

POLICY BRIEF

Beer, Barley, Livestock, and Milk: Who Adopts Agricultural Innovations in Rural Rajasthan?

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Summary overview:

Research conducted in developing countries suggests that most agricultural innovations end up reinforcing existing socio-economic hierarchies based on gender and class. However, most of this research appears to be based on innovations introduced during the Green Revolution, which focused on high-yielding varieties of rice, maize, and wheat, along with the expansion of irrigation and increased use of fertilizers and pesticides. Less is known about how innovations involving other crops or livestock, especially when introduced in tandem, perform in alleviating poverty or reducing gender inequality.

Feed-intensive cattle breeders. Buffalos are preferred for their higher milk price.



Photo: Dina Najjar

With this knowledge gap in mind, we conducted a study in three agricultural communities in rural Rajasthan, India to gain a more nuanced understanding of how the adoption of agricultural innovations for barley cultivation and livestock rearing is influenced by the gender, age, and class background of farmers, and whether such innovations can alleviate poverty and promote gender equality in rural settings. We used data from focus groups with women and men from different class backgrounds and generations who may or may not have adopted the innovations as well as in-depth interviews with male and female farmers who had adopted the innovations. We found that the capacity to adopt barley and livestock innovations was influenced quite strongly by gender, age, and socioeconomic background. To improve the ability of different groups of farmers to adopt agricultural innovations and benefit from them, researchers should pay more attention to these markers of identity.

Our findings also complicate several assumptions: that the adoption of agricultural innovations always results in a zero sum-game of men benefiting at the expense of women, or wealthier farmers benefiting at the expense of poorer farmers; that the neat distinction that exists in the literature between “food crops” and “cash crops” holds true on the ground; and that growing cash crops compromises the food security of poor rural communities. In fact, based on our study of interactions between new barley varieties and new breeds of goats, cows, and buffalo in rural Rajasthan, we found that the two can be mutually inclusive. In other words, food security and cash cropping can be accomplished simultaneously under certain circumstances in rural communities.

Introduction

Most social research on agricultural development emphasizes that better resourced people, typically men and those from socio-economically privileged groups, are able to reap more of the benefits from new agricultural technologies and innovations than less well-resourced farmers, including women and people from less privileged groups. In fact, the latter may even be disadvantaged further by new technologies and innovations. However, most of these findings draw on Green Revolution initiatives in India, which focused overwhelmingly on high-yielding varieties of rice, maize, and wheat, along with the introduction or expansion of irrigation and the increased use of fertilizers and pesticides. Less is known about how agricultural innovations involving other crops or livestock, especially if introduced in tandem, perform in alleviating poverty or reducing gender inequality. We conducted a study in three agricultural communities in rural Rajasthan,

India to gain a more nuanced understanding of how the adoption of agricultural innovations for barley cultivation and livestock rearing is influenced by the gender, age, and class background of farmers and whether such innovations can alleviate poverty and promote gender equality in some rural settings.

Background and rationale for study

Rajasthan is one of the largest barley-producing states in India, accounting for more than 50 percent of total barley harvested and nearly 50 percent of total barley acreage. It is a dry state, and in regions where irrigation is available, barley competes with wheat. This is because barley has a lower market price than wheat. However, barley has a higher yield than wheat in drought conditions and it can tolerate salinity better. Livestock farming has also historically been important in dry areas, especially as a protective measure against crop failure. Forage barley can be harvested twice a season and fed to livestock, especially during seasons of drought, which means it is also valuable as fodder.

Given such interdependencies, agricultural innovations in barley and livestock rearing tend to influence one another. Recent studies have found that social identities based on gender, age, and social class influence whether farmers are able to adopt and benefit from innovations. We looked at how these factors might influence the ability to adopt and benefit from innovations in barley and livestock cultivation in three rural communities in Rajasthan.

In recent years, barley has also gained prominence in Rajasthan as a cash crop due to the use of barley malt in the production of beer. Beer consumption has grown dramatically in India in recent years owing largely to a preference among younger urban Indians for beer over other types of alcoholic beverages, and demand is expected to remain strong for the foreseeable future. Several international manufacturers such as SABMiller and PepsiCo recently entered the Indian beer market, which is estimated to be growing at 15 to 18 percent per year. These companies initially imported malt but have more recently begun entering into agreements for barley cultivation with farmers. Approximately 6,000 farmers in Rajasthan are now part of SABMiller’s barley supply chain and PepsiCo has signed a three-year memorandum of understanding with more than 1,200 farmers in the state to produce high-yielding malt barley for the United Breweries Group.

Methods

The three villages studied, each from different districts of Rajasthan, were chosen based on differences in existing gender norms and access to agricultural markets and services. While Etawal Bhopji (Jaipur) and Mundru (Sikar) are better connected to markets, Mansegar (Jodhpur) is more isolated, with poorer access to agricultural services and markets. Furthermore, Mundru and Etawal Bhopji have been growing barley for fodder for a long time, but barley farming was only recently introduced in Mansegar.

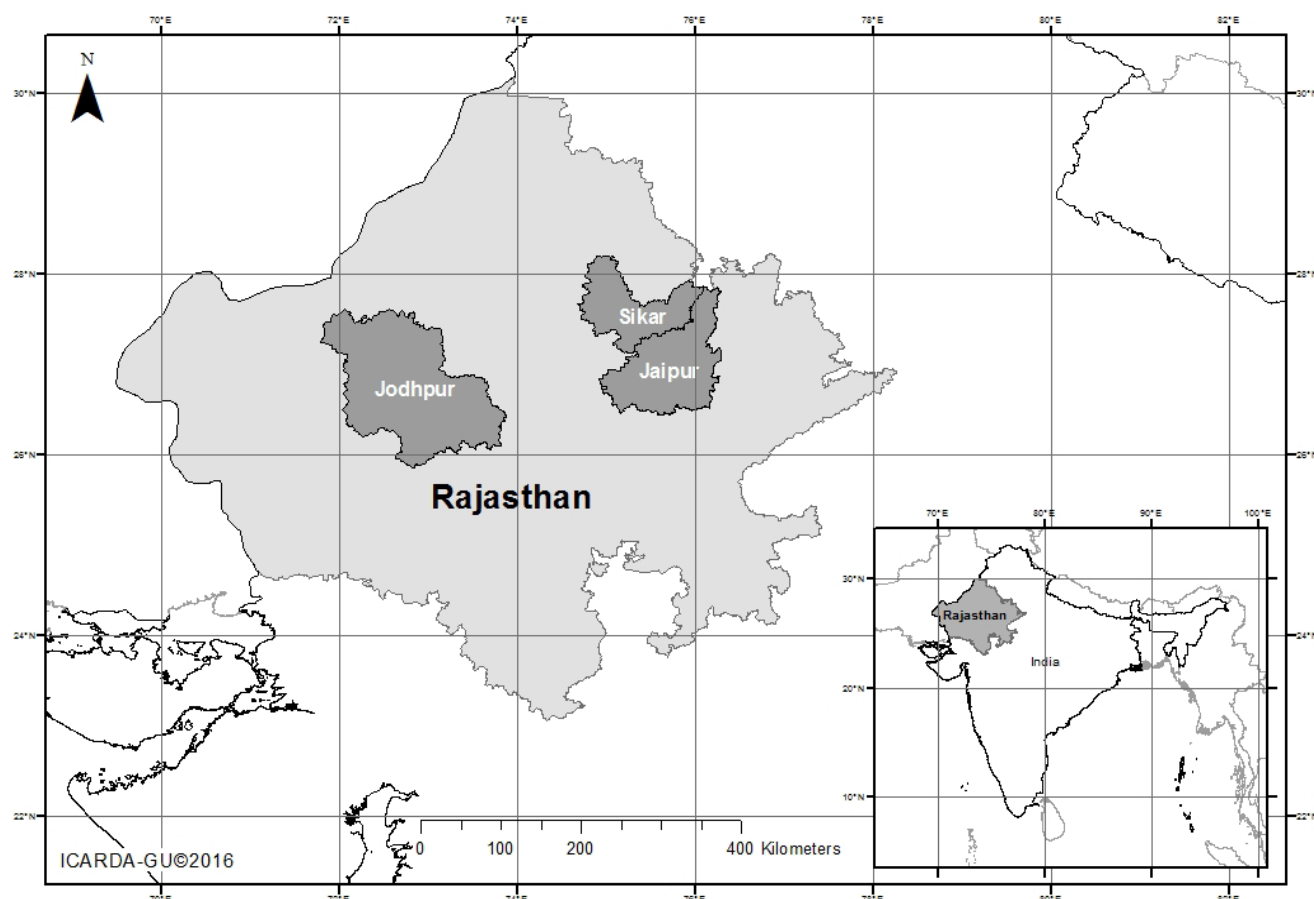
Focus group discussions and interviews were conducted with 240 individuals, with 79 participants in each village, and three barley breeders. Groups were segregated by age, class, and gender to minimize power differences and offer safe spaces for people to have freer discussions. We also conducted four interviews with two men and two women deemed to be early adopters of the innovations being studied.

The study sought to understand the differences between men's and women's capacities to adopt and benefit from

barley and livestock innovations and to understand the role of gender norms at the local level in influencing adoption decisions and outcomes. Participants were also asked to reflect on changes, if any, in local gender norms over the past ten years, and to describe changes in their communities as a result.

In each community, a male and female leader were interviewed to understand community level factors that affect women's roles in agriculture. These included men's and women's roles in local governance, participation in markets, the extent of outmigration from the community, types of families present in the community, the most important agricultural crops and related gender roles, access to education, and inheritance practices. Three open-ended interviews were conducted with barley breeders employed by ICARDA (International Center for Agricultural Research in the Dry Areas), RARI (Rajasthan Agricultural Research Institute, Jaipur), and SABMiller to understand innovations related to barley and their potential impacts, the role of government policies in supporting or inhibiting barley farming, and the local significance of barley in the three research sites.

Figure 1. Research sites in Rajasthan. Mundru (Sikar), Etawal Bhopji (Jaipur) and Mansegar (Jodhpur).



Findings and policy insights

Although women in all three study communities managed farms and sharecropped land, primarily due to male outmigration and widowhood, they almost always described themselves as playing supportive roles to men in agriculture, irrespective of class background or age. Women did not see themselves as farmers: regardless of the extent of their knowledge of or contributions to agriculture, both women and men deemed “helping men” to be the most appropriate role for women in farming. Only traditional roles related to domestic responsibilities were validated as socially appropriate for women. By contrast, men were expected to take on leadership roles in farming, which included not just being knowledgeable about farming practices and market prices and dynamics but also being able to take risks by adopting new technologies or farming practices. Unsurprisingly, then, most early adopters were men.

Existing male-biased gender norms also influenced access to credit, information and training about farming practices, and agricultural extension services. Because women were almost never perceived as farmers, men generally had much higher levels of entitlement and better access to formal agricultural services than women from the same households. Although women often understood the value of learning about irrigation or adopting new agricultural practices, no one encouraged them to do so. Thus, even when (as in Etawal Bhopji and Mundru) women were not forbidden by *purdah* (the norms of female seclusion) from attending training or meeting with (male) extension agents, they almost never did so. Women from more privileged families were more likely to adhere to local norms of *purdah* and even less likely than poorer women to attend meetings and seminars organized by male extension agents.

It is critical to shift the social perception of women from helpers to farmers. Governments, donor agencies, and both local and international agricultural institutions can support efforts to raise public awareness about women as farmers, their contributions to the national economy, and to society at large.

More women should be trained and employed as extension workers. The study found that women in all three communities emphasized that having access to female rather than male extension agents could facilitate their access to farming information. They identified their lack of access to extension workers as the main reason why men usually adopted innovations before women did.

Barley private sector extension agents following up with female barley growers.



Photo: Dina Najjar

Goat breeds in Rajasthan, known locally as “the cows of the poor”.



Photo: Dina Najjar

Women typically accessed information about new agricultural innovations indirectly through their husbands or other men in the community. In some cases, women learned from other women, usually the wives of male early adopters of agricultural innovations. The only instance in which women had direct access to farming information was in Etawal Bhopji, where some women were part of the local leadership in the community and were therefore invited to meetings. In turn, local female leaders encouraged other women to attend the meetings and to participate more actively in the barley adoption program.

Choice of venue for public meetings is an important consideration. Meetings in Etawal Bhopji were held in the dairy centre or the panchayat (local government council) building, locations that were familiar to everyone in the community, which also encouraged higher levels of attendance by women.

We found that men in all three communities were much more likely to access credit via formal loans from banks, state-run and private sector agricultural organizations, or farmers' cooperatives. Women had much weaker access to credit from formal institutions, and they were much more likely to access credit via informal means such as loans from family members, self-help groups, or moneylenders. Consequently, they were much more vulnerable to exploitative practices.

Strengthening women's access to formal financial institutions could help alleviate their dependence on informal sources of credit.

Women may face more challenges accessing credit from formal sources because land, which women rarely own, is often used as collateral by formal credit-granting institutions. Women's marginalization in independent land ownership has negative implications for women and household prosperity more generally, including adoption of new barley varieties and improved livestock breeds. This is especially the case if the women were the heads of households, as was estimated for between 5 and 10 percent of households in the three villages, largely because of male outmigration and widowhood.

Male-biased inheritance practices should be reformed and financial institutions should be encouraged to waive collateral requirements (especially for female borrowers) to reduce the gender gap in access to financing.

There are clear gender-specific preferences for innovations. All respondents, male and female, identified innovations related to farm machinery, pesticides, and irrigation as being the most useful for men. Similarly, all respondents identified innovations associated with dairy processing, livestock, and feed preparation as being the most helpful for women. These innovations were preferred by men and women across regional, class, and age categories.

Gender appeared to play a much bigger role in innovation preference than class or age.

We also asked participants to evaluate the usefulness of the recent innovations in barley and livestock (e.g. new goat, buffalo, and cow breeds). The new barley varieties were evaluated positively by most men, but particularly by men from poorer backgrounds. They emphasized that the yields from the new barley varieties were almost twice as high as those used previously. Barley also requires less water than other crops, and farmers can sell their yield at a higher guaranteed price than is the norm in the market via existing agreements with malting companies.

Women across class categories identified new breeds of livestock as most useful to them due to higher milk and meat yields. They identified higher milk yields as particularly important because women tend to exercise a higher level of control over income from milk sales than from wheat or barley. Milk was also typically sold from home, so women could comply with *purdah* norms while earning some income.

Furthermore, the introduction of new barley varieties (often due to demand for barley grain for malting), although targeted almost exclusively at male farmers, has had a strong positive effect on local food security and women's

income because once the barley grain used for malting beer has been sold off, the barley stalks are used as livestock feed. Even the landless poor mentioned benefiting from the introduction of improved varieties of barley through contract farming on wealthier farmers' land. Both livestock and barley innovations were often adopted first by wealthier farmers, but eventually also by less well-off farmers. The successes enjoyed by wealthier farmers in adopting the new varieties of barley and new breeds of goats, cows, or buffalo in rural Rajasthan appeared to have a strong demonstration effect on others irrespective of gender, class, or age.

These findings contradict the widely held assumption that innovation in agriculture and farming practices is a zero-sum game that always exacerbates existing gender and class inequalities. They reveal that the nature of the innovation and its interaction with the social, cultural, and geographic context in which it is introduced determines whether and how its benefits accrue to different groups of people.

Focus group with female farmers.



Photo: Dina Najjar

Focus group with male farmers.



Photo: Dina Najjar

Our findings from the simultaneous introduction in rural Rajasthan of new barley varieties and livestock breeds also complicate the neat distinction that exists in the literature between “food crops” and “cash crops” and the widely held assumption that growing cash crops compromises the food security of poor rural communities. While most female respondents in our study evaluated the new barley varieties very positively for their increased yields, resistance to water scarcity, and the extra household income earned from selling barley grain for malting, they also valued the new barley varieties because they augmented fodder supply, which in turn led to better food security via increased milk and meat yields.

As the example of barley demonstrates, food security and cash cropping do not have to be mutually exclusive.

Respondents attributed higher levels of education for women and access to (limited) home-based income-earning opportunities to small changes in women’s agency and freedom over the past decade. Activities such as marketing and selling agricultural products and managing finances were overwhelmingly perceived by both men and women as more socially appropriate

for men. Age and life stage were significant factors in influencing women’s household decision-making power. Older married and widowed women typically enjoyed more agency and freedom than younger married or single women. Despite small shifts in local gender norms, we did not find evidence from this study of deeper changes in gender norms represented by, for example, women’s land ownership or political leadership.

In 1992, the 73rd Amendment to the Constitution of India enabled the reservation of one third of seats in local governance institutions for women. Although the reservation has been criticized for being nominal, especially in the absence of other measures to promote gender equality, it was intended to optimize women’s ability to participate in local level politics and to foster rural development. Our findings suggest that women are still largely excluded from decision-making related to local institutions and common resources in all three communities.

Encouraging more women to participate in economic activities outside the home and in local governance institutions could also lead to longer-term changes that normalize women’s presence and participation in the public sphere.

Conclusions and outlook

Social norms strongly influence how people make decisions and act, making them vitally important for understanding whether innovations are adopted, how they are adopted, and who they benefit. We found that gender affected the reasons and preferences for adoption of innovations in several contexts in rural India. To improve the ability of different groups of farmers to adopt agricultural innovations and to benefit from them, researchers should pay more nuanced attention to the gender, class, age, and life stage of farmers.

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Further reading

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