

Agriculture, Nutrition, and Gender Linkages (ANGeL) strengthened the Agriculture-Nutrition-Gender nexus

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Abstract

The Agriculture, Nutrition, and Gender Linkages (ANGeL) Project is the first ministry-led initiative in Bangladesh to use evidence for designing a national program aimed at strengthening the agriculture-nutrition-gender nexus. The overall objective of the pilot project is to identify actions and investments in agriculture that can leverage agricultural development for improved nutrition, and make recommendations on how to invigorate pathways to women's empowerment; particularly within agriculture. The pilot project is implemented from July 2015 to June 2018 through delivering training to husband and wife from each project's household using extension agents and ANGeL Pusti Karmi (APK). Training discussed a variety of topics, from feeding practices to the importance of micronutrients, growing nutritive value crops, gender relations, power dynamics, and joint decision making, gender-based violence and early marriage. The impact evaluation for the ANGeL project involves a baseline survey just before the start of project interventions, and an end line survey immediately after the second year of project activities are completed. There were **positive and significant impacts found in several interventions and the greatest improvement in Agricultural production, Family health & nutrition and Empowerment emerged when trainings on agriculture, nutrition, and gender sensitization were combined**. Findings of the research will be used by Ministry of Agriculture all over Bangladesh.

Introduction

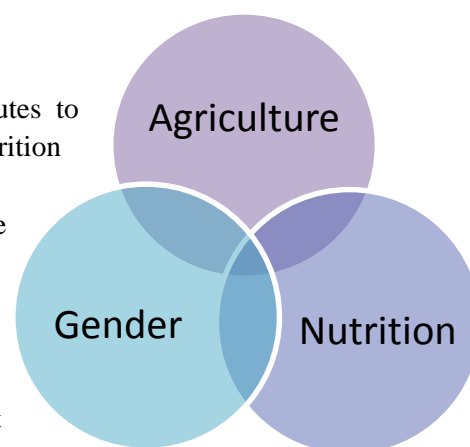
Agriculture provides a source of food and nutrients, contributes to income, and affects food prices. Exploring agriculture and nutrition linkages in Bangladesh using data

from a multi-round district level panel, a study finds that rice yields are associated with earlier introduction of complementary foods to young children, as well as increases in their weight-for-height (Heady and Hoddinott 2016). Agriculture can also have effects on women's health, nutrition, empowerment and time allocation, which can have important consequences for their ability to care for family members. Given these links, agriculture has the potential

to be a strong driver of nutrition. However, that potential is not being fully realized in Bangladesh because, traditionally, nutrition and agricultural policies have been uncoordinated. According to IFPRI research (2011-12) it is found that "Women's empowerment plays a key role in improving household food security and dietary diversity of children, women, and other household members". The study also shows that agricultural production diversity is associated with dietary diversity. Further, IFPRI research in Bangladesh shows that nutrition behavior change communication (BCC) training imparted to women and men in rural households leads to significant improvements in child nutrition and complementary feeding practices (Ahmed et al. 2016; Menon et al. 2016).

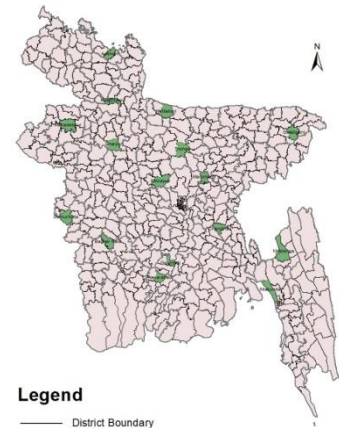
Motivated by this research-based evidence, this project (2015-18) is officially launched in October 2015 and implemented by Agricultural Policy Support Unit (APSU) of the Ministry of Agriculture with the support of U.S. Agency for International Development (USAID) through IFPRI, Bangladesh. ANGeL aims to identify actions and investments in agriculture that will help to improve nutrition and empower women. The specific objectives of the pilot project are to measure the effect of the project's interventions on:

1. Farm household income
2. Agricultural production diversity



3. Dietary diversity of pre-school children, child-bearing-age women, all household members
4. Infant and young child feeding practices
5. Intakes of calorie, protein, iron, zinc, and vitamin A
6. Nutritional status of pre-school children and child-bearing-age women
7. Women's empowerment and gender parity between adult male and female

To make ANGeL's findings are nationally representative, ANGeL covers a total of 16 upazilas under 16 districts across rural Bangladesh with 3 types of interventions in 5 treatment arms and a control involving **3,125 farm households**.



- T1: Nutrition BCC -1
- T2: Nutrition BCC-2
- T3: Agricultural Production
- T4: Agricultural Production+ Nutrition BCC
- T5: Agricultural Production+ Nutrition BCC + gender
- C: Control

Good practices

1. Capacity development & addressing nutrition through Household Approach

The ANGeL Project was focused on figuring out the most effective combination of trainings for promoting nutrition- and gender-sensitive agriculture. ANGeL took a **Family Approach** by bringing husbands and wives together for trainings.

In order to build farmer's skills and knowledge on production of the high-value food commodities that are rich in essential nutrients, extension agents are delivering agriculture production training for the farmers for 3 rounds under T3, T4 and T5 arms. The training covers importance of homestead gardening, planning for year-round production, bed and pit preparation, soil health management, water management, mulching, spacing and inter-cropping, pest control management, importance of high-value nutritious crops, quality inputs, post-harvest management, marketing, poultry, goat and cow rearing, and fish farming.

ANGeL's nutrition behavior change communication, or nutrition BCC, training focused on a variety of topics for nutritional development. The project facilitated high-quality behavior change communication (BCC) training for the trainers to improve agriculture and nutrition knowledge of women and men. These BCC trainings are delivered by government agriculture extension agents and local community nutrition workers; APK hired by the project.



Nutrition BCC covers malnutrition, food and nutrition, micronutrient deficiencies, breastfeeding, complementary and supplementary feeding, women's nutritional care and services, hand washing, safe food, and SMART cooking. This training aims to enhance intake of adequate and diversified diets of pre-school children, child-bearing-age women, and all household members, as well as improve infant and young child feeding practices, intakes of calories, protein, iron, zinc, and vitamin A.

ANGeL project focuses gender sensitization activities for T5 arm that may lead to the improvement in the status of women and gender parity between women and men. For gender sensitization, ANGeL worked with Helen Keller International, through its “**Nurturing Connections**” approach. The approach is highly interactive and participatory. There are groups for wives, husbands, mothers-in-law, and combined, where gender relations, power dynamics, and joint decision-making are discussed. Within this, there are also discussions on gender-based violence and early marriage.

2. Dissemination Process:

The AnGeL project considered **Family Approach** for motivation and dissemination. During trainings, husbands and wives attend trainings together. Selected farm households join the group trainings at 3-4 week intervals, and discuss use of agricultural technologies, knowledge, and skills to improve production practices. Trainers also identify role model farmers from the groups and encourage other farmers to replicate these effective behaviors.

ANGeL participants shared knowledge gained from the program beyond the household. Encouragingly, almost all participating women and men (90 percent and 96 percent, respectively) shared knowledge they gained from trainings to relatives, neighbors, or other community members. These are positive findings, possibly suggesting that program benefits such as improved agriculture and nutrition knowledge may spill over to non-participating households, too. Thus, a farmer-to-farmer learning approach is adopted.

Case study1: Farzana is Advocating for healthier moms and babies

Farzana is 29 and she lives in Gaurnadi Upazila. Before ANGeL, Farzana’s husband said that he felt entitled to spending the money because he earned it. Now, by attending trainings together, he understands that the decision on *how* to spend that money involves both him and his wife. Since joining ANGeL, Farzana and her husband have learned practical lessons on nutrition. Together, they received practical instruction on how to breastfeed as well as how much and what kind of food to provide for complementary feeding – after 6 months. They also learned smart cooking techniques, like how to test the iodine content in salt to prevent goiters. Since ANGeL, Farzana’s family uses a ‘tipi tap’ for handwashing, which has improved family hygiene.

Midway through trainings, Farzana gave birth to Ismail, who was 5 kg. at birth! When asked how she thought this happened, Farzana said it was because her “husband learned the rules of pregnancy.” For example, he learned that pregnant women have greater dietary needs, so he encouraged Farzana to eat a handful more food than usual and rest more. Since ANGeL, neighbors and relatives come to Farzana for advice.



I learned this knowledge from training. If you want to know anything, ask me. You don’t need money to learn, sister; that’s how I convince my neighbors and relatives. –Farzana

3. Linking farmers to market

ANGeL trainers assisted farmers with the information on market linkages for producers and buyers to ease the sale of the farmers’ produces. Trainers facilitated linking ANGeL farmers’ and seed vendors and agri-input dealers (e.g. fertilizer, insecticides, market cooperatives, wholesalers, retailers, animal feed and animal’s medicine seller) by providing contact information to the farmers. ANGeL trainers played a catalytic role in enhancing farmers’ production, access to quality inputs, and to expand and strengthening

technical knowhow. ANGeL training not only helped farmers to improving the quality of the produce, but also introduced them to invaluable sources of market information to help farmers receive the best market prices for their produce.

4. Address Climate change adaptation

Through ANGeL training, farmers were introduced resistance varieties (drought, salinity intrusion) ; like-ladies finger, brinjal, orange flesh sweet potato, sweet gourd, pulse type crop created BARI and BINA (e.g. BARI orange pulse-6, 7, 8, Chelon-1,2 etc.) The ANGeL project promotes sorjon technique and floating agriculture technique, vegetable gardening using sac, clay basket, plastic basket. ANGeL farmers also made aware on preparation technique and importance of organic compost and pesticides to better suit for climate change.

5. Application of ICTs

The ANGeL project disbursed training allowances using Dutch Bangla Bank Limited (DBBL), with technical support from the USAID-funded Mobile Solutions Technical Assistance and Research Activity (mSTAR) to 3,125 ANGeL beneficiary households across 16 districts in 16 upazilas. Bangladesh.

6. Collaborative Approach to Project Implementation

The APSU and the DAE jointly implement the ANGeL Project. Other agencies of the MoA- BARI, BRRI, BIRTAN and BADC provide support as needed to implement the project. IFPRI researchers in Bangladesh work closely with the officials of the APSU for building long-term analytical capacity within the Ministry. HKI developed the training manuals for diversified agricultural production in consultation with scientists from BARI and BRRI, and training manuals for nutrition BCC in consultation with BIRTAN scientists and IFPRI. HKI provides the necessary training of the trainers (SAAOs and APKs) on modern practices for producing high-nutritive value food commodities, nutrition BCC, and gender sensitization. Mobile Solutions Technical Assistance and Research Activity (mSTAR), a USAID contractor, provides technical assistance in rolling out mobile money in development projects.

Benefit and Impact

The ANGeL pilot project aimed to stimulate agricultural productivity by providing practical, hands-on agricultural production trainings through officials of the Department of Agricultural Extension (DAE). Encouragingly, all interventions that included agriculture trainings were successful in boosting knowledge of production techniques relevant for high-value vegetable and fruit production. Although both men and women benefitted from these trainings, women's gains in knowledge were far more substantial.

Men and women both benefited from agricultural trainings, yet women learned more from the same trainings. Crop diversity increased substantially in homestead gardens, mainly due to ANGeL's emphasis on homestead food production from nutritious crops. Farmers also adopted improved production practices. We consistently found that women were more likely to apply knowledge gained from agricultural production trainings to adopt various types of improved agriculture production practices, such as pest disease and control, seed production and care, and use of quality fertilizer.

Through practical instruction, ANGeL's nutrition BCC trainings aimed to provide essential nutrition knowledge and instill self-confidence in farm households, leading husbands and wives to make informed, healthy decisions for themselves and their families. These improvements in knowledge had impacts on nutrition outcomes, with increases in household diet quality and child dietary diversity over the project period. Dietary diversity increased for all children from baseline to endline. Various beneficiaries stated

that ANGeL trainings have made them more cognizant of nutritious foods that should be included in daily meals. Similarly, improvements in nutrition knowledge were far greater for women and when trainings were combined.

The strongest improvements in empowerment came when agriculture, nutrition, and gender sensitization trainings were combined. ANGeL's household approach empowered women and men in unique ways: while women became more empowered in asset ownership and income decisions, men became more empowered in production and income decisions in select interventions. Attitudes related to gender of both women and men also improved, with more women recognizing that they make important contributions to their communities.

Increased Knowledge on Agricultural Production:

According to End line survey of IFPRI (2018), 75% of the total participants found knowledgeable on agricultural production practices such as preparation of pits and beds for vegetable production, Size of composite pits and seed beds, Testing and identifying quality seeds and fertilizers, organic methods of controlling pests, Use of bio pesticides, Awareness of pheromone trap for insects, seed storage and Preserving seed quality etc. It increases in uses of improved production practices as well as diversified crop production on the home garden plots of the Households.



BAEN Team visited ANGeL activities at Golapgaj, Sylhet

Case study2: Shaida Khatun is Engaging in safe vegetable production

Shaida Khatun is 27 years old beneficiary. After getting the ANGeL training she stated integrated home farming. She is growing safe vegetable using organic fertilizer as well as applying organic pesticide to protect her crops from insects.

She is now preparing compost by herself, as she has cattle and poultry, she can manage cow dung and others' waste material to prepare compost. She is now cultivating different types of seasonal vegetables. Her family used to consume the produce and also sell them to the neighbors. She also has better idea about collection center marketing system.



When my crops were attacked by insects, I was helpless. Now, I know about organic pesticide like cow's urine and Gul [tobacco leaf powder] and I apply them in my garden. I can harvest more vegetables—Shahida

Increased Knowledge on Food, Nutrition and More diverse diets:

There were significant improvements in the number of crops grown in home gardens over the project period. ANGeL's focus on homestead food production is instructive for promoting women's inclusion and agency in agriculture, particularly in producing non-rice crops, which are more nutrient-dense and profitable compared to rice. It increases dietary diversity in households. Similar to agriculture, improvements in nutrition knowledge and impacts show a positive story. Household diet quality improved over the project period.

Community spillover effects:

Since starting trainings, beneficiaries reported that neighbors are seeking their advice on nutrition and agricultural production, which has boosted confidence. Additionally, neighbors have told beneficiaries that they can see notable improvements in the beneficiary child's health since joining ANGeL trainings. Beneficiaries reported that validation from community members has boosted their self-confidence.

Increase in male's nutrition-driven market decisions:

From attending nutrition trainings, it was reported that male household heads (usually husbands) consult their wives more often about what food to buy at the market.

Increase in savings and profits:

Many interviewed beneficiaries stated that consuming more nutritious diets has improved health, particularly for children, and thereby savings on medical expenses. Additionally, interviewed beneficiaries—particularly those in agricultural production trainings—shared that cultivating new crops, or engaging in livestock or poultry rearing, has increased household incomes.



Anwara & Khaleq Transformed land for production and consumption of high-value foods

Case study3: Shafina and Mehedi are Making farm profits through informed technology

Shafina and Mehedi learned many things from the training about vegetable production technique, they have learnt about preparing organic fertilizer, cow and goat rearing, poultry rearing.

After ANGeL training, they are rearing high yield variety cows that give more milk. And now a day it is giving 6 liter milk per day. Both the husband and wife together take care the cow, they keep clean the cow shed, mostly the work done by the wife but the husband also cut grass for the cows. They used to buy some *bhushi*, *khoil* for the cow from bazar. They used to sell the milk for 35-40 taka per liter. And they can spend the money for their HH purpose.



We learned from ANGeL trainings the importance of taking care of livestock and vaccinating our cows, as learned—Mehedi and Safina

Women's entrepreneurship:

By bringing husbands and wives together to the same trainings, nutrition and agricultural production no longer “belong” to men or women. Various female beneficiaries stated they felt more confident engaging in new activities, such as horticulture, joining a local cooperative, or extending a chicken shed. These actions led to increased profits. These areas affect the gender dynamics in the household. ANGeL has tapped into women's **entrepreneurial potential**, such as Ayesha and her summer tomatoes.

Increased Women empowerment:

Among ANGeL households, 31% of women are empowered at baseline. In other words, 69% of women are disempowered. ANGeL’s baseline results show that gender inequality remains significant at the household-level. Nonetheless, ANGeL’s impact evaluation framework can be instructive for helping to understand the specific pathways to improve women’s empowerment and gender parity between men and women, and how to add value to women’s contributions in Bangladesh’s largest sector—agriculture. According to End line survey (2018), women empowerment (using the A-WEAI) is found higher than it was at baseline.



Ayesha engaged for Boosting productivity & incomes

Increased in joint decision-making:

After ANGeL trainings, the key households (husbands and mothers-in-law) included wives for the opinion of family matter. Now, wives are more involving in decision-making processes. Increased Husband and wife accountability *by* helping each other learn and practice the knowledge. Significant “improvements” is found in women’s and men’s total gender attitude scores, particularly from T5.

Case study4: Saraswati has a stronger voice in family decisions

This case study shows a family from T5, which brings agriculture, nutrition, and gender trainings together. For the gender sensitization trainings, mothers-in-laws who are key household decisionmakers in Bangladesh –also attended, along with their sons and daughters-in-law.

The husband, Haripad, mentioned that he would typically not consult his wife on what to buy at the market, but after participating in nutrition trainings, he appreciated the link between what he buys and what his wife Saraswati cooks.

Before, my daughter-in-law did not make decisions because she felt shy. My son and I made the decisions. Now, we all make household decisions together –Durga (mother-in-law)



Experiences and lesson learned

Using rigorous research, namely, a randomized controlled trial design, IFPRI (2018) assessed impacts of the ANGeL project interventions on various outcomes. Over the 17-month implementation period, with no inputs provided to participating farm households besides knowledge from trainings, ANGeL generated useful lessons on strengthening the agriculture-nutrition-gender nexus in the country.

This improved agriculture knowledge contributed to the adoption of improved agriculture production practices. While both men and women’s adoption of improved agricultural production practices increased, women’s adoption rates were greater than men’s, indicating that women were more likely to act on the knowledge they gained from ANGeL trainings. The highly interactive sessions on *Nurturing Connections* explored gender relations, power dynamics, communication, and empowerment through games and role

plays, and the training sessions brought together husbands, wives, and mothers-in-law, who are typically key household decision makers in Bangladesh.

ANGeL’s results on empowerment are promising for women and men, showing that women and men both enjoyed gains in empowerment in unique ways. Specifically, ANGeL improved women’s asset ownership and decision-making over income, and improved men’s agricultural decision-making and decision-making over income. Although there were **positive and significant impacts in several interventions, the greatest improvement in empowerment emerged when trainings on agriculture, nutrition, and gender sensitization were combined.**

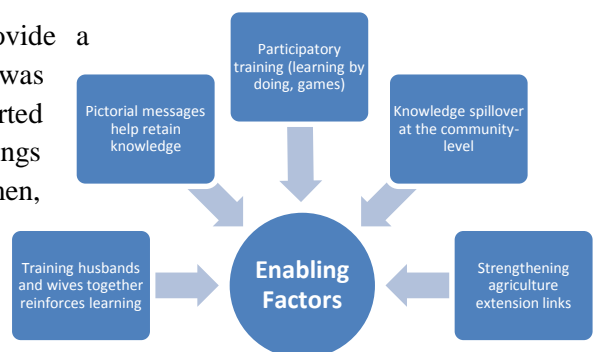
Attitudes on gender and relationships of both men and women also improved. For men, the strongest positive changes in attitudes toward gender and relationships are observed when agriculture, nutrition, and gender sensitization trainings are combined, which could be attributed to the gender component. Moreover, positive impacts on men’s attitudes towards gender and relationships were observed in two other interventions—nutrition BCC delivered by DAE, and when agriculture and nutrition BCC trainings were delivered by DAE. These interventions both provided information that men would typically not have received in the past—nutrition. Perhaps exposing men to key practices involved in good nutrition also changed their attitudes towards women’s roles within the family. The most consistent improvement was women’s recognition that they make important contributions to the community, observed in all interventions.

Sustainability and Scaling Up

ANGeL draws upon the government’s nationwide agricultural extension workforce. This project has been implemented using Government platform which could create evidence for scale up. The Ministry of Agriculture will take further action by using ANGeL data to scale up the best interventions which most effectively increased agricultural diversity, improved nutrition, and promoted women’s empowerment and all over Bangladesh.

Factors behind the Success

- Training husbands and wives, together, may provide a mutually reinforcing environment for learning. It was nearly universal that husbands and wives reported discussing lessons learned from ANGeL trainings together (94 percent of men and 97 percent of women, respectively).
- Pictorial messages help retain knowledge
- Participatory training (learning by doing, games)
- Knowledge spillover at the community-level
- Continuous field-level monitoring and constant communication between project partners strengthened training delivery and agriculture extension linkages during the project period.



Challenges

- Lower attendance of male participants
- Falling of market prices of the agricultural produce
- Illiteracy of some farm Households
- Limited childcare facilities during training
- Short project implementation period

Conclusions

ANGeL's positive findings on agriculture production knowledge and impacts, nutrition knowledge and impacts, and women's empowerment reinforce the potential of the Department of Agricultural Extension to effectively deliver knowledge that positively shapes behaviors.

ANGeL evidence shows that women consistently surpassed men in terms of agriculture knowledge and adoption of improved agriculture practices due to project participation. This demonstrates the value of improving women's contact with agricultural extension services, and bringing women and men together for agriculture production trainings.

While isolated, stand-alone trainings on agriculture and nutrition had impacts, combining trainings on agriculture, nutrition, and gender had much greater impacts. ANGeL's results also show that women consistently had higher achievements than men in terms of agriculture and nutrition knowledge gained, and adoption of improved agriculture production practices. ANGeL's household approach, whereby husbands and wives participated in trainings together, could be an effective vehicle for improving agricultural productivity, nutritional status within the household, and empowerment.

Additional links/References

- Ahmed, A.U., K. Ahmad, V. Chou, R. Hernandez, P. Menon, F. Naeem, W. Quabili, E. Sraboni, and B. Yu. 2013. *The Status of Food Security in the Feed the Future Zone and Other Regions of Bangladesh: Results from the 2011-2012 BIHS*. <http://thedata.harvard.edu/dvn/dv/IFPRI/faces/study/StudyPage.xhtml?globalId=hdl:1902.1/21266>
- Ahmed, A.U. 2015. 'Agriculture, Nutrition, and Gender Linkages (ANGeL) Pilot Project.' [PowerPoint presentation] Project Launching Ceremony for the Agriculture, Nutrition, and Gender Linkages (ANGeL) Project held in Dhaka, Bangladesh on October 26, 2015.
- Ahmed, A.U., J. Ghostlaw, L. Haque, N. Hossain, A. Parvin, F. Sufian, and S. Tauseef. 2017. *Agriculture, Nutrition, and Gender Linkages (ANGeL) Baseline Study*. Project report. Dhaka: International Food Policy Research Institute (IFPRI).
- Ahmed, A.U., J. Hoddinott, Menon, P., N. Hossain, A. R. Quisumbing, S. Roy, and Masuma Y.. Tauseef. 2018. *Agriculture, Nutrition, and Gender Linkages (ANGeL) Endline Study*. Project report. Dhaka: International Food Policy Research Institute (IFPRI).
- Heady, D. and J. Hoddinott. 2016. Agriculture, Nutrition and the Green Revolution in Bangladesh. *Agricultural Systems* 149: 122-131.
- Helen Keller International, Bangladesh. 2017. *Nurturing Connections - Adapted for Homestead Food Production and Nutrition*.
- Malapit, H., C. Pinkstaff, K. Sproule, C. Kovarik, C., A. R. Quisumbing, and R. Meinzen-Dick. 2017. *The Abbreviated Women's Empowerment in Agriculture Index (A-WEAI)*. IFPRI Discussion Paper 1647. Washington, D.C.
- Menon, P., P. H. Nguyen, K. K. Saha, A. Khaled, T. Sanghvi, J. Baker, K. Afsana, R. Haque, E. A. Frongillo, M. T. Ruel, and R. Rawat. 2016. Combining Intensive Counseling by Frontline Workers with a Nationwide Mass Media Campaign Has Large Differential Impacts on Complementary Feeding Practices but Not on Child Growth: Results of a Cluster-Randomized Program Evaluation in Bangladesh. *The Journal of Nutrition*. doi: 10.3945/jn.116.232314