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Heralding for a food secure future

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- A photograph of three white polytunnels (hoop houses) set up on a terraced hillside. The hillside is covered with green vegetation and some trees. The polytunnels are made of a white plastic covering supported by a frame. The ground in front of them is dark brown soil.
- HILL AGRICULTURE
 - Protected Cultivation of Vegetables
 - HPBS-1 : Brown Sarson for Mid-Hills
 - Climate Change and Farm Women in Hills

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Consequence of Climate Change on Farm Women in Hills

Renu Jethi¹, Nirmal Chandra², Mukesh Kumar³ and Manik Lal Roy⁴

Women in hills of Uttarakhand in particular are more vulnerable to climate change due to their being burdened with most of the agricultural works and household chores. Climate change usually have impact on the sectors that are traditionally associated with the working of women, such as crop production, cattle rearing, collection of water, fuel and fodder etc. Developmental policies and strategies should be supportive to enhance women's access and control over natural resources in order to reduce poverty, conserve natural resources, and ensure that women and poor communities could better cope with the climate change.

Hill and mountains in North Western Himalayan region are experiencing the consequences of climate change more than any other region. Climatic variability and environmental changes affect men and women differently due to the different roles they perform in their households and society. Although both are affected by the climate change, yet the degree varies according to the nature of their work, their accessibility to the resources and their capacities to cope with the changes (Leduc et al. 2008). Women in hills are more prone to be affected adversely from the impacts of climate change. Changes in the climate usually have more impact on sectors that are traditionally associated with women, such as crop cultivation, collection of fuel and fodder etc. Seasonal migration of men in search of job is both widespread and linked to low agricultural productivity. Because of male migration and thus

reduced workforce, women who already do a disproportionate share of work are now doing an ever-increasing portion of the work towards agriculture and earning livelihoods. This phenomenon is referred to as the 'feminization of hill agriculture and livelihood'. Increasingly women are left with no other choice but to cope with the food shortages and the management of the home and farm. There is a compelling need for a concerted effort to understand the implication of climate change on vulnerable sections of people which also include women and develop special strategies for making the fragile ecosystem of hills sustainable on which a large number of people depend.

Women and agriculture in climate change scenario

Role of women is crucial in agriculture and therefore they are rightly considered as the backbone of hill agriculture. Women are

responsible for almost all the agricultural operations ranging from field preparation, sowing, weeding, harvesting and supporting men in ploughing the fields.

Women are custodians of traditional knowledge related to seed conservation and maintain a diverse genetic pool of this valuable resource through in situ conservation (Dhakal et al. 2010).

Women and water scarcity

It is widely acknowledge that in hills women are the key managers of water and energy in households. Women walk 10-15 km distances every day in order to fetch the water. In dry season, it is not uncommon for women to walk twice the distances. As much as 82 per cent of the net sown area in hill region of Uttarakhand is rain fed (Statistical Diary Uttarakhand, 2009-10). In order to cope with the situation, efforts must be made for developing rainwater conservation mechanism along with sprinklers

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and drip irrigation systems (especially for horticultural crops) for efficient use of available water. Low Density Polyethylene (LDPE) repair of naula (traditional wells), construction of infiltration tanks and recharging of natural water springs, plantation of broad leafed trees species that enhance water retention property of the soil and strengthen slope stability are the actions need to be taken.

Women and forest

The livelihoods of most of the people in the mountainous region of Uttarakhand are directly dependent on the forests. In Uttarakhand 61 per cent land is covered by forests (*Statistical Diary Uttarakhand, 2009-10*). Due to over exploitation of forest resources i.e. wood, fodder, herbs and animals and lack of proper conservation measures, there is rapid degradation of the entire ecosystem (*Sundriyal, 1994*). Women are more dependent for their livelihood on natural resources that are threatened by climate change. It is well known that in Uttarakhand hills women are mainly responsible for the collection of fuel wood and fodder (*Chandra et al, 2008*). Reduction in availability of fodder in the village vicinity result in to walk long distances (about 10 to 15 kms) to collect fodder for their livestock which further adds to their hardship. Due to climate change many of the plant species with medicinal value are also now at the brink of extinction in Himalayan region. Besides providing rich nutritional supplements, such

forest products during famine, drought or floods help the starving population. Therefore, women are directly affected by forest degradation.

Women and health

Health of hill women is affected due to the effects of climate change. According to an assessment by *Bhati and Singh (1987)* in the Himalayan region, a pair of bullocks works for 1064 hrs, a man for 1212 hrs and a woman for 3484 hrs in a year on a one hectare farm. Most of the women in hills suffer from lower back pain due to carrying heavy loads over long distances; they also suffer from various skin problems due to long exposure to sun. Due to use of agro-chemicals women are exposed to several health hazards and gynecological infection. In case of rice transplantation, arthritis, intestinal and parasitic infections may take place due to long hours of work in mud and water (*Pandey, 2001*). Women are particularly vulnerable to diseases during dry season. During this time the journey times to collect water are the longest, food stocks are lowest, the workload is highest and diseases most common. Therefore, a concerted effort needs to be made for removing or reducing drudgery of hill women. Increased work loads for women is also a reason for that parents or guardians taking girls out of schools to encourage them in household and agricultural tasks (*Baten & Khan, 2010*).

Adaptation strategies to climate change and its consequences

The most common phenomenon as a result of climate change are varying temperatures, frequent and longer drought periods, erratic rainfall, untimely flowering in some plant species, slowly disappearing natural resources and occurrence of new diseases. Women are somehow adapting to these changes with the resources available to them. However, they currently lack information, services, technologies, assets, mobility, and the capacity to make choices and decisions. All these factors affect women more than men.

Women maintain and promote agricultural genetic diversity by selecting, conserving, and propagating seeds. While evolving adaptation strategies the women must be involved in order to tap their rich knowledge and experience with respect to crop adaptation to enhance food security. In order to address drought like situations and instances of less rain during cropping seasons, drought resistant crop varieties should be promoted. In order to check out migration of men folks from hills, it is important to increase agricultural productivity and ensure food security to farm families. This will also provide a better balance of workload between men and women and reduce stress of women.

The development of Clean Development Mechanisms (CDM), through carbon sequestration from afforestation

and reforestation can also be done by rural women. Rural women, with no access to modern energy fuels face problems relating to indoor air pollution and suffer huge health hazards i.e., high incidence of bronchitis, asthma and other health problems. Women should be provided good access to use fossil fuels like LPG or Kerosene, biogas and solar energy to save her from various health hazards.

Forest covers are gradually decreasing and grasslands are turning into wastelands in hills due to over exploitation, encroachments and improper management of these resources. These factors are often causing severe fodder and fuel scarcity and aggravating soil and water erosion. Studies conducted for about a decade at VPKAS, Almora shows that introduction of improved grasses and legumes like Pangola (*Digitaria decumbense*), Giant star (*Cynodon plectortachus*), *Panicum coloratum*, *Panicum repense* and *Setaria kazungula* are promising technologies for improvement of grassland and other forage production systems. (Bisht et al., 1999).

In fact, climate change is not a new phenomenon and people are apt to adaptation, but there is limited data on how they do this, where they get information, and how they use resources. Moreover, there is little information on the socioeconomic factors that enhance or inhibit people's capacities to adapt changes. In order to ensure an

efficient mitigation and adaptation strategy to climate change, policymakers have to acknowledge the different roles played by women and men, use of natural resources, their adaptation capacities and hence their needs.

Actions required for reducing future risks of climate change on women

It should be recognized that women in hills are more vulnerable in climate change driven scenario. Among the critical factors that can assist in women adaptation to the consequences of climate change are increased access and ownership of land, micro-credit directed to women, water, livestock, storage facility, women friendly agricultural implements, improved marketing infrastructure and education. It is required to analyze and identify gender specific impacts and protection measures related to droughts, diseases, and other environmental changes and disasters. Strategies should be developed to enhance women's access and control over natural resources, in order to reduce poverty, protect environmental resources, and ensure that women can better cope with the climate change. As women's knowledge and participation has been critical to the survival of entire communities in disaster situations, the specialized skills of women should be taken into account while developing livelihood and natural resource management strategies for

mitigation and adaptation to the impacts of climate change. Their increased participation in decision making is necessary.

Conclusion

It is evident that climate change has certain impact and is affecting the people of Uttarakhand particularly women folks. The impacts will be increasingly felt and will necessitate changes in people's livelihoods and lifestyles in time to come. Women of Uttarakhand play an important role in maintaining households and communities and in managing natural resources. Their knowledge also contributes to the survival and upbringing of their families and to their adaptation in extreme situations such as conflicts, natural disasters, and displacements. However, their role is seldom recognized, and their perspectives, needs, and interests are not properly taken into account while framing development and environmental policies and strategies. Women and men play different roles in the society, face different challenges, and demonstrate different reactions and methods for coping. These issues should be addressed in research, development, disaster preparedness, and adaptation and mitigation strategies. Multidisciplinary groups are needed when developing climate change mitigation and adaptation strategies, policies, research or initiatives so that environmental, social, gender and economical aspects receive equal attention. □