Gender Issues in Agriculture

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Introduction

Agriculture occupies a key position in the Indian economy providing a source of livelihood for a majority of the population. Successes in agricultural front with high production levels, especially in food grains have indeed been achieved. But more energy in the form of mineral fertilizers, chemical pesticides and farm machinery are required every year to produce the same quantity of farm products (Swaminathan, 1991). The yield plateau of crops in Punjab, Haryana, Western Uttar Pradesh and other states strongly indicate that there is a disturbance in our natural resources management and the present practices are not conducive to sustainable agriculture (Deb, 1994).

Area covered by soil degradation has increased by almost 800 lakh hectares and it has already consumed 57 per cent of the country's area. Apart from soil erosion, in situ degradation like water logging, salinization and nutrient depletion is responsible for a loss of up to 26 per cent of the annual agricultural output today (TERI, 1997). Another major cause of concern, particularly in the core Green Revolution belt, has been the decrease in genetic diversity of major HYV crops, which has increased the potential danger for sudden widespread loss of crops from unknown / uncontrollable diseases (Maji and Bhattacharya, 1994). Depletion of natural resource base due to deforestation, over grazing, desertification, excessive agricultural intensification, over fishing and agriculture on marginal lands leads to decline in agricultural production potential leading to decrease in the sustaining / carrying capacity of agriculture. Natural resources (soil, water, nutrients) have boundaries and improved management is needed to reverse the degradation of this resource base and develop agricultural production systems that sustain our ecosystem.

Effect of Over Exploitation of Natural Resources on Women

The interrelationship between human factors and natural resources management is complex and has remained at the centre of the development debate. It is acknowledged now that economic growth goes side by side with deteriorating conditions of work and living for sizable section of the poor, especially women. This is so because the growth process itself imposes new forms of deprivations, dislocations, exclusion and alienation from the productive resource base. In effect poverty, malnutrition, population, ecology and sustenance of our agricultural systems can no longer be dealt with or even thought of as separate issues. They are interlinked in practice and must be linked in policy formulation, for development to be meaningful, especially if it has to have a positive impact on women. Historically, women have been the managers of natural resources as they are dependent on them for their livelihood and their family's needs. The consequences of over exploitation of these resources have rendered them scarce.

The effect of environmental degradation and its consequences can be examined from the disturbance of linkages of women with respect to land, water and work. Over grazing of pastoral lands, degradation of land by water, wind erosion, salinity, alkalinity have all resulted in increasing working hours of women as she has to traverse long hours to locate productive

areas. Women are linked with forests for their supplies of fuel, fodder and minor forest produce. Non-commercial sources of energy-firewood, crop wastes and cow dung-provides nearly 90% of rural household energy requirements. The rural women collect over 28% of all energy consumed in India in the form of firewood. Most of the 140 million tonnes of firewood burnt annually come from forests. Deforestation and depletion of forest resources and loss of access to and control of forest resources have increased poverty, unemployment and drudgery of rural and tribal women. Soil erosion, water logging, siltation, shifting cultivation, construction of dams and reservoirs, mining and industrial activities and large scale tree felling for commercial purposes have taken a toll on agricultural and forest areas. Thus rural women are forced to work more, walk greater distances for long hours to collect fuel wood, fodder and other household biomass.

Discharge of effluents from industries and households have resulted in pollution of surface water and over exploitation of ground water, have led to fall in the water table. Natural reservoirs of rainfall have been diminished due to deforestation. Water is thus becoming a scarce commodity. The effect of depleting water resources is more severe on rural women. Women in Rajasthan and *Kutch* region of Gujarat travel several hours to fetch water to meet their family's needs. Even in high rainfall, hilly regions of Uttar Pradesh and North East deforestation had led to water shortages in summer forcing women to walk several miles in search of water.

Poverty and unemployment in rural areas have resulted in large-scale migration to urban areas. Women are being forced to take up more drudgerous jobs as a source of livelihood as most of the migrants are absorbed into the construction sector. Women form the largest work force in agricultural sector. Male out migration from rural areas in some instances is strong enough to suggest a process of "feminization of agriculture" or perhaps more accurately, of self-provisioning food farming.

Households headed by women now form on an average between 20 to 25 per cent of all rural households in developing countries. The rural woman's drudgery has thus been doubled with women performing the man's role as well. Thus women, the sustainers of family's health and prosperity, have slowly become the primary victim of deepening environmental crisis as they are the main users and providers of household biomass.

Woman's Contribution to Sustainability of Natural Resources

Sustainable agriculture is sustainable exploitation of renewable natural resources including annual and perennial cropping, agro-forestry and livestock as well as the conservation measures needed for long-term maintenance of resources. Thus, sustainable agriculture involves sustenance of our agricultural systems. This should be the major emphasis for all technological innovations involving land and water use so that there is no adverse effect on the biological productivity of the resource base in the long run (Deb, 1994).

Even in the larger scenario of rapid exploitation of natural resources woman has inadvertently been contributing to the sustenance by her traditionally assigned role. Domestication of crops is widely believed to have begun by women. Seeds are the source of food and are valued for their quality to maintain genetic continuity. From time immemorial, it has been a woman's domain to sort seed at home by observation and through experience. In doing so, the methods of seed storage were always practised by women. The search for medicinal seeds and plant material for her family, fruit seeds for kitchen gardens and ornamentals to quench her aesthetic needs have all contributed, indirectly, for preservation of seeds and the biodiversity that we are endowed with.

These activities make women trustees and users of crops, land races, forest genetic diversity, medicinal plants and also a source of information on use of local cultivars and various modes of conservation. Maintaining land fertility and sustaining it by adding domestic refuse and cattle dung to land when needed, use of trap crops as barriers, bench terracing and recycling water from water storage ponds to her kitchen gardens are all recognised activities by women practiced out of necessity. Realizing the importance of stabilizing the coastline planting shelter belts with coconut, areca nut, or grasses for stabilising coastline agriculture has been practiced. The farms are also dependent on the multiple uses of these trees. These are perennial and yield late and women have been involved in growing short duration intercrops to meet their family's nutritional needs.

Caring for livestock comes naturally to women. The most drudgerous jobs in livestock production like cleaning of the cattle sheds, feeding the cattle, collection of fodder etc. always fall on the woman. Care for young animals and backyard livestock is also largely done by women. In caring for sick young animals women have evolved several ethno veterinary practices. Many such practices, based on indigenous technical know-how vested with crop husbandry (especially in complex, diverse, risk-prone areas), animal husbandry, fisheries and home management have been traditionally practiced by women. These practices are usually eco-friendly, sustainable, economically viable and are examples of best utilisation of local resources and waste/bi-product recycling and management. The long association of women with environment can be utilised in the process of solving major environmental problems, by using their traditionally acquired skills and integrating it with scientifically studied and developed techniques. Women have come to be seen as the solution to the development-environment crisis, as major "assets" to be harnessed in initiatives to conserve resources and as "fixers" of ecological problems (Leach, 1992).

Technology Development & Women

The devaluation and marginalisation of indigenous knowledge and skills have disproportionately affected women as they have generally been excluded from the institutions through which modern scientific knowledge is created and transmitted (Agarwal, 1992). There is increasing evidence from agricultural project and program evaluations that insufficient attention to gender issues tends to increase or reinforce gender inequities in ways which hold productivity and welfare below the potential (Carloni, 1983; Dey, 1983; Jones, 1982; Pradhan, 1983). Women have thus far been neglected by and large as human resource in most of the development programmes and strategies.

Despite recent agricultural innovations there is no respite for rural women. While agricultural innovations leads to the reallocation of family labour and the assignment to men of complete control over output and income, without associated changes in the allocation of obligations, welfare and nutritional status of the family may actually decline (IFPRI, 1983). One of the barriers is agricultural extension through which so many innovations and services are channelled. In addition to the pressures which encourage field-level extension staff to work with larger farmers rather than small holders (Leonard, 1977), the fact that most extension staff are male has meant that, for any farm size or income category, extension agents have tended to work with male farmers rather than female farmers (Swanson *et al*, 1985).

A technology development process which is so structured that technical innovations in food cropping simply do not reach a major portion of the farming community makes very little sense. When new varieties were being developed, little thought was paid to the bi-products and their utilisation in rural existence. These products not only have a role within the domestic economy, they are the input to often complex divisions of labour and enterprise providing

income and employment to very many of the rural poor. Collection of household biomass is largely the job of women.

Women also use the bi-products in a variety of ways, both for domestic use as well as income generation. Straw from traditional varieties of rice was used as fodder and for thatching. But, straw from short height, high yielding varieties, developed to prevent lodging, cannot be used for thatching and yield less fodder. Possibly the importance of the contribution of multiple use of biomass to rural economies has been obscured by the concentration on the more favoured, irrigated areas where the high profits from HYVs complement existing, or induce the development of new infrastructures, commercial and industrial networks and livelihood opportunities. Technologies developed in areas like post-harvest operations have never really studied the inter-relationship that exists between production and post-harvest activities at the domestic level. Post-harvest technology was so far being designed from a distance.

Studying domestic processing, storage and cooking technologies can lead to development of appropriate technologies that are genderized as well. Mechanization of agriculture has not been gender sensitive. It has led to large scale dislocation and unemployment among rural women. Harvesters, transplanters and combines usage in field crops is one example. Failure to perceive women-over half the world's population and important to technology development as producers, workers and consumers - as clients of, or as forming an important constituency for agricultural research is one of the major blocks towards overall development (Jiggins, 1986).

Technologies for Empowering Rural Women

Recognizing the fact that women can and must play an important role in the sustenance of our agricultural systems they have to be involved in the process of evolution of new technologies which are eco-sustainable. Their needs and physical limitations have to be taken into account during technology innovations and development. Training, to disseminate these technologies, must be made a regular feature. The training should be vocational (skill oriented), organised for short duration within her social boundary during the lean months of her involvement in agricultural activities. Suitable Audio-Visual aids can be used to take the message across. Teaching aids like samples, models and visuals that are appealing and interesting must be used to improve the comprehension of the illiterate women and their capacity to retain the message disseminated.

Location specific traditional media like folk songs, folk theatre and folklore can be utilised to communicate technical information in an effective way. Ergonomically designed machinery, especially tools and implements, which are genderized can assure rural women employment and add value to her time. Implements like dibblers, hoes, weeders, seed and fertiliser drills, seed treating drums, pedal operated pumps and threshers and serrated sickles have been developed, but are yet to be popularised. Improvements in implements like clod breakers, tillers and transplanters have to be made for easy handling by women. Location specific, remunerative cropping systems that have capacity to enrich the soil, can tap nutrients from different soil layers and which includes legumes and tubers can be developed and suggested for practice. This has the added advantage of breaking pest cycles if properly planned, e.g. paddy-black gram and paddy-groundnut-green gram cropping system. Inter cropping like sorghum-red grams which have been traditionally practiced have been scientifically proven too, to be suitable to dryland areas. Finger millet and horse gram intercropping is also found to hold lot of promise especially in the marginal lands and risk-prone environments.

Women also need to be provided knowledge and skills in multi-storied cropping which can create favourable micro climate for crops and can tap solar energy efficiently. Eg: betel

leaf+moringa, coconut+pepper+banana+pine apple. Integrated farming systems with inclusion of diversified farming components: Crop (food grains / plantation / horticultural crops/cash crops / fodder), Livestock (Dairy/sheep/goat/piggery/poultry), Allied (sericulture/apiculture/mushroom cultivation) can be suitably packaged and taught to rural women. The scarce resources can be optimally utilised without over exploitation of any one resource and it also helps in risk aversion. Pest scout concept for use of IPM technology, for differentiating and diagnosing pest/disease/nutrient deficiency symptoms, and taking up preventive and curative measures including predators, parasites, microbes or botanicals (Neem and Karanj), biofertilizers like microbial manures (Azatobactor, Azospirillum, Rhizobium, Azolla), green manures (Sesbania, Crotalaria, green gram, Pongamia), organic manure (FYM, vermicompost) are eco-friendly and sustainable technologies which offer immense scope for employment of women.

Cultural practices such as contour cultivation to prevent soil erosion, summer ploughing, stale seed bed preparation, clean cultivation for weed control, micro watershed development for rain water harvesting, cyclic flooding and drying in rice for water conservation, seed selection and treatments by using germination tests, salt water and hot water, nutrients application on seed, use of pesticides/ botanicals for prevention of seed borne diseases and enhancement of early vigour have to be taught to women. Hybrid technology, a seed producing activity, involves skilful, finite operations which women have been found to have a natural knack for. The industry recognises this and 70% employees in hybrid seed production are women. However, the wage pattern should be based on skill rather sex which is at present very disproportionate and to the disadvantage of women.

Tissue culture technology offers new scope for conservation and rapid multiplication of cells. This is a highly skillful activity that can be taught to women and thus form an avenue of employment. Women's role as preservers of forest wealth can be further accentuated by technical knowledge on nursery maintenance - nursery grafts of horticulture and perennial crops-,agro-forestry, silvi-pastures etc. which can also generate additional income. These practices can be integrated in the farming system itself so that it can also meet the household biomass needs too. Ethno-botanical techniques are part of habits of tribal groups. Information search on ethics and ethos of these women and on modes adopted to choose plants for conservation is needed, to develop a national database.

Protecting bio-diversity and genetic conservation and women's role in this process has to be strengthened and policies made to modulate these operations. Livestock participatory extension services with an objective to empower women with scientific livestock production technologies like "clean" milking concept, new fodder grasses (amenable for multi-cuts and identified for marginal lands) are ways for sustaining production systems. Recycling of wastes and their use as animal or poultry feeds will help the animal husbandry component. Composite fish-culture can also be taken up as part of the integrated farming systems wherever feasible. But all these sustainable avenues cannot be harnessed till policy makers, decision managers and women involve themselves in the decision making process. Technological empowerment must be reinforced by social empowerment. This calls for gender sensitising field extension personnel at all levels and equipping them with new technological advances, knowledge of ecologically sound farming practices and management skills. Para-agricos, on the lines of para-vets, from rural areas, especially women school dropouts, can be trained in scientifically developed, sustainable technologies, provided with tool kits and inducted at grassroots level as barefoot extension specialists.

Professional-Rural Women Linkages

The number of women professionals in the field of agriculture, veterinary science and allied areas are increasing. This human resource can be effectively utilised to cater to the needs of the rural women. To be effective professionals they have to be involved in the process of decision making and thus aim for key positions of planning and policy making in with the formal organisations. They can help genderize research and development in their disciplines. The Professional-Rural Women linkages can be strengthened through formulation of gender sensitive, location specific, inter-disciplinary research with compulsory involvement of rural women in planning, technology re-assessment and evaluation process through PRA and PTD methods. More number of women have to be inducted into the formal extension system and provided with facilities like secure accommodation and transport, incentives for off campus activities and due recognition.

The professionals and para-agricos have to be given periodic refresher training courses in sustainable technologies to be able to effectively train their rural counterparts. The development and training programmes in IVLP, LLP and KVK should involve more number of women beneficiaries and professional women can play a decisive role in this. Professional women should also handle extension projects targeting rural women. Professional women should document successful and revalidated indigenous technologies developed by rural men and women and help them gain due recognition. Farm Women's Day should be organised by research institutes with active involvement of all development departments, NGOs and women entrepreneurs for better awareness, exposure and creation of interest in farm women about new technologies.

Vocational counselling and guidance service should be provided to rural women by professional women in research and development sectors. Data banks may be set up to disseminate information on technologies available for production, processing, bi-product utilisation etc. along with information on training facilities. Networking of women professionals among themselves and with NGO's and other grass root level social organisations working with rural women should be set into motion and strengthened. Sustenance of our resources and systems of agriculture are intrinsically linked with women and their roles. If we have to preserve our mother earth, the mother of the family also has to be able to carry on her jest for sustenance in a more scientific way.

Some Intervention Points for Gender Sensitivity in Agricultural Sector

1. Development of improved farm and home technologies integrating the livelihood opportunities of women in research: Varieties, cropping sequences, farm management, post-harvest operations, low cost improved implements and tools suited to the needs of farm women standardised interms of energy, cost and time efficiency and comfort in use based on ergonomics of women, incorporating the indigenous knowledge available, (seed treatment drums, seeders, transplanters, inter-cultivators/weeders, pedal operated threshers, miniatured grain mills, dal mills, cleaners, graders, maize shellers, ground decorticators), non-pesticidal pest management, smokeless chullah, Solar driers and other non-conventional energy devices etc.

2. Providing counselling and vocational training for knowledge and skill development in areas where women participation is high such as Dairy, sericulture, bee keeping, mushroom cultivation, poultry, rabbit rearing, livestock management, bio-diversity maintenance, waste land development, pond management (common properties management), nursery management, integrating farming systems, rural crafts, entrepreneurial development and frontier areas such as bio-technology, hybrid seed production, Computer aided water management, renewable energy technologies etc. Women groups can be organized for

production purposes involving various enterprises and providing specialised short-term and long term training for entrepreneurial development in areas like raw material procurement, processing, storage, quality control and marketing of finished products etc. Farm women can also be trained in safe handling and safety precautions for equipment and pesticides as well as educating on occupational health hazards and first aid training, including research and support components in training, providing package of technology, services and public policy which function in a mutually reinforcing manner. Therefore, appropriate technology kits to be designed and distributed.

3. Screening the existing technologies and developing inventory by documenting women specific technologies which are relatively simplified, economical in terms of time and resources, efficient and capable of drudgery reduction and increasing women employment which will also serve the purpose of setting research priorities suitable for women.

4. On-the-spot guidance and service for the women co-operatives (dairying etc.). Recognising and supporting successful NGOs through technical services. Information shops to be set up in areas where women programmes are implemented for continuous upgrading of knowledge and information.

5. Advocating in the policy making bodies for:

a. Tree pattas for farm women with a right to use tree products

b. Legislation that offers social security, health insurance and accident cover maternity benefits, crèche & primary health facilities, subsidies extension to farm women at normal times and at times of natural calamities.

c. Comprehensive legislation covering wastelands, degraded forests in and around villages to be distributed to landless labour families in the name of women only.

d. Constituting separate cells in R&D institutes, SAUs for promoting work on women in agriculture and for gender equity evaluation, monitoring and evaluation.

e. NCW and its multi-disciplinary task force of professional women to advise Government on documentation preparation for a sub-chapter on 'Women in Agriculture' spelling the Govt.'s proposals related to public policies regarding production and post- harvest technologies, training and re-training, techno-infrastructure including support services, trade, land ownership, wages and credit.

f. Subjecting all research proposals to gender audit before approval.

g. Policy interventions to build in access for resources and enterprises, such as milch animals, sheep and poultry; short-term operational ownership for women due to leasing land; and joint ownership for existing land resources.

6. Launching of mass literacy Campaign with the help of State and District level legal aid boards for farm women regarding their rights and awareness creation in the aspects of environmental degradation and consequences. Getting trained or have awareness on existing constitutional provisions for women in providing equality, opportunity and protection to women in agriculture in order to develop realistic plans for farm women development.

7. Energising extension system through sensitising extension personnel in gender related issues, and through development of technical women cadre in extension on priority basis to serve technological needs of women farmers. Multi-disciplinary team approach for all

extension activities with one women member in the team to study impact of technologies on women and on sustainability of natural resources is essential. Further, working along with agricultural labour inspectors for enforcing labour wages for farm women and counselling the farm women labour to get due wages and for awareness creation, working through *mahila mandals* and panchayats for organised extension work. Using progressive farm women as potential resource persons to facilitate extension work, and to interact with research and extension functionaries and following peripatetic training following the family approach at the time, duration and location is preferred by the farm women.

8. Documentation of the indigenous knowledge of farm women both at home and farm and validating, refining and blending with modern technologies for impact. Documenting the occupational health hazards, occurrence of accidents for women in various agro-climatic zones and the reasons for the same. Maintaining feedback from farmwomen on working of various tools /implements /equipment is thus essential.

9. Developing databases for the above publications, professional women available in agriculture field with their specialized areas of work for networking and awareness creation among the organisations dealing with agriculture and women. Creation of databases or Agricultural Census with separate section for women to include qualification in terms of different categories of women in agriculture, different categories of agricultural operations to facilitate desired policy shift by the Government. Database on activities and multiple roles of farm women in farming systems and farm women needs and software at R&D institutes to include latest technologies, indigenous technologies and success stories /experiences etc.

10. Promoting environmentally friendly concepts on sustainable agriculture such as natural/ organic farming which are traditionally practiced by farm women.

11. Promoting publications on gender issues for sensitising at national and international levels and for interactions, and publications for communicating the women specific technologies in local languages.

12. Organising *Mahila gosthis*, Farm women Days, Melas, Exhibitions for sharing information and getting direct feedback and communicating modern technologies and concepts through various traditional media specific to a region which are appealing to farm women by working with the traditional artists for the treatment of the knowledge base.

13. Following Participatory approach in appraisal, technology development and transfer. Emphasising on action research and demonstration oriented technology transfer programmes.

14. In Agricultural Education, by formulating a gender-sensitive curriculum with special emphasis on sustainable agriculture through compulsory 'Rural Work Experience Programme' for the agricultural graduates to identify gender-specific technologies, present level of adoption, their impact to provide feedback to the R&D system.