of four villages, the micro-enterprise Kudumbashree groups are crucial for women´s everyday life. In Wayanad, Kudumbashree neighbourhood groups are called Women Self Help Groups (SHG). Several office bearers form the groups: a president who attends meetings with the local panchayat, a secretary who is responsible for minutes and pass books, a treasurer who manages the funds, a health worker who looks after houses and attends health classes in the panchayat in order to inform the group members accordingly, an income manager who attends classes on governmental money schemes and a basic amenities worker who is in charge of housing and sanitation facility schemes provided by the government.

The ways in which the groups are socially organised is clearly gendered while reproducing traditional gender norms. Men have recently shown interest in becoming involved in Kudumbashree meetings for men. Unlike women´s groups, men's Kudumbashrees receive little support from the government. Field research has shown that in all three Kuruma communities mainly women participate in the Kudumbashree groups. Usually, the groups consist of up to a maximum of 20 women members only. In one community, two men's Kudumbashree groups existed, however, one woman described thess groups as unsuccessful

because in her view, “men finish the money very easily and they don´t save the money like women do. The secretary of that group took the money and ran away” (Interview, 13.06.2011). This statement nicely illustrates a gender difference in dealing with savings which are originally meant to support the family.

For the Kuruma women, the groups serve four main purposes: first, they appear useful in providing opportunities to take loans required for health issues, children´s education or marriages; second, they increase women´s social and economic responsibilities; third, participating in the groups has increased women´s mobility and fourth, the Kudumbashrees foster women´s empowerment. In order to become a Kudumbashree member, participants need to pay a weekly contribution between 10-20 INR which allows women to take loans which they need to repay within 2 years. The interest for the loans provided by a bank would be 9% whereas being a Kudumbashree member, women need to pay only 4% interest, the other 5% is subsidised by the government. The micro-credit programme is particularly important for widows who have the responsibility for their children´s education. One senior woman states that the Women SHGs have improved her life because,

> *No one from outside will give this much money as loan. And their interest rates are also very high. I have 2 daughters and to marry them off, we have to have some money and similarly there are many things in the house that needs money (Interview, 15.06.2011).*

This directly leads into increased social and economic responsibility for women. A former group secretary highlights the link between the Kudumbashree movement and increased responsibility for women today.

> *It was men looking after all such things and now with the Kudumbashrees, women started doing most of the things at home. Especially taking loans are done by women. In the past, women were involved in household or kitchen work but now women are involved in many things including bank dealings” (Interview, 13.06.2011).*

The majority of the Kuruma husbands support women´s participation in the group because through the units, women save money and help the family. One woman further clarifies that “if women have an opportunity to save this money then it helps in alleviation of poverty” (Interview 13.06.2011). This thought links to the main agenda of the Kudumbashree program stressed by the Government of Kerala. Some women say that men also borrow money from women through the Kudumbashree groups. A tribal promoter describes that through Kudumbashree, “responsibility of men is getting reduced and that of women is increased. … Here women are helping men so they won´t say not to go to Kudumbashree” (Interview, 08.03.2012). This statement reveals increased responsibility for women to fulfil the needs of the family which reinforces traditional gender roles and responsibilities. Nevertheless, most women participants support the view that the Kudumbashree Mission brought lots of positive changes in women´s everyday life. For example, a young woman states that “I also learned many things through Kudumbashree. I learned how to deal with money matters,

also banking process. I also learned how to behave with others. Now I am far better than I was" (Interview, 09.02.2012). For this young woman, the group helped to overcome an inferiority complex because she has improved knowledge of managing monetary matters and enjoys more interaction with other women. A senior women from the same village argues that today, "women go for work outside and so get to know many things and do works and we earn money. Now women are almost independent" (Interview, 9.2.2012). Overall, both statements highlight that improved access to training programs for poor women have reinforced self-confidence.

These insights are also related to another aspect that brought major changes to Kuruma women´s everyday life: increased mobility and participation in public life. A majority of the Kudumbashree participants appreciate that instead of being restricted to the domestic domain only, the group offers space for social interaction outside the home. The shift in the social organisation from the joint to the nuclear family system also results in greater mobility for women. In addition, greater freedom on how to use time is also linked to agrarian change. Due to the availability of mills, the processing of paddy demands less time than in the past which allows for greater flexibility. One woman expresses that today women enjoy "more freedom and get space for what they want to do and also to mingle with the rest of society" (Interview 23.06.2011). This thought clearly emphasises that the participation in the Women SHGs enables women to cross the domestic boundaries while entering a public space offered by the Kudumbashree movement. However, neighbourhood groups usually take place in private places such as the home and, therefore, uncover the fuzzy boundaries between public and private spaces.

Mobility is closely related to the empowerment of women, which is according to the official website, the overall objective of the Kudumbashree programme. The case study of the Kuruma in Wayanad stresses that from the women´s perspective, the participation in the SHGs has helped women to "grow, to develop and to empower" (Interview, 14.06.2011). Also the tribal promoter supports this view, arguing that "units like the Kudumbashree (…) gave opportunities for women to come forward and lots of good changes have come for women today" (Interview, 08.03.2012). This thinking nicely links to Devaki´s and Thampi´s (2007) notion of empowerment understood as creation of greater space and flexibility for the Kuruma women within the existing social structures.

Despite the positive effects of the program on women´s mobility and increasing social status within the society, the structure of the groups reveals a generation gap. As stated by many women participants, the Mission´s rules and regulations do not allow senior women over 60 years to participate in the programme. In addition, Kudumabshree excludesmothers with young children and reinforces the conflict between the group and domestic responsibilities including childcare. Furthermore, given the weekly contribution of 10-20 INR, uneducated extremely poor women are also excluded from the program because they do not have the economic means to become a group member. This contradicts the program´s overall objective of being a poverty eradication program addressing poor rural women. As men are

completely excluded from the programme, the Kudumbashree Mission fails to address its goal of promoting gender equity.

4.3.2 The Kudumbashrees and agrobiodiversity

Having looked at the social dimensions of the micro-enterprise community development initiative, the Kudumbashree also offer useful insights into how women cope with changes in land use. The meetings provide space for women to discuss any matters related to agriculture including the use of tractor, tiller and other machinery or which crops and vegetables to cultivate. It has also been common to buy cattle through the Kudumbashree groups. However, due to little land being available, it has become increasingly difficult to feed them and, consequently, stock farming has decreased. In addition, the decline in cattle has also a religious dimension because, as explained by one member, "animals were being reared for meat (…) and my conscience did not agree with it" (Interview 23.06.2011). Even though dung can be used as fertilizer, the women in this particular group decided to move away from joint cattle farming.

One main joint task women do through the group is group farming. Overall, the women find it easier to do group farming because "it is difficult to do cultivation separately and so we do it together in fields taken for lease" (Interview, 03.02.2012). As such, Kudumbashree participants come together to grow paddy, ginger and vegetables they either sell on the market or keep for themselves in order to maintain food security. If women decide to cultivate collectively, the group needs to apply for subsidies at the Area Development Society (ADS) who sends officials to the villages for approval. Once the application is accepted, the local government gives subsidies for cultivation. Vegetable seeds are provided by the "Krishi Bhavan" (a regional office of the Kerala Agricultural Department) whereas the choice of which rice variety to cultivate is with the women. Paddy cultivation is an important aspect for the Kuruma women and men farmers. They grow new and old rice varieties with the latter playing an important role for maintaining their tribal culture and traditions. Old rice varieties are necessary for catering wedding celebrations and religious rituals. In one village, yam cultivation is an important additional source of income. One SHG member explains that, "we were doing yam cultivation and for that work is also less (…) and at the same time we can earn money also. We will get subsidy from the government to make masala powders or to have a mill or anything that we like" (Interview 13.06.2011). However, joint decisions over vegetable cultivation also create conflict between the young and older generations. Unlike the younger generation, older women prefer to cultivate yams.

Exploring the role of Kudumbashree amongst the three Kuruma communities has shown that the movement offers space for collective farming for women. This space is little influenced by patriarchal power relations due to the gendered separation of space. This fails to challenge the status quo in regard to traditional gender performances on the one hand but also provides opportunities for women to cope with agrarian change. Furthermore, the study demonstrates that the Women Self Help Groups amongst the Kuruma are strongly related to agriculture which stresses the interrelations between space and locality. Being

agrarian Adivasi communities, women also successfully use the groups as a strategy to cope with changes in land use. Therefore, the case of the Women Self Help Group offers a useful example through which to better understand the social construction of gendered spaces.

4.3.3 Multiple dimensions of land use change

The reasons for changes in land use are constituted by agrarian and social changes occurring in Wayanad and amongst the Kuruuma. One important driver for land use change is the conversion from agricultural fields to land for housing. Population growth and infrastructural development including the construction of roads and new houses, all contribute to increased demand for land. A crucial change for all four Kuruma communities is the replacement of thatched houses by brick houses. The construction of the latter is also subsidised by the government in order to strengthen tribal development. Further development projects include the construction of roads, of ponds in the fields and of wells for household water.

The shift in the social organisation amongst the Kuruma is also linked to changes in land use because more land for housing is required for nuclear families who wish to live in separate houses built for single households only. As a consequence, as outlined by one woman farmer, “there is not enough space to construct houses so even if we want to construct a house in the fields we have to get permission from government” (Interview, 14.06.2011). Therefore, in order to prevent continued conversion of land, the Government of Kerala has introduced a law that prohibits the construction of houses in paddy fields.

A second dominant trend leading to land use change is changing cropping patterns associated with the shift from food to cash crops such as banana (plantain), yam, ginger and arecanut. As a result, the vayal (paddy field) has become kara (elevated land). A 72 year old village chief offers a historical perspective on changes in land use and argues that “now fields are less and if we cultivate other crops then paddy will not be sufficient” (Interview, 30.01.2012). In addition, a woman farmer underlines this thought while pointing to the on-going trend in shifting values in agriculture which are linked to a changing landscape. She describes that “all those places were paddy fields earlier, now there are buildings everywhere. People are lazy and do not want to do agriculture now. They want to make money (…)” (Interview, 23.06.2011). In addition, another male farmer sees the reasons for the shifting attitude towards agriculture based on an economic rationality.

> *The value of fields has changed and it is changing. Now nobody is interested in agriculture as earlier. Mainly because they have to spend lots of money for agriculture and they don´t get money back. Now people are looking for profit. That is why the shift came in agriculture. (Interview, 15.02.2012)*

This statement stresses that agrarian change in Wayanad is linked to the phenomena of de-agrarianization because farmers lose interest in farming activities as it is not profitable anymore. Changing cropping patterns are also linked to demographic changes in Wayanad. With the arrival of Christian settlers from the plains of Kerala, new crops such as arecanut

have been introduced to Wayanad. However, according to a woman farmer , this change in agricultural practices negatively affected paddy cultivation. She explains that,

> *(…) Christian farmers are cultivating arecanut in the fields and along with it came water shortage. One of the reasons (…) is that they make canals for cultivating arecabut, so all the water is drained away. So the water table level decreases and (…) there is scarcity of water everywhere. So that is why paddy cultivation has decreased thereby leading to the cultivation of banana and ginger. There is less coffee and almost no pepper now and instead people are cultivating rubber trees" (Interview, 15.06.2011).*

This explanation highlights that the lack of water due to changing cropping practices is a major concern for Kuruma farmers. One woman clearly expresses her disfavour of arecanut and explains that "(…) there should not be any arecanut. It is very sad (…) all we could see was paddy fields. Now in between, everyone has planted arecanut. This has decreased the water capacity of the area and it is not a good change" (Interview, 14.06.2011). This statement reveals that the lack of water can be interpreted as a result of changing cropping patterns. Central in this regard to water scarcity is also deforestation. Being described as another driver for land use change, deforestation is closely related to population growth, increased demand of land for infrastructure development and water scarcity in the region. Rising temperatures in Wayanad and declining rainfall can potentially have been caused by massive deforestation.

Overall, changes in land use in Wayanad have different causes and consequences for the Kruruma community groups. Agrarian change constitutes the conversion of agricultural fields and changing cropping patterns which are both caused by population growth and changes in the social organisation of the Kuruma.

4.4 Conclusion

Even though the Kudumbashree Mission may reinforce traditional gender norms and binary divisions between public/private spaces, I suggest that using this case study offers interesting insights into how rural, Kuruma women use that space to manage agrobiodiversity through collective farming approaches. Rather, the micro-finance programme presents one example of how boundaries between the private and the public spaces become fuzzy. Kuruma women either lease land or cultivate on their family`s fields that could be seen as a private sphere but they also interact with the local government in the public. However, discussions and negotiations over the choice of crop or vegetables to be cultivated remain within a "safe" space amongst women only, in which the power of patriarchy is less dominant. Furthermore, as feminist approaches to the gender and development nexus have shown, gender identities and performances are shaped by shifts in the social and environmental context. The Kudumbashree program builds upon this thought and reveals that agrarian communities such as the Kuruma have transformed the Kudumbashree Mission according to the local context and women´s needs. Being traditional agriculturalists and considering the on-going agrarian change in Wayanad, Kuruma women use the community program in order to maintain food security for their families. This reproduces the traditional gender norms associated with the caring notion of rural women on the one hand but also demonstrates the women's potential to become agents of development on the other (Devika and Thampi 2007). Therefore, the Kudumbashree´s functioning amongst the two Kuruma communities in Wayanad can be seen as one aspect of empowerment of rural Adivasi women. As such, the Kudumbashree Mission offers a new culture in rural development in which particularly women can perform as agents of development (Devaki and Thampi 2007).

However, using a feminist perspective, the overemphasis on women is highly problematic because it specifically excludes poor men from development initiatives. Furthermore, the impacts of the Kudumbashree on Kuruma men and women farmers are contradictory in nature. The Mission improves woman´s mobility and fosters empowerment on the one hand but increases women´s domestic responsibilities for sustaining the families' needs on the other. Consequently, Kudumbashree fails to address concerns associated with gender equity while reproducing traditional gender norms among the Kuruma.

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5 Discovering positionalities in the countryside: methodological reflections on doing fieldwork in South India

Abstract

Critical reflection on our positionalities fosters a better understanding of our embodied research experiences. Positionalities undergo transformation throughout the process of data collection and analysis. In this paper, we seek to engage with the question of how our situated, fluid positionalities shape relations and the data collection process in the field. To this end we discuss 1) our positionalities as researchers in the research process; 2) field entry; 3) embodied field performances; 4) marital status; and 5) the relationship between research assistants and researcher. Discussion of these interrelated themes is prefaced by a brief introduction to contemporary work on Indian feminism and gendered geographies.

Keywords: Positionality, reflexivity, gender, cross-cultural research, embodiment, India

5.1 Introduction

When conducting qualitative research we are challenged by our fluid and contested positionalities as researchers towards our subjects and the emerging relationship of power between us (Berg L. & Mansvelt J., 2000; Crang, 2003; Mcdowell, 1992; Rose, 1997) The notion of objective and value-free research delivering universal truth cannot be held up in the face of situated encounters, where the researcher as a social being is similarly questioned and interrogated by the interacting interview partner, thus co-creating statements. The 'crisis of representation' in the 1980s gave rise to an influential movement that questioned the possibility of truthful presentations and representations of the 'other' and the capacity of the subaltern to be heard (Nagar & Geiger, 2007). In response to this crisis, Western academics either abandoned fieldwork or adopted a reflexive approach that is usually incorporated into the post-fieldwork phase. Nagar & Geiger, 2007, 267) describe a feminist understanding of reflexivity as a way of acknowledging that "ethnographic knowledge is shaped by the shifting contextual and relational contours of the researcher's social identity and her social situatedness or positionality". Especially in feminist research, epistemologies demand reflexivity and introspection on positionality, that place the research and the researcher on a map of power relations (Jackson, 2006a). Building upon this idea, Smith (2003) claims that geographers need to critically reflect upon their positionality while doing research in countries not their own. She defines positionality as

> *…our "race" and gender … but also our class experiences, our levels of education, our sexuality, our age, our ableness [and] whether we are a parent or not. All of these have a bearing upon who we are, how our identities are formed and how we do our research. We are not neutral, scientific observers untouched by the emotional and political contexts of places where we do our research (Smith, 2003 286).*

Critical engagement with our positionalities, identities and emotions in the research process is crucial for doing fieldwork in an ethical and personal as well as academic and political sense (Wolf, 1996). This paper addresses a number of methodological questions that arose while conducting fieldwork in South India. In particular we explore issues related to our positionalities and revealed through a process of critical reflexivity. The two experiences of fieldwork discussed in this article were conducted early on in our careers as social scientists, in rural areas of the neighbouring states of Kerala and Tamil Nadu in South India, and in both cases with an explicit focus on gender issues. MARTINA Padmanabhan (2003) studied the social interaction between NGOs and rural women in Dindigul district, Tamil Nadu during the six months of research for her MSc thesis in 1995. This research was undertaken in association with the Gandhigram Rural Institute and supported by an individual grant from the Indian Council Cultural Exchange. Isabelle Kunze (Momsen et al., 2013) investigated the social organisation of agrobiodiversity related to land use change in Kalpetta district, Kerala during altogether eight months between 2010 and 2012. The research was undertaken towards her PhD, as a member of the 'BioDIVA' research group, hosted by the Indian NGO,

M. S. Swaminathan Research Foundation (MSSRF). BioDIVA was an Indo-German transdisciplinary research project (Christinck & Padmanabhan, 2013). The BioDIVA team included three interdisciplinary research 'tandems', each consisting of a Germany-based and an Indian doctoral student, working in the field of economics, ecology or the social sciences. Two of the Indian researchers were former staff members of MSSRF, and their perspectives were informed by this experience.

In this paper, we argue that critical reflexivity on our positionalities fosters a better understanding of our embodied research experiences. These undergo transformation throughout the process of data collection and analysis. We particularly seek to engage with the question of how our situated, fluid positionalities shape relations and the data collection process in the field. We also examine how our emotions and emotional relationships affect our positionalities as researchers.

Our critical and methodological reflections focus on five main areas of interest, which emerged while conducting fieldwork and also during the course of data analysis and retrospective interpretation of the experience: first, our positionalities as researchers in the research process; second, field entry; third, embodied field performances; fourth, marital status; and, finally, relationships with our research assistants. We focus on these themes because they are mutually related and were those that principally affected our positionalities during the fieldwork and afterwards. These methodological reflections are prefaced by a brief introduction to contemporary work on Indian feminism and gendered geographies that provides the theoretically context for our empirical work.

5.2 Indian perspectives on feminisms and gendered geographies

In order to understand the social and cultural context of the research described in this paper, it is important to refer to and reflect on contemporary debates on feminism and gendered geographies in India. The emphasis in these debates on fulfilling women's needs illustrates the intellectual discourse and climate in which the empirical work took place. In this paper, we argue that social relationships during data collection among the researchers, research assistants and interview respondents were shaped by power structures derived from hierarchies of gender, social status, class, age and ethnicity in the South Indian setting. Indian views on feminisms and feminist geographical research on India provide fruitful areas of theoretical discourse that can help to contextualise our empirical experiences in the field and inform reflection on our positionalities.

Indian ideas on feminism(s) are characterised by a number of ambivalences that highlight the multiple meanings of feminist thought (Bhagwat, 2004; Bhasin & Said K. N., 2004; Chaudhuri, 2004; Krishna, 2007; Rege, 2004). Adopting a postcolonial viewpoint, Chaudhuri´s (2004, xii) body of work focuses on women's activism in India but contains little on theoretical feminist approaches. Indian feminists are ambivalent towards the use of the term 'feminism' itself because Indian gender studies have focused strongly on exploring the

'history of the women's question in India' . In discussing exclusion, power and gender equality, Chaudhuri (2004) underlines the differences between Indian and Western social values. She notes that the Western idea of equality is 'alien' to Indian society with its strong hierarchical family and community structures. Thus, researchers doing fieldwork in India need to re-examine concepts such as equality and women's emancipation, informed by a critical analysis of our own embodied positionality and understanding.

Bhasin and Said K. N. (2004) argue that there is no single understanding of Indian feminism as it is based on historical and cultural realities and derived from differing consciousnesses, perceptions and actions. Historical research in India has laid the ground for theorising feminism as being strongly related to postcolonialism and the class and caste of feminist actors. Bhasin and Said K. N. (2004, 4) suggest a broad definition in which Indian feminism can be understood as 'an awareness of women's oppression and exploitation in society, at work or within the family, and conscious action by women and men to change this situation' . This idea clearly addresses gender issues and the subordination of women, but without referring to the roots of subordination in patriarchy.

According to Bhagwat (2004, 298), research on gender (in)equality needs to develop theoretical and methodological frameworks to deconstruct Indian masculinist culture. While feminist work critically engages with differentiations and specificities related to class, caste, tribe or cultural and religious minorities 'no one took note of the voices of women as women'. In examining the literature on Indian feminist thought, it becomes clear that the theorization of gender as an analytical category remains a gap in research (Krishna, 2007). However, feminists involved in Dalit studies and indigenous feminisms focusing on marginalised people stress that 'it is imperative for feminist politics that 'difference' is historically located in the real struggles for marginalised women' (Rege, 2004).

Contemporary feminist geographical writings by Raju (2011) and Raju and Lahiri-Dutt (2011) draw attention to geographical differences among constitutions of gender, age, class and ethnicity. Current work highlights how Indian feminism is distinct from Western feminist thought. Rather than emphasising the multiple meanings and representations of gender, power relations and the body, emerging feminist geographical research in India focuses on women's access to the basic resources, in order for poor households to lead better lives. They do so by calling for analytical frameworks which encompass the social and conceptual formations of space and place. These frameworks enable a better understanding of the spatial embeddedness of social relations that are shaped and created by notions of femininity and masculinity. Crucial for examining Indian gender geographies is sensitivity to differences among women from different subaltern locations. Lahiri-Dutt (2011) claims that in India, intersections of space, power and knowledge are experienced on an everyday basis. Activity spaces such as home (private) and the market (public) are not simply sexually segregated geographical locations but mutually exclusive. This observation is related to a key element of contemporary work on gender and geography in India: the much contested debate on the binary separation into public and private domains. Consequently, the "fluidity

of binaries" (Raju, 2011) appears to be a defining characteristic element of everyday life in most Asian countries that merits reflection during the research process.

Overall, Indian perspectives to feminism adopt a postcolonial approach[10] that puts the historical context and historical injustices at the centre of analysis, while focusing on women's voices rather than the analytical concept of gender. Inspired by poststructuralist thought, contemporary work on gendered geographies in India highlights the complex organization and meaning of space, understood as a product of social transformation and experience (Raju, 2011). In this paper, we uncover the ambivalences of doing fieldwork and respond to the call to critically reflect upon our positionality as researchers (Smith, 2003) in a cross-cultural setting, from a feminist perspective. We further aim to contribute to the theorization of gender as an analytical category (Krishna, 2007)that is socially constructed and, therefore, expressed differently in distinct cultural contexts and places. This builds upon current feminist geographical work on India that aims towards a better comprehension of the spatial embeddedness of social relations that are gendered. In addition, we address issues concerned with gender (in)equality and the ways in which Indian masculinist culture (Bhagwat, 2004) affected our positionalities in the field.

5.3 Methodological reflections on positionalities

5.3.1 Situating ourselves in the research process

In this section we reflect on the experience of doing fieldwork in South India and living in a conservative, rural environment over a period of several months, and on our roles as researchers, as women and as German citizens before and after fieldwork. Martina Padmanabhan is daughter of a Tamil Brahmin and a German mother and, at the time of her MSc fieldwork, was single and 25 years old. Having been brought up and educated in Germany, her Tamil is rudimentary. Experiences of family visits and traveling in South India, studying rural sociology, and working for a year on a farm in Germany feed into her ideas and images of rural India.

Isabelle Kunze is a white, middle-class, married and university educated woman. She was raised in Germany and, at the time of writing, is 31 years old. She started her PhD research in South India without having any proficiency in the local language (Malayalam). During her twenties, her strong interest in development and cultural studies led her to travel to countries like Thailand, Laos, Australia, New Zealand and Egypt; however, she had not been to India before starting work on her PhD. Looking back, she considers that her lack of knowledge about Indian culture and its complex, heterogeneous traditions reinforced her "outsider" position and resulted in a feeling of being "out of place". During her first research visit to India, a photo[11] taken by a colleague records her first encounter with the divide that separates the researcher from her respondents. The picture taken in 2010 in Wayanad

[10] A postcolonial engagement with the German-speaking development geography is offered by Lossau (2012).
[11] Due to ethical issues, the photo of Isabelle and the women taken in a South Indian village cannot be printed.

district, Kerala shows Isabelle's first field visit to a Kuruma village, standing next to village inhabitants and a social worker.

During the exploratory field study, Isabelle Kunze visually analysed the picture through the lens of critical reflexivity. These thoughts also underline her embodied positionality in the field.

> *The two taller women in the middle of the five women were the ones who took part in the interview. The young women on the right of the photo accompanied us throughout the whole visit; she supports the self-help group in the village. The other two shorter women were curious about our visit and spontaneously joined us. (…). It can be seen that the tribal women did not want to come closer to me. This reveals the 'artificial' disconnection between the researcher and the research participants. Furthermore, the differences in clothing also demonstrate cultural differences. Based on my experience so far, a lesson learned is that wearing traditional Indian clothes (Shalva Kameez) makes me feel that I am on a similar level to the respondents and more socially accepted. Wearing western clothes makes me feel "different" (or 'western' in terms of the 'other'). I feel it is important for the research and interviewing process to be 'among equals', even though I am aware that I am still a European, unmarried*[12] *'young lady'. I also hope that spending more time with tribal women in particular will help to establish some relationship between us. (Kunze, Exploratory study field notes, 2010)*

Similar considerations apply to embodied performances and to social and marital status; issues which will be further explored below.

On starting out the fieldwork for her MSc, MARTINA Padmanabhan (2003, 32) experienced a role reversal when women identified as respondents refused in a most charming way to follow the routines of a semi-structured interview. Instead they set out to interrogate the young lady from Germany, asking direct and detailed questions about her family background and set-up, as well as her educational aspirations. By interrogating her in this way according to their own criteria, the women situated the interviewer in their life-world. The exploration and comments on the obviously inter-religious marriage of her parents, her motivation to come to India to study and her pitiable lack of further sibling beyond one brother, had two ends. On the one hand, the information extracted served to place the lone girl in a social cosmos and revealed her embeddedness a wider network that offered her protection. On the other hand, these interrogations, that involved discussion of a wide range of topics from beauty patches to eating habits, taught the researched researcher about the criteria the women held to be important and applied to organise their social world and form judgments. While considering herself in the best western tradition as an independent woman with a great degree of self-determination, these cordial cross-examinations unveiled her own social blind spots. As Mosse (1993) notes, women in interviews do not clearly demarcate personal from private information, or subject from relationship. By locating the researcher within

[12] At that time (April 2010)

their own perspective, the women 'interviewees' laid the groundwork for the subsequent process of data collection.

5.3.2 Entering the field: encountering life-worlds

An exploratory field study conducted by the Indian-German BioDIVA research team promised to be a useful way for Isabelle Kunze to gain a first impression of the research area, Wayanad district in Kerala, South India. This study took place in April–May 2010 and provided an opportunity to meet research colleagues and to visit a number of field sites and indigenous agricultural communities. The experience enabled her to reflect on her positionality as a researcher, and led her to question both her outsider role as a European researcher, and her partial knowledge about the issues raised in the research proposal[13]. Even though Isabelle had conducted an in-depth review of literature on gender and agrobiodiversity, the feminization of agriculture and the use of participatory methods in the field, she felt inadequately prepared theoretically. In her exploratory field study report, she explained that

> *(…) leaving for India without having a clear picture of what we are going to find out and how (and also given the fact that this was my first time in India), I actually felt a bit under-prepared. However, the positive side of not being fully theoretically prepared was that it allowed for a great level of flexibility, which I believe was an essential asset for my first experience of field work in India. (Exploratory field study report, 2010)*

This commentary reveals a difficulty that many researchers probably find themselves in before entering the field. On the one hand, she felt the need to be familiar with the knowledge derived from the literature on the field of interest. On the other hand, she also wished to attain a "neutral" position as a researcher, being aware that knowledge entails a certain bias and, therefore, her own acquired knowledge represents only one amongst many modes of thought.

Isabelle's experience of undertaking an exploratory study underlines that knowledge is never value-free but situated and partial. England (1994) explains that reflexivity is central to fieldwork because it encourages self-discovery and may lead to insights and new hypotheses about the research questions. Billo and Hiemstra (2013) stress the importance of concepts such as reflexivity and embodiment within the context for doing fieldwork. Reflecting on field experiences in Ecuador, they highlight the incompatibility between writing a clear, precise and confident research proposal on the one hand, and dealing with the methodological "messiness" in the field on the other.

A literature review on the nexus between agrobiodiversity and gender identified two major themes relevant to Isabelle's research: the feminization of agriculture and the declining

[13] Isabelle Kunze considers herself as lucky to have had this opportunity to undertake an exploratory study, which in her case was incorporated in the research project design and thus the funding proposal. Such a study is useful in international research projects, helping to build cross-cultural capacities among team members and enabling contextualization of theoretical research proposals which are often written "out of place".

social status of women due to a loss of (agro)biodiversity caused by a conversion from rice paddy to banana and plantain cultivation[14]. It is considered that the better status of women in South India compared to the North has "something to do with the historical dominance […] of wet-rice cultivation, which makes significant demands for female labour" (Corbridge, Harriss, & Jeffrey, 2013). However, the exploratory study in 2010 challenged these assertions in the literature, because mainly men rather than women are involved in agriculture in Wayanad. Preliminary results of our research showed that women, particularly more educated women, often prefer to leave the agricultural sector because of its low financial returns. In addition, a crucial observation made during the exploratory study was that the loss of agrobiodiversity might not be as strongly related to a declining social status of women as is often portrayed in the literature on agrobiodiversity and gender (Howard, 2003). These findings forced Isabelle to question her initial assumptions after returning from the field, and led her to revise her research questions and identify new topics for investigation. The findings of the exploratory study lend support to (Raju, 2011) notion of spatial embeddedness of social relations, as being not only gendered but also shaped by other intersecting categories including age and social status. For example, Isabelle became aware that changes in the social organisation among land-owning indigenous communities in Wayanad affect women and men differently according to age. In addition, social changes, in particular related to improved education and increased mobility of women, contribute to changing agrarian relations. Consequently, the current focus of her research is to explore how agrarian and social changes are interrelated and how these changes are gendered. Overall, the exploratory study was a fruitful opportunity to question her positionality with regard to the overall research objective and the "problem situation" described in the initial research proposal. Discussions among the team with researchers from other disciplines on these matters also stimulated critical reflexivity on the research focus.

Isabelle's experiences were a consequence of the institutionalised structure of research projects and the need for research funding. Applications for grants require proposal writing and the production of outline research designs. Often, when the time comes to apply the theoretical research question on the ground in the fieldwork stage, carefully thought-out ideas go to pieces and prove inappropriate. Confrontation with the idiosyncrasies and strangeness of the field induces a slow, but persistent erosion of theoretical assumptions and concepts. Hypotheses based on literature review have to be altered to account for facts observed in the field, and discovered in encounters with respondents, colleagues and research assistants (Padmanabhan, 2003). In this situation, the researcher can feel overwhelmed by new impressions and confused by the loss of perceived stable positionality, making it hard to stay focused on the research aims. Participant observation can help overcome the feeling of disorientation in the field and provide inputs for productive reformulation of research methods. Thus the initial confusion can stimulate the

[14]The differentiation between rice paddy and banana/plantain has a gender dimension because paddy is often considered a 'female crop' whereas banana/plantain is a 'male crop'. Although in both cases men hold the decision making power, paddy cultivation involves mainly women's labour.

development of more adequate research questions and perspectives, and further the identification of relevant key-categories, revealed through a process of discovery. This is not a pain-free process for the researcher. Reflection, reformulation and slow development of a more relevant research question go hand in hand with intellectual and emotional friction, as unreasonable expectations of completeness and unlimited resources give way to a growing awareness of capacity constraints and the vastness of the field. But this painful encounter between an idealised research setting and the messiness of the life-world opens up the research process, making room for new and surprising findings from which new hypotheses can emerge. Thus, questioning of our positionalities is a fundamental stage of the research process: a source of irritation that becomes productive.

5.3.3 Embodied performances in the field

Field work literally implies stepping into field, villages and houses of people, where researchers and research subjects interact visually even before interview takes place. Jackson's work on feminist epistemologies and development research offers useful insights into reflexivity and its meaning in the context of doing fieldwork in an unfamiliar country. She argues that reflexivity "refers to the fact that, in describing something, we do not stand apart from it, separate from the order already existing around us" (Jackson, 2006a). This idea fits into the notion of embodied performance, understood as the ways in which performances of gendered bodies define masculinities and femininities, which are shaped by power structures (Datta, 2008), i.e. social hierarchy. The following commentary is the product of Isabelle's post-fieldwork reflection on the experience of the fieldwork process, and illustrates how the production of embodied performances in the field reinforces hierarchical structures within a cross-cultural research team.

Hierarchy in an Indian context is defined through social status, religion, marital status, caste and the level of education, all of which are gendered. In this case, data collection was planned and implemented by six doctoral researchers, three women and three men, with similar levels of education and assigned roles within the overall research project. However there were major differences among us in terms of social and marital status, as well as ethnicity. Two men were NGO staff members as well as researchers, and thus had a double role within the research team. Drawing on their Keralan origin, status as senior staff members, strong links with the partner NGO, extensive field experience and long-standing interactions with Adivasi communities in Wayanad, these two men designated themselves as being at a higher level in the hierarchy, over other members of the project team. The men perceived themselves as being responsible for the "protection" of the women colleagues at a lower level in the institutional hierarchy, adopting the Indian behavioural pattern of the elder brother. This embodied performance entailed the reconstruction of Indian masculinist culture (Bhagwat, 2004) within the context of the research team and the reproduction of patterns of gender (in)equality which are linked to social hierarchy. There were considerable unease on both sides in the Indian and German team members regarding what forms of professional behaviour were appropriate in this bicultural setting. Indian project partners

saw their role as hosts and interpreted this role in a tradition, conservative way. For Indian colleagues, it was a challenge to understand the idiosyncratic behaviour of German, female independent-minded but novice PhD students, and more so to operationalise this behaviour in a form appropriate for conducting research among socially orthodox and rather strict rural populations. Looking back, it is clear that the Indian male team-members were struggling to find the right words to express their concerns without hurting their colleagues' feelings, but at the same time determined not to risk their good working relations with communities by allowing their new German colleagues to commit (unintended) offences. At the same time, their behaviour towards us was partly unconscious and rooted in their cultural upbringing as members of Indian society.

The Indian administrative system categorises untouchables and tribal communities as "scheduled castes" and "scheduled tribes" for the sake of affirmative action. Often these terms are linked to the label underdevelopment, providing evidence of how the treatment of castes and tribal communities in India has become part of a wider societal debate on ideas and goals of development. The attitudes behind this discourse reveal themselves in bodily performance. The general preference shown to tribal groups with 'pure' ritual practices, or for the pleasant and worldly communication patterns of male elders over the uneasy reticence of poverty-ridden former bonded labourers, is not just a matter of convenience and the ease of establishing a working relationship. On a deeper level, disgust provoked by the embodied personification of ritual impurity is embedded in the ritualised Hindu value system, and as such can paralyze even the smartest Indian partner. Such embodied feelings are linked to the tradition of untouchability (Corbridge et al., 2013), avoiding social contact, joint meals and sharing water sources. (Bourdieu, 2001) has coined the term 'habitus' for this "embodied system of dispositions durably inscribed in people's reflexes, movements and desires".

Another strong hierarchical difference was spatial locality. Harcourt and Escobar (2005, 7) stress the interrelations between embodiment and emplacement in which "bodies are constituted through power" . One young women researcher had a north Indian background, was unmarried and unable to speak the local language. At the same time, she was a gender activist with a Master's degree in Gender Studies. Her north Indian ethnic background, her young body and her active political attitude put the male colleagues outside their comfort zones, which reinforced hierarchical gendered relations in the project team. These hierarchies are constantly reproduced through embodied performances (e.g. appropriate dress codes for men and women) that in turn reproduce gender norms and body language. This raised concerns related to gender (in)equality among the German women researchers. The way that appropriate versus inappropriate embodied performance were distinguished differently for women and men team members made them feel uncomfortable. This example highlights how intersecting aspects of identity such as ethnicity, gender and social status define the spatial embeddedness of social relations.

Researchers taking part in field visits during the exploratory study were given clear guidance on culturally appropriate versus culturally inadequate field practices. Overall, these practices reveal the ways in which masculinist culture in this particular context is reinforced by embodied performances in the countryside. A key concern was the 'right' embodied performance of women and men, with respect to clothing, body language and observance of purity customs. In particular, German female team members were asked by the Indian men colleagues to wear culturally suitable clothes for "young ladies" (the North Indian dress called Shalwar Kameez), that covers the signifying feminine body parts including breast and cleavage, accompanied by a shawl (duppata) which can even be worn as a veil. Men were supposed to wear long trousers. All team members were asked to remove shoes before entering a community household, and advised that tea and food should be respectfully accepted. It was noticeable that the rules were defined by the men colleagues, who saw themselves as experts based on their long-standing experience in the field. Significantly the team did not contain any local women.

Based on her field experiences in Dehli, Datta's (2008, 189) work explores how male and female bodies, in different locations in the field, are perceived both by researchers and participants as 'markers of gender identity' . Her work offers interesting incentives for a post-fieldwork engagement with positionality and reflection on the ways in which embodied performance affects the research process. Reflecting on her experience of fieldwork, Isabelle perceived the female dress code as a spatialised embodied performance, i.e. the representation in a particular space of social identities of class, gender and religion through the body (Datta, 2008). Wearing Shalwar Kameez made her feel comfortable and culturally acceptable to the project partner, Indian colleagues, participants in the research and the local community as a whole.

Moving in rural India as a young woman challenges common assumptions about appropriate behaviour for unmarried ladies. Mobility endangers a good reputation and indeed puts the women in danger of sexual harassment and violence. Patriarchal double standards operate under the pretext of providing protection to women, providing they define themselves via their relationship to men as fathers, brothers or husbands (Padmanabhan, 2003). Once without obvious male chaperonage and defence, women appear as threatening as they undermine the tacit acceptance of a patriarchal gender regime by defying male control and standards. Even successful women scientists have to guard their reputation by not going to the field on their own, in order to maintain marriage prospects.

5.3.4 The power of marital status

Given the cultural and religious diversity in India, intersectionality plays an important role in the construction of gender identities that are shaped by multiple layers of postcoloniality (Schurr & Segebart, 2012), including class, caste, social status (married or single, being a parent or childless), ethnicity, religion and level of education. Marriage, as an institutional arrangement between gendered bodies, is one of the factors shaping gender identity and can therefore be expected to have an important influence on the research process, though

there is relatively little discussion of it in the literature (Nagar & Geiger, 2007). In her post-fieldwork reflection on her social status during the research process, Isabelle recognised that marriage was one aspect that strongly transformed her role as a female researcher during fieldwork.

Married women in India are privileged over those who are unmarried. In social life, all women need to be closely guarded by their families, brothers and husbands. This practice is based on misogynistic ideas that construct women's sexuality as powerful and dangerous; therefore, women's bodies have to be controlled by men. Still today, a "good" woman is married, a caring wife and a mother who safeguards and protects the family order in its daily material and spiritual life (Hellmann-Rajanayagam & Fleschenberg, 2008). Or as expressed by Corbridge et al. (2013, 262) in their working definition of patriarchy: "the disadvantaged female body is produced at the end of a long set of decisions which seek the domestication of girls and women and which have worked to ensure their relative powerlessness."

Traditionally assigned gender roles of married women are constantly reproduced in rural environments. During her first visit to India, Isabelle learned that marriage defines the social status of men and women. Furthermore, the social process of getting married involves significant changes in men's and women's lives that influence their embodied performances in public spaces. When Isabelle visited a farm community the first time, the first question asked by a women farmer was "are you married?" At first, she felt uncomfortable answering this question because in her view, the respondents were crossing a private boundary into an area which, she assumed, was not relevant to her research endeavour. However the respondents needed this information in order to know how to relate to her. This incident illustrates the importance of learning by researchers about the relevant categories of social relationships and their spatial embeddedness through informal conversations in the field.

Isabelle got married between the exploratory study and the start of field work in 2011 and this change in relationship status markedly changed her positionality in the field. Initially, she did not see the need to share this change in her personal life because, based on her understanding, marriage and partnerships are private matters (although in Germany marriage is also an institutional act involving a number of publicly sponsored privileges). At the start of her second stay in Kerala, Isabelle was asked about her family's wellbeing. She then shared the change in her private life with some male colleagues. One commented on the change in relationship status and said, "congratulations, now you have reached a higher level in society" (Field notes February 2011). Her social status had changed from "young lady" in 2010 to a "married woman" in 2011, which her male Indian colleagues viewed as something "better" than being unmarried. In addition, this transformation in social status affected the ways in which her embodied performance was perceived by Indian colleagues and research participants. Without her wishing it, the change in marital status also separated her from other unmarried women team members, which required reconsideration of her positionality. Overall, Isabelle totally underestimated the importance

of this change in social status and the ways in which marriage would affect her role as a female researcher and cross-cultural team member.

These considerations relate to current approaches to gender and geography in India (Raju & Lahiri-Dutt, 2011) which address the fuzzy boundaries between private and public spaces. The social meaning of "being married" in Wayanad was negotiated with colleagues and participants – both actors who belong to a public space.

For researchers, coming-of-age in the field is asynchronous to our maturation and changing social status as citizens of our country of origin. Clark (1994) describes how she gained field-credibility in her vivid account of ethnographic work at the Kumasi market in Ghana. She started off as a relatively passive, but safe, trustworthy or at least harmless visitor, owing to her limited language and social skills. Learning in leisure periods about etiquette and proper behaviour was as important for her research as the acquisition of work-based skills. Clark describes her growing biological age as less important (and often crudely misjudged) for her reputation in the field than her increasing social age. First treated as a toddler, she gradually progressed into adolescence as she proved fit to oversee the business and learned how to keep quiet when necessary. Her husband's visit later established her as a functional young women and the label of 'student' – a well-respected status in India too – accounted for her privileged family background, currently limited resources, social immaturity, use of contraception and predictable middle-class future in the eyes of the women traders she related to in the field. This is a light-hearted reconstruction of coming-of-age as a scientific fieldworker that nevertheless takes seriously the research subjects' need to embed the intruding researcher into the social setting under observation. Moreover, this recollection turns the author's sometimes frustrating encounters into sources of learning about value categories perceived as valid among the research subjects and adaptation strategies towards them. Thus, understanding of relevant social constructions can only be acquired to a limited extend by studying relevant literature. Rather, just as Isabelle describes, it is the bodily and emotional experience of being subjugated to these rules that demonstrates the functioning of categories other than those of our own socialisation.

The unintended, unconscious and mostly naïve trespassing of lines around issues treated as sensitive in German was also experienced by Martina. When the unmarried student arrived in Tamil Nadu to conduct field research for the very first time, she found that people everywhere classified her socially as the daughter of a Brahmin and this put her evolving pride in finally entering the professional world on hold. While education, especially higher education is the means to financial and thus higher individual freedom in the West, for women in India this freedom is constrained by other social categorisations that are perceived to be more important. The incidents described above underline the different connotations of public and private in India and Germany. Nevertheless, we should keep in mind that the differentiation between public and private in Germany owes a lot to the patriarchal history of capitalist accumulation and industrialisation, which created the dependent housewife. The lack of this historical experience partly explains why this strict

dualistic value system of private and public matters is not as valid in India. Rather, the focus is on the individual embedded in wider social relations and social obligations, underlining the importance of kin as a safety net in the face of limited state support and other fall-back social positions in the case of breakdown of the former.

5.3.5 The relationship between researcher and assistant

Without language skills in the local language, doing fieldwork alone in India would be an impossible task. Therefore, the most important and crucial relationship during fieldwork and for the data collection is the one between the researcher and the field assistant. Pasquini and Olaniyan's (2004, 24) work on cross-disciplinary and cross-cultural viewing of positionality stresses that the "outcome of the research process is directly affected by the social makeup of both [the] research [team] and respondents" . In this section, we respond to the lack of work that critically reflects the relationship between the researcher and the research assistant (Pasquini & Olaniyan, 2004). We maintain that the success or failure of the data collection process strongly depends on the relationship between the researcher and the field assistant, and also on their respective positionalities and how their performances relate to each other in the field. Isabelle noticed that the positionality of the field assistants and herself were influential in the data collection process, due to distinct subjectivities. She worked with two different women field assistants in 2011 and 2012. Crucial intersecting aspects of identity were age, level of education, work experience, social status and family background. Her field experiences taught her that, for a researcher, working with an experienced field assistant of a similar age was challenging, because the assistant's role and responsibility were constantly being redefined by the assistant herself. The assistant´s previous involvement in an international research project and her partial knowledge of indigenous people in Kerala encouraged her to reverse the roles in the data collection process. This resulted in a continuous redefinition of responsibilities as a team while doing the fieldwork, and arguments about the manner, style and timing of interviews and group discussions, which hindered the data collection process. The 'reversed' power and hierarchical relations led to a constant questioning of Isabelle's role and skills as a foreign female researcher. Overall, the first phase of field work in 2011 was characterised by a feeling of being 'out of place and culture'. This reinforced Isabelle's partial self-conception and role as an outsider in the research process. However, reflection on these field experiences was a fruitful post-fieldwork exercise which allowed Isabelle to gain a clearer understanding of her role and positionality as a researcher.

Field assistants commonly also assume the role of translators, and as such their function as interpreters of data cannot be overestimated (Padmanabhan, 2003). Unlike foreign researchers, whose positionality in the field can only be fully established via 'reverse questioning' by the respondents (as described above), the research assistants enter the field with social status and biographical history attached. Like Isabelle, Martina worked with two research assistants. Their common trait was a slight standing apart from mainstream convictions and conventions. As Guttandin (1993) observes, it is often those not content

with their circumstances, dissidents, and seekers of alternatives, who offer their service as translators. One of Martina's research assistants had entered an inter-caste love marriage, which was a source of constant remarks and comments. With the support of her husband she was able to arrange for transport and childcare to join Martina in the countryside and capitalize on her education and previous experiences of working as an enumerator (i.e. census worker), when she had depended on translators herself. The second research assistant was married to an older man and embedded in a larger extended family. She also was encouraged by her husband to engage in activities that took her outside the family environment. Using her earnings from work as a research assistance, she planned to open a independent bank account, separate from that of her mother-in-law. Her secular perspective on the women's empowerment in the setting of a temple town was a most enlightening influence on the research process. She had an unusual awareness of the role of religion as a force for social control – thus displaying analytical positionality – and, together with Martina, interpreted and critically discussed the statements obtained right after the interviews. Positionality is a social fact and cannot be avoided. Recognising positionality and acknowledging its influence on the data, implies recognition of how the mutually dependent relationship of researcher and research assistant gives rise to a process of data creation, and of its importance as a source of knowledge generation. Similar ideas are expressed by (Husseini de Araújo, S. & Kersting, 2012) who reflect on the contradictions inherent in the concept of translation, from a postcolonial critical perspective. In their view, contradictions not only result in failure but also in the creation of new knowledge and, therefore, are fruitful for generating open avenues of critical thought.

5.4 Conclusion: positionalities lost and found

Methodological reflections on doing fieldwork in South India served to uncover changing positionalities in the countryside of our minds. Five interrelated key issues emerged during data collection and the subsequent process of analysis and retrospective interpretation: first, our situatedness in the research process; second, the experience of encountering life-worlds on entering the field; third, our embodied performances in the field; fourth, the power of marital status; and finally, the importance of the relationship between researcher and research assistant.

When analysing our positionalities as researchers, we do not only encounter friction with Indian value systems, but also realise that our social identity, that we had presumed to be stable, in fact undergoes changes in accordance with changing private and professional relations. Reflecting on our social situtatedness and positionality under conditions of cultural difference threatens the validity of received value systems. Emotional and intellectual engagement is required to come to terms with this new uncertainty. While this process is often ignored by published accounts of research methods and design, we highlight how reflection on mismatches and conflicts in the field is an indispensable source of new knowledge.

The large and small surprises encountered on entering the field provide ample opportunity to critically reflect on subjectivity and on constitutions of gender, age, social status and ethnicity (Raju & Lahiri-Dutt, 2011), revealing how knowledge is socially produced and bound to cultural contexts. Awareness of the disparities between the research proposal and the problem situation in the field can help to revise and improve the relevance of the research questions. When unreasonable expectations of completeness give way to awareness of capacity constraints in comparison with the vastness of the field, this can be a painful experience, both intellectually and emotionally; but at the same time one that leads to the fruitful advancement of hypotheses. Confronting idealised research settings with the messiness of the life-world enables us to reflect on the research process and to become more open to new and surprising findings.

Considerations of embodied performances highlight the close interaction between embodiment and emplacement (Harcourt & Escobar, 2005), in which gendered bodies are constantly reproduced through embodied performances—such as, in particular, the culturally appropriate dress code for females — that simultaneously reproduce gender norms and body language. This also applies to social identities such as marital status. Researchers unfamiliar with these norms may undergo unwelcome, unexpected and disturbing experiences; however upon reflection during and after the fieldwork and during data analysis these can give rise to new knowledge and understanding. Furthermore, reflexive identification with our positionalities can stimulate awareness of the importance of the relationship between the researcher and the assistant and thereby enrich the data collection process.

In our view, a reflexive identification with positionality is useful as it helps researchers to critically engage with differentiations and specificities related to gender, including social and marital status, that affect our roles as researchers and thus the production of data and its analysis. However, on an inter-cultural level, reflections of this kind can be challenging as they require engagement with different value systems, power relations and hierarchies, all of which are gendered. Specifically, doing feminist fieldwork and incorporating a reflexive approach in a country like India is challenging for researchers because the feminist idea of equality conflicts with the strongly hierarchical structure and traditions of Indian society (Chitnis, 2004), as defined and negotiated by cultural values.

Acknowledgements:

We highly appreciate the willingness of all respondents to participate in the field research. Special thanks go to the research assistants without whom in the field research would not have been possible, supporting us throughout our stays in India and in providing the basis for the data analysis. The funding of BioDIVA research group by FONA – Social-Ecological Research,grantnumber01UU0908 BMBF (Federal Ministry of Education and Research, Germany) and the ICCR (Indian Council for Cultural Relations) is duly acknowledged. We also thank two anonymous readers for their fruitful feedback on the manuscript.

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6 The social-ecological web: a bridging concept for transdisciplinary research

Abstract

Conducting inter-and transdisciplinary research requires integrative tools. This study aims at a better understanding of social-ecological transformation processes through the lenses of indigenous women and men farmers from three different farmer communities in Kerala, South India. Central to the interdisciplinary data analysis is the development of a social-ecological web understood as a bridging concept that seeks to integrate knowledge from social and natural sciences. The social-ecological web is a useful method to highlight differences between the communities, to foster interdisciplinary analysis of both social and ecological changes, and to reflect on the challenges of integrating several disciplines and stakeholders.

Key Words: Interdisciplinarity, social-ecological transformation, transdisciplinarity, Adivasi

6.1 Introduction

In this design report, we reflect on the challenge of integrating social and natural sciences during the research process and propose an innovative tool for interdisciplinary integration which we call a social-ecological web. The development of this web is the output of a social-ecological study conducted as a baseline study in Wayanad district, Kerala, South India. The study is based on an interdisciplinary research programme that looks into social-ecological changes occurring amongst agrarian communities in Wayanad. The rural agricultural landscape of the area is currently undergoing environmental changes (e.g. crop and land use conversion practices, soil degradation) and socio-economic ones (deagrarianization, farmers' suicides[15]), driven by agricultural intensification. These changes result in a transformation of landscapes (land use conversion) and livelihoods (deagrarianization) which particularly affect small agricultural communities and those whose livelihood strategies were based on rice cultivation in the past. In this research, we aimed to explore local people's ecological and agricultural knowledge, as well as the social transformation processes taking place in agrarian communities in Wayanad.

The social-ecological study is one outcome of the BioDIVA[16] research project, an interdisciplinary research programme that brings together experts from varied disciplines such as rural sociology, ecology, spatial science, gender studies, and institutional and resource economics. Moreover, BioDIVA adopts a transdisciplinary approach that integrates non-academic knowledge in order to foster an understanding of real-world problems, such as changing agricultural practices in Kerala. The overall project aim is to develop strategies for the generation of transformation knowledge for sustainable agricultural futures in Wayanad. Transformation knowledge is the knowledge needed for a society to move towards to a more sustainable status while taking account of existing technical, social, legal, cultural, institutional and other conditions (Cronin, 2008; Pohl & Hirsch Hadorn, 2008).

Wayanad: a biocultural diversity hotspot

This social-ecological baseline study was conducted in Wayanad, a mountain plateau district of Kerala state located in the Western Ghats in South India. The Western Ghats are a bio-cultural diversity hotspot (Brosius & Hitchner, 2010; Pretty et al., 2009) which has recently become one of the UNESCO Natural World Heritage sites (UNESCO World Heritage Centre 1992-2013, 2012). Wayanad is notable for its large indigenous population, known as Adivasi, an umbrella term for indigenous or tribal population groups in India (Rath, 2006b). Wayanad has the highest proportion of Adivasi inhabitants in Kerala but also the highest level of poverty amongst Adivasis (Chathukulam & John, 2006b). The Kerala Government records distinguish between twenty Adivasi groups in Wayanad. They can be broadly classified into farming communities, landless agricultural labourers, artisan communities and hunter-

[15] For more information on farmers´ suicides and its siginificance in India see Münster (2012)
[16] For a closer project description see: www.biodiva.uni-hannover.de

gatherer communities (Indian Institute of Management, 2006; Nair, 1911). Many Adivasi communities have traditionally been involved in agriculture and paddy cultivation in particular.

However, socio-economic trends such as the growing tourism and real estate industries and ecological changes including irregular rainfall patterns are all modifying agricultural systems and affecting small-scale farming communities (Guillerme et al., 2011; Kumar, 2005). Changing family structures and the reorganization of labour are further drivers of changes in the social organisation of Adivasi communities (Kunze & Momsen, 2015; Momsen et al., 2013). Overall, external challenges, such as the agricultural crisis in India (Lerche, 2011) and land-use change, limit the options for Adivasi livelihood strategies in Wayanad (Kulirani, 2011; Kurup, 2010).

In the first part of this report we outline the design of the interdisciplinary study and discuss research objectives, research ethics, data collection methods, and data analysis. This section concludes with the presentation of the social-ecological web. The second part of the report focuses on the results of the social-ecological study and evaluates the social-ecological web as an interdisciplinary research tool, in the context of the challenges of integrating different disciplines and stakeholders in the research process. We argue that the social-ecological web is a hybrid between social and ecological networks, which serves both as a bridging concept and as a tool for depiction and analysis of the qualitative social-ecological data.

6.2 Research design

Transdisciplinary research consists of three phases: problem identification and structuring, problem analysis, and the practical application of results (Pohl & Hirsch Hadorn, 2008). In addition, (Novy, Beinstein, & Voßemer, 2008b) highlight three defining characteristics of transdisciplinary research: interdisciplinarity, problem-orientation and an equal relationship between researchers and project partners.

The present study was planned and implemented by the research team consisting of rural sociologists and ecologists. Each discipline was represented by two researchers, one German and one Indian, and an Indian research assistant. We built upon (Pohl & Hirsch Hadorn, 2008) notion of interdisciplinary research as a form of coordinated and integration-oriented collaboration between researchers from different disciplines. The research questions were formulated by researchers from the two disciplines, including the research assistants, who formulated research questions from their own disciplinary perspective. Two main research interests were at the centre of this inquiry: first, ecological knowledge and agricultural practices and second, the multiple meanings of social-ecological transformation processes in Wayanad district in Kerala.

The comparative social-ecological study investigated communities of two landowning Adivasi groups, the Kuruma and Kurichya, and one landless group, the Paniya. By comparing three

contrasting Adivasi communities, we hoped to shed light on the nature and causes of the social-ecological changes occurring amongst rural communities in Wayanad.

Doing inter-and transdisciplinary research requires a sound research design, which needs to be developed jointly by all researchers involved in the study right from the start. Our research design included the definition of common research ethics, an interdisciplinary list of research questions and objectives, the joint field site selection and procedures for data collection and analysis.

6.2.1 Research ethics

The research ethics were embodied in a participation agreement between the researchers and the respondents and an information sheet for the participants who agreed to participate in the study. Both documents were written in English and the local language Malayalam in order to make sure that the respondents understood the overall objective of the study. Once the communities had been selected, we approached the head of each Adivasi community to ask for official permission to undertake the research and handed out the information sheet and a copy of the participation agreement.

6.2.2 Data collection methods

This qualitative study was carried out in March till May 2011 in three Adivasi villages: Kalluvayal (Kuruma), Maanikazhani (Kurichya), and Thannikunnu (Paniya), all located in Wayanad district. Random sampling was used for the selection of the villages; the choice of participants was based on snowball sampling (Newing, Eagle, Puri, & Watson, 2011).Three methodological tools were used for triangulation. First, we conducted semi-structured key informant interviews with the community chief of each settlement on 1) ecological knowledge and management practices and 2) social-ecological transformation processes. Second, we asked women and men separately to prepare village maps and seasonal calendars (participatory methods). This division appeared fruitful to gain gendered perspectives on the agricultural practices and village structures. Third, we carried out three focus group discussions with (ideally) five women and five men from each community.

The process of data collection was shaped by feedback loops between Indian and German researchers and between researchers and the Indian assistants. Reflexivity on methodology is crucial for interdisciplinary research processes (Jackson, 2006b; Padmanabhan, 2011). The constant academic exchange between the Indian and German researchers including Indian research assistants enabled us to critically reflect upon the whole study process and especially on the design of the research questions. Based on the assistants' feedback on the interview dynamics observed in the field, the researchers reformulated and restructured the questions accordingly, which improved the effectiveness of the interviews in the field.

6.2.3 Data analysis: the social ecological web

Integration is a fundamental requirement for interdisciplinary research (Bergmann et al., 2010). The combination of knowledge from various disciplines requires the creation of methods for integration and communication to overcome terminological differences. We

developed the social-ecological web as a bridging concept that seeks to integrate knowledge from rural sociology and ecology. A bridging concept is a common conceptual framework that facilitates analysis. (Deppisch & Hasibovic, 2011) note the importance of appropriate timing in the development of a bridging concept: the decision on whether to introduce it at the very beginning or to develop it jointly in the course of the interdisciplinary process. In this study, the social-ecological web was developed during the process of analysis. Figure 1 shows the first sketch of a social-ecological web.

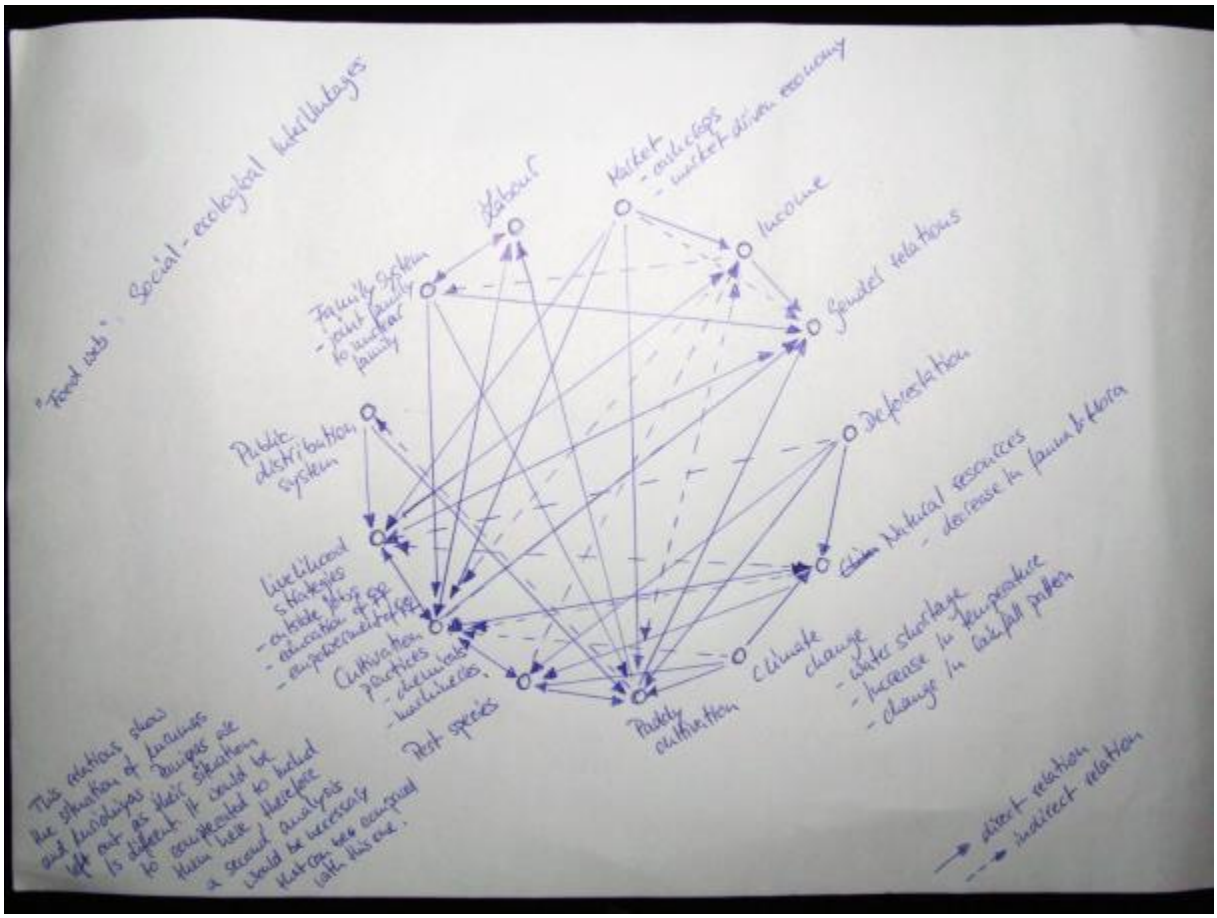

Figure 1: First sketch of a social-ecological web by Lydia Betz in 2011.

The social-ecological web is analogous to the food webs used in ecology to analyse trophic interactions, i.e. food relations. The basic idea of food webs is to map relationships between different species that inhabit a specific ecosystem on the one hand and to reveal the organization of this community on the other. Food webs vary in complexity, focus and scope depending on the studied system and the pursued goal (Sunderland, Powell, & Symondson, 2007). Just as organisms interact with each other in an ecosystem, different components in an agrarian system are linked in a similar way. Therefore, we applied the ecological method of food webs to analyse the qualitative data; replacing organisms by social and environmental topics (e.g. livelihood strategies, natural resources, and paddy cultivation). The initial idea was to map the complexities of the social-ecological system and to identify links between different components.

6.3 How to construct a social-ecological web

The construction of a social-ecological web is carried out in four steps. First, the components that describe the observed system are identified. All four researchers analysed the qualitative interview data and visual material collected through participatory method, from both disciplinary viewpoints, to identify key categories relevant to the initial research questions and interests. Then, each group of researchers discussed the results and their importance for an understanding the multiple meanings of social-ecological change in Wayanad. The aim was to determine key components of the social-ecological system (dots in Fig. 1-4). Second, we synthesised the disciplinary outcomes and pooled components for simplification (e.g. livelihood strategies as a composite of formal occupation, women's education and their empowerment). Third, we identified link*s* between the components based on different analytical procedures (lines in Fig. 1-4). We identified direct relationships (component A affects component B or vice versa) based on the interview data. This enabled us to grasp the actors' perspectives of the system's complexity. Indirect relationships (component C influences component A through component B) were determined from the researchers' disciplinary perspectives. Fourth, we indicated the direction of action for these relationships by arrow heads. Direct and indirect interrelations and the direction of action indicate on-going changes in the system.

6.4 Results and discussion

6.4.1 Comparing three Adivasi communities using the social-ecological web

In this section, we highlight some of the most pronounced observations and findings of our social-ecological study. The social-ecological webs (Fig. 2-4) reveal that the three Adivasi communities are structured differently and face dissimilar changes. The components of the social-ecological system (dots in Fig. 2-4) are of different importance for the Kuruma, Kurichya, and Paniya communities. Also the number of interrelations (lines in Fig. 2-4) between the components differs in each community. Taking the number of interrelations as an indicator of the magnitude of change, the Kuruma community (41 interrelations; Fig, 2) is undergoing most change, followed by the Paniya (39; Fig. 4) and lastly the Kurichya community (16; Fig. 3), which is experiencing the least change.

Unlike the Kuruma and Kurichya, the Paniya´s livelihood strategies are strongly influenced by other web components such as deforestation, paddy cultivation, and environmental changes (Fig. 4). This leads to the conclusion that their livelihood strategies are currently changing most, compared to the other two communities. Based on our interpretation of the data, the forest has a stronger meaning for the Paniya than for the Kuruma and Kurichya. In the past, the Paniya lived in the forest (Nair, 1911); as such deforestation has a huge impact on their relationship with nature and community life. In particular, members of the Paniya community referred to the negative effects of deforestation on the environment and on the use of natural resources and paddy cultivation. In line with (Mohindra, Narayana, Harikrishnadas, Anushreedha, & Haddad, 2010), we found that alcohol consumption is also a

severe problem in the Paniya community. This became very clear during the interviews, which revealed the highly disruptive effect of alcohol consumption on family structure and the gendered division of roles and responsibilities.

Among the Kurichya and Kuruma, most of the landholders are agriculturalists, and agricultural practices such as paddy cultivation are at the centre of community life. But a closer look at the social-ecological web for the Kuruma community reveals that almost all components are interrelated (Fig. 2). Hence, it seems that the whole community structure is currently in a phase of reorganisation. Unlike the landless Paniya, who also find themselves in a stage of reorganisation, the landowning Kuruma have the power to partially control the changes taking place in their community. As landowners, they are in the position to take agricultural decisions in response to market demand. For example they increased vegetable cultivation some years ago as the market price of rice was no longer profitable (Kerala State Land Use Board, 2006). Furthermore, the Kuruma do not depend on agricultural labour; therefore, they have the option to shape their livelihood strategies, for example by seeking higher education and formal employment. However this changes agrarian relations within the community due to reduced time available for agricultural work.

In contrast, social organisation in the Kurichya community, for example family structure and gender relations, appears to be largely unaffected by changes so far (Fig. 3). Indeed, compared with the other two, the Kurichiya community retains a more traditional social organisation. Of modern socio-economic institutions, only the market has some impact, on their agriculture; Kurichiya farmers now cultivate modern rice varieties on a small portion of their land for sale.

Despite these differences, there are also similarities between the three communities. Respondents all stated that on-going deforestation is the main driver of environmental degradation, e.g. changing rainfall patterns, which in turn has negative effects on agriculture, especially paddy cultivation. Furthermore, logging negatively affects the nutrition patterns of the all three communities. In the past, the forest was used as a resource for extraction of edible plants and hunting game (Münster & Vishnudas, 2012). Today, this is hardly possible anymore due to habitat loss as well as a hunting ban decreed by the central government under the provisions of the Indian Wildlife Protection Act (Government of India, 2012). The availability and/ or quality of natural resources (e.g. edible plants, fish) are important for the livelihood strategies of the Kuruma and Paniya communities due to the increasing cost of food purchased for consumption. Kurichya and Kuruma respondents considered intensified cultivation practices to be the cause of the declining quality and quantity of natural resources available.

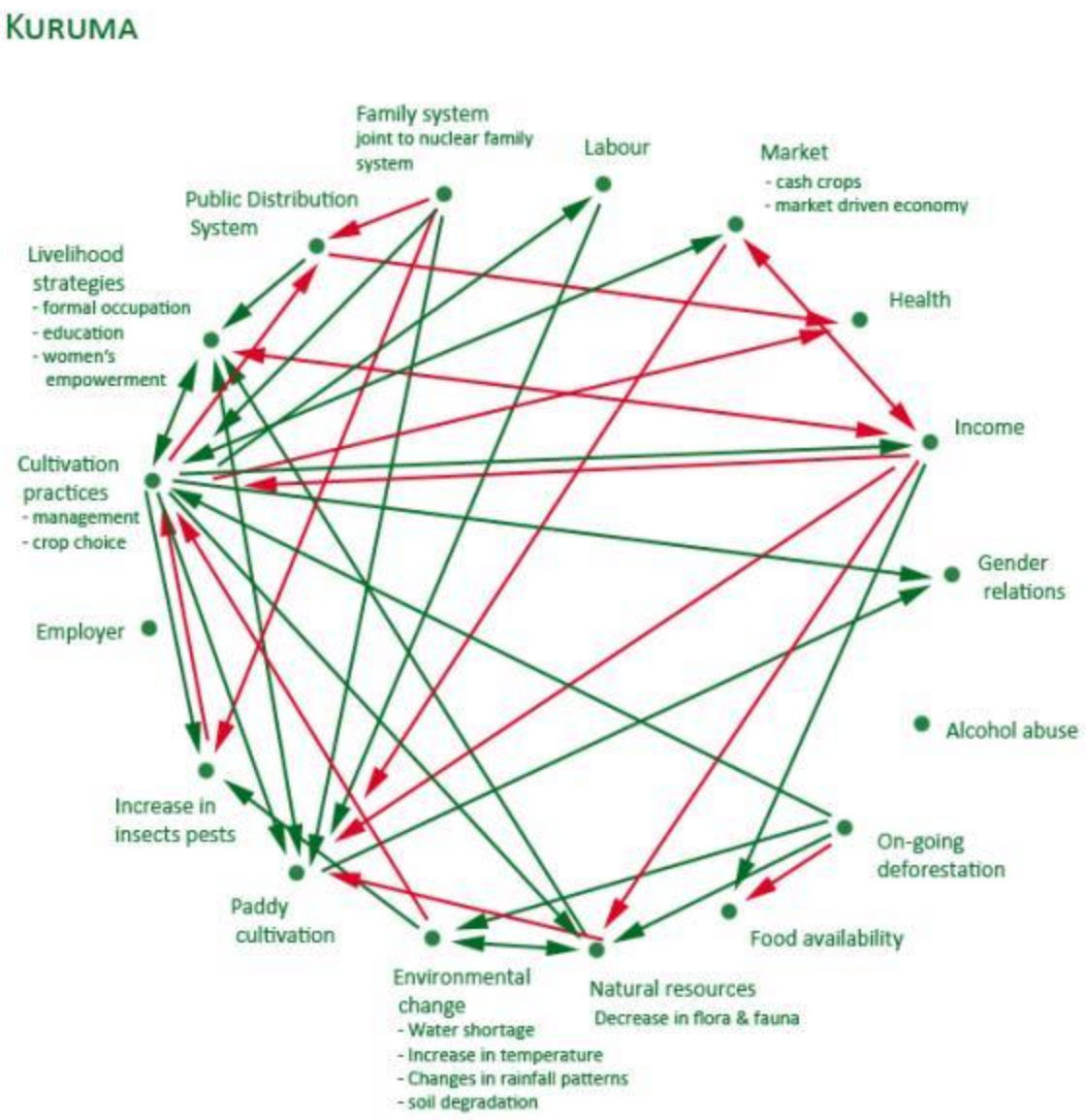

Figure 2: Social-ecological web of a Kuruma community. Dots: components important for the system derived from the data; green lines: direct interrelations between components, based on information given by participants; red lines: indirect interrelations, identified by data interpretation; arrows: direction of action, indicating on-going change processes.

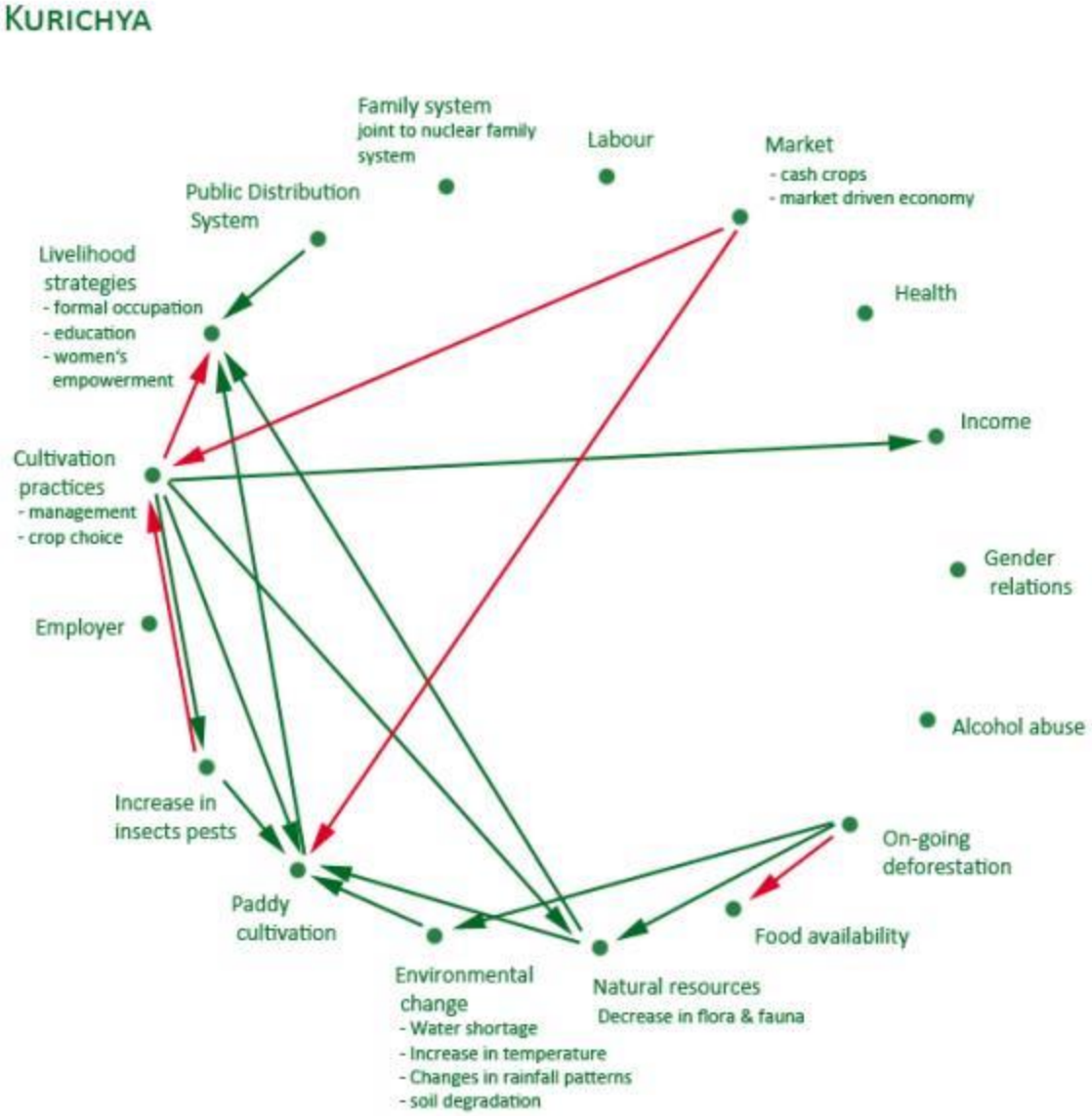

Figure 3: Social-ecological web of a Kurichya community. Dots: components important for the system derived from the data; green lines: direct interrelations between components, based on information given by participants; red lines: indirect interrelations, identified by data interpretation; arrows: direction of action, indicating on-going change processes.

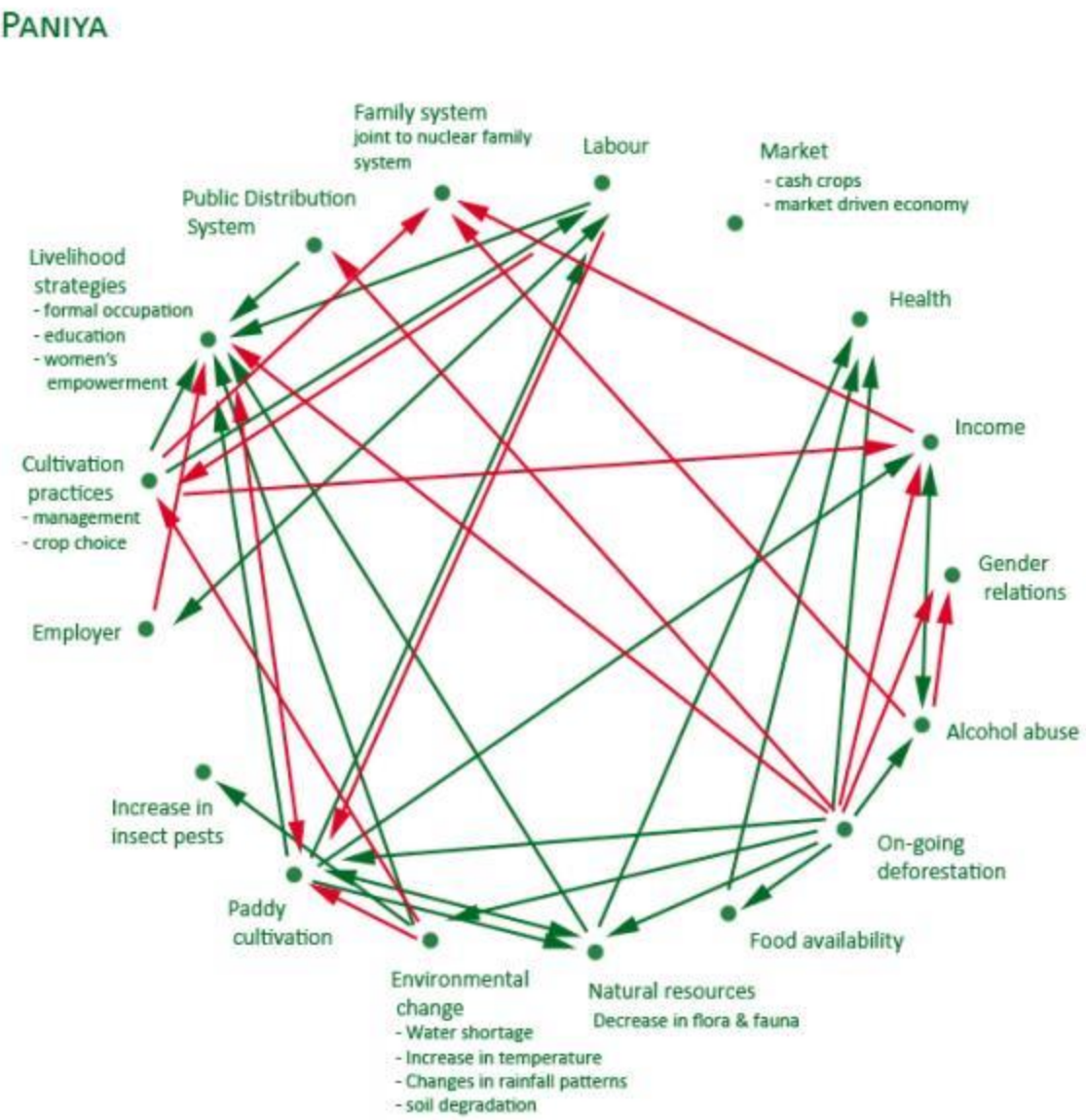

Figure 4: Social-ecological web of a Paniya community. Dots: components important for the system derived from the data; green lines: direct interrelations between components, based on information given by participants; red lines: indirect interrelations, identified by data interpretation; arrows: direction of action, indicating on-going change processes.

6.4.2 The Social-ecological web method – a useful tool?

The social-ecological web is the graphical depiction of the current state of a particular social-ecological system; in this case each of the three webs depicts an indigenous farming system in Wayanad. It is a useful tool that helps to simplify, portray and categorise the complexity and structure of an agricultural system, which leads to a better understanding of the system. It identifies important system components and those components most responsible for changes in the system. As such, the social-ecological web is a useful tool for a comparative analysis, as in our case, where it highlighted the differences between three Adivasi communities.

One limitation is that the web does not quantify the relative importance of the different components in the social-ecological system. Based on the available data this quantification was not possible. One option to improve the social-ecological web could be to ask the participants to rank the components according to their importance similarly as in Net-Map exercises (Schiffer, 2007; Schiffer & Hauck, 2010). Further enhancement of the social-ecological web method could be achieved by a participatory development of the webs. For example farmers could draw interrelations between components suggested by the researchers. Moreover participants could add components they think the researchers missed out. Using a participatory approach would also allow the formulation of social-ecological webs for the past and the future, which would highlight change processes even better. To complement this study, it would be interesting to use the same method with non-indigenous farmers in order to highlight the differences between different social classes and ethnic backgrounds, which are so important in such a culturally diverse country as India.

Although the idea of the social-ecological web was taken from food webs and thus ecology it became obvious during the critical reflection that this social-ecological web is similar to the methods used in social science e.g. Net-Maps or social network analysis (Schiffer, 2007; Scott, 2000). This leads to the conclusion that ecology and social science actually use similar methods. Therefore the social-ecological web is a kind of hybrid between methods from social and ecological science and thus an interdisciplinary tool that is easy to understand and use for both disciplines. It also fulfils the requirements of a bridging concept, by integrating knowledge from different disciplines and helping to overcome terminological differences.

The two objectives of this study were to learn about 1) the ecological knowledge and agricultural practices of the communities and 2) the social-ecological transformation processes taking place. It turns out to be difficult to tackle both issues at once. The social-ecological web method is an effective way to depict relationships between social and ecological components within an agrarian system and to analyse indicators of changes in agricultural practices. For detailed analysis of the ecological knowledge of members of the community, the social-ecological web is of limited use. The linkages between different ecological components, such as pest species, paddy cultivation or deforestation, as explained by farmers, offer some insight into their ecological knowledge. Nevertheless, interviews and ethno-ecological exercises might be a more appropriate methodological tool to elucidate farmers' ecological knowledge (Martin, 2004).

6.4.3 Challenges of integrating different disciplines and stakeholders

After having explained and discussed the use of the social-ecological web for this interdisciplinary study, we now focus on the challenges of integrating more than one discipline into the design of a research project. We consider that communication between the two disciplinary teams, including the Indian assistants, was the key to overcoming disciplinary boundaries, by establishing feedback loops within the research process from the very beginning of the study. This is in line with transdisciplinary reflections on the research process that emphasise reflexivity and the importance of feedback loops (Novy et al.,

2008b). Discussions among the researchers led to a common understanding of the research questions and to the necessary reformulation of the research questions, from the initial academic jargon into a simplified language. Nevertheless, for the data collection we used only qualitative methods from social science; methods used in ecology are quite different so that it is difficult to combine the two. To analyse the data we developed the social-ecological web, a tool which turned out to be a hybrid between social network analysis and ecological food webs. This social-ecological web allows for the visual portrayal of the complexity of a social-ecological system and enables researcher from different disciplines to better understand the changes occurring in agrarian communities.

Furthermore the experience of carrying out this social-ecological study provided insights into how stakeholders can be integrated into the research process. The tandem approach, whereby each team was composed of a German and an Indian researcher, allowed for an informal access to the Adivasi communities; performing as an intercultural team helped to overcome language barriers and cultural biases. In addition, the dual role of our Indian tandem partners being both staff members of the M.S. Swaminathan Research Foundation (MSSRF) and BioDIVA´s project partners led to a greater acceptance of the social-ecological study due to MSSRF´s high reputation among the Adivasi farmers and within Wayanad as a whole.

6.5 Conclusion

In this paper, we have described how ecologists and rural sociologists integrated their research interests into an interdisciplinary social-ecological study. The overall objective of this baseline study was to better understand changes occurring in the social-ecological system in Wayanad, Kerala. Central to this study was joint data collection and the development of an interdisciplinary concept, the social-ecological web, designed as a bridging concept to facilitate the integration of knowledge from social and natural sciences.

The social-ecological web is a useful tool to illustrate and to compare the complexities of three different agrarian systems. The comparative approach reveals the differences among the Kuruma, Kurichya and Paniya groups, in terms of the structural changes that are occurring in the communities, the interrelations among system components, and the overall number of interrelations, which together describe the degree of change in the three social-ecological systems. The results of the comparative study between the three Adivasi groups show that the social-ecological system is modified by different components in each case. For example, deforestation negatively affects livelihood strategies of the Paniya. For the Kuruma and the Kurichya, market mechanisms influence the traditional agricultural system e.g. the choice over crops and cultivation practices. Common to all groups is deforestation as the major driver for environmental change, the loss of natural resources and consumption habits. Overall, we can conclude that changes in the agrarian system strongly shape social transformation processes in all three communities.

As a problem-oriented hybrid between social and ecological network analysis, the social-ecological web is a useful tool that facilitates interdisciplinary dialogue by visualising the dominant themes identified through data analysis. It could be further developed in a transdisciplinary manner by involving stakeholders.

Acknowledgements

We are indebted to the three Adivasi communities, Kalluvayal (Kuruma), Maanikazhani (Kurichya), and Thannikunnu (Paniya), for their collaboration. We are particularly grateful to our research assistants Anushreedha and Sabitha for their inputs and skill in resolving translation problems. We appreciate the support of the M.S. Swaminathan Research Foundation and the Community Agrobiodiversity Centre in Kalpetta. We also hugely thank Teja Tscharntke, Andrea Höing, Janet Momsen and Silvia Werner for their helpful comments on the manuscript and anonymous reviewers for the careful reading of our text. We highly appreciate Andrew Halliday´s proof-reading efforts of the manuscript. The funding of BioDIVA research group by FONA – Social-Ecological Research, BMBF (Federal Ministry of Education and Research, Germany) is duly acknowledged.

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7 Synthesis of research results

How do we understand the social organisation of land-use change in Wayanad? In order response this research question, it is crucial to firstly return to and answer the three guiding research questions. Research questions one and two explore the multiple dimensions of social-ecological transformation processes and address the ways in which land-use change and the social reorganisation amongst the Adivasi in Wayanad are interrelated. The findings present an overview of the different indicators that define agrarian change. Research question two looks at the gendered implications of agrarian change using a feminist analytical perspective. As such, these findings particularly critically engage with the issue of gender equity and its meaning in relation to the use and management of agrobiodiversity. The answers to question three offer reflections on the use of inter-and transdisciplinarity as research methods to better understand social-ecological transformation processes. Secondly, I will close the thesis synthesis by spelling out some key ideas that aim to theorise the social organisation of land use change.

7.1 Answers to research questions

1) How do adivasi describe changes in agriculture and what are the reasons for declining paddy cultivation amongst the Kuruma?

Three trends describe agrarian change and rural diversification amongst the Kuruma: firstly, conversion of agricultural fields to land for housing; secondly, changing cropping patterns from food to cash crops and finally, changes in the social organisation amongst the Kuruma (chapters two-four). In addition, environmental changes such as water shortage and increasing variability in rainfall negatively impact agriculture. Changes in land use are also seen as the result of on-going deforestation due to the growing demand of agricultural land for housing such as infrastructural development, real estate industries and tourism and infrastructural development projects. The conversion of agricultural land and of cropping practices is interrelated as today fewer fields are available for agriculture and for paddy cultivation. As such, the choice of crops to be cultivated is increasingly dominated by an economic rationality. The qualitative data show that paddy cultivation has decreased as it is no longer profitable (chapters two, three, four and six). Also, changes in demand for labour such as rising cost labour and labour shortages further challenge the future of paddy cultivation. The low profitability of rice on the agricultural market results in changing cropping patterns from food (rice) to cash crops (plantain, ginger, arecanut).

Overall, agrarian change in Wayanad is the result of socio-economic and ecological changes that are linked to the phenomena of deagrarianization. However, the research results in chapters three, four and six also illustrate that despite these changes in cropping patterns and land use, paddy cultivation still remains an important crop for the Kuruma women in

particular to sustain food security on a household level. For example, the findings in chapter three demonstrate the ambivalences of the variety choice of growing traditional over hybrid rice varieties and emphasise the contradictory values of agrobiodiversity use. On the one side, environmental changes (irregular rainfall patterns and rising temperatures) and economic driven agricultural intensification negatively affect the cultivation of traditional rice varieties (Gandakashala) so that high yielding varieties of rice are preferred because they can be cultivated in only one agricultural season instead of two in the past. For the Kuruma, intensified cultivation practices are the result of declining quality and quantity of natural resources (deforestation) (chapter six). This trend highlights a shift in values towards an economic rationality that seem to contradict with Kuruma´s moral economy. On the other side, the cultivation of traditional rice varieties has a strong cultural meaning for the Kuruma because it is mainly used for weddings, religious ceremonies and festivals. As such, the use and of agrobiodiversity relates to the idea of consuming culture through sustaining traditional consumption and food habits.

The shift in the social organisation from the joint to the nuclear family structure amongst indigenous communities is the third main driver of agrarian change and results in a reorganisation of property rights from collective to individual ownership of land. This impacts societal relations with nature with regard to the ways in which land is being used, for example for cultivation or for housing due to demographic development. Factors that further contribute to a social reorganisation of the Kuruma are increased education, changes in labour and mobility. All three factors influence women´s subjectivities in Kuruma communities and result in a social reorganisation of the Kuruma household.

2) What are the gendered implications of agrarian change?

The findings of chapters three and four offer interesting insights into the ways in which agrarian change in Wayanad is gendered. At the case of the Mahatma Ghandi National Rural Employment Guarantee Act (MNREGA), I show that this governmental work programme reshapes gender relations on a household and community level because it has improved women´s social status, increased women´s geographical mobility and enlarges women´s economic possibilities to generate additional income for the family. But, using a critical feminist perspective, I argue that the off-farm employment programme also reinforces the social hierarchies amongst gender while building upon the men as breadwinner and women as co-earner economic model (see chapter three).

Another example relevant towards a better understanding of the gendered impacts of agrarian change is the Kudumbashree, a women-oriented poverty eradication programme based on micro-finance microenterprise launched by Government of Kerala, 1998 (chapter four). It is linked to agrobiodiversity as it provides space to firstly, manage agrobiodiversity through group farming as these programmes are little influenced by patriarchal power relations and secondly, to discuss agricultural matters such as the choice of crop/vegetable

for cultivation However, the analysis of the Kudumbashree shows that this mirco-development programme constitutes a space in which conservative gender norms and the gendered separation of space remain powerful. Both the MNREGA and Kudumbashree examples need to be analysed in the context of the on-going changes in the social organisation amongst the Kuruma. The use and consequences for the social reorganisation are deeply gendered as it is mostly women who utilize these programmes as a means to cope with agrarian change. This redefines gender roles and responsibilities as changing labour opportunities enlarge women´s space to cross domestic boundaries and, therefore, increase women´s power and independence in decision-making on a household level. At the same time, this phenomenon reproduces traditional gender norms because it is increasingly women´s responsibilities to sustain food security which reinforces the caring role model of rural indigenous women.

3) How do inter-and transdisciplinary methods reflect a better understanding of social-ecological transformation processes?

The two methods papers of this thesis (chapters five six) provide relevant information on the methodological process from two different perspectives. Chapter six proposes an innovative tool for interdisciplinary integration which is called the social-ecological web. It is the result of a social-ecological baseline study towards a better understanding of social-ecological transformation processes amongst three distinct Adivasi communities in Wayanad: the landholding Kuruma and the Kurichyas and the landless Panyia. The web serves as a bridging concept by integrating knowledge from social science and ecology and presents a hybrid between methods from both disciplines. Overall, the web approach was a useful methodology to illustrate and compare the complexities of three different agrarian systems building upon a participatory research design. Similar to all three communities is deforestation described as the main driver for environmental change. This builds upon the results of chapters three and four that refer to deforestation as the core reason for irregular rainfall patterns and the loss of agricultural land resulting in land use change. Furthermore, the comparative web analysis showed that deforestation negatively affects livelihood strategies of the landless Paniya whereas market mechanisms rather influence the traditional agricultural system of the two landholding communities. Crucial to the interdisciplinary research process was to incorporate feedback loops with all stakeholders and practice partners involved because this allowed overcoming disciplinary boundaries. As such, our social-ecological study and the development of the web method potentially add to current approaches of transdisciplinary research which is characterised by an equal relationship between researchers and partners of practice, interdisciplinarity and problem-orientation (Novy, Beinstein, & Voßemer, 2008).

The relationship between the researcher and the research assistant while doing fieldwork in a foreign country like India is also one amongst five issues (our positionalities in the research process, field entry, embodied field performances and marital status) that has been analysed

from a feminist methodological point of view in chapter five. Instead of presenting results or findings, we critically engage with our embodied positionalities using a reflexive approach. Particularly in cross-cultural and interdisciplinary research teams, critical reflection on reflexivity and positionality of researchers, research assistants and partners of praxis involved are inevitable for the successful implementation of inter-and transdisciplinary research projects. Integrating a reflexive approach in the early planning of a research design not only helps to overcome interdisciplinary but intercultural, personal and emotional boundaries we as researchers are confronted with during the research process including pre-field work phase and the research proposal writing process, fieldwork, data collection and data analysis. Understanding social-ecological transformation processes is also an embodied research experience that aims at acknowledging different views, values and interpretations of research results. As such, using a critical transdisciplinary viewpoint, chapter five reveals that it is rather the messiness of the life-world that allows us to reflect on the research process and become more open to new and unexpected findings.

7.2 Theorising the social organisation of land-use change

7.2.1 Theoretical implications

The gendered implications of land use change

Overall, this research reveals that land-use change is characterised by changes in the agrarian system and gender relations that are constantly being redefined by social-ecological transformation processes. I propose that the social reorganisation is directly linked to the ways in which agricultural land is used for cultivation. Furthermore, shifting social organisation, from the joint to a nuclear family structure amongst indigenous communities, here in the Wayanad case, led to a reorganisation of property rights from collective to individual ownership of land. This change of the social system is mutually related to changes in the agrarian system resulting in conversion from food to cash crops. Therefore, the choice of crops links to agrobiodiversity understood as the part of biodiversity involved in agriculture and food production (Momsen, 2007). Central to this is the human activity involved in the use and management of agrobiodiversity because women and men farmers are the ones who decide crop cultivation including traditional rice varieties to sustain local food habits, culture and religion. This highlights the idea of consuming culture through agrobiodiversity to sustain indigenous traditional culture sustainably. Agrobiodiversity can also be understood as one way in which small-scale indigenous farmers make use of the environment or nature in a broad sense. However, contradictory values describe the use and management of agrobiodiversity in regard to the choice of growing traditional over hybrid rice varieties. These values reproduce the progressive/ non-progressive and traditional/modern agriculture binary.

Three important determinants characterise the social reorganisation amongst the Adivasi and affect women's everyday life in particular: improved education, increased mobility and

changes in labour practices. These factors redefine gendered performances at the household level in an ambivalent manner: they increase women's opportunities to cross domestic boundaries by participating in the government supported off-farm rural employment programme (The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)) and the women-orientated micro-finance programme (Kudumbashree). Feminist analysis of the micro-finance programme Kudumbashree shows that it provides space for women to use and manage agrobiodiversity (see chapter four by Kunze and Momsen (2015). Thus, this thesis shows that participation in these programmes reproduces traditional gender norms while reinforcing social hierarchies amongst gender and, is therefore directly related to the notion of gender equity.

Crucial for a better understanding of social-ecological transformation processes is the analysis of gender subjectivities in agrarian relations. For example chapter three portrays how women´s and men´s agricultural knowledge is influenced by interrelations between gendered knowledge, local environment and gender roles (Momsen 2007). It reveals how complex dualisms (of traditional/modern agriculture, formal/informal agricultural knowledge, progressive/anti-progressive methods and social/anti-social practices) structure societal relations with nature in relations to agrarian change. Gender subjectivities are characterised by contradictory self-perceptions of indigenous (Kuruma) women and men farmers that particularly build upon the dichotomy of traditional /modern agriculture. Whereas masculine subjectivities are defined by the idea of being a ´good traditional farmer`, feminine subjectivities are constituted by social reorganisation on a micro level that directly change women´s spatial mobility and access to improved education. This finding offers an important contribution to the gender-environment debate as it deconstructs the essentialist notion of women being closer to nature (in this case agriculture). Moreover, it is the complexities of gender subjectivities that describe gender roles and subjectivities amongst small-scale agricultural communities (the Kuruma). As such, the use of poststructuralist analysis of gender subjectivities appeared to be extremely helpful to uncover the multiple meanings of shifting gender-agrarian relations, and, therefore, enriches contemporary debates on gender and the environment. Furthermore, putting the analysis of gender subjectivities in the context of land use change helps towards a better understanding of how women and men farmers perform and interact in certain spaces. Therefore, the distinctiveness of place is an important aspect to consider in the analysis of societal relations with nature as both are interrelated. Overall, what we can learn from the Wayanad case study is that agrarian change is not only gendered but defined by socio-cultural and spatial practices of making use of nature.

Theoretically, this thesis highlights that agrarian change and social reorganisation constitute each other and directly influence land-use change. Agrarian-social transformation processes are gendered and relate to the notion of gender equity in the sense that these transformations result in a reproduction of traditional gender roles. This stresses the ambivalences related to the social reorganisation and empowerment of women´s roles in

Adivasi communities. Advanced education, improved mobility and changing labour structures might improve women´s social status in society but might not necessarily question essentialising notions of feminities and masculinities as gendered power relations still remain powerful. Another important theoretical implication of the Wayanad case study towards a better understanding of the social (re)organisation of land use change is that agriculture is associated with a masculine domain that results in uneven social relations of power and authority between women and men indigenous farmers, and, therefore denies women a claim to agricultural knowledge. This viewpoint addresses power issues as a dominant theme in regard to the construction of gender subjectivities and performances.

Gender, space and the use of nature

This thesis provides a number of interesting insights of how social-ecological transformation processes can be understood through the lens of gender equity and the sustainability framework. Chapter two contributes to contemporary research on the gender-environment debate on a meta-level while reflecting on current development discourses on the gender gap on an institutional level. It provides a useful overview of international policy agreements and strategies to sustain agricultural biodiversity. These include for example the Convention of Biological Diversity (CBD), Global Action Plan (GPA), and the Millennium Development Goals (MDGs) that all somehow acknowledge the link between gender and agrobiodiversity but fail to incorporate a gendered approach to the use and management of agrobiodiversity on an institutional level. What is also missing is work published by development agencies on gender-disaggregated data that highlight´s women´s contribution to agriculture. Furthermore, academic research concerned with rural development, agriculture and gender issues (Howard, 2003; Lope-Alzina, 2007; Momsen, 2007, 2009) critiques the lack of work the ways in which biodiversity management impacts gender dynamics while focusing on social practices and uneven relations of power between men and women.

Chapter three and four add to the little research on the links between gender, agrobiodiversity and poverty reduction. Key is the strong interrelation of gender, space and the use of nature (the use of agrobiodiversity).The analysis of two institutional innovations, the Kudumbashree micro-development programme and the rural employment scheme (MGNREGA), address the gender gap in agricultural research and reveal the ways in which women and men Kuruma farmers adapt to agrarian change and social transformation processes. Overall, both programmes are influential in reshaping gender performances and agrarian relations (as related to the use of agrobiodiversity) on a micro- level. The analysis of both programmes entail a gender bias as outlined in Agarwal´s work (Agarwal, 2003) in chapter two that critiques the essentialising tendency and social perception about women´s limited capabilities, roles and responsibilities. Moreover, findings demonstrate how both the rural employment and micro-development programme reinforce social hierarchies amongst gender. This underlines women´s dependent social status, and, therefore, rather reinforces gender inequalities. However, the analysis of the two institutional innovations highlight the need to foster an intersectional analytical approach that not only includes gender but other

social subcategories such as social status, educational level, age, ethnicity, religion, class e.g. when examining issues concerned with gender (in)equity. With regard to the question of how we can theorise the social organisation of land use change, it is the interplay of intersecting categories of difference that define power relations between men and women and the ways in which agricultural land is used.

Gender needs in development discourse and practice

Researching the social organisation of land use change through the lens of an intersectional theoretical approach appears to be a suitable approach to incorporate practical and strategic gender needs in development discourse and practice. Fundamental is the question of how strategic gender needs can be advanced through action based research that demands inter- and transdisciplinary research approaches that include not only academic but farmers knowledge that considers differences in gender. This thesis offers some interesting points on how institutional innovations mainly enhance practical gender needs but fail to address the strategic needs of both women and men to use agrobiodiversity sustainably. These findings also link to the challenge of how to tackle issues concerned with gender equity, agrobiodiversity and development.

The distinction between strategic and practical gender needs situates itself in discourses on gender mainstreaming and planning (Moser, 1998, 2012; Mukhopadhyay, 2004; Wieringa, 1994). Particularly chapter two of this thesis reflects on gender perspectives in sustainable development strategies while considering on gender mainstreaming (Momsen et al., 2013). Overall, practical gender needs usually fail to confront women´s social status in a particular socio-economic and cultural setting (Moser 1998). This research stresses that establishment of the institutional innovations such as the women self-help groups and the rural employment scheme was successful in addressing practical gender needs. However, the commitment to enhance strategic gender needs still remain challenging because the impacts on gender relations are contradictory concerning gender equality in particular. From an emic point of view, MGNREGA has positive impacts on women´s social status in society due to mobility, additional income for the family and increased economic responsibility. Taking a critical feminist perspective, this example entails the gender bias of men as breadwinners and women as dependents dualism as intersectional relations between gender, age, ethnicity, social status and caste are often overlooked and potentially hamper women´s empowerment. A similar analytical view can be applied to the micro-finance programme that improves women´s mobility and fosters empowerment on the one hand but increases women´s domestic responsibilities for sustaining families ´ needs on the other. Consequently, the programme also addresses practical gender needs but fails to challenge strategic gender needs while reproducing traditional gender norms amongst the Kuruma. Overall, the feminist analysis of these two governmental programmes demands a critical engagement with values and meanings on gender equity as analytical perspective might differ from actor´s views and interpretations on women´s empowerment.

Theoretical implications in a nutshell

Coming back to the key concepts and theoretical thoughts I engaged with throughout the doctoral research, this thesis offers a number of interesting research results that enrich contemporary debates on gender and the environment. To begin with, the analysis of gender subjectivities in agrarian relations links to co-construction of both gender and nature and the ways in which both are socially constructed (Bauriedl, 2010). A key outcome is that land-use change is characterised by changes in the agrarian system and gender relations that are constantly being redefined by social-ecological transformation processes. These are based on distinct views of women and men farmers on the use of agrobiodiversity in a shifting social system. Furthermore the analysis of the two institutional innovations that aim to promote rural development and agriculture provides interesting insights of how traditional gender roles and responsibilities are being reproduced in Wayanad. This outcome relates to Elmhirst´s and Resurreccion´s work (2008) that view the institutionalisation of gender as problematic because it devalues gender as a feminist concept. In addition, particularly the results of the analysis of the micro-finance programme builds upon the women-centred association of gender (Momsen, 2009). However, the spread of these programmes and easier credit has empowered women as has the growth of nuclear families.

Summing up, the social organisation of land use change needs to be viewed in the broad context of rural development as related to growing tourism, infrastructural development and conversion of farm to land for housing. In addition, agrarian change is linked to decreasing paddy cultivation due to low economic profitability and to environmental change. Declining rainfall is related to loss of forest and loss of ground water is related to other water users and water hungry crops such as plantain rather than just a broad 'climate change' scenario. Furthermore, I argue that agrarian change and social reorganisation affect each other as the shift from the joint to the nuclear family system amongst small-scale farming communities result in higher education levels, increased mobility and changing employment strategies outside agriculture. These changes affect rural indigenous women in particular.

7.2.2 Practical implications

Contextualising the research objective in practice

After having presented the theoretical implications of this cumulative thesis, I now reflect on the practical implications while focusing on the question of what we can learn from the Kerala case study from a methodological point of view. This thesis stresses the challenge to enhance strategic gender needs in the application of inter- and transdisciplinary research methods. The underlying question is how to include peoples' needs in the research planning process? Based on the experiences in the field, the Indian and German research team aimed for a close cooperation from the very early stage. The first step to identify peoples' needs (meaning the local community and those who participated in the research project) is to

modify the academic phrases and research questions into everyday language. The reasons for doing this are: firstly, to get an idea of peoples' understanding of the overall research aim that should be adapted to the local context. Secondly, finding a common ground in terms of language is the first step towards a good communication and fruitful cooperation between researchers and research participants as well as transdisciplinary partners including Non-Governmental-Organisations (NGOs). And finally, putting research questions in non-academic language sometimes helps to reassess the adaptability of academically formulated research questions as these are often the result of a research proposal and literature review.

Doing research in foreign countries demands a high level of intercultural and gender-sensitive skills. However, it is not only the research process but the very early stage of the planning stage that poses a challenge to us as researchers. The question of how to include gendered perceptions on agrarian change in the planning process is another theme of interest relevant to the practical implications of this thesis. The distinctiveness of place and culture is crucial when identifying the very objective and aim of a research endeavour. Participatory methods such as stakeholder workshops with women and men of different social status appeared to be a useful way to bring together research aims and questions as well as local actors perspectives. Crucial for arranging and conducting workshops, meetings or interviews is to consider the cultural context of social and gender norms in which the research project takes place. A gender separation sometimes helps to overcome gendered power relations and to identify women and men´s distinct views on land use change and the use of agricultural land. Because in the rural Wayanad context, it is usually men who officially speak during meetings. In order to give women farmers the opportunity to share their views on shifting agrarian relations, a separate meeting place was a useful way to foster dialogue with women only. The same applied to obtain men farmers' perceptions on land use change. Based on the fieldwork experience I argue that identifying gendered views on the broad research objective and questions is the first step towards a more gender-sensitive planning process that differentiates between practical and strategic gender needs. The analysis of the institutional innovations that aim at women´s empowerment is a valuable example of how the promotion of practical gender needs are the main focus of their practical implementation. The governmental employment scheme and women self-help groups were successful at increasing women´s economic responsibility at the household level. However, they missed taking strategic gender needs into account; these could include a stronger involvement of women´s active participation in the organisational level of the programmes. During fieldwork, I met one woman who actually held a powerful position in organising the employment scheme in her village and neighbouring communities. Based on her experience, the absence of women in decision-making, planning and organisational processes might be the result of an inferiority complex of many rural women in Wayanad. This observation not only relates to gender differences but to intersecting categories of difference including social status, level of education, class, race, age and ethnicity (amongst others) that all need to be taken into account when identifying peoples' needs and perceptions on world-life issues. Meeting strategic gender need would, therefore, require an

advanced gender-sensitive view on how to identify the added value of institutional innovations such as the employment programme and women self-help group that are not only gendered but bound to locality. This notion of locality is defined by complex social relations structured by power relations based on intersecting categories of difference that are hierarchical.

An appropriate question to pose in this context could be who benefits from such institutional innovations and why? This approach could help to identify the ways in which these programmes change gender relations on the one hand and impact community development on the other. Furthermore, this question could also be formulated to the partner NGO I have worked with throughout the BioDIVA research project. Based on the experiences made in the field, strategic gender needs might not be addressed by involving rural women in cooking workshops as this rather builds upon women´s domestic responsibilities than on strengthening their role in the use and management of agrobiodiversity. Moreover, it was mostly men farmers of high social status who were invited to share their knowledge on agriculture and on land use change as it was assumed they are the ones responsible for cultivation on their home fields. This observation links to the research result of agriculture as being socially constructed as masculine domain. However, if strategic gender needs and the gender gap in agricultural extension are serious issues to be addressed by the NGO, this finding needs to be taken into account and discussed from both women and men farmers´ views. The use of participatory methods and gender-sensitive staff members might offer new insights on gender performances in the use and management of agrobiodiversity in future. However, one limitation to a participatory approach to tackle life-world issues such as agrarian change Wayanad are dominating interests of all actors/farmers/stakeholders involved.

The methodological limitations of being a feminist in the field

Having worked with a number of research participants of different ethnicities in Kerala, I learned that it is not only gender differences that are shaped by power relations but social status, age and marital status that strongly define Keralites´ roles and responsibilities in the society as a whole. This directly affected the research process and my individual role as a Western researcher throughout the fieldwork phase (see chapter five on 'Discovering positionalities in the countryside: methodological reflections on doing fieldwork in South India`, (Kunze & Padmanabhan, 2014). A practical implication of a critical engagement with the very idea of positionality is concerned with the transdisciplinary research process, meaning the cooperation with the local NGO and with the local research participants.

I suggest that critical reflection on our positionalities is inevitable for the successful implementation of inter-and transdisciplinary research projects because it offers one way to grasp the complexities and ambivalences of life-world issues. However, critical reflexivity in the research process may cause uneasiness to those people involved in the research project who are not familiar with it. Reflecting upon our roles and responsibilities as a researcher is

sometimes considered to be too personal and, therefore, might appear as an inappropriate academic practice. However, I argue for a strong need to critically reflect upon our positionality in the research process, particularly during the fieldwork phase in a foreign spatial setting, for two reasons. Firstly, incorporating a critical reflexivity in the process of data collection helps to uncover issues concerned with power relations not only between the researcher and participants but also between research cooperation, e.g. university staff and institutions/ NGOs we are working with in the field. Power relations are often based on hierarchical relationships that might be either defined by a formal or informal social code. This leads me to the second reason that argues for including a reflexive view of our positionality in the research process. Indian society as a whole is strongly hierarchical and, therefore, understanding power relations in this regional context is a challenging undertaking and cannot be seen separate from hierarchy. A central outcome and recommendation for future research is to contextualise power as an intersecting and cross-cutting theme that not only structures social norms and behaviour between women and men but between age, social status, religion, caste, ethnicity, marital status and education. Understanding the complex dynamics of power relations amongst those people/institutions involved in the research process might help towards a better understanding of the ways in which social interactions work. In India, these are usually based on a certain hierarchical system, for example older people are seen higher in hierarchy than younger. Overall, these hierarchies are gendered and defined through power relations. The same applies to differences made between married/single, indigenous/mainstream society and between socially constructed roles of women and men. Even though as a foreigner we are not necessarily part of this system while doing fieldwork, it is still helpful to identify our hierarchical stand in this system because it may avoid cultural misunderstandings. Furthermore, a critical reflexivity of our positionality is important for establishing a fruitful work environment for those who are part of the research project including researchers, partners in practice, stakeholders, research assistants and participants. In order to be able to understand social norms distinct from Western culture and values, an open dialogue on cultural differences on issues concerned with power and hierarchy is the first step towards a respectful and diverse cooperation. Transdisciplinary research appears to be an effective approach to reflect upon a critical reflexivity as it also considers actors´ and researchers´ interactions using a gender-sensitive view (Hofmeister et al., 2013). However, this view also requires the willingness to share and reflect upon differences which might not be of interest to all members of the research team. Consequently, a positionality approach bears strengths and weaknesses to be considered carefully at the very beginning of the field phase.

The power of participatory research

The use of participatory research methods can have powerful impacts on the research process. One way to explore the local understanding of land use change in the two small-scale indigenous farming communities was to apply participatory research tools such as a time line and a mapping exercise as well as a village community map. A lesson learnt from

working with participatory research tools is the group dynamics and power relations between those who participated in the mapping exercise. Even though this tool aims to demonstrate local knowledge on the ways in which agricultural land was used over the last 15 years, the map most likely represents the dominant views of those who participated in the exercise. In addition, hierarchal community structures also strongly influence the choice of community members to be involved in the mapping exercise. Therefore, the question is whose perspective is being portrayed when we build upon participatory research tools to explore the complexity of changes in land use in the context of agrarian change? This highlights that despite peoples' involvement in the data collection, it is still challenging to overcome informally defined power structures amongst the community. I argue that transdisciplinary research, understood as a self-reflexive approach that focuses on the production of knowledge (Hofmeister et al., 2013), is a fruitful approach to reflect on how local knowledge is collected by applying participatory research tools because it also acknowledges the limitations of these methods. For example, considering the limitations of applying participatory methods, a useful question to raise in a research team could be what do we gain from using these tools and who benefits from it? This question might potentially also be relevant for planners who aim to include participatory approaches in their work.

An important practical implication of this research is the way in which language is being used in a powerful manner during data collection and analysis. This relates to a critical reflection on concepts and terms used in an English speaking environment and the question whether the terminology derived from the literature is locally transferrable. Particularly concepts such as sustainability and (gender) equity have powerful academic meanings. However, doing fieldwork in Wayanad stresses that these terms entail a normative meaning and need to be used carefully because they often cause uneasiness in a rural indigenous setting. A possible way to avoid language barriers is an open dialogue on these widely used terms with the translator in the first place and to share views on possible local translations as a second step. During fieldwork, I often asked participants about their understanding of nature. Most female participants associated nature with the use of natural resources, most importantly water, as this resource is vital for sustaining paddy cultivation and for the future of agriculture as a whole. From an academic point of view, this appeared to be an interesting perception of how indigenous farmers view nature. Instead, a term such as sustainability was often neglected. Furthermore, this finding highlights the strong interplay between space, gender and (the use) of nature.

Having looked at the added value of incorporating a critical reflexivity in the research process, the great challenge is how to translate a positionality approach into an inter- and transdisciplinary research framework? Establishing a culture of open dialogue is the first step for a fruitful teamwork environment. Second, sharing individual views on each team member on their self-perception and assigned role in the research project helps to foster capacity building. Finally, a sound practical cooperation with the research partners and a clear idea of the overall research aim and objective is helpful for establishing a joint research

vision. A good example of how interdisciplinary tools enrich transdisciplinary research is chapter seven in this cumulative thesis on the social-ecological web that serves as an innovative tool for interdisciplinary integration (Betz et al., 2014). This web method was applied in order to better understand social-ecological transformation processes amongst three distinct Adivasi communities. The research design was based on participatory research approaches and, therefore, demonstrates a practical way to work in an interdisciplinary manner on the one hand and to integrate local knowledge on the other. Crucial to the interdisciplinary research process was to organise feedback loops with all stakeholders and participants involved as this allowed disciplinary boundaries to be overcome. As such, our social-ecological study and the development of the web method potentially add to current approaches of transdisciplinary research which is characterised by an equal relationship between researchers and partners of practice, interdisciplinarity and problem-orientation (Novy et al., 2008).

In conclusion, doing inter-and transdisciplinary research appeared to be a useful research approach to contextualise the hierarchisation of knowledge production. Crucial in this regard is the distinction between participants´ and researchers´ perspectives on the life-world issues such as the relationship between agrarian and social changes and its impacts on land-use change which are all gendered. In addition, a key element of doing transdisciplinary research is the need to consider the normative meanings of gender equity which differs in different cultural contexts.

7.3 References

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8 Conclusion and outlook

8.1 Research findings

Overall, agrarian change in Wayanad is influenced by changes in land use and social-ecological transformation processes. Key drivers of changes in land use in Wayanad are agrarian transition, environmental changes and the growing real estate market. Key aspects that shape social-transformation processes amongst the Kuruma are changes in the social organization from the joint to the nuclear family system, increased mobility and advanced education for Kuruma women in particular. Land-use change describes the current situation that is directly linked to social-ecological transformation processes. Both shifting agrarian and gender relations are fields of inquiry that define changes in land-use as both constitute each other. This relates to the social-ecological research framework and the concept of societal relations with nature. As such, this research on the social organization of land use change emphasizes that societal relations with nature are characterised through changes of agrarian and gender relations.

Agrarian relations

Agrarian change is currently characterized by the conversion from food to cash crops which has reduced agriculture due to increased need of land for infrastructural development. Furthermore, the findings show paddy cultivation (both the traditional and hybrid varieties) has decreased over the last 15 years due to low economic profitability. This might result in an on-going deagrarianization. However, as landholding agriculturalists, the Adivasi prefer home-grown rice consumption over the rice available from shops subsidized by the India government due to taste and quality preferences. Therefore, if agricultural land is available, the Kuruma would continue with paddy cultivation as it forms an integral part of their culture and traditional consumption habits. As such, agriculture is mainly sustained to fulfill subsistence needs. Nevertheless, the growing need for cash crops such as banana, beans, ginger, coffee and arecanut is a tempting source of additional income for both female and male farmers. The younger generation shows little interest in agriculture, especially the young women.

Paddy cultivation is gendered in the sense that women see it as most important and most favorite crop to be cultivated in order to sustain food security. The qualitative data reveal that Kuruma men farmers usually do not have a preference over crops. However, women and men farmers both stress the importance of paddy cultivation for food security. The cultivation of the old varieties has a strong cultural meaning as it is needed for wedding celebrations and other main community-based events.

Overall, the two case studies underline that the Kuruma community in Panamaram shows less interest in cultivating old rice varieties than the Kuruma in Kanjambetta. The reasons are based on environmental aspects as well as the ways in which the communities are socially

organized. Key is the availability of agricultural land that defines the choice of crops and rice varieties to be cultivated.

Gender relations

Agricultural transition redefines gender subjectivities and performances and stresses that agricultural decision-making processes are gendered. Mostly men decide which crops to be cultivated. Only in Kurumbashrees (Women Self Help Groups), women decide over cultivation practices. As such, the Kudumbashree example portrays a space in which conservative gender norms and the gendered separation of space remain powerful. Whereas men are seen to have "formal" knowledge on agriculture and the environment, women see themselves as "informal" knowers. This dualism reveals the hierarchies between men and women. Shifting agrarian relations impact gender relations. Women in the Kuruma communities have traditionally been involved in paddy cultivation. One initial assumption of this research was that the loss of agrobiodiversity (in relation to shrinking paddy cultivation) and the social status of women constitute each other. However, the field work has shown change opens space for empowerment because women look for work opportunities outside agriculture (if her husband, family allows; young women with small children are in a disadvantaged position because they have to look after their children). The National Rural Employment Scheme offers agricultural jobs for women in particular. However, it also raises criticism because these employment schemes limit women´s emancipation due to low payment and little other options available in Wayanad.

8.2 Methodological review

This piece of work offers interesting insights in the methodological reflections on doing interdisciplinary and feminist research. I put forward that inter-and transdisciplinary research requires integrative tools such as the social-ecological web to integrate knowledge from social and natural sciences. The research process described in chapter six is the result of a baseline study conducted in the early field phase of the BioDIVA project and offers methodological incentives for doing interdisciplinary research in a cross-cultural team. The study appeared to be useful towards a better understanding of social-ecological transformation processes in Wayanad. Based on a comparative approach, we were able to develop and illustrate the complexities of three different agrarian systems. Moreover, the social-ecological web serves as a useful example of applying participatory research methods.

Using a feminist analytical viewpoint, we argue that a critical reflexivity on our embodied positionalities as researchers stress the ways in which knowledge is socially constructed and bound to local contexts (Raju & Lahiri-Dutt, 2011). This helps to accept the "messiness of the life-world" and opens intellectual space for new and unexpected research results.

8.3 Future research avenues

This thesis offers a number of possible avenues for future research. First, building upon Bina Agarwal´s work as outlined in chapter two, collective farming or group farming with particular focus on gender and power relations seems to be an interesting theme to be explored further. This could also include a feminist analysis of the household theory adapted to the Indian context. These two themes would address the gender bias in agricultural research from a feminist point of view. Second, the research area on gender, agriculture and sustainability also demands further research on the Sustainable Development Goals in regard to the question of how can strategic gender needs can be enhanced through action based research. I would argue this field of interest needs a stronger involvement of transdisciplinary research approaches that foster an equal relationship between researchers and research partners. A third future research field of inquiry could be the impacts of rural-urban migration and the tourism industry on agrarian relations using a gender-sensitive perspective. This could include a closer look at the feminization of agriculture and why the Wayanad case studies oppose this trend often described in literature on gender, agriculture and development.