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Women and Climate Stress: Role Reversal from Beneficiaries to Expert Participants

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SUMMARY

Women, especially in the marginalized communities of the high-risk regions prone to flood and drought are considered most vulnerable to climate change risks. They play a very important role in household nutrition management and resource management in terms of labor, off-farm products, and small savings. In the absence of help from formal and informal R and D and technology institutions, their knowledge and resources' exchange system has to be very robust to cope with the seasonal shortages arising due to climate fluctuations. The study found that these exchanges, spilling over caste or class boundaries, serve as valuable informal safety nets and contribute to household resilience. Researchers seeking to strengthen community coping strategies should pursue such policies and institutional interventions which strengthen women's resource exchange and exploitation mechanisms. We offer in the end a 4-E model involving exchange, expertise, ethics, and environmental consciousness which describes how these empower women and help in articulation of their unique coping strength at intra- and inter-community levels. Lateral learning among community members sustains and enhances over time collective and household coping strategies with climate risks.

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1. Introduction

Adjustment strategies of women at the farm and household level play an important role in coping with climate variability and food security. Some of these strategies are short term or episodic while some others are institutionalized over time in the form of traditions and culture. Several studies have observed that women are more vulnerable to climate risks due to institutional factors (Adger, 1999), socio-economic factors (Bäthge, 2010; Denton, 2002; Terry, 1999), higher dependence on natural resources (UNWomenWatch, 2009; UNDP Policy brief, 2013), etc. However, the lack of empirical studies at the household and individual level has been a major gap in understanding their role in coping with climate uncertainty (Berrang-Ford, Ford, & Paterson, 2011; Goh, 2012). The tendency to see women as homogenous group and resort to excessive generalizations has also been rightly decried (Arora-Jonsson, 2011; Kelkar & Nathan, 1991).

This exploratory study looks at women's role in ensuring availability of material like food, seeds, etc., and non-material resources like labor during climate fluctuations, through social exchange/pooling, sharing nursery, vegetables, and/or harnessing local

knowledge about edible weeds. Their access and ability to convert access into availability of resource varies among different women members of the community. The asymmetry in access to different resources, institutions, and networks contributes to their vulnerability (Dankelman, 2002). In a rainfed region, a household diversifies their portfolio of livelihood options by including farming and nonfarm activities, animal husbandry, etc., to minimize risk over time and space. Some of these activities may be season, space, or skill specific [Niehof, 2004; Ellis, 1998]. They may also cope by distributing risk over different livelihood options at various times and among members of the community.

Although adaptation takes place over time, short-term concurrent adjustments to cope with stress help the household to observe, experiment, learn, and adapt. The heuristics derived from the successful experiments are often used to build an institutional arrangement around them, thus ensuring continuity. The ability to absorb, or insulate from the stress induced by climate fluctuations depends on the institutional context, agro-ecological conditions, and household endowments of individuals and dynamics of knowledge and material exchanges (Agrawal, 2010).

2. Part 1- Conceptual framework

(a) Vulnerability and variability

Climate fluctuations and changing patterns of climate have a direct bearing on food security and the marginalized communities are likely to suffer most from altered environment (Gupta, 1984; Burke & Lobell, 2010; Chakraborty, 2001; Tompkins & Adger, 2004). The effects of climate fluctuation is different for men and women, partly due to different perceptions (Hemmati, 2005), physical and cognitive attributes (Eckel & Grossman, 2008), and their expertise due to difference in access to resources, technology, and institutions (Demetriades & Esplen, 2010; Denton, 2002; Nelson, Meadows, Cannon, Morton, & Martin, 2002; Reid et al., 2009; Yavinsky, 2012). Social sanctions and historical discrimination against women have limited their access to institutions to a varying extent (Quisumbing, Brown, Feldstein, Haddad, & Peña, 1995; Adhikari, Di Falco, & Lovett, 2004; Resurreccion & Elmhirst, 2012). Women in the marginal communities are vulnerable due to their limited access to resource support (Mearns & Norton, 2010). Gender inequalities and other socio-economic differences increase their vulnerability to climate risks and hence uniform adaptation strategies for men and women might not work (UNDP, 2011; Ahmed & Fajber, 2009; UNWomenWatch, 2009).

Within their socio-cultural limitations, women's role has been central to meet household subsistence nutrition and energy needs especially in the least developed and developing nations (James, 1995). They mobilize resources at the intra-house level through reallocation, storage (apprehending future scarcity), and modifying their consumption over the needs of other family members (Quisumbing, Brown, Feldstein, Haddad, & Ray, 2007). Women often forgo their own nutritional requirement to meet the family needs. This has also been called "maternal altruism" (Whitehead, 1988). This increases their vulnerability to food insecurity in the wake of climate change. Climatic stress affects other activities like collection of firewood and managing agriculture, especially in marginalized communities in high-risk regions (Morton, 2007). The ability of women to access Climate Smart Agricultural (CSA) practices may not improve if their constraints in dealing with imprecise weather information, increased work load due to new technologies and lack of access to validated indigenous knowledge practices of other communities facing similar risks (Jost et al., 2016).

At the inter-household level, men are involved more in financial exchanges with formal or informal financial institutions and at generally a higher scale, women take precedence in managing non-monetary exchanges and financial exchanges of much smaller order. These exchanges are important strategies of coping with market and climate risks. They can also pool or amalgamate resources to cope with the risk. In his study of Northern Cameroon, Molua (2011) observes, "Despite the economic challenges and the exposure to food insecurity risks, these households provide an interesting test of women's capability as household-level resource administrators and food security managers." They play a crucial role in household adjustment and coping by managing intra- and inter-household resources, especially in a high-risk environment (Gupta et al., 1985).

This study tries to assess the role of individual women in coping with the climatic risks, with special reference to managing agriculture, energy, and nutrition in flood- and drought-prone paddy-growing region of eastern India. The central research question is how can external agencies from public, private, and civil society help disadvantaged women in coping with climate fluctuation particularly in the context of paddy cultivation in mainly rain-fed regions?

Women's participation and involvement is much higher in the nursery than men, transplanting, weeding, harvesting, and post-

harvest operations in paddy cultivation (Singh & Tiwari, 2009 in Singh & Hensel, 2012). Physical strength may have partly influenced the gender-based role division but also the different degree of tenacity in tasks involving higher degree of drudgery like transplanting paddy (Chi & Yamada, 2003; Mbiti, 2007). Technological change has been rather slow in the tasks that women do (Balakrishnan, 2000; Gupta, 2012; Gupta et al., 2003). The persistence of drudgery necessitates higher reliance on socio-cultural exchange mechanisms rather than technological innovation. The role of women in science and technology institutions has also remained under-studied (Gupta & Mashelkar, 2005) affecting the rate of innovation development targeted at reducing their constraints. Institutional factors such as negligence by both formal (and sometimes by informal R and D sectors) in developing strategies reinforce the social inertia that enhance women's capacity in different agro-climatic regions to cope with climate fluctuations. Historically, several cultural factors have also contributed to these constraints such as denial of opportunities to pursue the occupations of black smithy and carpentry in south Asian region. Therefore, even if they had ideas, they did not always have the tools to execute them or innovate new solutions (Gupta, 2012; Gupta, 2016; Stanley, 1995)¹. The cultural norms also inhibited women to express and articulate their technological needs stifling lateral learning potential (Häusler, 1997; Singh, 2010).

3. Context changes the content

In a situation like this when not many technological alternatives are available and climate change/fluctuation risks have to be coped with, we argue that there are ingenious ways in which individual women find creative ways of coping by managing resource exchange and pooling, overcoming class and cultural boundaries.

Many women are simultaneously part of several institutions like social groups or networks that help them to draw on collective support and solidarity. This reinforces their confidence and the capability to take decisions i.e., agency. Unequal power dynamics affect their autonomy even in reciprocal relationships, shaping the terms of exchanges (Riley, 2008). The effectiveness of their decisions and coping strategies has to be assessed by examining the embeddedness of their responses (Reid et al., 2000). They might not be assertive or stand-alone and may be highly contextualized in certain cases (Johnsson-Arora, 2011). They follow different cultural traditions, and technological practices evolved through a dynamic interplay of social and economic institutions and ecological endowments. This lends to diversity of coping strategies, which may later be embedded into a portfolio of adjustment strategies. Many of the earlier studies considered women as a part of one group (Gabrielsson, 2014). Such an assumption may deny the opportunity for creating a knowledge network among different women for developing diverse coping strategies across regions.

Many adaptations are autonomous i.e., done by the local communities/social groups/individual on their own. These may complement the ex-ante strategies that government might have planned to reduce overall loss to the households due to climate fluctuations. However, these become imperative where timely governmental intervention is difficult or absent.

Earlier studies on vulnerability (Adger, 1999, 2006, 2006), sustainable livelihood (Krantz, 2001; Scoones, 2009) gender analysis (SEAGA (Socio-economic and Gender Analysis), and adaptation to risk (Oxfam and UN, 2009) have pointed toward need for augmenting assets, increasing capacities and improving policy and

¹ Autumn Stanley (1995) studied the USPTO database for 200 years and found share of women innovators to be much lesser than that of men.

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