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Governing the Use and Conservation of Agricultural Biodiversity Institutional and Gender Analysis of Transition in South India[1]

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Abstract

Agrobiodiversity is a common resource, on which our future global food security rest, while simultaneously representing the means of survival for many local farmers at present. Women have been identified as the key-persons regarding knowledge and management skills to use and thereby conserve biological diversity in agriculture. The Indian Government has introduced the "Protection of Plant Varieties and Farmers' Rights Act" in 2001 and the "Biodiversity Act" in 2002, setting a formal framework for the management of the global resource biodiversity, which falls under her national privilege.

The paper introduces the natural resources at stake and the social and cultural organisation of biodiversity management in Southern India. Since the category gender is central to the question of equitable governance structures, its' integration into the framework for institutional analysis is made explicit. Understanding the interactions between natural resources and relevant actors requires knowledge on the properties of transaction and the characteristics of actors. The institutional analysis asks for the study of property rights, influencing the access and control of resources and power in decision making processes. The emerging governance structure reveals conflicts and co-operations, missing links and innovations. An analytical framework for the study of rice-farming system in Wayanad, Kerala is proposed. It draws on empirical evidence from Kerala, South India, a hot spot of biological diversity. Results are considered for relevance regarding the theory of co-evolution of social and natural systems.

(1) The National Indian Situation in Agrobiodiversity Governance

India passed the Biodiversity Act 2002 (BD), in conformity to the CBD to facilitate conservation with economic benefits. The BD envisages a governance structure consisting of the National Biodiversity Authority at national level, a State Biodiversity Board at each state level, and Biodiversity Management Committee (BMC) at the level of each local body of the *panchayat raj*. The BMCs are required to promote conservation and sustainable use of biodiversity and to

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prepare and maintain a biodiversity register for documentation. The draft rules for the implementation of the act are currently widely discussed, especially the practical consequences at the local level regarding the definition of farmers, property rights and community.

The task of realising both acts in rules and legislation starts with a consideration how *de jure* definitions turn out *de facto* in the given social and institutional situation. A farmer is "any person, who conserves, preserves individually or jointly, with any person any wild species or traditional varieties, or adds value to such wild species or traditional varieties through selection and identification of their useful properties" (PPVFR Act k(iii)). The understanding lacks a clear gender perspective and it appears as if the farmer is exclusively perceived as male. The dilemma becomes obvious when considering that women are involved in developing and conserving plant varieties, while the land is held under the name of male family members. This results in difficulties to access credit, agricultural inputs, technology, extension, training and services for women. Parthasarathy (2003) argued for the recognition of women as individual breeders, as co-breeders with her immediate family or within the community. The consequences for her in the capacity as an individual, as a inheritor through succession, as a spouse through matrimonial property rights and as a member of the community have to be taken into account. Women's succession claims depend on the existing inheritance laws, the social legitimacy of her claim as perceived by her community and her educational status and legal literacy. The importance of differentiation owes to the fact of particularistic succession rights in Hindu, Scheduled Tribes, Muslim and Christian communities.

The definition of benefit claimers becomes even more of a challenge, when potential benefit sharing targets the "community". Under the rather cloudy term, different distinctions and dimensions of inclusion and exclusion are subsumed. Is the geographical location, the user group, the caste or class membership decisive over participation in the potential benefit stream? Are these benefits reaching those persons who bear the cost of conserving and developing the variety? In the case of rice diversity in Wayanad, the communities of Paniyas, Kuruichiyars and Wayanadan Chettys differ as regards their property and inheritance rights and their management institutions for developing the resource agrobiodiversity. On top of that, their access to formal governance structures, their capacity to process information and influence decision makers varies to a great extent between ethnic communities, like the mostly illiterate Paniyas and the formally educated Wayanadan Chettys. The government of India is currently preparing the implementation rules and legislation for both Acts. The challenge of an effective and equitable enforcement points to the need for collective action to maintain agrobiodiversity in the face of the heterogeneity of farming communities.

(2) Agrobiodiversity in Rice-based Farming Systems

Agrobiodiversity comprises a multitude of plant and animal varieties, continuously cultivated over time. It is the result of an ongoing process of domestication and selection by generations of farming families to meet their needs in food security, nutrition, income and cultural integrity. While for the majority of time farmers relied on their cultivation and breeding practice to innovate and meet ecological, economic and social demands (Richards 1990), agricultural science and plant breeding has to a great extent taken over this service to supply farmers with improved breeds, implying other farming practices and inputs. The Green Revolution has been able to increase production tremendously and has spread across the globe (Khush 2004), but challenged the traditional institutions for the maintenance of diversity. The commodification of agriculture has resulted in a tremendous loss of biological diversity among crops (Shiva 2000). This reduction of species which have only come into being through men's handling of wild plants lessens the base for further breeding activities and leaves mankind more vulnerable to hunger,

when food supplies rely on a small genetic base. Along with biodiversity as counted in species and varieties, ecological, cultural and social functions are eroded and lost.

While biologically diverse farming systems conserve and adapt the genetic base for further breeding by utilisation, they are endangered by competing land use practices. Alternative, more market oriented farming systems involve other costs and benefits which are accumulated and distributed differently. With altered production systems, surpluses come under other access and control regimes and imply other time horizons. In order to look for institutional solutions to the dilemma of the "poverty ridden custodians of genetic wealth" (Swaminathan 2000: 6), between further marginalisation or market integration, a consideration of biological diversity, contributing to food production and food security (FAO 2003c) at the genetic, species and ecosystem level is necessary. The diversity in agricultural ecosystems is important for the production of food and for the conservation of the ecological foundations that sustains rural peoples' livelihoods (Brush et al. 1987).

In the rice-based farming system in Wayanad, India, one observes a reduction of varieties alongside with the green revolution and a reduction of the area under cultivation for local consumption and food security. Agrobiodiversity is threatened by the competition of banana and finally arecanuts for commercial purposes, thereby converting integrated agro-ecosystems into unsustainable cashcrop plantations. The farming communities of the Kuruichiyars and the Wayanadan Chettys face the dilemma of poverty reduction or agrobiodiversity decline, while endangering ecosystem functions. The Paniya are affected severely, because their livelihood depends entirely on employment in the paddy fields and further utilisation of that ecosystem. The question arises whether such heterogeneous communities will be able to maintain agrobiodiversity through informal institutions for seed exchange or innovative ones like farmers' variety registers in the future. With the recognition of property rights to local knowledge, the notion of community has to be critically scrutinised and broken down to ethnic, gender and age groups. Power relations at local level have to be considered as well.

(3) Gender Analysis of Resource Management

Agrobiodiversity, as a special category of biodiversity, has come under the mandate of the FAO (2004) and receives attention from the Convention on Biological Diversity (CBD 2001). Both identify women as users, managers and preservers of biological diversity and give priority to their recognition and consequent involvement. Agricultural research and development sociology have identified women as key actors in the management of agrobiodiversity. A comprehensive overview of the relationship between gender relations and plant management practices and its effect on biodiversity is provided by Howard (2003: 6). She links cultural with biological diversity and provides evidence that mainly women are the principal farmers and informal plant breeders, particularly of indigenous crops. She identifies the powerful archetype of 'productivist agriculture' as a norm to confine women to the sphere of consumption and make their productive work invisible. Therefore it is not surprising that the kitchen emerges as the most undervalued site of plant biodiversity conservation and as a dynamic and creative sphere (Padmanabhan 1998). Culture and culinary requirements determine the value of a variety. Women's selection criteria turn out to be broader and often overlooked. The relationship between the maintenance of culinary traditions, home-gardening, biodiversity conservation and cultural continuity is closely connected to the welfare of indigenous people (Kanvinde et al. 2001).

Jackson and Chattopadhyay (2000) identified the conflicts over resources in their gender analysis of environmental relations in agriculture as closely linked with the negotiation of identities in Bihar, Northern India. Similarly, the rice-farming communities in Wayanad distinguish themselves profoundly by caste, marking hierarchy and difference in Indian society (Gupta

2000). The gender construction in the Paniya community is rather egalitarian, respecting women for their massive contribution to food supplies through the collection of wild foods, many of them closely linked to the ecosystem of paddy fields (Narayanan, Swapna, Anil Kumar 2004). Kuruichiyar communities recruit all necessary labour for paddy cultivation from within their large joint families with matrilocal residence and inheritance structures. They sustain a large variety of rice landraces to achieve security, though the younger generations of both genders would opt for the conversion into banana plantations. Coming from Tamil Nadu, Wayanadan Chettys belong to the Hindu community and have adjusted their customs to those of the influential caste the Nairs of Kerala, while maintaining a patriarchal social structure and hierarchical gender relations. The diversity of gender relations in these three communities indicates that gender driven change goes beyond the material transactions of land and labour and involves the issue of identity and hierarchy in patterning social relations to be observed at inter- and intrafaces.

The question how gender relations are entailed in processes of biodiversity loss as well as the distribution of cost and benefits of conservation between men and women remains to be answered. Howard has pointed out that rights to plant-genetic resources are not gender-neutral: "...while women constitute the majority of those gardeners, gatherers, herbalists and plant breeders who have developed agrobiodiversity and identified useful pants, they are likely to be the last to have their rights recognised and therefore to benefit from compensation schemes or rights regimes" (2003: 8). Therefore the need arises for a empirical analysis of local people-plant relationships to promote conservation efforts that benefit women as well as men. Merging the sociological perspective with the institutional approach allows to overcome purely altruistic and reductionist assumptions regarding the household (Waller and Jennings 1990) and to differentiate the process of negotiation on the grounds of power, property rights and co-ordination.

(4) Institutional Analysis in Natural Resource Management

Considering agrobiodiversity loss as an institutional failure, it is necessary to analyse the institutions – in the sense of rules and regulations - under which men and women accomplish agrobiodiversity management and which hinder reasonable decisions for the maintenance of it (Wolff 2004). Research in natural resource management from an institutional perspective has been pioneered in the field of forest management, taking into account the evidence of local-level case studies on the social and economic factors that mediate the relation between population and the environment. It became evident that local communities both filter and ignore government rules, add their own rules and generate diverging informal local institutions – i.e. rules in use - and patterns of activity. Regarding the complex interaction between local communities and their environment, Gibson, McKean and Ostrom (2000) identify the relationship between ecosystem conditions, individuals and institutions at local level as the important dimension. Institutions generate behaviour and incentives and filter factors like the governance structures through local institutions. The approach is interesting in the case of agrobiodiversity, since agriculture and forestry alike create multiple products and are generated by multiple users groups.

The institutions, rules and regulations co-ordinating the rice farming systems in Wayanad are not sufficient to maintain a high level of agrobiodiversity. Property rights and organisational structures are different between the communities at local level. The landless Paniyas are a scheduled tribe and as indigenous people enjoy certain privileges of self-organisation at the local governance level of the *panchayat raj*, while their access rights to the forest have been severely restricted by conservation policies (Singh 1994). The joint land holdings of the Kuruichiyar communities require co-ordination and conflict solving skills by a senior male, though there are tendencies of the younger generation to separate from the large family units. The Wayanadan Chettys own their rice farms as private property and are well integrated into formal governance

structures, owing to their education. Within this diverse scenario rudimentary institutions of seed management, exchange and enhancement exist, which need to be distinguished at the operational, collective choice and constitutional choice levels. Furthermore, they form the foundation for collective action in agrobiodiversity management in organic farmer clubs, farmer's varieties registers and *panchayat* level organisations. To understand options and limits of innovative institutions the national Indian situation in agrobiodiversity governance needs to be considered.

(5) Agrobiodiversity Management in Kerala, South India

The empirical evidence comes from the hilly district of Wayanad, which is considered as one of the richest "hot spots" in biodiversity in India (Rengalakshmi 2002). Relevant transactions occur around the cultivation of paddy landraces, - some of which have medical value- that are threatened by the cultivation of perennial crops like banana and arecanut, while the forest is replaced by tea and coffee estates. Agriculture is the main stake of the districts economy, and the rich cash crop plantations of pepper, cardamom, coffee, tea, spices have made Wayanad one of the districts with the highest earnings form foreign exchange in Kerala. Paddy used to be the dominant crop in the area, including some varieties that have medical and dietician value. But its area of cultivation has decreased to mere 15% (Girigian 2003). A good road system, high literacy rate, politically articulate population and strong unions frame the conditions for the management of agrobiodiversity. The trend of turning multifunctional paddy fields into monoculture banana plantations has economic, cultural and ecological consequences (Vedavally, Anil Kumar 1998: 96). The extent of the loss of agrobiodiversity is accelerating and accompanied by weakening food security.

The ethnic diversity is evident in the population of the District Wayanad. It consists of 17% of tribal or indigenous population, which is the largest in the state of Kerala. The total number of agricultural labourers is 75 000, of which 27 000 are women (Narayanan et al. 2004). The major religious groups Hindu, Christian and Muslim are more or less equally represented in the district. Indian society is particularistic and diverse (Rothermund 1995). The system of caste, which separates communities through restrictions of intermarriage and commensalism in food habits, forms the hierarchical background for conflicts over access to and control over resources and the power to establish these in institutions through rules and regulations. The communities of Paniyas, Kuruichiyars and Wayanadan Chettys have been selected for this study, to cover the diversity of different gender relations, property rights to land as well as farming-practices and thus agrobiodiversity management. All three communities depend on the cultivation of paddy fields for their livelihood, but their property rights to the land, their involvement in management and their institutional set up varies.

(6) Analytical Framework

Although the important contribution of women farmer's to agro-biodiversity in terms of labour and knowledge has been identified (Murthy 2001), little is known about their involvement in decision-making, their agenda in agricultural production and the gendered aspects of those institutions relevant to women farmers' interactions with nature. The structured analysis of such institutions is enriched by the focus on the social category of gender and complemented by farming-system analysis and the consideration of best practice in collective action. The institutional analysis highlights the management of the resource biodiversity from a local perspective to understand how agro-biodiversity is actually developed and sustained. This approach towards the analysis of the existing institutional arrangements concerning agro-biodiversity is supplemented by a sociological inquiry into the interface (Long 2001;1992) between farmers, policy makers and other relevant actors. By investigating women's share in the provision in this environmental service from a combined institutional and sociological perspective a gap in the current literature will be filled (Swaminathan 1998, Kumar-Range 2001,

MSSRF/FAO 2002). The socio-cultural dimension of institutions is researched along the lines of the components of the "Institutional Analysis and Development" framework (Ostrom 1990). The analysis of actors and transactions, property rights and governance structures is accomplished by applying the concept of social interface to negotiations between actor groups and enhanced by investigating into intrafaces (Padmanabhan 2002) regarding members of the gender groups sharing the same life world.

The analysis of the rice-farming system and the interplay of the physical properties of biodiversity management with its social organisation (Devra and Hodgkin 2000) calls for a thorough analysis of the kind and distribution of work and the function of knowledge that can be observed . Based on a reliable understanding of the involvement of actors, the dimensions of agency are analysed, i.e. interaction, condition, consequences, strategies and tactics (Strauss 1987), that constitute the options and forces for institutional transformation and collective action. The institutional analysis will reveal the institutional environment and arrangements that co-ordinate the conservation and utilisation of agro-biodiversity, with special emphasis on gender dimensions. The relevant factors fall into four broad categories: 1) the features of transactions, 2) the characteristics of actors, 3) property rights on environmental functions, and 4) governance structures (Hagedorn et al. 2002).

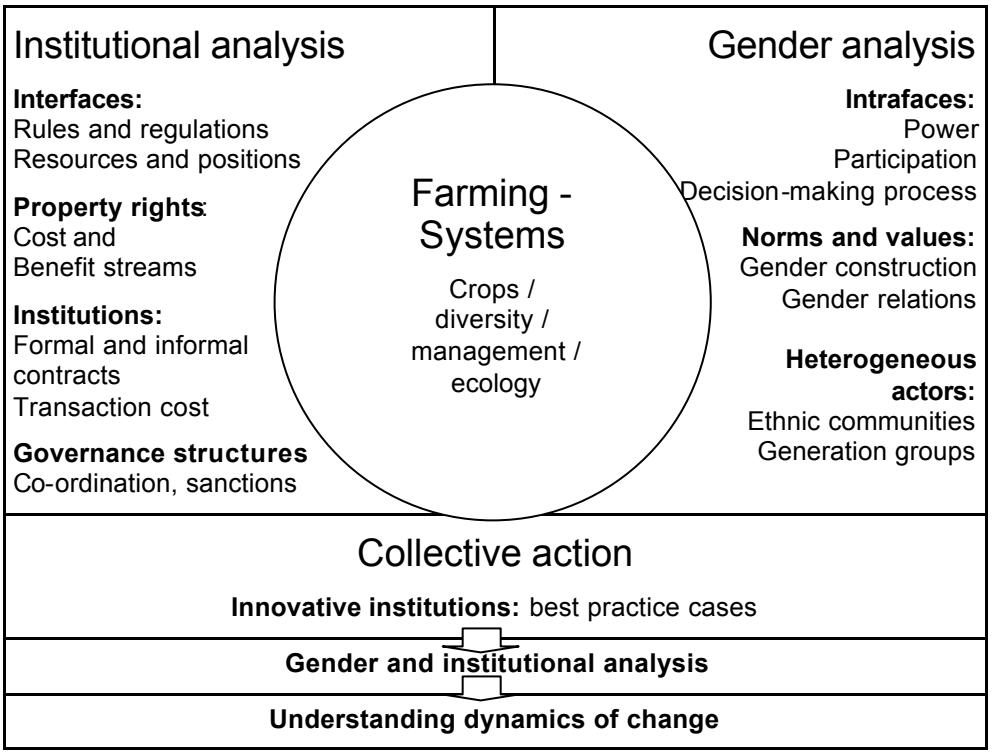

Figure 1: Analytical Framework for Agrobiodiversity Management

This approach enables an understanding of institutional driving forces that may create incentive and reward mechanisms in agro-biodiversity management. Simultaneously, it allows for an improved understanding of the informal and formal institutional barriers, which hinder biodiversity provision and force farmers to adopt biodiversity degrading activities in order to avoid poverty. The gender analysis takes the different interests and responsibilities of men and women farmers into account and, in this way, allows for a conceptualisation of their particular contribution to the maintenance and utilisation of agrobiodiversity. The intraface (this is where negotiations between members of a community take place) is the key concept for integrating the gender dimension with the analysis of environmental management by farmers. Collective action organised for joint management of the common pool resource agrobiodiversity is analysed by

observing interactions at the interface, i.e. between different actor groups, which are influenced by cultural norms and values. Conflicts between different communities, age and gender groups can be expected to develop when interests differ and diverging knowledge systems are encountered by the actors. Negotiations over power, meaning and resources that take place at the interface represent an important action situation providing the opportunity and scope for institutional innovation. The interfaces of major concern in this study are the gendered ones between actors sharing a common life-world. Male and female farmers use the same local knowledge system for their orientation but encounter different realities because of their gender. In this case, the term intraface appears to be appropriate to cover the simultaneity of a commonly perceived famework of an ethnic group and the distinct room for manoeuvres according to respective gender (Padmanabhan 2002: 8). This extension of the concept of interfaces concurs with Long's definition as a critical point where structural discontinuities due to different normative values and interests between entities of social groups occur (Long 1992: 274). A distinguishing aspect of interacting individuals or formations are often differences in power and endowment with resources and rights. The analysis of interfaces and intrafaces is concerned with the dynamic character of these interactions.

(7) The Empirical Case Wayanad

The Rice-Farming-System observed current changes in agricultural practices in Wayanad and there are interdependencies between social organisation of labour and agroecological conditions. While integrated homegardens with high biological diversity are still maintained in every farm, the Kuruichiyars convert paddy fields to commercial banana plantations and at the same time abandon elaborate water storage systems. Both of these changes threaten the ecology of the rice farming system, food security and employment opportunities, especially for the community of landless labourers of the Paniyas. The trend toward commercial plantations has been set by the Wayanadan Chettys.

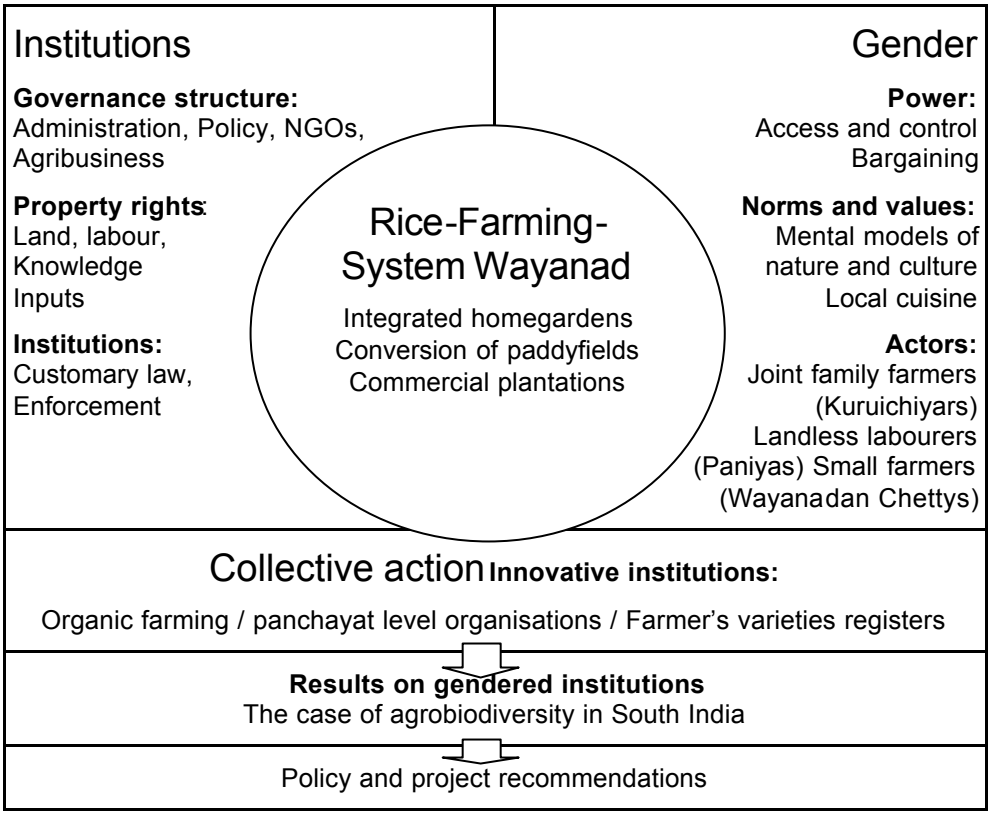

Figure 2: The empirical case Wayanad, India

On institutional level an investigation encompasses the local level *panchayat*, agricultural administration, NGOs and agribusiness in order to map and understand the governance structure. The property rights to land, labour, knowledge and inputs differ between the Kuruichiyars and the Wayanadan Chettys, since customary law and the enforcement mechanisms vary. The capabilities to voice interests and influence formal and informal institutions are limited for women and for the Paniyas in general because of lacking status and education. The focus on gender particularly emphasises the issue of power within the communities, or more generally, the availability of action resources for competing and negotiating groups. Access and control over such resources is related to the success of bargaining strategies and also influenced by the norms and values prevalent in the ethnic community. Mental models regarding nature and culture shared by tribal people like the Kuruichiyar and the Paniyas are distinct from those of the Hindu Wayanadan Chettys. Similarly, their local cuisine, which is important for the utilisation of agrobiodiversity, is particular to the respective castes or ethnic groups. Best practice examples of collective action in agrobiodiversity management further identify the factors that make innovative institutions viable. For this purpose currently active groups in Wayanad district have been selected. Wayanadan Chettys have taken the initiative to form an organic farming association to pursue the idea of labelling the products of their farming system. Farmers from all ethnic communities, including the landless Paniya, are supposed to be involved at panchayat level when documenting agrobiodiversity in a "Farmer's varieties register".

(8) Conclusion: Co-evolution of natural and social systems

The integration of institutional and gender analysis for the study of the resource agrobiodiversity stresses the co-evolution of natural and social systems. When recognizing the need for new institutional arrangements and incentives to govern the resource agrobiodiversity, we need to consider the arrangements that where able in the first place to bring forward such a diversity of varieties and farming-systems. The active creation of agricultural biodiversity rested on the high involvement of women farmers. These systems have come under pressure through the effects of the Green revolution, following the logic of market orientation and short term benefits. With the goal to preserve and continuously develop genetic materials and manage faming ecosystems according to future demands, the contribution of women farmers in the social system for maintaining and enhancing crop diversity needs to be considered distinctively. This is necessary to understand the parallel development of natural and social systems. Women's contributions make the difference and the analysis of their institutional situation appears as a key to the understanding of agrobiodiversity management. The possibilities for institutional arrangements, that better serve the diversity in agricultural varieties, is ultimately linked to the adequate recognition of women farmers activities, being obscured by a productivist ideology. The further evolution of the natural system agrobiodiversity is intrinsically linked to the social system, which consists of men and women actors. This we have to take into account when analysing institutional arrangements in agrobiodiversity management.

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