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BASELINE REPORT OF EXPANSION OF
ADAPTIVE TECHNOLOGIES- AGRICULTURE
INITIATIVES IN ALWAR
2017-18

BHAWNA MANGLA
S M SEHGAL FOUNDATION



BACKGROUND: ABOUT THE INITIATIVE

The Adaptive technology – agriculture (ATA) is one of the initiatives at Sehgal Foundation which identifies new technologies and farm practices that save water in agriculture, improve soil health and increasing farm income of small and marginal farmers of India. For that purpose, ATA has successfully introduced short duration variety of pigeon pea (ICPL 88039) in existing crop systems in Mewat district of Haryana. After successful introduction of short duration pigeon pea in Mewat, ATA decided to scale it up in Alwar region.

Pigeon is a leguminous crop which is best suited for semi-arid climate region like Alwar. It demands less water and fertilizer like Urea. The crop has tendency to absorb atmospheric nitrogen and is rich in protein. Majority of vegetarians in India depend on pulses for protein intake and India being the largest consumer of pulses in the world, production in India is not sufficient to meet the demand. Additionally, the remunerative value of pigeon pea is more than other conventional kharif crops like millet, sorghum, etc.

The scale up is planned through collaboration and partnerships with local implementing organization, IBTADA. The partnership will provide a platform to work with women members of SHG network already established by IBTADA. Thus, program not only promises better agriculture technology for rural inhabitants but also builds capacity of unrecognized women farmers.

ABOUT THE STUDY

The study aims to capture the current agricultural situation of the women farmers who will be associated with the initiative. The information is collected using structured interview schedule on land, agriculture, women's role in decision making and their outlook towards entrepreneurship. The study uses purposive sampling strategy where information is collected from the women SHG members who had agreed to give space to pigeon pea cultivation in their farmland. The respondent group are inhabitants of three blocks in Alwar district- Umren, Ramgarh and Pratapgarh. The implementation team shared a list of 143 women who registered for pigeon pea cultivation but 140 were interviewed¹.

Activities	Outputs	Outcomes	Impact Indicators	Long Term Impact
A. Training on Package of Practices for Pigeon Pea cultivation	A1. Number of women farmers adopting Pigeon Pea cultivation A2. Number of training sessions A3. Number of women farmers attended training	A1. Change in crop productivity A2. Improved household consumption of pulses	A1 Increased farm productivity A2. Increased income from agriculture A3. Increased household intake of proteins (pulses)	<u>Social:</u> 1. Empowered women entrepreneurs 2. Recognition of women farmers and gender equity <u>Economic:</u> 1. Financial security of women farmers 2. Increased standard of living 3. Improved health status <u>Environment:</u> 1. Improved soil health 2. Efficient use of water in agriculture
B. Training on building entrepreneurship skills	B1. Number of training sessions B2. Number of farmers attended training on entrepreneurship B3. Number of women who started their own enterprise	B1. Empowered women farmers B2. Improved livelihood options	B1. Increased participation in decision making B2. Increased income earned by women members	

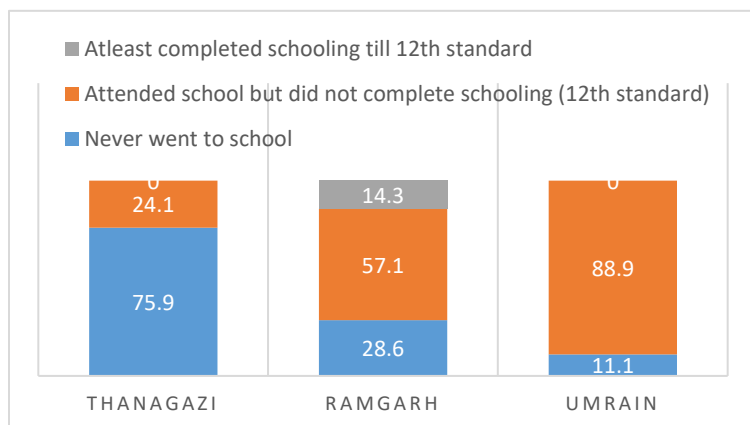
¹ Three women were not available for interview.

DEMOGRAPHIC PROFILE OF THE RESPONDENTS

The respondents of this study comprises of women farmers who are members of SHG groups formed by IBTADA. SHG for these women is not just a platform to save and take loans but also to build their capacities as a farmer. They have received training on better farming and livestock rearing practices. The education profile of the respondents displays a different levels in different blocks of Alwar. Thanagazi is relatively remote in terms distance from the district headquarters and therefore have

limited awareness on education levels. While in Ramgarh, women farmers were found to be graduated or

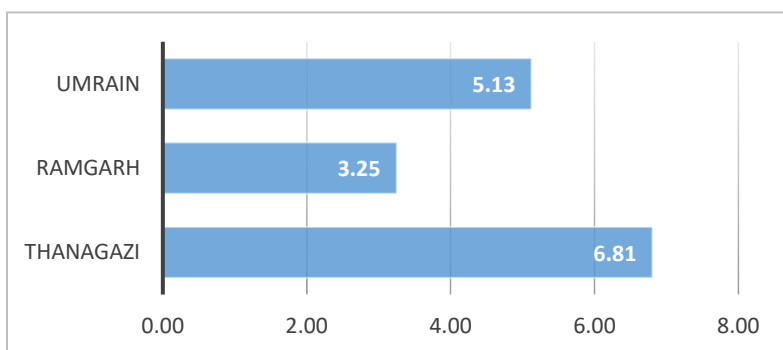
Figure 1: Education profile of respondents (in percentages)



pursuing graduation as well. More than 95% of the respondent farmers are Hindu. Caste dynamics also varies across the blocks. While a major 71% respondents in Thanagazi belong to scheduled tribe group, 52% in Ramgarh belong to scheduled caste group and 56% in Umrain belong to other backward caste group. Interestingly, more than respondents in Thanagazi and Ramgarh have taken debt in last twelve months

while only 44% have taken in Umrain block. The most common reason for taking debt is for investing in agriculture (42%) followed by education (40%), repayment of loan (36%), health expenditure (32%) and construction of house (32%). The association of women farmers with SHG group ranges from few months to fifteen years (Figure 2).

Figure 2: Average years of association with SHG (in years)



CROPPING PATTERN

The most popular crop cultivated in the study region during kharif season is millet. The second important crop is maize in Thanagazi block, cotton in Ramgarh block and Cluster bean in Umrain block. Other crops cultivated by small group of onion, moong, sorghum, etc. The study will therefore analyze crop dynamics of four crops- millet, maize, cluster bean and cotton.

Table 1: Proportion of farmers growing crops in kharif season (in percentage of respondent farmers)

	Millet	Cluster bean	Cotton	Onion	Moong	Maize	Others
Thanagazi	100%	3%	0%	2%	0%	39%	1%
Ramgarh	95%	0%	33%	5%	5%	10%	10%
Umrain	89%	44%	33%	0%	0%	0%	0%

Table 2: Crop season calendar

	January	February	March	April	May	June	July	August	September	October	November	December
Millet					Sowing				Harvest			
Cluster Beans					Sowing					Harvest		
Cotton				Sowing						Harvest		
Maize					Sowing				Harvest			
Wheat			Harvest								Sowing	
Mustard		Harvest								Sowing		

Data on land details highlights the existence of fallow land (34%) during kharif season since gross cultivated land (218 acres) is less than net sown area (332 acres) available for cultivation. This is primarily because farmers who plan to cultivate mustard or vegetables in September and most of kharif crops are harvested post September. Since majority of farmers are growing millet in the season, millet crop holds the maximum proportion of land under cultivation. Therefore, majority of farmers are found to be substituting millet crop (partially or completely) to cultivate pigeon pea.

Table 3: Land under cultivation (in acres)

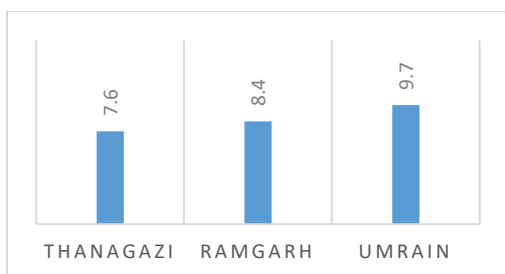
	Net Sown Area	Gross Cultivated area in kharif season	Land under millet cultivation	Land under cluster bean cultivation	Land under cotton cultivation	Land under maize cultivation
Thanagazi	248.84	166.88	129.69	2.19		32.50
Ramgarh	52.19	27.66	20.63		3.44	0.63
Umrain	30.94	23.75	16.25	2.50	3.13	

AGRICULTURE: COST, YIELD AND INCOME

Millet

Millet is mostly a rain-fed crop except for 4% farmers in study region who irrigate once. People who own resources are also found to be dependent on rain for cultivating millet.

Figure 3: Yield of millet (quintals per acre)



This is because during kharif season, most of the wells and bore run dry owing to hot climatic conditions and very few farmers have functional water sources. So there exist a double whammy, rain-fed cultivation for farmers with no resources and for those who have resources but they are non-functional because of lesser rain and have to depend on rain itself. The average yield for the district is found to be 8.6 quintals per acre (Rajasthan Government agriculture statistics, 2016-17). While in the study region, it was found that yield of millet in Thanagazi is lower than average district yield while is more in Umrain (Figure 1). The reason for lower yields in Thanagazi blocks is primarily because farmers in Umrain and Ramgarh use additional fertilizer – Single Super Phosphate (SSP) which they believe have increased their yield by 2-3 quintals per acre. They mention that SSP maintains soil moisture for a longer time and is a cheaper fertilizer. They have adopted this fertilizer in last five years learning from the SHG group meetings. The average cost of cultivation millet was found to be ₹4303 per acre. Therefore, at MSP of ₹1330 (for the year 2016-17) per quintal fixed by central

government, on an average, net returns from cultivation one acre of millet plot is ₹5871 in Thanagazi, ₹6642 in Ramgarh and ₹8156 in Umrain. Additionally, the data reveals that more than two-thirds (68%) of the respondent farmers are selling crop produce in the market while others are using for self-consumption.

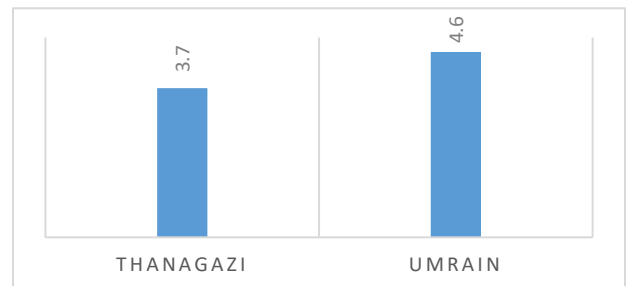


Achraj from Prithivipura, happily shares her life changing experience on joining SHG platform. She joined SHG ten years ago. Earlier, it was not more than monthly small savings and small loans as and when required. Over the years, she learned new methods on agriculture- new crops, fertilizers, methods of cultivation and information on better seeds and efficient seed rate. She is now capable of carrying out bank related work all by herself. She has travelled to city for meetings and exposure which has increased her confidence in communicating with strangers especially men. Her husband takes her advice on agriculture when she comes back from meetings. She mentioned that new fertilizers like SSP has improved their yield tremendously. Her neighbors also seek advice from her on farming methods, inputs and first aid for livestock. It is her confidence in SHG that motivated her to undertake pigeon pea cultivation this khareef season. She recognizes herself as a farmer, that too a confident and informed one.

Cluster Beans

Cluster bean is another rain-fed crop and only one farmer in Umrain is found to be irrigating the crop once. The average yield for the district is found to be 4.1 quintals per acre (Rajasthan Government agriculture statistics, 2016-17). While in the study region, it was found that yield of cluster bean in Thanagazi is slightly lower than average district yield while is more in Umrain (Figure 2). The reason for lower yields in Thanagazi blocks is primarily because of crop is frequently damaged by wild animals as it lies in close proximity with Sariska National Park. The average cost of cultivation cluster bean was found to be ₹4274 per acre. Additionally, the farmers mention that they choose cultivation of cluster beans over other crops because the crop has two commercial values- while the beans are sold at agriculture produce markets, its residue is sold at brick kiln which is burnt to heat the kiln. The beans are sold within a price range of ₹ 3000-3200 per quintal and crop residue is sold at around ₹1200 per acre. On an average, per acre cultivation of cluster beans provides net returns of ₹10,256.

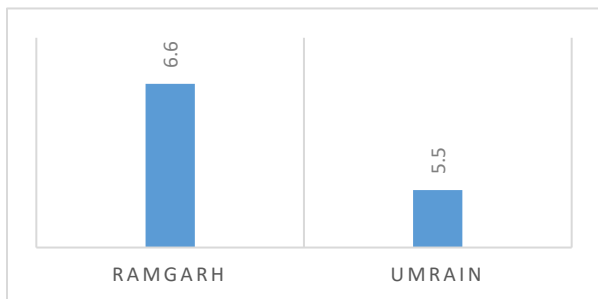
Figure 5: Yield of cluster beans (quintals per acre)



Cotton

Cotton is a fiber crop which has become choice for many farmers in the semi-arid belt of Haryana and Rajasthan in recent years due to less water requirement and good market value. The average yield for the district is found

Figure 7: Yield of cotton (quintals per acre)



to be 2.3 quintals per acre (Rajasthan Government agriculture statistics, 2016-17). While in the study region, it was found that yield of cotton is more than average district yield in both Umrain and Ramgarh blocks (Figure 3). Farmers are providing two to three irrigation cycles for the cotton cultivation. However, Umrain has one quintal lesser yield than Ramgarh due to couple of farmers who reported very low yield (less than one

quintal) owing to crop disease. The average cost of cultivation of cotton is found to be ₹8720 per acre. Since cotton is a commercial crop, all the respondent farmers are selling crop produce in the market. at MSP of ₹3860 (for the year 2016-17) per quintal fixed by central government, on an average, net returns from cultivation is ₹15762 in Ramgarh and ₹14830 in Umrain.

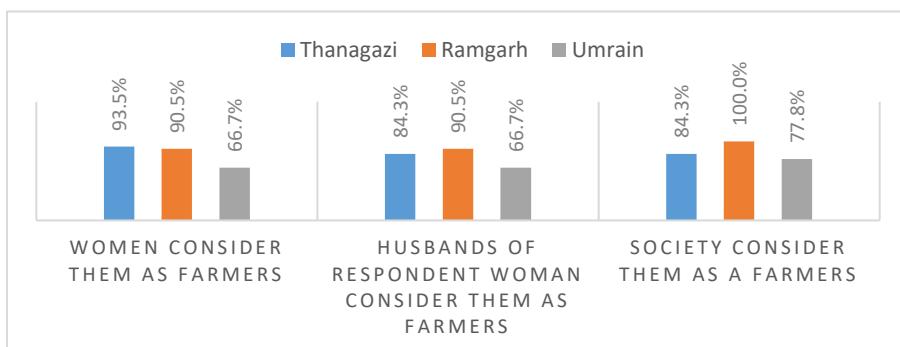
Maize

Another popular cereal crop is maize which mostly cultivated in Thanagazi block and cultivated by only two farmers among the respondent farmers in Ramgarh block. The average yield for the district is found to be 3.8 quintals per acre (Rajasthan Government agriculture statistics, 2016-17). While in Thanagazi block, it was found that yield of maize is 5.5 quintals per acre which is approximately 45% more than the average district yield. The yield form maize is highly variable because of several factors- water in cultivation affects the yield considerably, also the standing crop attracts lot of animals like pigs and monkeys which destroys it significantly. The farmers use Urea and compost only in cultivation of maize. More than four-fifths of the respondent farmers are not providing any irrigation and are dependent on rain for the same. The average cost of cultivation of maize is found to be ₹4535 per acre. Additionally, the data reveals that a little more one two-thirds (36%) of the respondent farmers are selling crop produce in the market. At MSP of ₹1365 (for the year 2016-17) per quintal fixed by central government, on an average, net returns from cultivation is ₹2973 in Thanagazi.

WOMEN AS FARMERS: SOCIAL OUTLOOK

Women are neglected half of the society, whose contribution mostly get unrecognized whether it is in form of

Figure 9: Recognition of women as farmers (respondent's perspective)

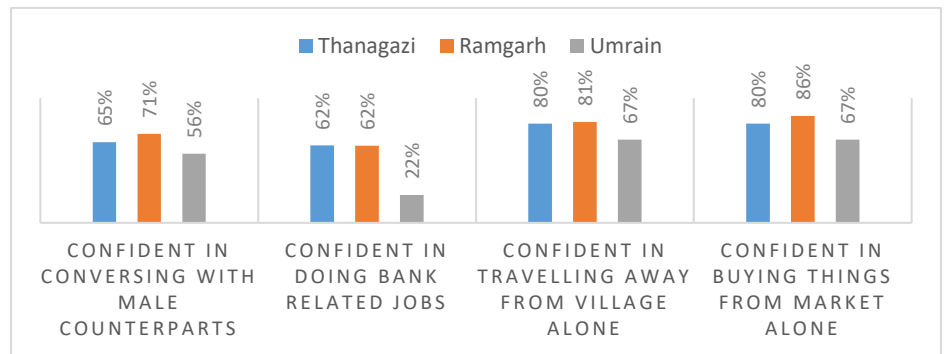


performing endless household chores or labour intensive farming activities. Contribution of women is not just trivial to men and society as a whole but also to woman herself. Despite doing all physical labour intensive work on field like seeding, weeding, harvesting, etc. they are hardly recognized as farmers.

However, with strong association of women with SHG groups where their capacities are also built as a farmers, they are found to be recognizing themselves as farmers along with their husbands and society. We find a positive correlation between years of association with SHG and recognition.

Rural women often find it difficult to engage in conversation with their male counterparts, traveling alone outside village for market, banking or other kind of work. However, association with SHG help women to interact with male members confidently because they are required to exchange dialog with staff of IBTADA during monthly meetings, trainings, etc. They are also required to maintain bank account of for their group and travel to different places for exposure visits and other group related works. This has given them confidence in performing these daily tasks without help of their husband, son or father. Interestingly, after learning banking related works, they also handle bank accounts of their male family members.

Figure 10: Confidence of women respondents in performing daily tasks

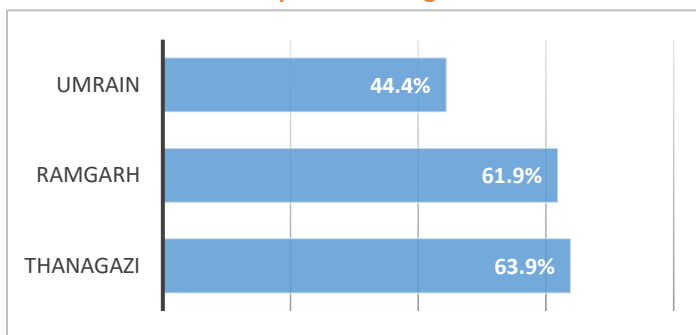


Chanda from Salpuri, is one of the oldest members of SHG who has made a name for herself despite illiteracy. Her association with SHG has helped her save, gain new knowledge and build her capacities as a leader who mobilizes her griup members in the village. She shares an experience where she was expected to give an exam on her learning at an external forum. This gave her jitters since she was illiterate and the team had full confidence in her capabilities. Her performance at the forum shock the examiners and they congratulated on her knowledge as she performed better than the literate ones. Since then, she was unstoppable. Her dedication and willingness to learn has helped her transform her piece of land with learning from the SHG group meetings. She was excited about the new crop pigeon pea and hope to experience amazing results.

WOMEN AS ENTREPRENEURS: WILLINGNESS OF WOMEN FARMERS

With respect to training of women SHG members on livelihood generating activities, only five respondent farmers (3.6%) have reported to have received the same. But only two could generate monthly income generating opportunity from the same which helped them to support their family to reduce financial stress.

Figure 11: Willingness of respondent farmers to indulge in farmer producer organization



With respect to their willingness to engage in different activities beyond crop production as a part of farmer producer organization, more than 60% have agreed in Thanagazi and Ramgarh. The popular choice for these expansion activities are (a) collecting the total produce, packing it and selling it; followed by (b) directly selling to customers instead of selling in the government agricultural produce markets; and (c) selling agro-processed items.

LENTILS: CONSUMPTION PRACTICES

Since lentils are rich source of proteins, especially for vegetarian population who have limited source of protein in their daily consumption. Findings reveal that respondent households are found to consuming pulses in their diet except for 5% households in Ramgarh block. The most common consumed pulses are moong, masur, and Bengal gram. Of all the households consuming lentils, only one-fifth households are found to cultivate for self-consumption. With average household size of six members per household, annual pulse consumption is eight kilograms when cultivated themselves and five kilograms when purchased from market. The frequency of consumption also decreases from an average of 4.8 times in a month to 3.6 times a month when purchased and not cultivated. Thus, consumption of protein rich lentils is increased if cultivated by the farmers themselves than purchased.

CONCLUSION

The study highlights the cropping details of the farmers who willingly accepted to cultivate new crop pigeon pea in kharif season of the year 2017. The common choice of crop is millet and other crops like cluster beans, cotton, maize varies for different blocks in Alwar. Mostly women farmers have cultivated pigeon pea replacing millet cultivation on half or one acre of land. The semi-arid climatic zone forces majority of farmers to carry out rain-fed agriculture. This includes farmers with no resources as well as with resources whose resource go dry in the summer season in absence of sufficient rain. The yield of different crops is close to district average figures and variation is largely caused by rain, wild animals and fertilizer use. Women farmers have a long way with their association with SHG platform provided by IBTADA. They have learned better farming practices and the exposure received from their training and meeting has boosted their confidence. Pigeon pea cultivation will be a climate smart crop for the semi-arid region which not only rejuvenates the nitrogen in the soil but the harvest will help address nutrition security of the rural inhabitants. The consumption of lentils is found to be abysmally low where it is mostly purchased in small quantities. It is observed that consumption of lentils increases if cultivated instead of being purchased.