

# Gender Implications of Agricultural Technology in the Marginal Mountain Farming Environments

by Prem Gurung<sup>1</sup>



View on scattered houses of Mulgaon Village, a Mewahang Rai community in Sankhuwasabha District, Eastern Nepal. (Picture A. Björnsen)

## 1. Background

In Nepalese mountain subsistence farming, maize is the staple food crop and the family food security is largely dependent on household production where gender plays an important role. Widespread poverty (Sheddon, 1987), leading to increased male out-migration to urban centres for off-farm income has resulted in women managing the subsistence food production. As subsistence livelihood depends on household food production, the family food security is primarily ensured through maximising food produc-

tion. Imposed by land scarcity and consequent small farm size, the strategies to maximise food production rely absolutely on the choice of crop, varieties and management practices. The choice of crop varieties within a household reflects the prioritization between the household food security (high yield) and the gender-specific needs (better quality). In maize, traits such as high yield and quality are mutually exclusive, as modern varieties (refers to improved varieties released by National Maize Research Centres) are endowed with high yielding potential but are poor in quality, in stark contrast to traditional varieties that are rich in quality (includes food taste, food processing, storage and fodder biomass) but low yielding.

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Typical Rai house in Mulgaon Village. Maize is stored outside in the crib, hung below the roof, or inside on the second floor. (Picture P. Gurung)

Within this context, the paper<sup>2</sup> presents a case from rural Nepal illustrating women's disadvantage resulting from existing gender-biased maize varieties, and points to the strong need to incorporate gender-specific needs in developing agricultural technologies. In general, failure to assess the gender impact of new agricultural technologies in subsistence farming families often results in negative impact on women (Grenier, L., 1998).

## 2. Study Site – Tamku

Tamku is a rural Rai ethnic village in Sankhuwasabha district, eastern Nepal that is highly dependent on subsistence farming. It is representative of the region in terms of agro-ecological settings, socio-economic conditions and physical accessibility. It lies at a distance of a four-day walk to the closest road.

The village consists of marginal small-size farms with narrow terraces on steep slopes at 1400 m above sea level, on the southern aspect of the Himalayas. Maize is the staple food crop and modern varieties were introduced in 1993 that largely replaced traditional

varieties except on extremely marginal land unsuitable for modern varieties demanding high fertility. As food deficit is common in mountain subsistence livelihood (Adhikari, 2000), the majority of households face chronic food deficit during 3 to 6 months annually. Male out-migration for cash income to supplement own production is a short-term response to family food insecurity. Migration for employment to urban centres and abroad is much more common for men than for women (Shakti, 1995). The male out-migration has added new responsibilities to women such as family food security, traditionally a men's responsibility (Acharaya and Bennett, 1983). Accordingly, the gender roles are changing, due to women's new role such as securing family food, in addition to their existing gender-specific role. Consequently, women assuming dual roles today, might face dilemma between modern varieties favouring food security and traditional varieties enhancing quality, as both are relevant to them but mutually exclusive.

This raises three related questions. First, do women and men prefer different varieties, as suggested by their gender-specific roles and needs? Second, do they have the possibility to plant their choice varieties? Third, do men compel women to plant their preferred variety within the household decision-making pattern of patriarchal Nepalese society? These questions can

<sup>2</sup> The study was conducted during 1999-2000 under International Development Research Centre (IDRC) sponsored by Consultative Group for International Agricultural Research (CGIAR) in marginal mountain environments.



Women farmers of Mulgaon Village (Tamku VDC, Sankhuwasabha District) discussing labor division in maize production and storage (Picture A. Björnsen).

be formulated into a working hypothesis. It can be hypothesised that since the introduction of modern varieties, women farmers are marginalised in terms of quality, inherently linked to the gender-specific role of women, as the food deficit compels them to plant modern varieties. It is based on two premises: first, as demanded by their gender-specific roles, women and men farmers prefer traditional and modern varieties respectively, however, the extreme food-deficit condition masks this differential preferences, resulting in both opting for modern varieties. Second, in patriarchal Nepalese society, planting modern varieties could be dictated by men's decision within household rather than gender-based needs. The following section investigates the above questions and assumptions for analysis.

### 3. Methods

The field research employed participatory methods and surveys. Participatory methods included focus group discussions, key informant interviews and rankings. Twenty-eight farmers (14 women and 14 men) participated as key informants in discussions based on their knowledge and interest in the discussion and analytical process. Adopting a gender-differentiated approach, it focused on identifying and ranking criteria for selecting maize and ranking existing maize varieties.

Two household surveys were conducted: first, the entire 118 households in the village were surveyed for maize varieties. Second, to see whether women and men actually plant their choice varieties, 2 types of decision-making households were analysed. As there were 33 women-headed households with absolute control of farming activities by the women in the village, an additional 33 households with men as sole decision-maker were purposely selected to determine the maize varieties planted in these households.

## 4. Results and Discussion

### 4.1 Top Four Preference Ranked Criteria for Selecting Maize Varieties by Gender

Women	Men
1. Tasty food	1. High yield
2. Ease in grinding or milling	2. Resistant to lodging
3. Less susceptible to store pests	3. Early maturity
4. Good fodder quality	4. Grows in low soil fertility

Table 1

The women's preference of quality-related criteria contrasted with men's quantity-oriented criteria reflecting their gender-specific needs. Overall, women

cared for post-harvest, food quality and preparation against men that focused on securing high production in marginal environments and early maturity to reduce the food-deficit period prior to harvesting. Interestingly, the women’s criteria established their absolute choice of traditional varieties, as opposed to the men’s pointing to modern varieties except for the fourth criterion, reflecting marginal land. However, the women’s choice of quality represents an “ideal” situation rather than a marginal, food-deficit reality where priority is quantity to ensure survival.

#### 4.2 Top Four Maize Varieties Preference Ranked by Gender

Women	Men
1. Traditional variety – <i>bhote paheli</i>	1. Modern variety – <i>manakamana-1</i>
2. Traditional variety – <i>dudhey seti</i>	2. Modern variety – <i>rampur composite</i>
3. Traditional variety – <i>paheli</i>	3. Modern variety – <i>khumal yello</i>
4. Traditional variety – <i>chepti seti</i>	4. Traditional variety – <i>dudhey seti</i>

Table 2

Gender preferences of top 4 varieties selected from a total of 12 varieties were contrasting in that women preferred all traditional varieties, whereas men chose 3 modern and 1 traditional varieties. Discussion with men revealed that traditional varieties are often planted in marginal lands where modern varieties fail due to poor soil fertility. For both genders, the varieties selected were consistent with the preferred criteria (table 1), clearly establishing their gender-specific needs. Conclusively, the above analysis (table 1 and 2) proves that women have a strong preference for traditional or quality-oriented varieties. Subsequently, the following survey will reveal whether women plant their choice traditional varieties or are compelled to do otherwise.

#### 4.3 The Household Survey for Maize Varieties

Varieties	Households	Percent
Modern	94	80
Traditional	24	20
<b>Total</b>	<b>118</b>	<b>100</b>

Table 3

The survey result (table 3) of 118 household in the village revealed that 80 percent households planted modern varieties for high yield as against 20 percent planting traditional varieties in extremely marginal lands unsuitable for modern varieties. Although the result revealed an overwhelming adoption of modern varieties in the village, it does not show gender-based decision-making, thereby, raising the crucial question such as to who within a household (woman or man) decides the varieties planted.

The survey 2 (table 4) focuses at gender-based decisions regarding maize varieties analysing 2 types of decision-making households based on gender.

#### 4.4 Decision-making of Maize Varieties by Two Types of Households

Types of households	Total households	Modern varieties		Traditional varieties	
		Households	Percent	Households	Percent
Women-headed	33	29	88	4	12
Male-headed	33	24	73	9	27
<b>TOTAL</b>	<b>66</b>	<b>53</b>	<b>80 (average)</b>	<b>13</b>	<b>20 (average)</b>

Table 4

The result of 66 households categorised into 2 types of decision-making households by gender showed that the overall adoption of modern varieties is very high. The total households adopting modern varieties was 80 percent as against 20 percent planting traditional varieties. Comparatively, 88 percent women-headed households planted modern varieties as against 73 percent men-headed households, 15 percent more than men-headed households. The high adoption of modern varieties by women-headed households sharply contrasts to their strong choice of traditional varieties (table 1 and 2). Discussions with women revealed that they were responding to marginality or food deficit and not to either gender-specific needs nor responding to influence by gender-based decisions.



Male farmers of Mulgaon village discussing storage pest occurrence in maize. (Picture A. Björnsen)

## 5. Conclusion

Women's response to marginality or food deficit depriving them of quality or gender-specific needs, establishes the hypothesis that women are disadvantaged or marginalised. Likewise, the first premise is supported, that women's preference is masked by the top priority accorded to household food security, thereby sidelining women's gender-specific needs. However, the second premise is disproved in that women are not compelled by men to plant modern varieties as apparent from the overwhelming adoption of modern varieties by women-headed households (table 4). The women's decision is rather independent of gender and imposed by marginal conditions. Conclusively, the extreme food deficit condition has an adverse affect on women's gender-specific roles, particularly when the technology is gender-biased disfavouring women.

To address the women's marginalisation there is a strong need to incorporate gender-differentiated experiences and knowledge in the technology development initiatives, thereby making technologies gender neutral. A framework for Participatory Technology Development (PTD) that is essentially based on close collaboration between farmers, extensionists and researchers (Sumberg and Okali, 1997), and combines community development with technical research processes supports such initiatives. The interface between

external knowledge (extension), and local knowledge and practices resulting from collaborative actions can incorporate women's needs in the technology development process. Moreover, effective participation of women and men farmers in the PTD process is dependent on local organizational capacity. Hence, it demands local capacity building to enable farmer groups to lead locally adapted technology development processes, which may be facilitated by outsiders (Chambers, 1992). Therefore, a farmer-led, gender-sensitive PTD approach combining both, community development and research initiatives, that incorporates gender-specific needs of women and men farmers, can address problems of food security in the marginal farming environments in a sustainable way.

## References:

1. Sheddou, David. 1987. Nepal: A State of Poverty. Vikas Publishing House Pvt. Ltd. 576 Masjid road, Jungpura, New Delhi 110014.
2. Grenier, L., 1998. Working with Indigenous Knowledge. A Guide for Reseachers. Published by the International Development Research Centre, P.O. Box: 8500, Ottawa, ON, Canada K1G 3H9.
3. Adhikari, Jaganath, 2000. Decisions For Survival. Farm Management Strategies in the Middle Hills of Nepal. Published by Adroit publishers C- 8/2, Yamuna Vihar, Delhi- 110053.

4. Shakti, S., 1995. Women Development Democracy. A Study of the Socio-economic Changes in the Status of Women in Nepal (1981-1993). Shtri Shakti; Kathmandu, Nepal.

5. Acharaya, Meena and Lynn Bennett, 1983. Women and the Subsistence Sector. Economic Participation and Household Decision-making in Nepal. World Bank, Washington D.C. USA.

6. Sumberg, James and Okali Christine, 1997. Farmers' Experiments. Creating Local Knowledge. Lynne Rienner Publishers, Inc. 1800 30th Street, Boulder, Colorado 80301.

7. Chambers, R., 1992. Rural Appraisal: Rapid, Relaxed and Participatory. Institute for Development Studies. University of Sussex, Falmer, Brighton, UK. Discussion Paper No. 311.



Women farmers of Mulgaon Village listing and scaling criteria important for selecting various traditional and improved maize varieties. (Picture P. Gurung)