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Kelly Bridges
University of Pennsylvania

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News reports about extreme heat inundated my social media accounts and television in the weeks leading up to my internship in India. Less than three months beforehand, I received a travel grant from the University of Pennsylvania's Center for the Advance Study of India and Penn Abroad's International Internship Program to intern with the non-profit organization, Samaj Pragati Sahayog. The organization was established nearly twenty-five years ago in the central Indian state of Madhya Pradesh to fight rampant large-scale dam projects that threatened the food, water, and economic securities of marginalized agricultural communities (Shankar 2015). Since then, the organization has diversified its projects to address watershed management, climate-resilient crop production, animal health and husbandry, community media, maternal and childhood nutrition, adult literacy, textile training through Kumbaya clothing company, and Self-Help Group programs (Samaj Pragati Sahayog 2014). My role this summer was to collect case studies of some of Samaj Pragati Sahayog's initiatives, as well as to help develop their website, which had last been updated in 2012. I also used the ten weeks that I was in India – from June 4, 2015 to August 11, 2015 – to conduct interviews for my independent research.

Although I arrived in Madhya Pradesh on June 4, the monsoon did not arrive until July 18 – nearly one month later than expected. I initially dreaded the thought of monsoon rains before I arrived in western Madhya Pradesh; however, like the others that I lived and worked with, I began yearning for the rains to arrive. Not only was I relieved from the summer heat, but so too were local farmers. Not long after the monsoon rains began did the region blossom with water and green life. Nearby farms, some of which had unfortunately flooded, were also starting to see increased growth of cotton, soy, maize, and indiginous crops. Despite this growth, the month-long

wait for monsoon rains increased the vulnerability and risk amongst local farmers of poor agricultural production. For example, high temperatures at certain periods of a crop's life cycle can lower yields (Challinor et al. 2007). Due to the events I experienced, I decided to investigate climate change risks in the region that I worked in.

In addition to climate change risks, I also became interested in social vulnerabilities through the interviews I conducted with female farmers for my internship. Over the summer, I interviewed women belonging to the Self-Help Group Program and other related initiatives, including the Livestock, Poultry and Adult Literacy programs. Through these conversations, I learned about several vulnerabilities that plague rural female farmers. These include gendered vulnerabilities, arising from inadequate access to education, daughter-in-law status, and the purdah, as well as economic vulnerabilities and cultural vulnerabilities relating to their status as members of Scheduled Tribes, Scheduled Castes, or Other Backward Classes. These conversations prompted me to look further into the intersection between socioeconomic vulnerabilities and climate change risks. I was guided by the following research questions: (1) what are the socioeconomic vulnerabilities rural female farmers face and (2) how do existing and future climate change risks affect existing socioeconomic vulnerabilities?

Samaj Pragati Sahayog and Socioeconomic and Climate Vulnerabilities

Before arriving in India last summer, I failed to fully comprehend how large Samaj Pragati Sahayog is. The non-profit organization consists of approximately 250 employees and works in 436 villages and 15 towns throughout the Dewas and Khargaoan Districts. The organization also operates an office in the city of Dewas, which I had the opportunity to visit. In total, Samaj Pragati Sahayog works with approximately 34,400 families throughout the region, most of which belong to Scheduled Caste (or Dalit) and Scheduled Tribe (or Adivasi) populations. They also work with Other Backward Classes (OBC) communities (Samaj Pragati Sahayog 2014).

This summer, I mostly worked with and interviewed Scheduled Tribe and Scheduled Caste

populations in rural and semi-urban communities whose primary livelihood is agricultural production. Most of the men and women I interviewed were landless laborers. In total, I interviewed two men and twenty-nine women associated with Samaj Pragati Sahayog as either employees or beneficiaries. As indicated by the number of women I spoke with, I spent my summer primarily focused on female farmers in the region. These women have not only been historically marginalized due to their gender, but also their status as either a member of a Scheduled Tribe or Scheduled Caste community. These conditions have created and deepened existing vulnerabilities.

Although members of India's Scheduled Castes were granted legal protection in India's 1949 Constitution through a ban on caste discrimination and the establishment of affirmative action policies, many continue to be disenfranchised especially in the "Hindi Belt," which includes Madhya Pradesh (Bob 2007). In rural India, "Dalits [Scheduled Castes] are excluded from village wells, temples, and tea shops, forced to subordinate themselves before upper caste neighbors, discriminated against in land and housing allocation, and prevented from participating in local government institutions [and receiving adequate education]" (Bob 2007, 173). Consequently, members of Scheduled Castes are disproportionately poorer than any other caste group (Thorat and Newman 2007). Approximately 33% of average income disparities between upper castes and the marginalized Scheduled Castes and Scheduled Tribes are ascribed to discrimination (Borooah 2005). Furthermore, the agricultural wage rate is lower for Scheduled Caste individuals than nonscheduled ones (Gaiha et al. 2007). Due to the millennia-old Hindu Varna and Jati caste systems, systematic and historic discrimination and violence against Scheduled Castes are only now beginning to change (Deshpande 2001).

Scheduled Tribes – 23% of whom live solely in Madhya Pradesh – are even more marginalized than Scheduled Castes (Ito 2009; Mitra 2008). The Indian government defines Scheduled Tribes as having "tribal origin[s], primitive ways of life, and habitation in remote and inaccessible areas" (Gaiha et al. 2008, 113) Although

Scheduled Tribes are excluded from the caste systems, British colonialism forced the previously self-governing Scheduled Tribes to the fringes of society, as the areas they inhabited were reclassified in 1935 as '(partially) excluded' (Kijima 2006). Like Scheduled Castes, Scheduled Tribes have also been discriminated against with lower wages and poor access to education (Dhesi 1998). Consequently, 50.3% of rural Scheduled Tribe households and 49.2% of rural Scheduled Caste households are poor (Gaiha et al. 2007). Furthermore, approximately 23.5% of the poverty gap between upper castes and Scheduled Tribes is ascribed to disparities in education (Gaiha et al. 2008). Illiteracy amongst those in Scheduled Tribe populations is as high as 45.3%, whereas this number drops to 33.4% in Scheduled Caste and 24% in nonscheduled populations (Gang et al. 2008).

Lower caste and tribal women are some of India's most marginalized social groups (Deshpande 2007). More specifically, Haan (2004) claims that "Tribal women in 'remote' areas are among the most deprived people in the sub-continent" (3). Scheduled Tribe women (as well as Scheduled Caste women) face numerous pressures that affect their socioeconomic status and agency. In many communities, females are unable to move about freely due to the purdah and daughter-in-law statuses (Roy and Tisdell 2002). Several of the women I interviewed told me that cultural restrictions govern how, when, and where a woman can travel. One woman that I met in passing even told me that if her son were to go to the hospital, she would not be able to leave her house to accompany him because of her daughter-in-law status. Other disadvantages that Tribal women face include low literacy rates, limited employment opportunities, and poor access to loans and private sector assistance (Bhasin 2007; Roy and Tisdell 2002). Regarding literacy, girls are oftentimes denied a full education, because of "financial constraints, early marriages, submissiveness, motherhood, and parental perception of education on women's worldview" (Bhasin 2007). Consequently, only 27.24% of rural tribal women are literate in Madhya Pradesh, whereas 52.51% of rural tribal men are literate (Mitra and Singh 2008).

Not only are these communities socially

and economically vulnerable, but they are also climate vulnerable. Regional Scheduled Caste and Scheduled Tribe farmers are particularly reliant on constant and predictable rainfall, as they work mostly in rain-fed fields. Since 1990, Samaj Pragati Sahayog has worked to increase the use of irrigation through dams, wells, and other watershed structures and management methods in an effort to help farmers adapt to climate change. In helping farmers irrigate their fields, however, the organization has unintentionally promoted mono-cropping. The farmers that now have enough water to sustain fields of cotton, corn, and soybean, are also beginning to deplete groundwater resources at a higher rate to feed these water-intensive crops. These practices have made farmers especially vulnerable to climate change (Shankar 2015).

Additionally, since 2012, monsoon rains have become more variable. Both this year and last year, the monsoon rains were delayed by one month, which affected the harvest. Additionally, two years back, fields flooded during the summer devastating soybean fields. That February, hailstorms caused 100% losses in some areas where wheat was grown. In order to address these concerns, Samaj Pragati Sahayog is currently promoting indigenous varieties, such as sorghum, to decrease the number of mono-cropped fields and to limit groundwater usage. These crops are also adapted to drought conditions. Samaj Pragati Sahayog is also implementing additional technologies and management methods to address climate variability (Samaj Pragati Sahayog 2014).

Samaj Pragati Sahayog has established a number of diverse programs since its creation in the 1990s – the most important of which is its Self-Help Group Program that serves as the vehicle by which community members can learn about and access other Samaj Pragati Sahayog initiatives, including those that address climate change risks and socioeconomic vulnerabilities. The Self-Help Group Program consists of 2,253 Self-Help Groups and 34,400 female members, and each Self-Help Group consists of 10 to 20 women. The groups are the means by which women voice their concerns, such as poor access to water, lacking education, alcoholism, poor nutrition, and economic hardships, among others. It is also a vehicle by which women can create

bank accounts, promote savings, attend day or night school, access Samaj Pragati Sahayog's various programs, and acquire low-interest loans. These programs include Samaj Pragati Sahayog's Livestock Program – which not only creates additional income generating activities through the production of meat (e.g. goat) and milk (e.g. buffalo and cow), but also helps sustainably maintain current traditional livelihoods – Poultry Program, and Adult Literacy Program (Samaj Pragati Sahayog 2014).

Although these programs have helped protect existing livelihoods and create alternative ones, the Adult Literacy Program has been one of the more influential programs. The program was established in October 2010 to improve female literacy and to ultimately empower rural women. When Samaj Pragati Sahayog first entered the region, they noted that women were not allowed to use public transportation, enter banks, or run for public office without knowing how to read and write. By providing adult literacy courses through the day and night school programs, Samaj Pragati Sahayog could help local women gain their independence by allowing them to travel more freely, manage their bank accounts, and advocate for themselves politically by attending government meetings or by running for office. In the rural countryside of western Madhya Pradesh where Scheduled Castes, Scheduled Tribes, and Other Backward Classes reside, very few women had ever even sat in a classroom. By 2011, Samaj Pragati Sahayog established six night schools in Khategaon, Bagli, and Udainagar. The Khategaon site had the largest number of students with other seventy women enrolled (Samaj Pragati Sahayog 2012).

The interviews I conducted provided me with greater insight into the socioeconomic vulnerabilities and climate change risks female farmers face in western Madhya Pradesh. Five interviewees acknowledged climate change risks within their farming communities. The last three even borrowed livestock loans to purchase cattle and poultry in response to these risks. Furthermore, all of the interviewees discussed socioeconomic vulnerabilities that exist within their communities including: travel limitations, social stigmas towards work, poor political representation, defaulting on loans, illiteracy, cultural expect-

tations, and discrimination. In western Madhya Pradesh, existing socioeconomic vulnerabilities may worsen with existing and future climate change risks.

One of most significant socioeconomic vulnerabilities is poverty, which all my interviewees live in. As explained in earlier sections, Scheduled Caste and, especially, Scheduled Tribe women are disproportionately poorer than their nonscheduled counterparts due to inadequate access to education, loans, and employment opportunities (Bhasin 2007; Roy and Tisdell 2002). Poverty is not only a socioeconomic vulnerability, but also a climatic vulnerability for rural women, as the poor are “immediately and adversely affected by all forms of environmental degradation, including climate change impacts,” as they are “dependent...on their natural environment” to survive (Roy and Venema 2002, 80). Extreme weather events can negatively impact water and food security. Furthermore, they can negatively impact economic security. In Madhya Pradesh and across the world, agriculture-dependent livelihoods are at risk from climate change (Varghese 2011).

As exemplified in the previous paragraph, the concerns that arise from socioeconomic vulnerabilities and climate change risks are food, water, and economic insecurities. Samaj Pragati Sahayog is addressing these concerns through its Self-Help Group Program and other related initiatives. Samaj Pragati Sahayog’s alternative livelihood loan packages (e.g. sewing machine loans, shop loans, livestock loans, and poultry loans) and Self-Help Group programs provide women with more reliable income generating activities apart from agricultural production. These income generating activities provide women with the financial means to increase their access to food and water resources outside of their communities. Furthermore, it allows women to break the cycle of poverty, by giving them the financial means to pay for their children’s private education and for climate adaptive tools (Shankar 2015). Samaj Pragati Sahayog also addresses food and water insecurities directly through the aforementioned climate-resilient projects, management methods, and technologies (Samaj Pragati Sahayog 2014).

Before Samaj Pragati Sahayog creat-

ed Self-Help Groups in the Dewas District, the communities relied heavily on moneylenders and micro-finance institutions (MFIs) for loans. These institutions provided loans with a significantly higher interest rate and inadvertently promoted indebtedness. In contrast, Self-Help Groups provide communities with easy credit, low interest rates, tailored loan installments, and the ability for individuals to negotiate the terms of their loans. Self-Help Groups also have a social component, as I mentioned previously, in that Self-Help Group meetings serve as platforms for members to discuss issues in their communities, form friendships, and learn about government schemes and programs (Turkey 2015). Despite the current and future climate change risks, I am confident that the lives of local women will improve through Samaj Pragati Sahayog’s alternative livelihood loan programs and other Self-Help Group Program initiatives.

In order for the organization’s work to be the most successful, however, it must also be sustainable. The most efficient way for the Self-Help Group Program to become sustainable is through the expansion and improvement of the Adult Literacy Program, which can mitigate some socioeconomic vulnerabilities. Of the current programs Samaj Pragati Sahayog must address, this is perhaps the most daunting, because of social pressures and misconceptions that affect attendance (Bachaniya 2015). Literacy is a powerful tool to empower women and is key to improving political involvement and communication with bank officials, as well as lessening the economic gap (Samaj Pragati Sahayog 2012; Mitra and Singh 2008; Gaiha et al. 2008; Bhasin 2007; Roy and Tisdell 2002). For example, women with improved reading and writing skills can qualify for other forms of employment, including positions as mitaans and community resource workers. Consequently, it is also key to mitigating climate change risks and climatic vulnerabilities. In the coming years, Samaj Pragati Sahayog will have to improve other current initiatives and create new ones to best address the existing socioeconomic and climatic vulnerabilities rural Scheduled Caste and Schedule Tribe women face.

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