

Research and innovation

The Global Forum on Agricultural Research (GFAR) brings together all those working to strengthen and transform agricultural research for development around the world. As part of this role, GFAR is working with New Agriculturist to showcase and raise awareness of important initiatives and their outcomes, to update and inspire others.



Gender equity in agricultural research

Men and women often grow different crops, use different methods of cultivation, and make different use of the produce they grow. Therefore, men and women also have different concerns regarding improving crop yield or increasing its resistance to disease. From work to include women at the forefront of agricultural research and development, to women taking the lead in developing potato enterprises in Peru and fish farming in Bangladesh, GFAR draws attention to a number of examples of how organisations are helping to transform and strengthen agricultural innovation to more directly benefit women and enable effective access to knowledge, credit, inputs and other resources.

Small fish bring big benefits in Bangladesh

In Bangladeshi communities, women are often restricted to the home, but by involving men and women in the research and development process, a project to reduce malnutrition has laid the foundation for social change and the empowerment of women.

Women take the lead in agricultural innovation in Peru

To engage women in the commercialisation of native potato varieties in Peru, Papa Andina has been working to foster innovation, knowledge sharing and capacity development for men and women, and implement specific actions in response to gender challenges in the value chain.

Nourishing the world requires women at the forefront of agricultural research and development

If agriculture is to successfully address the problem of malnutrition, greater involvement of women in the research process is required. At AVRDC - The World Vegetable Center, women are being brought to the forefront of its research and development efforts.

Nourishing the world requires women at the forefront of agricultural research and development

Achieving genuine food security is no longer a matter of making enough food available, but about making enough of the right kind of wholesome food available. Although hunger persists among 870 million people, the diets of 2 billion people are deficient in minerals and vitamins. The emphasis has thus changed from considering hunger alone to regarding malnutrition as the key constraint to widespread human health.

Balanced diets for humans require a diversity of food products. Fruits, vegetables and pulses are key dietary components and the richest source of micronutrients and plant proteins. It is largely women who grow these crops and decide what to feed their families. This has profound implications for research: greater involvement of women in the research process is required if agriculture is to successfully address the problem of malnutrition. Eliminating malnutrition has been AVRDC - The World Vegetable Center's ongoing mission, and recent shifts in global thinking have brought women to the forefront of its research and development efforts.



Greater involvement of women in the research process is required
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Who decides what we eat?

While staple carbohydrate-rich crops are usually eaten daily, the consumption of fruits and vegetables is certainly not as routine - the choice to include them in a meal is almost entirely up to women. Presently, consumption of fruit, vegetables and pulses in most countries fails to meet the target of 400 g/person/day established by the World Health Organization. Changing the food preferences of households, particularly of young members, must become a priority if good health is to be attained and maintained.



Many producers and market traders in vegetables are women
©AVRDC - The World Vegetable Center

Thus, new challenging research questions emerge in which gender must take centre stage. For example, how to influence households to adopt balanced diets that include fruits and vegetables? Home and school gardens are now a vital tool as part of AVRDC's work to influence the preferences of consumers, chiefly women in the case of home gardens, to ensure healthy families and to teach children how to make informed eating choices. Recent evidence from projects in India and Bangladesh shows that where vegetable consumption is low, home gardens can be very effective in increasing it. A new AVRDC project, funded by the Swiss Agency for Development and Cooperation, is setting up school vegetable gardens in six countries in Africa and Asia to establish healthy food preferences among school children at a young age.

AVRDC has actively taken up the development of new food recipes that match cultural food preferences and employ preparation methods that better preserve the nutritional value of food. For example, in cooking mung bean to make *dhal* in south Asian cuisines, the use of a little oil, tomato and cabbage can triple the amount of essential bioavailable iron to children.

Womendominate vegetable growing, but not the value chain

Women are the chief producers of small-scale fruit and vegetables in many countries. In contrast, large-scale production tends to be mechanised and is usually dominated by men. Gender equality in access to and control over resources is therefore required if women are to benefit from horticultural development, especially since parts of the vegetable value chain such as transport, wholesale markets, storage, agrochemical and seed suppliers, and extension services are still mostly the purview of men. For example, in Tanzania many producers and market traders in vegetables, such as the very popular AVRDC-bred African eggplant 'DB-3', are women - and yet private-sector improved seed supply, input provision, product bulking, transport, and ensuring sustained supply to supermarkets throughout East Africa are issues in which men predominate, and typically accrue a greater share of the product value than might be seen as equitable by the original producers. AVRDC therefore generally aims to include at least 50 per cent women in all their training programmes.

Nourishingthe world

AVRDC is now well-equipped with capacity among its staff to apply gender tools in its research and development work. Thirty AVRDC scientists attended a week-long training in 2013 to mainstream gender into the Center's agenda. As a result, mainstreaming gender into any new technological interventions along the vegetable value chain is now mandatory to enable AVRDC to encourage beneficial social change for women so that they gain better access and control over the resources involved in the full vegetable value chain, from the field to the kitchen, and can make good food choices for the whole family.



It is largely women who grow fruits, vegetables and pulses
©AVRDC - The World Vegetable Center

Links

- AVRDC (<http://avrdc.org/>)
- High-iron Mungbean Recipes for South Asia (http://avrdc.org/?wpfb_dl=267)
- Vegetable Nutrient Database (<http://avrdcnutrition.gtdtestsite.comoj.com/nutrition/>)

Written by P. Schreinemachers, I. Nagaraj, J. d'A. Hughes and J.D.H. Keatinge, AVRDC

Small fish bring big benefits in Bangladesh



Mola contains high levels of vitamin A, calcium, iron, zinc, and phosphorus
©Holly Holmes/WorldFish

Most rural Bangladeshi households depend on farming and fishing for food and income. But faced with the challenges of low productivity, and limited access to resources and training, farmers and fishers struggle to produce enough food to nourish and support their families. As a result, rates of poverty and food insecurity remain high, with women and young children particularly at risk from malnutrition.

It is estimated that 41 per cent of Bangladeshi children under the age of five are moderately stunted, and more than one third are underweight. Malnutrition early in life has irreversible effects on a child's brain development and cognition. Women who lack adequate nutrition have little energy to meet their heavy workloads, and when pregnant or lactating cannot sustain their infants with enough nutrients for

healthy growth and development.

Nutrition and new technologies

To help combat these issues, a Small Fish and Nutrition project* has worked to increase the quantity of the small micronutrient-rich fish, mola, in household ponds and natural water bodies, and diets of rural Bangladeshi households in Rangpur, Dinajpur and Sunamganj districts. Mola (*Amblypharyngodon mola*) is an indigenous fish species, which contains high levels of vitamin A, calcium, iron, zinc, and phosphorus, and is also an important source of animal protein. Culturing mola and carps in ponds connected to rice fields can yield up to 7.4 tonnes of fish per hectare, and up to three tonnes per hectare in stand-alone ponds, providing an opportunity to further boost household income.

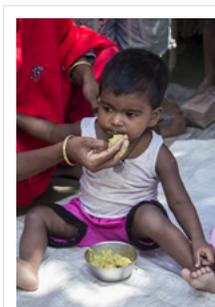
At the start of the project, mola had a relatively high mortality rate when transported from its natural habitat to household ponds, which was overcome through the development of simple technologies and good practices. For example, in capturing mola brood stock from natural water bodies and to prevent overfishing, nets with a large mesh size are used to catch only large mola. Once caught, farmers are encouraged to keep them in a *hapa* (inverted mosquito net tied to four bamboo poles), and to aerate the water by splashing, before being transported in plastic bags or earthen containers in the cooler early morning.

Methods for feeding and harvesting the fish have also been fine-tuned to achieve optimum growth rates and production for the benefit of rural families. For example, mola feeds on natural food organisms, so the project recommended that cow dung, urea and triple superphosphate are added to the bottom of the pond during pond preparation to stimulate growth of natural organisms. Mola spawn two to three times a year so partial harvesting of adult fish must occur frequently to prevent food scarcity in the pond.

Cooking demonstrations have also been provided to highlight the ways to prepare mola, and how to use it as a complementary food in the diets of infants and young children. Traditionally, when women clean mola for cooking, some discard the head - the part richest in vitamin A. But by cooking the whole fish, grinding it into a paste, and mixing with rice and vegetables, women are able to make an affordable one-pot meal (*khichuri*), which is child-friendly and high in micronutrients.

Empowerment

In Bangladeshi communities, women are often restricted to the home and are excluded from decision-making. However, by taking a 'household' approach to the research and development process and working with both men and women, the project laid the foundation for social change and the empowerment of women. Throughout Bangladesh, there are more than 4 million household ponds enabling women to tend to the fish alongside their duties in the home, and have easy access to fish for home consumption. However, further work needs to be done to develop a technique to allow women to easily harvest mola from the pond in small amounts.



Mola can be used as a complementary food in the diets of young children
©Holly Holmes/WorldFish

Throughout the project, local women have monitored the progress of fish production, which has provided them with knowledge and training in both data collection and aquaculture, and increased their role in managing the homestead. Many women reported that their role as researchers gave them greater physical mobility, status, and respect in the community. "After we started the project, we learnt many things, spoke with many other people and are now going out from our houses," explains Jeheda Begum. In some cases, husbands and wives are now making joint decisions at home and sharing the workload in maintaining the pond. These changes signify shifts in the social norms of the community - one of the hardest changes to achieve.

Scaling up

Through its research, training sessions, and instruction manuals, the Small Fish and Nutrition project has directly benefited 2,000 families and increased fish production 3.5 fold in household ponds. Government extension officers and NGOs have also integrated the promotion of micronutrient-rich small fish into their package of interventions being implemented in other regions of rural Bangladesh, as well as Cambodia and Nepal. In addition, the World Bank is supporting advocacy and awareness of the importance of these technologies for improved nutrition in Bangladesh.

* Funded by the International Fund for Agricultural Development (IFAD)

Written by Holly Holmes and Shakuntala Haraksingh Thilsted, WorldFish



Women have monitored the progress of fish production
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Women take the lead in agricultural innovation in Peru



Native potatoes are crucial for food security
©Guillermo Yupanqui

"Adding value to *papitas* (potatoes) gave me the opportunity to become a 'farmer'," Nelly Escurra, a *campesina* (peasant woman) from Peru proudly explains. "I am not the 'male community member's wife' anymore. I am a female producer that sells native potatoes to the world." Nelly was one of thousands of beneficiaries of the Papa Andina Regional Initiative in the central Andes of Peru, which promotes the development of niche markets for potatoes and their products and assists smallholder producers to respond to these emerging markets.

Making the most of potatoes

In the Andes, native potatoes are crucial for food security, both as a direct food source and as a cash crop. Native potatoes are primarily produced by smallholders who live in resource-poor communities and farm under customary laws and norms. Traditionally, women take the lead in selecting, conserving and managing seed potatoes due to their knowledge of the different varieties and their culinary, productive and commercial qualities. Even though the women take the lead in production, for men the top priority is the commercialisation of native potatoes.

For smallholder producers in general, the shift to commercialisation of native potatoes is a challenge due to a lack of key inputs such as transport, illiteracy and limited exposure to market mechanisms. Women often face additional hurdles, including access to and control over natural resources. So to engage women in the commercialisation of native potato varieties and ensure that men and women work together as equal partners, Papa Andina has been working with COGEPAN (the Management Consortium of Native Potatoes) and a local NGO (FOVIDA), with support from the International Potato Center (CIP), to foster innovation, knowledge sharing and capacity development for men and women, and implement specific actions that responded to gender challenges in the value chain.

To build trust and collaboration between actors in the native potato value chain, improve the linkages of farmers with markets, and stimulate pro-poor innovation, the project functions as an 'innovator broker'. Through this process, women become active and visible community members, gaining the opportunity to represent their families in a formal setting for the first time. Farmers have also been engaged in on-farm research and learning opportunities. Even in some of the most remote areas, producers worked with interdisciplinary teams* to document innovations and their achievements, through video and photography.



Producers documented innovations and their achievements
©Guillermo Yupanqui

Breakingdown barriers

Cultural norms and exclusionary practices that prevent women from participating in community-level activities were challenged through the use of a farm family competition which encouraged families or entire communities to compete for the best results in agricultural production, soil conservation, processing and marketing. The competition required that women and young people become leaders or spokespersons about their knowledge on how to grow native potatoes.

One of the most important achievements of the project has been that some husbands are learning to give women an equal role in the household. "I support my wife in all activities in the field," explains Nilo Quispe. "She is one of the leaders at COGEPAN. She has to attend meetings and training and somebody needs to take care of the fields and the children. We share the work."

Through COGEPAN, women have also been able to access and control land, some for the first time, in order to cultivate different native varieties for international markets, for domestic industries, and for seed tubers. The women paid particular attention to the varieties they chose for international markets so that their produce fulfils certification, quality and sanitation requirements.

Accessing markets

Multi-stakeholder platforms have also been implemented to enable producers, market agents, service providers and professionals from research and development organisations to identify mutual interests, build trust and work together. After each interaction, male and female farmer representatives return to their communities to

share their findings and innovative ideas. As a representative, Nelly is able to share information with seven communities in the Huancavelica Province. Adding value to native potatoes by turning them into flakes or chips is one idea that she has encouraged. FOVIDA, for example, has supported the development of 'gourmet' native potato products, including naturally red and purple coloured chips.



Women have also been able to access and control land
©Guillermo Yupanqui

Innovation fairs have also been created to showcase women's knowledge of native potato varieties and processing techniques for potato chips, flour, shampoo, coffee and potato starch (*almidon de papa*). This also allows women to interchange or buy tubers from other groups. These events have given women confidence to integrate themselves into new and extended networks, share their knowledge, and build their communication, negotiation and facilitation skills.

Papa Andina has also enabled farmers like Nelly to exchange knowledge and explore innovations with farmers from Bolivia, Ecuador and Uganda. "I can share information and seeds from native potatoes with different people from different regions," Nelly reveals. "Visitors from Peru and other countries come to visit my fields and they want to know how I cultivate the potatoes. I have more than 300 hundred varieties. I know all of them and how I can use them. I feel proud of myself because I know many things that people could learn. Now, I see myself as a contributor and entrepreneur."

* The teams were made up of researchers, practitioners and development specialists, including sociologists, economists, market specialists, nutritionists and communication specialists from FOVIDA, researchers and scientists from CIP, representatives from the local and national gastronomy sector, and researchers and specialists in participatory video from the University of Guelph in Canada.

Links

- Papa Andina

(<http://iniciativapapandina.wordpress.com/2012/01/24/innovacion-para-el-desarrollo-la-experiencia-papa-andina-nuevo-libro>)

- Gender Analysis for the Assessment of Innovation Processes: The Case of Papa Andina in Peru

(<http://siteresources.worldbank.org/INTARD/Resources/335807-1330620492317/8478371-1330712196245/Module7-IAP3.ppt>)

- Andean women's worldviews (<http://www.youtube.com/watch?v=upbXPJQ8gt8>)

Written by Silvia Sarapura, WorldFish