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Quick Response Report #135

"We Want Work": Rural Women in the Gujarat Drought and Earthquake

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Our bodies are our wealth
Our houses are our workplace
Our children are our future
Our lives are full of crises

SEWA poster, Ahmedabad, Gujarat

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The Black Friday Earthquake: Social Context and Impacts

In the past decade alone, two damaging cyclones, a malaria epidemic, flooding, and a prolonged drought have hit the state of Gujarat in northwestern India². In the early morning hours of a national holiday (January 26), a 7.7 magnitude quake centered in the town of Bhuj in Kutch district killed at least 20,000 people and injured many thousands more. Second only to the 1773 earthquake, which took more than 300,000 lives, the two-minute tremor caused extensive damage to houses, buildings, infrastructure, livestock, and natural resources. The area of heaviest impact was the northwestern district of Kutch, where few structures in the towns of Bhuj, Anjar, Bhachau, and Rajkot remained habitable. Collapsing buildings 275 kilometers away in Ahmedabad, the state's business and cultural center, killed 750.

Although Gujarat is one of India's most prosperous and industrialized states, more than 60% of the population earns a living from the land, and poverty is widespread. The earthquake destroyed or damaged more than a million homes, leaving some 600,000 residents homeless months before the coming monsoons. Over 20,000 cattle died. Water harvesting systems across the desert region were extensively damaged, and abrupt alternations in the salinity of water were reported in some areas. Damage to public facilities was extensive. Of 1,359 schools in Kutch, 992 were destroyed; 300 youngsters were crushed when their schools collapsed on them during a Republic Day parade. Damage to hospitals and clinics took the lives of many patients and medical staff, and the four district centers for mentally and physically disabled residents were destroyed (Mistry, 2001).

Relief was uneven. Despite recent tremors in nearby Bhavnagar, which kept 50,000 people sleeping on the streets for over a month (Vasta, 2001), no state disaster management plan or agency was in place. Remote villages throughout Kutch were slow to receive assistance, as were those in the surrounding districts of Patan, Banaskantha, and Surendranagar. Panchayat (local government), military, and state responses were hampered by lack of institutional capacity and emergency preparedness, making residents' spontaneous search and rescue efforts even more critical. State governments in India bear primary responsibility for emergencies. However, the government of India soon intervened in light of the scale of destruction and the "weak and chaotic" response of the nationalist Bhartiya Janata Party (BJP), which holds power in the state and leads the governing coalition at the central level (Vatsa, 2001). Offers of foreign assistance were quickly accepted, including those from Pakistan made possible through "disaster diplomacy."³ Within two weeks, an estimated 245 governmental and nongovernmental agencies from India and around the world were conducting relief operations in Gujarat. The state government soon established a new agency for emergency management and developed a number of recovery and reconstruction measures, including direct payments to individuals for housing damage, personal injuries, and livestock loss; extension of existing drought relief work to

earthquake relief; and the immediate construction of nearly half a million semi-permanent dwellings.⁴

"Black Friday" hit an extraordinarily diverse people who reside in a desert region of a nation shaped by colonial domination, the forces of globalization, and the struggle against both. In addition to political tensions between the BJP and the opposition Congress Party, residents are divided by caste, social class, and religion. Soon after the quake, dalit ("untouchable") and adavasi (tribal, or indigenous) leaders protested caste barriers in the distribution of relief goods, water, and land for temporary encampments. Religious divisions apparently privileged some survivors over others as emergency relief resources controlled by faith-based NGOs were distributed first to believers.⁵

As conditions deteriorated, existing and emergent groups organized protests, for example against the slow arrest of contractors held accountable for unsafe construction methods. A sit-in in one village shut down a major highway in protest over lack of water deliveries by government tankers. Over 4,000 residents in Bhuj, where building destruction was nearly total, demonstrated against government plans for their mandatory relocation to a new town site (*Times of India*, March 16). But media attention soon shifted to concurrent financial and political crises and an absorbing scandal in the military/political procurement process (*Times of India*, March 18). When the government put forward its annual budget, a national tax surcharge but no direct line of funding was provided for earthquake relief. The relief efforts of most humanitarian agencies wound down after three months.⁶

Action research on poor rural women's livelihoods

It is in this context that the Ahmedabad-based Disaster Mitigation Institute (DMI) undertook to assess the compound effects of sustained drought and a major earthquake on the livelihoods of poor women in the district of Surendranagar.

Since the 1979 cyclones, active in participatory research, planning, and action to reduce vulnerability, DMI's work reflects an analysis of disasters as "unresolved problems arising from the very processes of development" (Twigg and Bhatt, 1998, p. 3). Women's livelihoods in disaster-vulnerable regions are a particular concern, as the institute identifies women as important community actors, income-earners, and stewards of natural resources whose efforts increase the food, water, housing, and fodder security of the rural poor. Noting the invisibility of women in relief operations, lack of gender-specific data, and inattention to women's unique needs in disasters, a recent DMI publication concluded:

In addition, women are active workers in South Asia. Although the majority of work is home based, how disasters impact such work is neither studied nor known.⁷

The research was enabled by DMI's established presence in the quake- and drought-affected regions of Gujarat. Since the late 1980s, DMI has conducted numerous workshops, consultations, meetings, and focus groups with highly vulnerable villagers.⁸ In the wake of the January quake,

the institute worked through its organizational and personal networks to help focus attention on the economic survival of the poor. DMI director Mihir R. Bhatt cautioned that the significance of work,⁹ like damage outside the Kutch region, might be overlooked (Pathak, 2000):

We need to get priorities right, that is, first focus on work and livelihood. Second, focus on water and community infrastructure. And third, focus on shelter and services. Shelter without water and shelter without work makes limited sense.

This report describes the major findings from a DMI study conducted in March, 2001, into the effects of the twin disasters of drought and earthquake on village women in northern Surendranagar. The following sections address, in turn, indicators of gendered vulnerability in India and Surendranagar; guiding research questions; research strategy and study site; findings and implications; research needs and final observations.

The Social Construction of Gendered Vulnerability

Vulnerability analysis attributes the social effects of naturally occurring events to the social relations, institutions, culture, and power relations of people who reside in hazardous built and natural environments.¹⁰ As neither the routine nor extreme events of life are experienced identically by women and men, gender relations have come under increasing scrutiny.¹¹ As a social category cross-cutting class, caste, culture, religion, and age, gender shapes men's and women's lives in ways that matter in disasters.¹² While gender differences are relevant and need investigation (e.g., in women's and men's coping strategies, the division of labor, emotional impacts), it is the subordination of women that puts girls and women at risk in disasters around the world.

Indian women have enjoyed suffrage rights since Independence under a constitution guaranteeing many kinds of formal equality. The nation is committed to a policy of increasing women's freedom and autonomy but gender inequality here, as around the world, is deeply rooted. Women's social, economic, and political status, male-dominated cultural systems and social institutions, interpersonal relationships, and the reinforcing constraints of caste, class, and age leave a great many girls and women poor, overworked, sick, illiterate, and silenced (see [Table 1](#) below).

In the face of chronic or sudden disasters, these patterns translate into lack of economic assets (savings, credit, land, tools, training), personal safety and nutrition, health care (maternal and reproductive), social security (education, child care, insurance), political voice (in the media, electoral politics, village councils, households, and personal relationships), education, transportation, and other resources vital to survival and long-term recovery (Walker, 1994; Enarson and Morrow, 1998).

These gender patterns were conspicuously unexamined in the aftermath of the January 26 earthquake, in striking contrast to the interest of the media in caste-based inequalities. As "misery is more interesting to report" (Chowdhury, 1997), most photojournalists showcased

images of grieving and exhausted women (e.g. Chakravarti, 2001). Indeed, Gujarati women were victimized by a damaging earthquake occurring in the second year of a major drought. Many thousands lost their lives.¹³ As well as losing housing, employment, and family members, poor rural women lost the child care centers, community centers, school buildings, and health centers upon which they depend. Many anganwadi centers providing government assistance "completely collapsed, leaving an estimated 1.5 million women and children without nutrition support and health services" (UN OCHA, 2001). An increase in child labor due to extreme economic need is feared, especially among girls; the NGO ActionAid (2001) has also cautioned that young girls orphaned by the earthquake (or misrepresented as orphans) may be at increased risk of sex trafficking.

Table 1
Women at risk: indicators of social vulnerability

These and other indicators of women's life chances, social status, and living conditions reduce the ability of girls and women to prepare for, cope with, and recover from disasters.

- a skewed sex ratio (934 women: 1000 men) in Gujarat reflects conditions prevailing across India (927:1000);
- an estimated 25 million women are "missing" due to sex-specific abortion, femicide, high rates of violence against women, nutrition and health care preferences disadvantaging girls, and other factors;
- 65% of all Indian women report having experienced some form of domestic violence, with the highest rates reported among women employed as agricultural laborers;
- 54% of Gujarati women marry before the age of 18; marriages are often arranged; widows rarely remarry, especially in rural areas;
- the average Indian woman is younger than 22 when she bears her first child and lacks control over her own fertility;
- 45 % of Gujarati women need permission to go to the market and 49% to visit friends and relatives; 29% are not involved in decisions even about their own health and 10 % about what to cook; only one quarter have access to household money;
- fewer women (48.6%) than men (73.13%) over six enjoy functional literacy; literacy rates are lower among adivasi or tribal women (24.20%) and women in the Scheduled Castes (45.5%);
- one in four girls did not attend school in Gujarat even before the earthquake destroyed their schools; many of these "nowhere children" are likely to be working in the informal sector;
- the vast majority of the nation's women earn income through informal work, where working conditions are poor and few workers are organized;
- women hold fewer than 8% of parliamentary seats, 6% of cabinet positions, and 3% of administrative and managerial positions in the nation;
- Indian women earn an average of 30% less than men;

- 100,000-120,000 women across India die every year due to pregnancy-related problems; half of all married women suffer from anemia;
- most Indian women do not own any property in their own names and don't inherit parental property; barely 2% of women claim their family property rights.

Sources: Sen and Kumar, 2001; Government of Gujarat, 2000.

Gender-aware Response and Reconstruction

But neither disaster vulnerability nor women's lives are a simple function of poverty or inequality. Indian women have long shared a legacy of self-organization, professional achievement, and community leadership, especially around issues of environmental protection and sustainable development. This social history, and experience gained by women in the Latur earthquake and other disasters (Krishnaraj, 1997) fostered earthquake responses that were more gender-aware in vision (and perhaps in practice) than is generally the case.¹⁴

While these proposals must be monitored over time, the Gujarat government's outreach to women includes plans for 200 child care centers, 50 short stay homes for women and girls lacking social support systems, 20 temporary working women hostels, training programs for poor women, and support to women's groups working toward the development of women and children.¹⁵ United Nations-affiliated organizations with gender and development programs in the region soon targeted women and children for services ranging from mobile health vans and food supplements to vocational training, with a formal commitment to ensuring that "gender issues are addressed in designing entitlements - grants, houses, land titles, and livelihood" (UN OCHA, 2001).

The tangible and dramatic losses of over 20,000 Kutch women artisans, whose intricate mirrored embroidery work is highly prized, attracted immediate national and international attention. Benefits were held in Ahmedabad and across the nation to raise funds for the construction of these women's livelihoods and to protect this cultural legacy. Craft kits provided by women's organizations to the craftworkers housed in tents helped many earn needed income and regain some sense of control in their lives (Lak, 2001).¹⁶ In the public sector, the International Labor Organization has prioritized the reconstruction of these women's homes and livelihoods.¹⁷

Contradicting the victim paradigm, women's grassroots organizations played key roles in disaster response. The Society for Promotion of Area Resource Center-Swayam Shikshan Prayog (SPARC-SSP), an NGO whose members designed houses and monitored construction after the 1993 Latur earthquake in Maharashtra, proposes to "sustain the self-reliant spirit and enterprise of local communities" by collaborating with *mahila mandals* (women's groups) to plan, build, and manage 20 multipurpose community centers.¹⁸ The Self-Employed Women's Association (SEWA) and Kutch Mahila Vikas Sanghathan (KMVS) will work with the United Nations Development Program (UNDP) to rebuild the markets and assets of Kutch craftworkers and their families (UNIC Backgrounder, April 10). The UNDP is also developing an innovative radio

program to be produced and broadcast by local women's groups in an effort to increase communication with women during reconstruction (UNDP Press Release, April 21).

Women's high level of self-organization at the local level enables these partnerships. SEWA, a trade union registered since 1972 to represent low-income women workers in India's vast informal sector, is a case in point. SEWA was instrumental in ensuring that relief supplies reached women and immediately conducted village-level needs assessments with its members. Funds and networks are now being directed toward rebuilding child care centers, health clinics and other facilities that increase women's social security, and toward participatory action planning that integrates earthquake response with drought mitigation and the larger goals of gender-equitable sustainable development.¹⁹ Other groups dedicated to community-based mitigation (e.g., Seeds) worked through SEWA's local family records to distribute relief packets directly to women.²⁰ SEWA is also collaborating with DMI to train women in earthquake-resistant masonry techniques, and is a DMI partner in gender-aware action research being conducted in Surendranagar, Patan, and Banaskantha.

Women's Livelihoods in Surendranagar: Key Research Questions

With an overarching interest in gauging the synergistic effects of compound or "embedded" disasters, DMI researchers sought to influence disaster reconstruction by answering one essential question: What were the immediate impacts of the earthquake on the livelihoods of poor rural women in a drought-stricken region? This large question implied a need for more knowledge both about how rural livelihood systems are impacted by disasters and about rural women's work, as both bear on the capacity of households and villages to cope with the challenges of embedded disasters.

Assessing Economic Vulnerability and Impacts

Physical damage to housing stock, industry, agriculture, and infrastructure is generally the yardstick for gauging the economic impacts of disasters, resulting in this case in an estimated 1.3 billion dollar loss (US).

As Dennis Mileti has observed of the US, "considerable confusion" exists about how best to measure economic hazards and impacts in disasters (Mileti, 1999, p. 99). Disaster researchers in developed nations tend to concentrate on business recovery and insurance finance (e.g., Webb et al., 2000) while development-oriented researchers measure impacts on deficits and GDP in poor countries (Otero and Marti, 1995; Benson and Clay, 2000). This reflects theoretical and conceptual disagreement (where do disasters begin and end? how do disaster events change societies over time, or do they?); different levels of analysis (international economic systems? national debt and growth rates? the regional labor force? local firms?); and impacts (short/long term, direct/indirect, primary/secondary) measured differently (Mileti, 1999, Chapter 3; Kreimer and Arnold, 2000).

Assessing economic impacts in countries like India certainly requires attention, as Charlotte Benson and Edward Clay (2000) urge - to state of development as well as type of hazard, scale of impact, structure of economy, prevailing economic conditions, and stage of technical and scientific advancement. Clearly, developing countries pay the highest price in terms of lost opportunities and physical damage to costly infrastructure; per capita losses alone can be as much as twenty times higher in developing than in wealthy industrial nations (Clark and Munasinghe, 1995, p. 1). Just as clearly, economic effects mirror past decisions about the use of private and public resources, as Stephen Bender has written (1997, p. 38):

When a natural event such as an earthquake, hurricane, or flood prompts a request for external assistance, the overall course of development may be altered for years. The disaster may create further scarcity, dependency, and the loss of hard-earned development gains. In any case, disasters reveal that risk has been preferred to investment in vulnerability reduction. . . Natural disasters are no more "natural" than ecosystem degradation; both result from choices made by societies.

The economic effects of the Gujarat earthquake, like any disaster, will mirror these choices. It is estimated that 60% of the poor in Asia live on marginal land highly vulnerable both to environmental degradation and natural disasters. While India is the world's twelfth largest industrial power, 63% of its people depend on agriculture for their livelihood. In Gujarat, as across the nation, farmers work small landplots (2.93 hectares). The state has a ratio of "marginal" (seasonal/irregular) to "regular" workers twice as high as the Indian average (6%). The rural poor here are particularly exposed to national patterns of low life expectancy (63 years), child malnutrition (47% of the global total) and disease (40% of the global polio cases). In addition, low rural literacy rates (53%) and high infant mortality (64 per 1000 live births) are stark indicators of how risky even "normal" living conditions are for these rural villagers.²¹ The "fragility" of life is further undermined by India's recent turn toward privatization, which has reduced the production of local grain crops and undermined food security (Wisner, 2001).²²

To earn a living in this environment, the rural poor depend primarily on wages earned through the physical labor of household members, often including children; they need healthy livestock, sustainable environmental resources, good health, and social support systems. Despite their larger consequences, disasters are experienced in the first instance at the household level, where labor is profoundly shaped by gender.²³ The second essential research question, therefore, focused on how the drought and earthquake affected women's livelihood strategies in particular.

Assessing Impacts on Women's Livelihoods

The cultural fiction of women as homemakers and helpmates to male earners (e.g. "the farmer and his wife") shape public discourse and policy decisions following disasters. In fact, women's daily lives around the world are structured around a complex web of work and responsibilities - to others in the family and community, to the household economy, to employers and, for the poorest women, to the natural environment that supports them. The ability of poor women to earn money every day is vital for their survival before, during, and after disasters (Varley, 1994; Agarwal, 1990; Jiggins, 1986), yet women's paid and unpaid work is still poorly understood by students of disaster and those who respond to survivors (Enarson 2000; 2001).

Despite the salience of women's work in development projects, women's work is not often addressed in disaster contexts, in part because their income-generating activities do not mirror those of most men. At the close of the century, nearly 90% of India's working poor were women employed in the informal sector (Arunachalam, 1995). In Gujarat, a 1997 survey (cited in Sen and Kumar, 2001, p. 57) indicated that 285 of every 1000 women work for wages (researchers cautioned that 17% of rural women were undercounted); three-quarters work as cultivators (34.2%) or in other forms of agricultural laborer (44.9%), earning substantially lower daily wages than their male peers (10.65 Rs. vs. 14.58 Rs.).

Women's ability to earn income is an essential survival strategy for families living close to the margin in disaster-vulnerable living conditions and struggling to cope with successive economic and environmental crises.²⁴ In many drought-impacted households across Gujarat, women's income alone now supports the family as declining agricultural production has forced men out of their home villages in search of waged labor. As much as poor rural women need paid work, conflicts with child care and other domestic work, gender restrictions on tasks and occupations, low wages, and hazardous working conditions limit their ability to convert hard work to income. In the vicious cycle all too familiar to people in hazardous environments, disastrous events or conditions rob women of the time, health, autonomy, and security they need to survive the extreme events certain to come.

Recognizing that reconstruction planning and action must be guided by knowledge about local women's livelihoods and environments, DMI worked collaboratively with low-income women in Surendranagar to explore how sustained drought and a sudden earthquake has changed women's paid and unpaid work.

Study Site and Methodology

The study was conducted in the district of Surendranagar, located west of Ahmedabad and southeast of Kutch. Surendranagar was identified by the UN Disaster Assessment and Coordination Team as one of the four worst-affected regions, in which loss of life was relatively low (112) but damage widespread (661 villages were affected; 29,500 houses destroyed).

Pre-quake Working Conditions

A SEWA action research project conducted in the late 1990s provides valuable insight into the risky living and working conditions of Surendranagar women (Bhatt, 1998).²⁵ Resource-based livelihoods and the constraints of gender, caste, and class make economic insecurity a constant, exacerbated by lack of rain in a rainfed agricultural region. Poor rural women decried their lack of good land and water (e.g., barren trees, dry wells), the poor health of their livestock, their inability to purchase seeds, low-waged and irregular work, and their spiraling indebtedness as they were forced to borrow money to meet the exigencies of daily life, from food to funerals. Their neighbors judged that women lacking access to male income or family entitlements were most at risk of exploitation by employers and money lenders. As the poorest of the poor, *adavasi*

women facing drought spoke of living "like nomads without a proper roof over our heads or a guarantee of our next wage, job or at times even a meal" (Bhatt, 1998, p. 15).

The insistent need to earn income each day made even more difficult the routine tasks filling women's lives in Surendranagar: caring for children; cleaning the house, courtyard, and cattleshed; attending to the ill and elderly; gathering fuel wood, water, and fodder; and tending cattle, water buffalo, goats, and other livestock. As non-farm employment is extremely limited outside the middle class, most poor rural women take on paid agricultural work (Bhatt, 1998, p. 18):

Contrary to the popular perception of women not doing productive jobs, we found that they worked on their own as well as others' lands in a variety of tasks that included threshing, cleaning, drying, storing and growing vegetables and winter crops, feeding the cows and poultry, replastering the huts with mud, stitching and mending quilts and mats, and a host of other jobs. Floods or drought leave them without this work and the income from it. And in spite of such a work load their food intake within the household is often minimal, even during the pre- and post-natal periods.

In addition to waged agricultural labor on land owned by others, poor rural women in Surendranagar frequently migrate with their families to the Little Rann of Kutch desert, where 60% of the nation's salt is produced. A SEWA study conducted in 1990 with 150 agarias (contract salt workers) in Surendranagar found most living below the poverty line, 98% illiterate, and 68% forced to take their children along with them to the distant worksheet (SEWA, 2000). Families work for merchants who hold government leases on salt mining operations, receiving a fixed payment at the end of the season. Leaving their native villages for as long as eight months (September to March), large numbers of salt farmers from Surendranagar (12,000-15,000) work under grueling conditions to "mine" the naturally saline water and prepare it for processing. Their makeshift shelters offer little protection from the elements; chronic skin diseases, coughs, and tuberculosis are common, education or health care for children nonexistent. Child labor is common as families share daily work shifts at the salt pans.

Some poor rural women in this region also earn income harvesting gum from babul trees, a hardy tree surrounded by thorny bushes painful to harvesters. Except in areas with women-run cooperatives, the market is controlled by private wholesale merchants licensed by the State Forest Development Corporation. Most gum harvesting is done by Koli and other low-caste workers, who may walk 10 kilometers a day with children in tow to reach the babul forests, leaving before dawn for 12-hour work days in hot and humid weather (SEWA, 2000a).²⁶ Shifting market rates for gum make women's wages erratic but most earn below-poverty line wages.

SEWA's organizing efforts in rural Gujarat (66% of their members are rural) have brought some improvement in working conditions and wages; for example, 23 child care centers are now available in the areas to which salt farmers travel for work. Women can also control their own savings and borrow money through the SEWA bank, and purchase insurance against disaster losses and other risks. SEWA's Mahila Housing Trust (MHT) helps members harvest rainwater from roofs for storage in underground tanks, loans women money to repair or build homes, and

offers technical training in masonry skills to women. Working through federations sponsored by the state office for Development of Women and Children in Rural Areas (DWCRA), SEWA buys nutritional foods in bulk and distributes and offers shakti food packets to members at affordable rates. A recent federation initiative in Surendranagar to train village women to manage local water supplies enabled the fast restoration of water after the earthquake (Sucharita, 2001).²⁷

As important as self-organization is, these living and working conditions left rural women in Surendranagar highly vulnerable to the effects of the January 26 earthquake, as they have long been to the short- and long-term effects of prolonged drought.

Method

Semi-structured discussions were conducted through focus groups in 37 villages in the northern region of Surendranagar during the second week of March, 2001, six weeks after the January 26 earthquake.

Five DMI and five SEWA employees worked in small research teams to visit these remote villages in three talukas (counties) of northern Surendranagar (Patdi, Dhangadhra, Halvad). They recorded their observations of physical damage on a standardized form, and conducted group discussions lasting an average of 90 minutes. Focus group members were selected in a two-step process. First, the local SEWA representative was asked to identify three women whose extensive knowledge of village life allowed them to generalize about the community as a whole. These three then suggested other women to be invited to participate in the study, with whom the travelling research team then met to conduct focused discussions based on semi-structured questions asked of residents in other affected regions. The unit of analysis is the village.

No descriptive sample data are available, but it is probable that this innovative strategy produced a sample best representing socially engaged, long-term residents; as participants were identified through SEWA, most respondents were themselves employed and low-income. The field team estimated that over 90% of villages are Hindu, many born into caste-based work in agriculture and animal husbandry.

The survey elicited information from village women about the immediate effects of the earthquake and the overall effects of the two-year drought on: 1) housing; 2) work; 3) water resources; 4) livestock; 5) natural resources, and 6) social and cultural facilities.²⁸ For the Surendranagar study, questions were added to the existing survey used in other DMI/SEWA action research projects. Women were asked to report on their collective responses to these two disasters, changes they sought during reconstruction, impacts on household size, and patterns of vulnerability among village women.²⁹ Completed surveys and the field team's empirical observations of damage are the basis for findings reported below.³⁰

Impacts on Women's Work: Findings and Implications

Overall, women spoke first and most strongly about the lack of paid work, a pre-existing problem made acute by the January earthquake; a second major concern was lack of housing, especially for children and others still sleeping outside as the rainy season approached; third, women cited lack of water and water resources. Difficulty locating nutritious food and navigating rural roads were also concerns.

Though no data were collected on the point, the field team reported their sense that Surendranagar women were "thinking positively" and focused on the future, and that close living quarters and mutual aid appeared to have increased solidarity across caste lines, between women and men, and among extended families brought together by the quake.

Intersecting Vulnerabilities

In any community, some are more vulnerable than others to the unexpected. Age, class, and caste clearly differentiated women's experiences during the drought and earthquake. Regarding social class differences, which cross-cut caste identities, women from 23 villages (62%) observed that low-income women were most hurt by the intersecting effects of the embedded disasters. Among middle class women, the quake appeared to have more impact than the drought. Women in Scheduled and Backward Castes linked to low-status agricultural labor and animal husbandry were judged by respondents to be most hard hit. Koli, Bhervad, and Dalit women were seen as particularly affected in more than half the villages surveyed; these women were seen to bear the brunt of drought (14 villages, or 38%) and particularly of the recent earthquake (24 villages, or 65%).

Regarding age, in some villages young girls and elderly widows were seen as those most heavily impacted; widows as a group were seen as in great need of paid work as well as help repairing their homes. However, more villagers identified middle-aged women as those most impacted, presumably reflecting their extensive and life-cycle-related roles as family earners and caregivers.

Housing and Livestock Losses

Personal injuries were reported by women in 19 villages and deaths in 5; most women reported that people in their village had lost personal possessions as well as livestock. Respondents from 21 villages (57%) reported that more than 70% of local dwellings were damaged or destroyed, including 11 villages in which every structure sustained damage exceeding 70% ([Table 2](#)).³¹

Table 2 Damage to housing

20% or less damage N=10 (27%)	20-70% damage N=6 (16%)	Over 70% damage N=21 (57%)
Joghad (n=570) Nimaknagar (n=474) Koparani (n=343) Virendragdha (n=300) Surel (n=645) Rozwa (n=675) Kuda (n=2376) Susvan (n=386) Narichana (n=519) Odu (n=700)	Thada (n=570) Savlas (n=550) Jinjuwada (n=2100) Hadvad GIDC (n=1200) Patadi (n=4194) Jenabad (n=1500)	Kidi (n=506) Chaldhra (n=117) Old Devadia (n=1125) Khod (n=130) Ajitgath (n=421) Miyani (n=291) Tikar (n=1621) Narali (n=300) Moti Malvan (n=1500) Mangalpur (n=125) Bharuda (n=572) Degam (n=456) Sultanpur (n=185) Kherva (n=1100) Sedla (n=500) Jesada (n=500) Dhama (n=314) Iesanpur (n=433) Vusavadi (n=441) Mithaghoda (n=325) New Enjar (n=230)

Insufficient Income

In only one of these 37 villages was embroidery work common, in contrast to women's work in the district of Kutch. Instead, these villagers earn money primarily through a combination of salt farming, farm labor, gum collecting, animal husbandry, tree nursery work, and construction. Both the quake and the extended drought appeared to hit two groups of women especially: women who worked as waged agricultural laborers and women employed as salt farmers. The prevalence of women's occupations in the village sample and disaster-related effects on these occupations are summarized in [Table 3](#).

Table 3
Impacts on rural women's income-generating activities

<i>Type of work</i>	<i>Women do this work in this village</i>	<i>Women's work was or is still interrupted</i>
Waged agricultural labor	34 villages (92%)	14 villages (38%)

Salt farming	33 villages (89%)	14 villages (38%)
Other (e.g. soil digging, masonry)	21 villages (57%)	11 villages (30%)
Gum collection	10 villages (27%)	6 villages (16%)
Plantation (nursery)	9 villages (24%)	5 villages (14%)
Dairy	7 villages (19%)	6 villages (16%)

In seven villages (19%), salt farming stopped and had not restarted at the time of the survey six weeks after the earthquake; in another seven villages, it stopped and then resumed. Salt pans used for drying saline water were cracked and could not be used (reported in 18 villages, or 49%); borewells through which water was drawn to the surface were damaged (five villages); and women were reluctant to leave children unattended at home to travel to work (three villages). The quake also had dramatic effects on complex underground hydrological systems; "black" water (generally contaminated by salt) was reported in five of these villages, though they were located far from the seismic epicenter. As these changes significantly reduced the demand for female labor, they have significant implications for long-term regional and household economic recovery.

Regarding farm labor, 14 villages (38%) reported "no work available" for women following the earthquake, primarily due to damage to land and crops; in six of these villages, work had not yet resumed at the time of the survey. Though lack of rain, seeds, crops, and money to purchase seeds were seen as drought-related losses that reduced farm employment for women well before the quake, women more often spoke of work stopping due to earthquake (in 14 villages) than to drought (in eight villages). Gum collection and plantation work were also more affected by earthquake than drought; data were not available on this point regarding salt farming and dairy work. Women also reportedly earned money through relief work (soil digging, rubble clearing), related to the drought in 17 villages and to the quake in 20. However, these accounts do not distinguish between anticipated relief work and relief work earning impacted women money at the time of the survey.³²

Deteriorating Natural Resources

Drought conditions in desert regions like Surendranagar greatly extend the time women must spend gathering water and fodder. When water conservation systems are damaged, as they were as a result of the drought and earthquake across Gujarat, women's work increases correspondingly.

Communal village wells, present in 30 of the 37 villages, were damaged by the quake in 11 cases, largely by cave-ins or increased salinity. Lack of rain had already dried up these wells in 10 villages. The quake also damaged tankas (large, above-ground storage tanks) provided by the government to help collect and conserve rainwater. These were present in 34 of the 37 villages.

In 19 cases (51%), tankas cracked or were otherwise damaged by the earthquake; in 11 cases, they were unusable due to drought. Most villages (33) also maintain community ponds used by livestock. The earthquake damaged or destroyed these ponds in 10 cases, for example by cracking pond linings or damaging bunds/embankments. These ponds, too, had deteriorated due to lack of rain long before the earthquake; in 15 villages, the pond was completely dry.

Standposts and borewells sustained long-term and short-term damage from both the drought and quake. In six villages, women reported that water from borewells suddenly turned saline after the quake; in six villages, it was saline due to the drought. Standposts were damaged in 11 villages by the earthquake; drought caused standposts to stop providing water in seven villages.

Household Changes

Household coping strategies often include migrating for waged labor and consolidating the resources of the extended family. Changes in household size and residence were reported following both the drought and quake. While migration away from villages to cities was attributed to the earthquake in 12 villages (32%), in nearly half of these communities (18 villages, or 49%), women observed city kin dealing with quake losses by returning to their extended families in rural Surendranagar. This pattern was reversed regarding drought. Lack of rain caused more migration away from villages to cities (reported in 15 villages, or 41%) than movement from cities back to home villages, reported in eight (22%) of all villages. Family size was seen to increase more in the wake of the quake (reported in 14 vilages, or 38%) than as a result of the drought (in 12 villages, or 32%).

Declining Social Security

Poor rural women in this region were also hard hit when these concurrent disasters disrupted the few existing social support systems. In 28 of 37 villages (76%), nutritional shakti packets were available to help low-income women feed their families but were temporarily disrupted due to the drought (in four villages) and the earthquake (in six villages). Savings groups were present in 25 villages but women's access to the small loans they offer declined following the quake in eight villages; in only two villages were they disrupted by the drought. Some degree of local schooling was available in all 37 villages; women in 27 villages (73%) reported that schools stopped temporarily and then restarted in makeshift locations, despite the total destruction of schools in 17 villages (46%). In contrast, the drought appears to have had a less immediate impact on education, and hence on future earning power, though families have had to keep both girls and boys out of school to help with family earning and caregiving. Girls are burdened by increased responsibility for the care of siblings as mothers search for waged work and work harder at domestic tasks in living conditions made much more difficult by the quake. Health services, only available in 20 of these villages (54%) before the earthquake, stopped entirely in six villages; again, the drought had a smaller impact, though services did stop entirely in one community. The earthquake damaged or destroyed a great many community buildings, including panchayat offices, community centers, and temples. Women in 14 villages lost their local temple; in 10 villages, government offices were destroyed; in six villages, the quake destroyed the community centers in which many local activities are conducted.

Increased Community Work

Asked how women were becoming involved in grassroots disaster response, respondents in 21 villages (57%) observed that women were already participating in community meetings about the quake; in 18 villages (49%), they also meet with other villagers to address drought issues. In 10 villages, women noted their contribution of information to previous disaster studies (drought-related), not including the 37 villages participating in this study of earthquake effects.

Women envisioned an array of possibilities for post-quake reconstruction. In 15 villages (41%), they sought improved child care centers that could be rebuilt closer to their workplaces and home villages; in 13 villages (35%), more earthquake-resistant homes built from bricks rather than stones; in 13 (35%), more collective action to increase ways for women to earn income; in 12 villages (32%), higher wages, especially for salt farmers; and in 13 villages (35%), skills training in masonry. At the time of the survey, women in six villages (16%) had already received masonry training.

Discussion and Implications

The research strategy employed in this study lays a foundation for follow-up evaluation of how prolonged lack of rain and the sudden transformations of a major earthquake alter the economic status of rural women in places like Surendranagar. At this point, three conclusions relevant to reconstruction planning are evident.

First, women's unpaid domestic and community work greatly expanded, a pattern often observed (e.g., Morrow and Enarson, 1996) but rarely theorized by analysts focused on business and labor impacts. Disasters create more work for all survivors, but women's time and energy are especially impacted by deteriorating working conditions and new needs. Larger households mean more people with more needs, and damage to water and fodder systems increases the time women must spend on daily chores. Domestic labor continues unabated but under more difficult conditions. Women must still provide food and water for the household and tend animals desperately in need of water and fodder; they cook and clean in hot tents or under plastic sheeting, supervise children at play in rubble and studying in makeshift schools, and care for the ill and injured out of doors, without ready water or food. A DMI researcher commented on gender labor in a disaster:

Men have the time to sit and think about - but women have to start their activities immediately. Immediately after the earthquake, she has to prepare foods, she has to gather water. . . Women do not have this time. . . Women have to do many activities - men have to do only one or two activities. . . She starts from early morning and goes to 8 or 9 at night. Women's work continues.

The labor of women and girls cushions the shocks to families when schools, child care centers, and health centers close, whether due to the sudden losses caused by an extreme weather event or the insidious erosion of state spending due to privatization.³³ Women's already full days expand

to include political work at the community level to deal with deteriorating living conditions, for example drought- and quake-induced loss of health and nutrition services. This, too, means more work for women, whose unpaid community labor is an essential community resource in the best of times and vitally needed in emergencies. Gender analysis of all relief, recovery, and reconstruction projects is essential in order to assess and monitor their direct and indirect impacts on women's time and resources. Gender-equitable reconstruction is not possible without this perspective on economic recovery.

Second, because rural women's work is so highly resource-dependent, they suffer immediate unemployment and indirect loss due to the ripple effects of degraded natural resources. Water resources are a case in point. Already undependable water sources were rendered useless in some cases by the earthquake, while elsewhere the quality of water deteriorated. As women are responsible for water gathering, more limited water supplies translates into less time for income-generating work. Lack of water also obviously reduces women's opportunities to earn money through waged labor on local farms. When alterations in hydrologic systems affect salinized water, women whose income depends on water may lose a reliable, if limited, source of income. Women salt farmers, who are 50% of the migratory labor force to the Little Rann, are at risk of long-lasting economic stress under these conditions, which may force them out of villages and into informal work in cities. Women's local knowledge and historical perspective on natural resource-based employment is an essential asset to economic planners working at the community level. Their work as guardians, users, and managers of scarce natural resources positions them as experts in the decisions to come about how to rebuild in ways that mitigate damage from future disasters. Across castes, classes, and ages, women's "inside out" perspectives on environments, disasters, and development must be brought to bear on the question of reconstructing Gujarat's economy.

Third, these events cost women money they could not afford to lose, leaving them and those who depend on their income at greater risk in future disasters and complicating their ability to move forward. While their economic need to work increased, women's time and options for waged labor declined. This contradiction makes the chronic economic insecurity of poor rural women an acute condition, a way of living that must be addressed in the process of developing regional economic recovery strategies. It is important to recognize the economic vulnerability of low-status workers (e.g., women salt farmers or gum harvesters) as well as those whose skills are more colorful and highly valued (e.g., women artisans). More positively, women's paid work, working conditions, and worker associations may come under scrutiny in communities, institutions, and relationships where routine patterns and expectations have been so profoundly disrupted. To the degree that this "window of opportunity" is exploited, women may benefit (e.g., through ILO initiatives) from skills training and alternate employment opportunities (Delaney and Shrader, 2000); from gender-equitable housing design and ownership policies (Bari, 1997), from more women-friendly features in newly constructed communities (e.g., better and closer child care centers), and perhaps from finding new avenues of political and cultural expression (Vaughan, 1987; Enarson, 2000a; Soares and Mullings, 2001). Conversely, disproportionate emphasis on economic losses centered on direct losses in the formal sector will disadvantage women's economic recovery.

Research Needs

Community-based action research is an essential planning tool for private and public responders, and a process that can help give survivors a voice in the fashioning of the future. At the state and national level, economic reconstruction planning must be informed by knowledge about the gendered division of labor in the home, in agriculture, in formal employment, and in the informal sector. Clearly, more gender-specific data are needed to anticipate, mitigate, and respond to the likely economic consequences of disasters on women, e.g. regarding wage rates, disability, unemployment, labor force participation rates, business recovery, paid relief work projects, and training programs.

The major findings of this survey can and should be tested using different methods, in other populations, and over time in order to contribute substantively to gender-equitable reconstruction in Gujarat. Qualitative research strategies allowing survivors to articulate their experiences, feelings, ideas, needs, and demands are essential if disaster social science is to generate knowledge and insight useful to those most at risk. Comparative analysis of these findings is also needed across regions and nations, in urban contexts, and between women and men (Enarson, 2001).

This study helps fill a void about the particular experiences of vulnerable women, who are so severely impacted and yet so systematically silenced in disaster decision making. Students of disaster, and disaster responders also need concrete knowledge about gender issues in men's lives, for example disaster-related changes in the division of labor, men's paid and unpaid work, men as caregivers in disasters, interpersonal violence, and other under-investigated topics.

This study did not speak to the question of indirect or long-term economic effects or to disaster-related changes in the gender division of labor, but these are important issues. Longitudinal study of gender, work, and reconstruction is essential to grasp the long-term, indirect, dynamic, and holistic effects of natural disasters on poor rural women. Clearly, the "snapshot" profile afforded by needs assessment surveys cannot capture this knowledge. Postdisaster shifts in women's income-generating opportunities in emerging economies, and in the regional and global economies to which they are tied, must also be monitored as they will impact women's livelihoods long after houses and businesses are rebuilt.

Organizational and program evaluation research will also be needed in Gujarat. Monitoring the short- and long-term effects of housing, economic, and community reconstruction projects on women's income, time, and employment is an important research topic. Will homes, businesses, and communities be reconstructed in ways that reflect an understanding of women's working lives? How will women workers' short-term needs and long-term interests as income earners be monitored and addressed in the difficult years ahead? How transparent, accountable, timely, appropriate, and gender-equitable will economic rehabilitation be in Gujarat?³⁴ These questions need answers if the region is to rebuild in ways that reduce, rather than reconstruct, gendered vulnerability.

Conclusion

Finally, the study invites some general observations. First, understanding the economic impacts of disasters demands understanding economic vulnerability, that is, what the root causes are that create living conditions leaving the great majority of the world's people without secure food, water, housing, or food, and often without personal safety or political voice. Both an historical perspective and livelihoods analysis are needed to do justice to the complex and creative ways in which ordinary people across the globe - not only in developing nations or in rural regions like Surendranagar - mix and mingle work with different meanings, structure, and conditions.³⁵

Secondly, without gender analysis, a good deal of what is important to know about disasters may be missed.³⁶ Regarding work, a single-minded focus on losses easy to measure (e.g., GDP, business closures, insurance payments, employment rates) directs attention to the formal economy and the private sector, and hence to men. This constructs a knowledge gap about disasters that robs planners of insight into women's role as food producers, their income-generating activities in the vibrant informal economy, professional women's disaster-relevant skills, and the vulnerability of women as contingent workers in national economies shaped by continued losses from extreme events. Women's struggle over time to cope with embedded disasters cannot otherwise be understood.

Third, we have learned that mitigation, crisis response, and long-term reconstruction are advanced when disaster-impacted neighborhoods and communities are cohesive, integrated, and organized (Maskrey, 1989; Comfort, 1995; Berke and Beatley, 1997). In disasters, as in development planning and organization, grassroots organizations are increasingly recognized as resources in crisis, planning partners, and leaders in community-based mitigation. We must also appreciate their role in creating new knowledge by, about, and for those people most at risk and most engaged in mitigating and responding to extreme events, among them the rural women profiled here. This study was possible only because DMI and SEWA had deep roots in the women's communities they studied and an understanding of how action and inaction now will shape community vulnerability and resilience in the future.

Finally, the economic and social impacts of disasters cannot be understood if disasters are treated conceptually as discrete events rather than as the social processes they are - sparked by naturally occurring events, but arising from the social organization, history, culture, and physical environment of people and place. Every disaster has a history, and sets a future in motion. Postdisaster reconstruction affords an opportunity to intervene in this future in ways that reduce risk if disasters are seen from the birds-eye view of vulnerable people. Disaster research, practice, and planning that is community-based, gender sensitive, development-driven, and mitigation-oriented can make a real difference.

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