Gendered Knowledge and Gender Relations: Case studies in Two Agro-biodiversity-rich Locations

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INTRODUCTION

The expression "Knowledge is Power" is common, but assumes special significance in the contemporary context, where the future is seen as a "Knowledge Society" and those without knowledge are seen to be disempowered. Women in traditional agricultural communities around the world have long been known for their specialized knowledge related to seeds including selection, storage, management and exchange. Experiential knowledge arises out of the experiences and routines of daily life, and hence gendered knowledge also arises from the gendered roles and responsibilities of men and women in different situations and communities. It is argued that in traditional agricultural communities, this experiential knowledge gave women an important role in decision-making, at both the family and community levels. In consequence, status accrued to women at both levels, contributing to equitable power relations between genders.

But in the modern world, no community is isolated from larger social and technological changes, and in the era of globalization, the speed and nature of change have become both bewilderingly rapid and full of novel and unpredictable elements. Changes in the agricultural production systems across different agro-ecosystems have led to consequent changes in gender roles, responsibilities and knowledge. How are these changes affecting gender relations/women's status? How does agro-biodiversity loss relate to the possibilities for knowledge as power? Is women's traditional specialized knowledge still valued, and valued enough to give them social status? On the other hand, if circumstances lead to lack of demand for such knowledge, and it becomes socially devalued, how would this affect gender relations at the family and community level? These questions were sought to be explored in two traditional communities in two different locations, well known for their rich agro-biodiversity, one in small millets and the other in rice. The paper is an exploration of themes, theorizing on the data available as a result of M.S.Swaminathan Research Foundation's (MSSRF) field interventions.

GENDERED KNOWLEDGE IN TWO COMMUNITIES

The Two Locations: The two sites, Kolli Hills and Jeypore, are located in the Eastern Ghats with varying climate and cultural characteristics. A culturally homogenous *Malayali* tribal group inhabits Kolli Hills in Tamil Nadu, whereas in the Jeypore tract (undivided Koraput district), Orissa, twenty-nine tribal communities are present, of which three groups namely, *Gadaba, Paroja* and *Bhumia* are dominant in the study area. Diversity of small millets in Kolli Hills and traditional landraces of paddy in Jeypore are the focus of attention in this paper.

Malayalis in Kolli Hills are early migrants from the plains at the beginning of the sixteenth century[1]. The mainstay of the economy is agriculture, combined with cattle herding and pig rearing, supplemented by collecting Non-Timber Forest Products (NTFP), and by working as labourers in coffee plantations or migration to other districts/states as wage labourers. Little millet, proso millet, kodo millet and Italian millet are the four common small millet species which have been cultivated with wider intra-specific diversity on terraced beds (mid slope) as well as rocky terrain (highest slope) under rainfed conditions. Of the total workers, 88 % are cultivators (of whom 90 percent are small and marginal holders), 7 % are agricultural labourers and 5 % are other workers[2]. Small millets, grain legumes and wild yams supplemented with rice and wheat served as their staple food. The traditional agriculture of Malayali people has been undergoing changes during the last three decades, due to the introduction of cash crops such as tapioca, coffee and pineapple[3]. Consequently their diet have changed and the main staple today is rice.

In Jeypore, however, the tribes are original inhabitants who have domesticated rice[4]. Agriculture is the main activity, supplemented by NTFP collection, hunting, fishing and wage-earning. Both shifting cultivation and settled agriculture are practised under rainfed conditions at the subsistence scale, and cultivation is carried out at different altitudes[5]. Of the total workers, 39 % are farmers (70% of which are small and marginal farmers), 26 % are agricultural labourers and the remaining 35 % are other workers[6]. Rice is the main crop raised in three distinct seasons. Rice supplemented with ragi, pulses, vegetables and forest products form the staple food. In recent years, sugarcane, maize, tobacco, ginger, vegetables and cashew are being grown as cash crops in uplands[7].

Loss of Crop Genetic Resources: During the last century, agro-biodiversity loss has been triggered by many factors. Advances in enhancing the productivity of major crops like wheat, rice and maize have resulted in the replacement of numerous minor cereals and millets, legumes, tubers, oilseeds and vegetables. The loss is also associated with changes in the local culture and dietary habits over time. Today, the fate of global food security is linked to the performance of less than ten crops out of nearly 7000 edible species[8]. Besides threats to global and national food security, hidden hunger and malnutrition arising from dependence on too few crops are likely to have a negative impact in the future. Also, the disappearance of agro-biodiversity results in loss of local knowledge on the management and conservation of local resources[9]. Most importantly, gender issues of roles, access, control and decision-making and related local knowledge systems have undergone changes, and marginalized women's knowledge and status[10] and decision-making power[11].

In both the study sites, the area under cultivation as well as the number of landraces has been declining. The area under cultivation of sorghum, pearl millet and small millets in Kolli Hills has declined from 1799 ha during 1970-71 to 766 ha during 2003-04. During 1883, tapioca was not even listed as a cultivated crop in Kolli Hills[12], whereas in 2003-04, the area under the crop was 5,848 ha. This was mainly due to assured market linkages, better prices and crop loans for cultivation[13]. In proportion to the decline in area, landrace diversity has become reduced, as farmers excluded certain landraces largely due to changes in the cropping system geared to commercial crops[14]. Agricultural intensification driven by the assured market for tapioca, lack of market for small millets, less supportive government

policies, erratic climatic factors, drudgery in processing of millets and decline in per capita land availability are other important factors speeding up the erosion of diversity of millets. The introduction of rice in the Public Distribution System (PDS) and Noon Meals Programme in schools has begun to have an impact on culinary preferences. In addition, the menace of wild animals and changes in cultural values and lifestyles has reduced the preference for millets[14].

Jeypore tract being the secondary centre of origin of rice, the diversity of rice landraces here is enormous. To explore and collect the extant rice germplasm, the Central Rice Research Institute, Cuttack, India collected about 1,750 land races of rice from the Jeypore tract in 1955-60. But in 1995-96, the MSSRF could document only 256 land races of rice from the area[15], pointing to the rapid rate of loss of genetic diversity in a span of forty years. An important factor behind this loss was the spread of High Yielding rice Varieties (HYV) with subsidies for seed and fertilizers by Government agencies. In fact, by 1996-97, thirty-six percent of the land was under HYV[16] and by 2005-06 this became eighty five percent[6]. Presently, only small and marginal farmers in remote areas cultivate land races. Recently, the central area of the Jeypore tract received irrigation facilities from Kolab river, which has brought more area under high-yielding rice and commercial crops like sugarcane, maize, cotton, and sunflower, with improved vegetable varieties[7].

Gender Relations and Practices: The prevailing gender relations both at the household and community levels in the two sites show differences as well as commonalities in different aspects.

To take commonalities first, in both the communities, family type is nuclear (even though joint family is the ideal norm in Kolli Hills), descent is traced through the male line, society is patrilineal and residence is patrilocal. Divorce and initiative for divorce can be from either spouse, and the father takes responsibility for the children of divorced parents in both the sites. Similarly, in both the cases, women do not inherit land or any other permanent assets, despite their substantial contribution to the household economy. Also, leadership is restricted to male members only in the traditional Panchayat, and also for priests and traditional healers' in both sites. However, in the absence of male children, daughters may inherit property[17,18]. In both the sites, men and women are involved in local marketing; women take the lead in local trade, while men lead in marketing products that involve external traders and cash transactions[7,19].

There are also differences between the two communities. For example, traditionally polygamy (men with more than one wife) was allowed in Kolli Hills, but now monogamy is practised; while in Jeypore, monogamy, and arranged marriages are considered ideal, with the consent of both son and daughter, but personal choices are accepted. In Kolli Hills, the daughter on her marriage is now given dowry either in cash or kind, though earlier bride price was practised; whereas in Jeypore bride price is still the custom[17,18]. In Kolli Hills Sankritised god worship is common, mother goddess and ancestral worship are still common in sacred forests[20] and Christianization is a recent trend in the terrain due to evangelical movements of different denominations and .nissions of Christianity, whereas in Jeypore animism, nature worship, fetishism and ancestor worship are still common. In both the sites, women have access to all types of lands. However, in Kolli Hills, decisions related to the

choice of crop are seldom decided by both, and mostly men decide[21], while in Jeypore women make decisions on mixed farming in uplands, and in addition to that, joint decision-making is the norm for medium and low land. Women have control over their own income and manage the household in both the sites, but in Kolli Hills men have control over common earnings. Traditional Panchayat systems are completely dominated by men; and women are not allowed even to participate in the meetings in Kolli Hills. However, but rarely, a woman may attend, if her presence is essential for finding a solution to a specific problem related to her, such as divorce[17], whereas in Jeypore women participate in the *palli samithi* meetings. Regarding mobility, Jeypore women are much freer compared to Kolli Hills, where women's mobility is restricted to the market and relatives' houses. Nowadays, after the formation of Self Help Groups, women are going to banks, government departments etc on their own in both the sites[7,19].

This brief comparative account of selected ethnographic details gathered in two different tribal cultural contexts indicates that gender relations are somewhat more egalitarian in Jeypore than in Kolli Hills.

The roles and responsibilities of women and men in small millet cultivation in Kolli Hills indicated that women do most of the tasks, which need more energy and time when compared to men[21] and require specialized skills and do not involve any money tranctions[22].

Gender Roles and Responsibilities in Seed Management: Social, economic and cultural factors determine the gender division of labour, which in turn influences responsibilities, knowledge and decision-making capacity in various agricultural activities. However, the roles are dynamic depending upon changes in the socio-economic, cultural and political climate. According to Davison[23] the gender relations of production are socio-economic relations between men and women described by differential labour tasks, control over resources (land and income) and decision-making. The role and responsibility of men and women of the two tribal communities of both Jeypore and Kolli Hills vary widely. In small millet cultivation, the critical area is decision-making, especially in crop selection and agronomic management, and in this regard gendered knowledge plays an important role. Table 1 clearly discloses the structure of roles and decision-making processes of men and women in seed management, exchange and utilization in the two sites.

Table 1.Gendered roles and decision-making in seed management, exchange and utilization

Roles	Kolli Hillls[21]						Jeypore[24]					
	Women		Men		Both		Women		Men		Both	
	R	DM	R	DM	R	DM	R	DM	R	DM	R	DM
Seed Management												
1. Identifying quality grains	√	√	-	-	-	-	-	-	-	-	✔	✔
2. Separating quality grains for seeds	√	√	-	-	-	-	✔	-	-	-	-	✔
3. Drying with care	√	√	-	-	-	-	✔	✔	-	-		-
4. Seed treatment (plant leaves / other methods)	√	√	-	-	-	-	✔	-	-	-	-	✔
5. Arranging storage containers & cleaning	√	√	-	-	-	-	✔	✔	-	-	-	-
6. Monitoring of pests and periodical drying	√	√	-	-	-	-	✔	✔	-	-	-	-
7. Storing seeds	√	√	-	-	-	-	✔	-	-	-	-	✔
8. Checking seed quality	√	√	-	-	-	-	-	-	-	-	✔	✔
Seed Exchange												
9. Managing seed lending	√	√	-	-	-	-	-	-	✔	-	-	✔
10. Checking seed quality before exchange	√	√	-	-	-	-	-	-	-	-	✔	✔
11. Getting back the seeds from borrowers	√	√	-	-	-	-	-	-	✔	-	-	✔
Seed Utilization												
12. Monitoring pests	√	√	-	-	-	-	✔	-	-	-	-	✔
13. Winnowing			-	-	-	-	✔	✔	-	-	-	-
14. Drying	√	√	-	-	-	-	✔	✔	-	-	-	-
15. Pounding and polishing	√	√	-	-	-	-	✔	✔	-	-	-	-
16. Removing stones and chaff	√	√	-	-	-	-	✔	✔	-	-	-	-
17. Preparation of food items	√	√	-	-	-	-	✔	✔	-	-	-	-
18. Storing and using husk as pig/cattle feed	√	√	-	-	-	-	✔	-	-	-	-	✔

R- Role , DM – Decision making

Table 2 summarizes the gendered contributions to varietal selection. Though both men and women are involved in crop selection, knowledge of varietal characteristics, as well as selection criteria varies, largely due to the gender division of labour and age. In Kolli Hills, older women (> 40 years) identify and classify using phenotypic characters, geographical distribution, agronomy, relative gastronomical qualities and use more than the younger generation (<40 years) The younger age group is often not able to distinguish much among the various landraces, perhaps due to the lack of experience and less frequency of interaction with different landraces[25]. The study on wild foods among the tribal communities of

Wayanad district of Kerala also confirms that along with gender, age is also an important variable in differential knowledge[26].

Table 2. Gendered knowledge, criteria and decision making in seed selection

Category	Kolli Hills	Jeypore
Knowledge of landrace characters/ characterization	Women use geographical distribution, edaphic requirements, plant height, shape/ arrangement of grain in panicle, ease in processing, meal quality, and impact on health; men use method of harvesting, cropping system and maturity periods and productivity[25].	Women use leaf sheath colour, husk and grain tip color; men use grain taste, panicle weight and degree of grain filling. Both use plant height, panicle length and tillering vigor[24].
Criteria for selection of seed	In panicle selection, both men and women use size, maturity of the panicle, and absence of chaff, ill-filled grains, and pest and disease infection. But men use good panicle alone as main criterion whereas women consider vigor of whole plant with well-filled grains in panicles[14].	In field selection, the whole family is involved, and uses disease- free plants, lengthy, well-filled panicles, and bright-coloured husk as criteria. In the threshing yard, women alone are involved and collect, clean and remove under-sized, off-colored grains/ stones[7].
Preferences for landrace selection	Stability and productivity by men, meal quality, resource availability, easy of processing and multiple uses of the crop by women[21].	Women consider cooking quality, suitability for value-addition like popped/puffed rice, milling quality, rice: husk ratio and men look for taste, yield potential and market value [27].

However, in spite of women's vital role in seed management, generally women are not involved in the crop improvement programmes. Swaminathan[28] pointed out that very little research is in progress on the role of women in the conservation and sustainable management of biodiversity. At the same time, when women's knowledge and skill are lost, it not only leads to decline in agro biodiversity, especially among under-utilized and neglected species/varieties, but also to loss of status for women[29].

FINDINGS FROM INTERVENTIONS

In this backdrop, an attempt was made to study how interventions to strengthen the conservation, enhancement and utilization of agro-biodiversity in the two sites affected the process of agro-biodiversity loss, adding value to women's knowledge and consequently affecting women's status/gender relations. The interventions tried between 1999-2000 to 2005-06 to revive the cultivation of small millets in Kolli Hills were through creating demand and market linkages, while in Jeypore between 2000-01 to 2005-06 the productivity of traditional paddy landraces were enhanced through crop improvement. In the process, laterally cultivation-enabling services like seed banks, market linkages, and drudgery reduction in processing were facilitated. Market linkages and Community Seed Banks (CSB)

in both the sites, and crop improvement in Jeypore were the chosen intervention activities. Studies of the gender roles and responsibilities in agriculture, especially with regard to seed selection and management had already been carried out in Kolli Hills[21], and were carried out in Jeypore during the interventions[24] casting light on gendered knowledge and practices.

Interventions in Kolli Hills

The various factors responsible for the decline in millets production over the last few years, leading to the disappearance of many landraces, has already been mentioned. It was therefore felt that developing a strong market demand would be a new and powerful strategy to promote the cultivation of this nutritious food crop, and conserve biodiversity represented in the landraces. Reduction of the drudgery of women involved in processing was facilitated by putting in place dehusking machines and new mechanisms developed to make seeds available in desired quantity.

Market Linkages: These were developed in two phases. In the first phase, a direct market linkage was established between the local cultivators and the Tribal Co-operative Marketing Development Federation of India Ltd. (TRIFED), the government marketing agency for tribal produce, to sell the product as whole grain without any value addition. Women and men millet growers from 30 villages were mobilized into seventeen Self Help Groups (both men and women were members of SHGs) with equal representation to all the millet-growing areas. Area-based procurement centers were opened in the villages where SHGs functioned, which helped farmers to sell the grains directly. Price fixation was also done in a participatory way, and women were involved in making decisions on the prices. From the second year onwards, the minimum procurement price was announced even before cultivation began, and assurance was given by TRIFED to buy the product from farmers, which encouraged farmers to cultivate small millets. Table 3 indicates the amount of grains marketed during this period through TRIFED[30] with a small gain of about Rs 1000 per household in a year (three to five months crop duration in a year). This arrangement came to an end in 2002 due to the price offered by the TRIFED being lower than the previous year.

Table:3. Quantity of small millet grains marketed through TRIFED

Year	Quantity (Kilograms)	No. of farm households	Gross return to farmers (Rs)
1999-2000	10,000	56	65,000
2000-01	12,500	88	84,375
2001-02	12,500	112	86,250

In the second phase, from 2002-05, a different system was organised; dehusked grains and flour were marketed in urban centers (both metropolitan and local), to enable farmers to get an additional Rs 1 per kg, and also as an income-generating activity for the SHGs. A diesel-driven dehusking machine was introduced in two villages, with the twin objectives of catering to market demand and increasing local consumption by reducing women's drudgery. An additional facility to mill paddy grains was launched as a microenterprise to two SHGs (one mixed SHG group in the northern part and one men SHG in the southern part). Table 4. indicates the amount of millets marketed as value-added products and the gross return to the

local men SHGs. The returns to value-addition are significantly higher than the returns to farmers.

Table 4:Quantity of dehusked grains/powdered small millets marketed in urban centers

Year	Urban – metropolitan		Urban –local level		No.of farm households supplying grain	Gross returns (Rs)	
	Little millet (kg)	Italian millet (kg)	Little millet (kg)	Italian millet (kg)		Farm households	SHGs
2002	5600	5000	-	-	53	68,900	2,65,000
2003	1400	1200	120	130	29	18,525	65,625
2004	5600	5200	119	130	73	74,583	2,20,988
2005	3500	3000	940	545	64	53,898	1,67,125

In this system, processed product marketing was entirely carried out by the men SHG and women SHGs were involved in local grain procurement.

Community Seed Banks: Farmers' decisions on the seed source are a critical variable influencing genetic variation. They usually prefer to use their own source of seed, and in case of need, they get seeds from neighboring farmers through seed exchange, which is considered the most reliable source of seed. Farmers, especially women, resort to exchange when genetic/agronomic performance of the cultivated landraces is poor, or at the time of seed scarcity resulting from crop failures, or temporary discontinuity in cultivation (3-4 years). The traditional horizontal seed networking among farmers has evolved to facilitate access and ensure availability of seeds, but though the network is functioning effectively in Kolli Hills, the intensity of the process has been declining over the last two decades as a result of reduction in the area under millets. To ensure availability of seed at the village level, five CSBs were established, managed by five SHGs (four women and one mixed), covering an average of four to five nearby hamlets each. On an average, there were 10-12 members in a group; in the case of the mixed group, care was taken to include women in leadership positions either as Secretary or President. The management follows the traditional seed exchange norms; the kind of landraces stored in each of the CSBs varies depending upon the local requirement, and SHGs decide this at the time of establishment. Table 5 shows the role of women and men in the management of the seed bank. Women carry out almost all the activities[21].

Table 5. Activities of women and men in Seed Bank

Activity	Kolli Hills		Jeypore		
	Women only	Both men & women	Men	Women	Both
1. Collection/deposition	-	✔	-	-	✔
2. Maintaining registers	✔	-	✔		-
3. Seed weight measurement	-	✔	-	-	✔
4. Checking physical seed purity	✔	-	-	✔	-
5. Drying of seeds	✔	-	-	✔	-
6. Cleaning of seeds	✔	-	-	✔	-
7. Insect control with mix of dried leaves	✔	-	-	✔	-
8. Monitoring storage pests	✔	-	-	✔	-
9. Seed germination	✔	-	-	-	✔
10. Lending to farmers	-	✔	-	-	✔
11. Cleaning and periodical maintenance	✔	-	-	✔	-

II. Interventions in Jeypore

In Jeypore, it was found that the major problem with landraces was their low yield leading to a cycle of poverty. Tribal farmers were also unable to cultivate HYVs due to lack of access to assured irrigation and inputs. Non-availability of quality seeds or financial support for proper cultivation of landraces compounded the problems, resulting in shortfalls in annual food consumption and low incomes. In order to improve productivity and production while conserving and enhancing the genetic diversity of landraces, agronomic intervention and crop improvement activities were selected as the major strategy. In addition, facilitating and strengthening the supply of local seeds was also taken up as a supportive strategy.

Crop Improvement/Participatory Plant Breeding: The common agronomic problems associated with low productivity were sub optimal land preparation, use of impure and poor quality seeds and broadcasting of seeds. To overcome these constraints, land preparation with farmyard manure, selection of seeds before sowing, raising of nurseries with line sowing, line transplanting and selection of main panicles for seed were introduced. Intensive training on these modified agronomic practices was conducted and targeted at agricultural operations that have a bearing on both women and men.

Seed purification was initiated in 1998 to tap the yield potential of the landraces. Out of 26 land races, six land races (two best land races from each land category) were selected by farm families according to their yield performance, for large-scale demonstration in 2000. At the end of this exercise, the land race *Kalajeera* (average 4 tons/ha) was found to have a potential for gainful marketing for its quality and selected for large-scale production and marketing[31]. In this process, women's knowledge and skills (Table 2) were fully drawn upon and utilized, making them full partners in the process. Training was provided on seed selection before harvest. Farm families, particularly women, learnt to select panicles from the mother and primary tiller and successive steps of seed purification. Over a period of three years, this led to better quality seeds and increased yield (Table 6).

Table 6. Spread and yield of *Kalajeera*

Details	2002	2005
Villages	5	11
Area (Acres)	14.2	67
No of farm families	26	83
Total Grain Yield (t)	13.80	29.30 grain sold to NAFED 8.50 grain self consumption and 7.50 pure seeds

***Market linkages*:** Increased productivity due to improved agronomic practices and seed purification stimulated interest among farmers leading to an increase in the area under cultivation of landraces. '*Kalajeera* was planted for sale of seeds and grains, and other landraces for consumption. Earlier, farmers were not able to meet their subsistence needs, but now the interventions resulted in surplus grain for sale in the market'[32]. Three kinds of market linkages were developed. Initially sales were promoted in only exhibitions and fairs like PARAV - 03 at Koraput and International Year of Rice 2004 celebrations at Jeypore for *Kalajeera*. Local marketing of the grain was promoted as nutritious hand-pounded rice. 2500 kg of hand-pounded rice @ Rs.18.00 to 20.00/kg were sold in local markets and also through door-to-door campaigns[33]. In 2005, a market linkage was established with NAFED (National Agricultural Co-operative Federation of India Ltd.) and 29.3 tons of grains @ Rs 10/kg were sold.

Community Seed Banks: Traditionally, farmers exchange seeds by borrowing them from neighbors and friends, and returning them with interest at the time of harvest. This mode was adopted as a management practice in the CSB. Trainings were provided on CSB management, distribution, sale, and record keeping. CSB have been set up in seven villages, each managed by a local management committee consisting of a President and Secretary (male in the case of all but one woman President) and four members, three of whom are women. This has boosted the confidence of women in collective management of seeds as well as providing choice, quality, safe storage and timely availability of seed. In addition to this, the process of pure seed production has been initiated in seven villages, thereby providing seed security at the village level. There has been continuous increase in the number of borrowers and the quantity of seed transacted over the years. Men and women's roles in Seed Bank functions are given in Table 5 [24]. Women have an increased workload as well as responsibilities as a result of this activity, but cannot participate in record keeping because of their less education as well as tight workload.

DISCUSSION

In order to study the impact of these activities on gender relations/women's status, the area under millet cultivation in Kolli Hills was taken as a proxy indicator to assess the changes, because women's skills and knowledge are maximally utilized in the cultivation of small millets. In Jeypore, the area, spread and improved productivity of landraces were taken as

proxy indicators, because of women's high involvement in the entire process, and the utilization of their knowledge and skills in the conservation and cultivation of paddy landraces.

In Kolli Hills, since the introduction of a cash crop from the 1980s on a large scale with buyback arrangements from nearby agro-industries located in the foothills, Kolli Hills agriculture started to shift from subsistence towards commercial farming and traders emerged as a strong force. The area under small millets cultivation started declining rapidly between 1970-71 and 1999-2000; however, since 2000, there has been slight increase in the area under cultivation (Table 8). It is not possible to say on the basis of one year's data if the trend has been arrested or reversed permanently. Market linkages, value addition and access to dehusking facility in Kolli Hills might have generated some awareness and motivation to take up cultivation among both women and men farmers. But it should be noted that such small interventions might not be enough to arrest or reverse the overall decline over the entire area. It is suggested that with the continuing decline in area under millets, and consequent decline in the use of and demand for women's specialized knowledge and skills, the social value of women's gendered knowledge would also decline, adversely affecting women's status in the family and community.

Table: 8. Declining trend in cultivation of small millets in Kolli Hills

Year	Little millet (samai)	Italian millet (thinai)	Kodomillet (varagu)	Prosomillet (Panivaragu)	Total
1970-71	-	-	-	-	1799
1996-97	-	-	-	-	967
1999-2000	135	189	141	-	465
2000-01	227	176	161	103	667
2001-02	224	168	159	100	651
2002-03	252	172	163	60	647
2003-04	323	243	141	59	766

Source: Department of Agriculture, Namakkal, Tamil Nadu[34]

In Jeypore, an opposite trend is indicated by the increase in productivity, area and spread across a number of villages of the cultivation of landraces, notably *Kalajeera*, in the region, as a result of improved agronomic practices and seed purification (Table 6). Women's traditional knowledge and skills in seed selection (Table 1 and 2) have been fully utilized in these activities. In addition, intervention on improved agronomic practices has helped the women to gain new skills and knowledge on cultivation, reduced women's burden in weeding and harvesting, and given them more employment days in paddy transplanting. So it is postulated that women's status in both family and community will remain at the current level or increase, since their knowledge is valued.

With regard to women's role in marketing as well as in CSBs the situation is somewhat different. Women's participation in marketing is directly linked to its location. The earlier phase of direct marketing of grains at Kolli Hills itself facilitated eight women SHGs to participate in all aspects of marketing, whereas their participation in distant urban markets

during the second phase has been restricted. Direct marketing helped them to take up new roles in the market, enhanced mobility and linkages with institutions, and also gave visibility to their knowledge and expertise in small millet cultivation[30]. But the second market linkage for the value-added products has been handled completely by members of one male SHG and there is no participation by women. In a patriarchal community, the mobility of women is customarily restricted; hence since women's participation in the market has been further reduced, and this reduces the space for women to take decisions related to marketing. The domination of men SHGs in external marketing can be considered as the typical outcome of the traditional practices of a patriarchal society, in which men have greater access to both economic opportunities and productive resources as farmers and value adders. Rao's[35] study among Santal tribes of Jharkhand also reported that external market linkages for forest produce supported men, while women have lost control over income, adversely affecting gender relations. The strategy of using external market linkages to create an economic stake in conservation needs to be carefully planned for an equitable sharing of benefits between men and women.

In Jeypore, landraces of rice, traditionally sold by women in local markets, fetched only low prices. However, since 2003, some of these landraces have entered external markets due to the purification and quality seed production, much higher prices are being obtained. Women's participation in the external market is practically nil; for similar reasons as in Kolli Hills, though women continue to be active in local marketing and barter of rice, vegetables, seasonal food items, forest produce and fuelwood.

As far as the seed banks are concerned, both in Kolli Hills and Jeypore, women were active participants in the earlier informal seed exchange system, so the CSB strengthened them, helped them to source seed without much difficulty and provided seed security. Women's skill and knowledge in seed management have been recognized and utilized in the management of CSBs. In Kolli Hills, the entire management, including all the 11 functions, is carried out entirely by women. In Jeypore, the management committees are mixed, and the functions divided according to skills (Table 6). However, the various processes involved in managing CSBs have increased both the workload and responsibilities of women members considerably. While women's status in the community has increased, they have also been burdened with extra responsibility and the most time-consuming tasks, and record keeping (in Jeypore) is done entirely by men, because women are less educated than men and engaged in multiple productive and reproductive activities. It is not clear how this trade-off will work out in the long run, and whether it will be beneficial to women.

CONCLUSIONS

The study indicates that interventions attempting to reduce the decline in small millet cultivation and of traditional paddy diversity in Kolli Hills and Jeypore respectively have considerable potential to affect women's status both positively and negatively. While it is too soon, and the interventions are on too small in scale, to draw firm conclusions, trends are clearly visible. The value of women's specialized knowledge, based on use and demand for such knowledge, would clearly be linked to the rise or fall of production of the particular crop. If small millets continue to fade away, or vanish, in Kolli Hills, knowledge about them

would no longer be valuable or needed by the community, and that would affect women's status adversely. On the other hand in Jeypore, where women's traditional knowledge as well as new skills are visibly helpful and adding to the prosperity and welfare of the community, it would have positive effects on their status. As regards the impact of new marketing strategies and new social institutions like the CSBs, there is evidence on both sides, and no clear conclusions can be drawn. In the long run, gendered knowledge in agro-biodiversity can play a significant role in bringing about more equitable gender relations only when women's knowledge is fully recognized, utilized and rewarded.

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