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Agro-Ecology and Food Security: Studying the Grain Bank Practice of Women Peasants in Odisha

Abstract

The literature on women and sustainability justifies women's central role in promoting agro-ecology. Feminists contend that women's engagement with agro-ecology is closely connected to the process of social formation, and in network of society-ecology-sustainability, women are seen as potential actors. Although, salient features of sustainable paradigm recognize women as central actor, women and their practices, still own marginal position in mainstream agricultural research and extension.

Therefore, certain practices like 'institutionalization of grain bank' to ensure food security is far from analysis due to its local nature and perhaps being a feminized practice. This paper argues that there may be communities practicing similar kinds of sustainable and shared methods to ensure food security, and there is an urgent need to integrate such practices with policy-making to make agricultural extension network responsive towards the community needs.

This empirical study deals with how women of *Kondh* tribe in Odisha negotiate with their ecosystem and their embodied socio-cultural capital to address seasonal food insecurity in a sustainable way. This study was conducted among *Kondh* women of five women collectives to explore the process of grain bank formation while analysing the sustainability of this practice from the politico-ecological dimension of caste/tribe and class continuum.

It was observed that grain bank is developed as community of practice model in which women farmers primarily use social capital for ensuring food security.

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Introduction

Beginning with late 1990s, the food security discourse has been dominating the discussion in international and national platforms, in connection with increasing food inflation, market instability, changing climate and land use pattern, and impending resource constraints (editorial, p. 1). The global food system is failing to address the food needs of larger segment of population, simultaneously intensive agriculture is creating pressure on the ecosystem coupled with loss of forest, agro-biodiversity, genetic resources, and soil nutrients (Gonzalez, 2012). As a result, multiple frameworks including, scientific intervention, social interpretation and institutional models have emerged to examine ‘food security politics’ from a diverse perspective (Ibid. p. 4). Both in developed and developing countries, the crisis of food security is experienced by resource poor people. “People go hungry, even in countries where food is abundant” (Gonzalez, 2012, p. 3) and the countries and households who depend upon local agriculture are more likely to face food insecurity (Ibid.). According to Sunilam, in India, around 75 percent of land is single cropped which are primarily owned by the marginalized farmers, who often not covered under PDS. Therefore, it becomes necessary to protect all forms of cultivable land to ensure food security (Ali, The Hindu, 2012). In India, resource poor communities often adapt to differential micro-community-practices for agriculture and food security in their everyday struggle. The dominant agro-food system is an obvious answer to the food crisis, yet it is disengaged with the social struggle of local communities to address the domestic food needs (Hassanein 2003). Community approach to food security has evolved as part of the social process. The dominant approach and the local approach to food security are functioning in separate spheres, yet need to be engaged in a non-dichotomous relationship.

Social analysis of food security holds significance not only in the context of policy making but also needs to mainstream a set of agro-ecological initiatives as viable alternative as against the conventional techno-scientific models. With this background, this work tries to understand food security in a relational term—intensity of food security varies in combination with ‘space, place and the region’ (Ricour, 1986 cited in Editorial, p.4). Hence, the question in relation to social interpretation of food security, i.e., community practices involving access to food

deserves attention in the food security framework. Thus networks of alternative agro-food system need to be explored, and entangled with the dominant institutions of agriculture policy-making.

In global debates, the context of local, community practices, and agencies of change aren't often highlighted. For instance, the context of 'local' is hardly discussed as part of the official food security frame (Kirwan and Maye, 2012). The need is 'to recognize that there are spaces of resistance and creativity in which people attempt to govern and shape their relationships with food and agriculture' (Hassanein 2003, 79). Prior to 1970s, food security was defined in relation to national food production and international trade but since then, the concept has been evolved to incorporate household's access to food (Devereux and Maxwell 2001; Maxwell and Smith, undated, see Mavengahama et.al. 2013). In instances of household food security, it is seen that women play a key role not only as providers of food and nutrition (Philopose 2012) but also initiate transformative and progressive strategies towards building up local food system. Food security can be referred as a social process which is shaped by women's organized effort (cited in Kirwan and Maye, 2012). Global food security frame cannot be discussed in isolation of the local as it involves community practices as part of women's organized effort towards addressing household food insecurity. The paper argues that women in every community developed food security strategies and it is primarily determined by their social contexts. Every community practice isn't homogenous in nature, it essentially varies with women's social context. Therefore, it is essential to study these practices to develop them within a framework. With this, the study sets out to discuss the grain bank practice of women peasants in Kandhamal as an informal initiative to build local food system.

What is Grain Bank?

Grain bank is an agro-ecological practice embodies the culture of grain preservation in the region. It can be described as women farmers' community mechanism to deal with their situational household food vulnerability. These strategies are old-age agro-ecological practices not often tapped as valuable resources to strengthen social institutional mechanism to deal with nutritional security and resource governance.

Institutionalisation of grain bank is a social process and is intertwined with women's socio-cultural capitals and their ecology. In the region, grain banks have formed over a decade as an informal practice of depositing different types of grain and seeds and are influenced by the social practice of Kondh towards collective grain saving. Simultaneously, the practice contributes to maintaining local crop diversity by preserving indigenous seed varieties which are in the process of extinction (Gonzalez, 2012).

Methodological Framework

This is an ethnographic enquiry into the community approach of food security model which has examined the underlying relationship between women collectives, agro-ecological initiative, and food security. Kandhamal district was chosen purposively due to its significance importance as the organic district in the state of Odisha. Farmers in general are primarily dependent upon traditional methods of farming due to its socio-ecological parameters. Until recently, the district is facing frequent droughts, and decreasing agricultural yield, for which small and middle farmers often are facing seasonal food insecurity. In developing countries, majority of undernourished people are the small farmers (Gonzalez, 2012) due to their limited access to food.

Six women collectives were chosen as the sample in which grain bank has been operating as a community practice to combat seasonal food insecurity. Operationally, SHGs are described as women collectives due to their informal engagement with the operation of grain bank, and are structured around the social identities of women peasants (Kalpana, 1997). Total of 54 women farmers were interviewed individually across the axes of caste, tribe and class categories. Apart from holding interviews, focus group discussions were held with a few women collectives on the common questions related to women's knowledge system. Informants including NGO activists and extension workers were contacted and their views were also recorded in the field diary to contextualize the existence of grain bank practice.

The purpose of this paper is to examine grain bank as a Community of Practice approach to food security, while analysing women farmers' collective strategies to sustain this ecological practice.

Description of the Field

The Women collectives of Kandhamal have an informal functional structure, as its representation is within the social institutions that include caste, tribe, and kinship. The membership strength varies (between 10 and 12 members) among the Women collectives and functionally they are oriented towards economic and social activities. Internal lending among the collective members represent the economic functions, whereas the social function of the collectives are broad based in nature and include health & nutrition campaign, awareness on land and forest rights and fair price for non-timer forest produce (NTFP), campaign on liquor prohibition and so on.

A description of the composition and functioning of the SHGs gives an understanding that they operate largely on an informal basis, depicting the social character of any community based organization. In the case of *Lakshmi Bahi*, *Suna Muhi* and *Banalata Mahila Sangha*, it is observed that these social groupings are informally engaged in a community practice, which reflects the social embodiment of a practice. Further, a detailed structural analysis of each collective manifests the significance of social groups and their role in nurturing a community practice. In this context, *Ma Naraani* SHG, comprises members from a patrilineal kinship structure, which is represented by the Kondh tribe. For certain collectives, the structural unity rest with members' family, caste, and tribal alliances.

In this regard, the respondents stated, 'family/caste/tribe identities are critical to maintain a cohesive relation within the group'. Thus, the caste, tribe and kinship polarity of each women collective have differential impact on the functioning of the grain banks.

Inference drawn from the field data shows every community practice is deeply embedded in and shaped by its social structure, which allows heterogeneity within the community practice. Access to family farm enables them to cultivate a maximum of ½ acres in every cultivable year, in which they grow seasonal crops such as: pulses,

vegetables, paddy, spices and oilseeds (District Agricultural Strategy Committee Meeting, *Kharif*, 2011) as part of family cultivation. The cultural preference for traditional farming by the Kandhamal farmers has put the district in the category of lowest chemical fertilizer consuming district, where use of bio-fertilizer is also noticed (Kharif 2011). In addition to subsistence farming, the women are largely responsible for collection of NTFPs, which provides an alternative source of income (Ibid) for the family. Respondents stated that collection of wood, *mahuli* flower, *Sal* leaves and *Jhuna* earn them subsistence livelihood to survive and address the risks of food scarcity (Frost, 2000).

Food Insecurity: Reflecting through Women's Experience

Food insecurity at the household level in the region is largely attributed to crop failure, which the respondent state is the outcome of minimum irrigation facility coupled with climatic variation and changing cropping pattern. The underlying field conditions have amounted to households resorting to new crop varieties, although they face problems of different nature.

Case note 1: Women from Dharitri SHG shared their experience with lady finger cultivation using new seed varieties. Recently, we cultivated new variety of ladyfinger received from the Panchayat office. We found that this variety of ladyfinger has a higher yielding; but problem is confronted in plucking them, as this new crop variety of has thorns. The thorny vegetable (lady finger) has not been able to get a fair amount of demand from the market. The low demand for this crop, forced us to leave the crop in the field, thus leading to loss of investments. This situation has brought a sense of income vulnerability, which farmers linked with seasonal household level food insecurity.

The above narrative can be supported by the work of Dostie, Haggblade, and Randriamamonjy (2002), who argued seasonal food shortage pulls up around rainy season, when one million Malagasy residents living below the poverty suffer from food insecurity. The literature substantiates that causes of food insecurity are varied and its intensity is determined by micro-level realities. This is one of the reasons, why women farmers in similar vulnerable regions develop community approach to food insecurity as an answer to their everyday struggle to tackle food deficiency.

Genesis of *Shashya Bhandar* (Grain Bank)

The local food system of Kandhamal has inherent elements of interdependence of human ecology and society. Thus grain saving and seed preservation practices are commonly observed, in which women play a dominant role. Grain bank in this specific context has been mainstreamed from the traditional practice of seed preservation and crop saving at the household level. Women in *Suna Muhi* and *Lakhmibahi* collectives stated, “we knew about the practice, but initiated it within our group during our discussion meetings on mother’s health and nutrition”. In the study area, it was seen that women farmers and civil society organisations operate as key agents in transforming the culture of grain saving into a community practice. The grain banks operate with the help of women’s informal network inclusive of neighborhood and larger social structure (Forst, 2000). Prior studies have shown that among resource poor communities, women possess the ability to organize effective farmer’s groups and can effectively manage community-led organisations for technological innovation, can develop market-linkage, and enhance their access to credits if such collectives can receive support from public agencies (Song & Vernooy, 2010). Grain bank can be referred to as the remote component of extension network with significance for restoring household food security. It was also stated by the informants that collective observance of rituals relating to agriculture and other social functions has profound influence on the retention of grain saving practice. The evolution of the grain banks has two interfaces, one is cultural and the other is adaptation of the grain saving practice in the village common pool during social functions by the women symbolizing the Kondh community’s collective feeling.

The below case notes amply reflect the Kondh culture and their common practice to tackle food insecurity at the household and the community level.

Case Note 2: We started the institution of grain bank before 10-12 years with an initial membership of between six and seven although it is difficult to ascertain the year of its initiation. The practice evolved through multiple steps with preservation of rice crop in one chosen household being the first step. At this stage, the household with adequate space to preserve around 70 tambies of *Jhunga* rice (a local rice variety) was chosen. This involved five members of the same patrilineal kinship, who preserved rice to avoid any impending food shortage among the member households. Currently, we have 10 members in this woman

collective from the same jati – i.e. *Gauda*, and all are economically backward. The practice was emulated from the existing village level practice to save grains for meeting food needs during social functions such as: marriage, death rites and so on. However, the purpose of having grain banks is to address micro-level food need which may arise owing to various contexts at the household level.

Case note 3: Hatimasa village - We have learned the collective system of grain saving from our Kondh culture. We used to preserve grains in our homes for about a year or so, and this grain bank is a steady graduation from informal saving of grains from individual households to collective level. Within the group, one of the respondents viewed that grain bank is intrinsically linked with our village tradition of collective celebration of festivals. We used to collect grains at the village level for certain functions and performance of rituals. Villagers used to collect various types of grain from each family to organise the common feast during celebration of rituals. After the feast, the left over quantity of grain was to be stored for the next occasion. Recently, we adopted the name *Sasya Bhandar* and named this institution of informal grain saving, which we learnt from NGOs working in this area.

Grain bank and food security interface: Through the Narratives of Women

The core elements of ‘Grain bank’ suggest preservation of local seed varieties, which is useful in retaining the culture of local food systems that is linked to food security within the community. A few women farmers were of the opinion that ‘even in situations of crop scarcity, we continue to preserve seeds of local crops in these banks, by which the practice is sustained within the community. For instance, preservation of local seeds by collectives include rice varieties: *Rabana, Guda Dhana, Jolka, Punia, Chinabali, Jajati*), black grams, maize, *Kandula*, mustard (*Raee Sorisha*) and local beans (*Jhuadanga*). The practice of “seed preservation often saves us (women) from crop failure as some of these crops are climate resilient’. The below case note substantiates the reasons offered by women collectives for continuing with the community level practice.

Case note 4: Seed preservation is inherent in Kondh culture, as it saves ‘us’ from the imperils of seed dependency. The respondent stated that ‘every year we receive rice seeds from government (*sarakar dhana*) varieties and mustard from the Panchayat office at a low cost Rs.10 per kilogram. Apart from this, we believe in keeping our local seeds as it is easy to cultivate the traditional crops, which gives us a sense of security from crop loss. For instance, we always keep the seeds of *Banua dhana* (local rice named as wild rice) for cultivation. This crop is easy to cultivate in dry season as it grows wildly on receiving one spell of rainfall.

This rice variety is resistant to climate variability, hence, we feel safe to cultivate local crops even in adverse climatic conditions that are sometimes reasons of our seasonal food insecurity.

The note above highlighted the significance of local seed saving practice that inevitably places women against the growing culture of dependency on monocropping, and this acknowledges them as agencies of knowledge bearer (Morgan, 2011). In some sense, 'Grain bank' embodies a holistic approach to food security as it encompasses traditional seed saving practices. It functions as a medium that interconnects community food security approach with crop diversity, climate change and women's knowledge.

The conception of these 'Grain banks' in informal processes of social networking such as family, tribe and kinship, sans any nature of contractual negotiations (Gathii, 2011) amongst women farmers. The management of these banks depend upon the 'system of grain exchange' shaped mostly by informal rules, social norms and collective attitude towards sharing. The practice is reflective of the social phenomena, i.e., how women negotiate with their social and ecosystem to ensure sustainable access to food in a non-market mode of exchange (Wilson, 2013). The relevance of interdependence between members within groups has implications for the execution of grain bank as community practice (Waylen 2013). To quote, 'a peculiarity of traditional agriculture is that the system works along with 'culture', 'value', tradition, decision-making, and epistemology of knowledge, some of which have been crystalized into stable structures, institutions, and organizations (Richards, 1993; Brodt, 2001; Cernea, 2005, cited in Sabar, 2012, p. 206). 'Grain bank' as an agro-ecological practice has been created through social structure and further can be developed as an institution to consolidate the epistemic knowledge base of women farmers.

It is observed that social network and cultural knowledge of women are fundamental to managing and governing the grain banks. From the sample of six grain banks, two have been able to efficiently manage the practice. For instance, members of *Banalata Mahila Sangha* state, 'the patrilineal kinship/family ties ensures a smooth coordination of different activities, and builds mutual trust among group members'. In

a group discussion it was highlighted that 'relation of trust' forms the core principle of the community practice within which the informal transaction of food grain takes place. Structures such as: patrilineal kinship, neighbourhood network, and extended families have contributed to sustaining this community practice of food security. Use of social capital is a vital factor to institutionalizing the practice within the collective. In this regard, respondents view, 'reciprocity and understanding of each other's economic condition within the group' influences the effective functioning of grain banks. In case of individual collectives, the social relationship determines the sustainability of these banks, and alike CoP model, members are able to achieve some common economic gain as a group. Grass-root organizations have redefined the market in relation to the local food where purchase and exchange of food happens in the context of community (Hinrichs, 2003; Lee, 2000 cited in Starr, 2010). Similarly, grain bank operating within social structures have enabled women farmers to establish direct relation with the market to meet livelihood challenges faced by the collectives.

Community food security mechanism holds limited potential to channelize the farm production to market; however these community practices need to be mainstreamed as alternative food institutions. Hinrichs (2003) discussed about the 'Community Supported Agriculture (CSA)' as an alternative food institution to evolve various mechanisms to develop the discourse of local food in Iowa (p. 39). Reciprocity, community rootedness, and relations of regard within the collectives played significant role to govern the grain exchange in the grain banks and expanded its scope of operation in the local economy. Women collectives in absence of these social capitals do confront challenges to operate grain bank, ultimately leading to dismantling of the banks occasionally. It was observed, in *Suna Muhi* and *Lakhmi Bahi* collectives, the grain bank had limited scope of operation as the group often engaged in conflict due to collapse of social relationship and trust. According to Leave and Wenger (1991), CoP model is described as a system of relationship between people who develop a sense of place, identity and purpose to initiate any activity while resolving the sense of differences (cited in Amin, Roberts, 2007, p. 354). In accordance to the above argument, in case of *Suna Muhi & Lakhmi Bahi women collectives*, grain bank functioned as a situated community practice. On the contrary, in *Bhatalpadar* women collective, despite intra-group differences, members

have been able to establish linkages between the grain bank and niche market as all the members hold a sense of common identity of Kondh community.

The grain bank developed in *Bhatalpadar* village adhere to dimensions of CoP framework— sustained mutual relationship, tracing a sense of common identity in relation to the practice, and shared ways of learning which posited grain bank a form of joint enterprise (Wenger, 1998; cited in Amin & Roberts, 2008). The case note above justifies women's use of social capital as a vital element in connecting grain bank with the dynamics of niche market that diminishes the food vulnerability among the women. Women's use of social structure explains a situated practice to be further evolved as CoP model. Policy decision demands an understanding of the 'situated details' that exhibits the interconnectedness between a practice and the social structure within which the knowledge management approach of CoP model has been sustained (Amin & Roberts, 2007, 355). According to Amin and Roberts (2007), different groups with specific identities reflect different dimensions of knowledge use. The social interaction that developed with a group's social identity has shaped the pattern of 'knowledge use' within the grain banks. Collectives lacking communitarian belongingness display level of cooperation for a specific time period, and failed to institutionalise grain bank as a CoP model.

The Primary data shows, *Lakshmi Bahi, Suna Muhi and Dharitri* groups in absence of social ties, resorted to the practice whenever there is a requirement of food. These groups show similar characteristics like 'epistemic communities who tend to be structured more closely around common projects and problem-driven cooperation' (Amin & Roberts, 356).

Case Note 6: In HatiMasa village, we Kondh women created the grain bank which is 5-6 years old. We have deposited 40-50 quintals of rice and 20-25 quintals of Mahula. There was no turmeric in the bank as harvesting was yet to occur. We developed our own norms to govern the mode of grain exchange. To start the bank, all the members contributed 10 tambis of paddy, three tambis of Mahula, and one kilogram of black whole gram. The initial contribution from each individual member is decided on the crop cultivated by the contributing members at that particular time. Last year we experienced large scale crop failure; hence we did not contribute anything. The saved grain (paddy), which is kept in the bank has been contributed from earlier years and procured from some members in the form of return against their grain loan. One of our members took 20 tambis of rice in 2011. She will now return 30 tambis of rice to the bank within three to six month of time period. Since, she didn't have any crop last year she couldn't return the grain to our Shashya Bhandar. We cannot enforce rules upon her as we know she doesn't have money either to repay the crop loan this year. The purpose of grain bank is to support members during food crisis, so we will wait for next yield. . If she gets

good crop this year, she would return the loan amount with 5 *tambi* more as an interest. We have kept the period of loan repay between three to six months, often it is extendable to the harvesting season of the next crop.

In case of grain bank in Dadki members give 25 percent more than the rice borrowed to meet food insecurity. For crops like rice and pulses, an additional 5 *tambis/khandis* is returned as interest, whereas, for 1 *tambi* of mustard, the interest rate charged as 1/4 *tambi* (25 %) more within a duration of three to six months. The grain exchange system is operated on the basis of informal rules which vary across collectives. These rules/norms are meta-narratives of grain banks within which 'mutual dependence' is inherently rooted. Social interdependence seems significant in implementing these rules to become self-governed practices. Unlike, biodiversity governance, governing the grain bank resonates the understanding of societal needs and individual beliefs on nature and human relations (Editorial, p.231). Sometimes, informal nature of rules increases the risks of managing these banks which is substantiated below.

Case note 7: In the *Kanideni* village, the grain bank created by the Lakshmi Vahi women collective is currently facing challenge due to the existing informal system of grain exchange. One of the respondents shared, currently our reserve of rice is bare minimum, because the members who borrowed rice during their need could not return because all of them faced crop failure last year. In a situation of increasing drought and lack of capital, we tend to cultivate on a small holding to minimize risks, for which members usually are unable to return the loan. The remaining amount of grain is kept exclusively as seeds. The secretary couldn't keep a record of grain loan previously taken by all the members; hence she is in no position to pressurize the members to return the grain. Discussions about the repayment of loan leads to conflict and distrust for which we are saving grain for a limited period and using the bank exclusively for the purpose of community seed preservation.

The above note suggests that informal modes of grain exchange always act as a safety-net for small peasants. Due to its informal nature, the rules can lead to non-operation within the grain bank in a situation when the group is in the process of disintegration. Similar to governance of biodiversity, the governance of grain banks is largely dependent upon the societal norms and community needs (Vadrot, 2011). The norms of withdrawing and depositing of grain is defined as per the local agricultural calendar and conform to rules, which are integral parts of the indigenous agricultural system of Kandhamal.

Further, the discussion on grain banks gives insight to on the significance of ecological knowledge. Women use ecological knowledge for preservation of local

rice, beans and pulses for about successive cultivating years in the banks. Women of Kondh tribe said, 'we have never preserved *Sarakar* rice variety since these are meant for commercial purpose'. The 'system of seed preservation/grain storage' is applied for the local crop varieties, and is adapted by the women of other communities to restoring the community system of food management.

Grain Bank as an Agro-ecological Practice

In India, forest management, cattle-rearing, and agriculture are traditionally been seen as female spheres (Arora-Jonsson, 2013), which has enabled women to generate a wide spectrum of local knowledge. This local knowledge is tapped as potential resources for innovating new technologies in areas of medication, nutrition, and genetically-modified organisms (Editorial, p.3). Further, the research needs to entail questions on significance of knowledge-bearers, and the way this knowledge forms have been sustained in local contexts. In the study, the practice of grain storage and seed preservation reemphasized women's skill of local knowledge management. These skills are learned within the community and structured around women farmers' embodied labour. During the field work, majority of women stated, 'our skills to preserve seeds and store grains are recognized as mother's knowledge', which is creating a space for women as knowledge bearers.

Women's engagement with traditional agriculture constitutes the basis for gaining skills and beliefs useful in storing large quantity of grain. Their knowledge form is systematic and logically put into practice. Their firm belief in their ecological knowledge qualifies the grain bank practice as a CoP model, because it infuses the principle of self-reliance (Hara, 2007; Hara & Hew, 2007 cited in Blankenship & Ruona, 2009). In the context of grain bank, local knowledge of storing seed and grain is considered as operational skills that provisions grain to the household during food crisis. Moreover, these practices can be treated as viable resource to effectively support and mobilize measures for tackling food insecurity (Richards, 1985 cited in Altieri, 2002).

The farm women covered under the study narrates the common ecological knowledge of seed saving and grain storage, which is given in the case note -

The practice involves identifying the healthy fruit, observe these fruits on a regular basis, collect those crops, purify it, put it for sun drying prior to preserving in the bamboo basket in an elevated/auspicious place. Both seed and grain are preserved in tumbler shaped containers made up of bamboo, locally named as Bhoogi, Bhogly, Bhooga and Dooli. The first crop (rice/pulses/oilseeds) is normally selected as 'seeds' are considered healthy and pest free.

The practice of preserving local seed varieties and grains are a task carried out by womenfolk, and are shared in the larger social structure embodying caste/tribe/class categories.

The entire process adopted for grain storage and seed preservation involves intricate procedures starting from 'careful selection of seeds' and 'cleaning and drying of paddy and pulses'. The place for drying paddy and pulses is mopped with a semi-solid paste prepared from cow dung and mud mixture. After the place is dried, grains are stored and seeds are preserved in bamboo baskets. Women farmers mop the baskets with mud from outside to protect grains from pests, rodents and insects. The use of brick red coloured mud on the bamboo reflects the artistic ability of Kondh women, further the women feel that the red colour has a pest-resistant character.

As the preserver of grain and seed, the women feel it is one of the key elements of ensuring households' access to food. The practitioners stated, seed preservation process is an indispensable part of grain bank as it allows us to go for future cultivation in multi-cropping and rotational cropping pattern. Both seed preservation and grain storage are described as mutually inclusive practices of women farmers to cope with food scarcity.

Through prior studies, it is evident that the representation of women and other minority groups in the executive committees and decision-making bodies formed for managing natural resources locally is negligible (Kellert, Mehta, Ebbin, & Lichtenfeld, 2000; Aggrawal). Such local level institutions have largely remained in with the male folk, who dominate the decision-making process. Thus, understanding of the community-based practices helps us to engage with the issues relating to use of women's knowledge in sustaining agro-ecological practices. Women's indigenous knowledge is used as a powerful adaptive measure in maintaining grain banks, which reaffirms the fact that women farmers' knowledge is central to the community survival and the survival of ecological knowledge (McGuire & Sperling 2013). Further, dissemination and transfer of knowledge signifies the dimension of creating a

knowledge repository within the collectives. In this sense, grain bank reconciled with the dimension of CoP, i.e., knowledge repository. Community practices expand the scope for creating knowledge repository within the society. Therefore, any ecological practice cannot be seen in isolation from its social and cultural capitals.

Discussions

In Kandhamal, farmers often face seasonal food insecurity due to partial crop failure, linear/unitary cropping pattern, and erratic climate variation. Moreover, the intensity of food insecurity gets accentuated due to unavailability of alternative sources of income, changing cropping pattern, and use of family labour in agriculture. Grain bank as an agro-ecological practice provides the possibilities of individual's access to food beyond capitalism. This community-initiated mechanism can create 'autonomous food spaces' for resource poor women to meet the challenges of seasonal food insecurity (Wilson, 2013). The ethno-graphic account of the informants shows that, this practice has more or less originated from the culture of grain saving as an existing practice of the Kondh community. The micro-management of food security outside the agriculture extension system is practiced by the community of women farmers. Women collectives are the bearers of caste and tribal identity that served as a social frame in the management of the grain bank system. The data reflects that women collectives, which, are primarily dominated by the kondh women, are more effective in delivering the outcomes, i.e., access and availability of food grains. These skills can be seen as women farmer's cultural wealth that is reproducing the knowledge system over generations. Each grain bank is governed by its informal norms/rules for operationalizing the notion of food sovereignty in a community context. Use of social capital by women farmers determines the extent of self-sufficiency within the grain bank.

According to Wenger (1998), mutual engagement, joint enterprise, and shared repertoire are necessary dimensions of CoP framework that enables farmers' continuous engagement with informal learning process (cited in Morgan). The case studies have shown that the aspect of mutual engagement among women farmers has emerged as a significant condition to sustain this community practice of grain saving. In practice, mutual engagement among women farmers and their social capitals are

intertwined and mutually dependent to sustain the practice of grain bank. Primarily mutual engagement within the group seems to emerge from the farmer's social embeddedness and their social networks of family, caste/tribe affinity, market link. Further, the intricate relation between farmers' mutual engagement and social capital produces the possibility of meeting food crisis beyond grain saving. The activities of five women collectives are more or less aimed at bringing practical solution to tackle food insecurity; which facilitates the use of practical farming practices, i.e, indigenous methods of seed saving and preserving grain. In a way, grain bank is successful in creating repository of shared agro-ecological knowledge. In a similar way, continuous engagement with the process of institutionalizing grain bank has driven women farmers to develop new repertoires of practices such as selling of certain kinds of food grain in the market to create a corpus amount for the group. The grain bank institution clearly reflects some characteristic of CoP model in which the practice itself is expanded through group interaction and sustained by shared repertoires of practices to meet food insecurity. All women collectives show different levels of commitment to operate the grain bank, as it is highly dependent upon mutual trust and ongoing process of farmers' informal learning. In all sense, the practice of grain bank is described as essentially a self-organizing institution (Morgan, 2011) in which agricultural extension agencies have limited role in providing support. Policy makers and extension network are increasingly aware of farmers' approach of problem solving; rather they need to aim for a new social synthesis of infusing certain community practices as parallel to the formal discourse on food security.

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