

Contributions of Women in Agricultural Engineering & Technology

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Advancement of science and technology in different fields has created new vistas for progress and well-being of humankind. Agriculture is one such field that continues to benefit from new knowledge and technological breakthroughs. An important aspect of all these changes that was missing earlier, but has gradually been realized is the scope and opportunities of agricultural knowledge & technologies for women.

Agriculture is a crucial sector for human survival, and women's contribution to it is undeniable. It is an important engine of growth and poverty reduction. India's economic security is heavily dependent on agriculture. In terms of employment, it is the most important source of income, especially for rural women. Women play a significant and crucial role in agricultural development and allied fields including, main crop production, livestock production, horticulture, post-harvesting operations, agro/social forestry, fishing etc. in addition to household activities. However, the nature and extent of their involvement is different in various agro-production systems. The mode of female participation in agricultural production varies with the landowning status of



farm households. Their roles range from managers to landless labourers. In India, about 74 per cent of the entire female workforce is engaged in agricultural operations, but the nature and extent of women's involvement in agricultural operations varies greatly from region to region.

Agriculture--the single largest production endeavour in India, contributing about 18% of GDP, is increasingly becoming a female activity. Agriculture Sector employs 4/5th of all economically active women in the country. 48% of India's self-employed farmers are women. Beyond the conventional market-oriented

narrower definition of 'productive workers', almost all women in rural India today can be considered as 'farmers' in some sense, working as agricultural labour, unpaid workers in the family farm enterprise, or combination of the two. Moreover, several farm activities traditionally carried out by men are also being undertaken by women. Together with male migration into non-farm employment, agricultural modernization appears, thus, to be an important factor behind the rising proportion of women in Indian agriculture. The positive impact of this is that more women are moving into wage employment. Thus, rural India is witnessing a process which could be described as "Feminization of Agriculture".

There are 75 million women engaged in animal husbandry as compared to 1.5 million men. A significant shift in approach towards well-being of women from "Welfare during Fifties", to "Development during Seventies" to "Empowerment during Nineties" and to "Participation during Two Thousand" is a most welcome trend. The National Agriculture Policy has recognised incorporation of gender issues in the agricultural development agenda in

view of women's role as farmers and producers of crop and livestock, as users of technology, as active agents in marketing, processing and storage of food and as agricultural labourers.

Closing "gender gap" in agriculture— or increasing women's contribution to food production and enterprise by providing equal access to resources and opportunities—could reduce the number of hungry people in the world by 12-17%, or by 100 to 150 million people (FAO, 2011). Women's leadership in agriculture can help address gender inequality, promote sustainable agriculture practices, and increase productivity and income.

With the modernisation of agriculture - introduction of high yielding variety seeds, mechanisation of farm operations, use of chemical fertilizers, insecticides, pesticides, weedicides, herbicides, hormone - accelerators etc. the traditional role and status of women has changed. There is immense drudgery in sowing, transplantation, irrigation, fertilizer application, weeding, plant protection and harvesting. Even in post harvest work, women carry out the operations manually in an arduous manner when technologies are now available for threshing, winnowing, and milling as also for shelling of maize and groundnuts. There are hand/pedal-operated cleaners, solar dryers, metallic storage structures; power operated mills, etc. which can reduce the drudgery in these operations. Introduction of modern marketing systems has also affected women's contribution in terms of post-harvest operations, home made consumer goods and decision making in agriculture.

Now, women have managerial and organisational skills so that they themselves can utilise new technologies such as those relating to biofertilizers, seed production, pest surveillance, bio-



mass utilisation, crop livestock and fish integrated production systems. Targeting women for training in technology would also benefit the entire family in terms of better health, nutrition and an improved home environment.

As horticultural crops are gaining importance owing to their commercial, nutritional and export potential, the role of women is likely to be more substantial. Women play an active role in the production of quality planting materials of horticultural and ornamental plants for entrepreneurship and employment generation which will be a small step towards prosperity of farming community. The contribution of women is invaluable in the development of horticulture and dairy farming, poultry farming, bakery, forest industry, fisheries, kitchen garden etc.

In the present scenario of perpetual demand of vegetables and shrinking land holding drastically, protected cultivation is the best alternative and drudgery-less approach for using land and other resources more efficiently. In protective environment (green house glasshouse or poly house), the natural environment is modified to suitable conditions for optimum plant growth which ultimately provides quality vegetables. Nursery for ornamentals, flowers, vegetables, fruits and plantation crops can be successfully

developed inside greenhouse. Women can grow the high- priced vegetables such as asparagus, leek, tomato, cucumber and capsicum round the year especially during winter season for sound profit.

Post-harvest management, processing, storage and utilization of vegetables and vegetable products are generally the domain of women at home scale. Cultivation of horticultural crops plays a vital role in prosperity and it's directly linked with health of people. These crops are not only used for domestic consumption but also processed into various products like pickles, preserves, beverages, jam, jelly squash, etc., which offers employment opportunities to the rural women. The focus on the value addition in the horticulture sector is vital for comprehensive development of the rural economy. Processed horticultural products have also good export potential in our country. Vegetables and fruit processing and preservation play a great role to provide employment and industrial base for export of dehydrated and preserved products. Mostly dehydrated vegetables are being exported. The other products that are being exported or consumed within our country are juice, ketchup, pickles and canned vegetables and fruits. Tapioca is used for manufacture of industrial products like sago, stars noodles and quick food products. Entrepreneurs and growers



from Tamil Nadu, Karnataka, Kerala, Andhra Pradesh and Maharashtra have recently taken up large scale mushroom cultivation. Various women's help groups in north east region are growing paddy straw mushroom in backyard.

Eco-friendly management practices such as integrated pest management practices, cropping/farming systems, conservation technologies etc. are now frequently used by farm women. Horticulture and floriculture technologies like improved, dwarf, high yielding varieties/hybrids, nursery technologies, protected cultivation, meadow orcharding, inter-cropping and management practices, INM & IPM, use of biotechnology, micro-irrigation etc are also popular and widely used.

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 are also handled

by 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.

Tissue culture technology offers new scope for conservation and rapid multiplication of cells. This is a highly skillful activity that are also learned and applied by women. 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. Ethnobotanical 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 also recognized. 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 feed supplied for the animal husbandry component. The number of women professionals in the field of agriculture, veterinary science and allied areas are increasing.

There are many 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.

The world community today sincerely recognized the role of women in agriculture and the constraints that they face in earning a decent and sustainable livelihood. There are many constraints and challenges to address the gender issues, and create opportunities for women in agriculture in the face of rapidly changing agricultural scenario. It is well evident that educated, informed and empowered women can contribute to sustainable and inclusive development.

