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Factors Stalling Agricultural Growth- Micro-level Evidence from Karsanda Village of Uttar Pradesh

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ABSTRACT

Green revolution in Uttar Pradesh was fairly successful but after 1990 agricultural growth has slowed down in the state. Farm households of the state are among the poorest in the country. This paper investigates the factor responsible for low levels of agricultural growth in UP from a micro-perspective. The study was carried out in the Karsanda village located 40 km away from the Lucknow city. Primary information was collected from the farmers with the help of various Participatory Rural Appraisal (PRA) tools. Garret's ranking technique was used for problem prioritization. Knowledge gaps, low market prices, irrigation water scarcity, poor crop yield at farms, poor institute Linkage and loss due to wild animals were found to be the main reason for lower growth.

Key words: *Uttar Pradesh, Agricultural Growth, Participatory Rural Appraisal, Garret's ranking.*

INTRODUCTION

Uttar Pradesh with 24.1 million hectare area is the fifth largest state of India. It is the largest state on the basis of population and accounts for around 16.7 per cent of the national population. Majority (78 %) of the population of Uttar Pradesh resides in rural areas making it primarily a rural economy. Being a rural economy, 59 per cent of the workforce of the state is employed in agriculture. Diverse agro climatic condition of the state permits cultivation of wide variety of crops. It is the largest producer of food grains in the country and is therefore referred to as the "granary of India". Other than food grains it ranks number one in the production of Sugarcane, Mango and Potato. The state also supports 15 per cent of India's total livestock population and is the top milk producing state of India.

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But on the other side, farm households of Uttar Pradesh are among the poorest in the country. Poverty levels in the state exceed the national average. Around 23 per cent of farm households in Uttar Pradesh lie below the poverty line. The average monthly income of an agricultural household in UP is third lowest (Rs.4701) in the country after Bihar and Uttarakhand[2]. The state also accounts for the largest share (16.9 %) of all indebted agricultural households in India – 90.4 percent of these being marginal and small agricultural households[1].

This shows that the production levels in Uttar Pradesh are high but mostly due to large area of the state. Incidence of high poverty in the farm households indicates the need for higher growth in the agriculture sector. Considering the fact that agriculture sector of Uttar Pradesh is not only an integral part of the state's economy but is also important from national perspective, so it is necessary to identify the factors which are holding back the agricultural growth so that required interventions can be made. This paper explores the factors responsible for low levels of agricultural growth in UP from a micro-perspective. The specific objectives of the present study are:

a) To identify the factors stalling the agricultural growth

b) To prioritize the identified factors based on the perception of farmers

MATERIAL AND METHODS

The study was carried out in the Karsanda village located 40 km away from the Lucknow city in the Mohanlalganj Tehsil of Lucknow district, Uttar Pradesh. Primary information was collected from the farmers with the help of various Participatory Rural Appraisal (PRA) tools like transect walk, Venn diagram, matrix ranking, mobility map, resource mapping, seasonal analysis, consequence diagram etc. Focused group discussions were also done in order to identify the problems that hamper agricultural growth. The identified problems were then enlisted for their prioritization. For this purpose, thirty farmers were selected from the village using snowball technique. One by one all 30 farmers were asked to rank the problems based upon its severity and percentage of loss they are personally facing due to that. After obtaining the rankings given by individual farmers Garrett's ranking technique was used to arrive at the aggregate ranks. Garrett's formula for converting ranks into percent was used to obtain percent position which is given by:

$$\text{Percent position} = 100*(R_{ij} - 0.5)/N_j$$

Where,

R_{ij} = rank given for i^{th} factor by j^{th} individual

N= number of factors ranked by j^{th} individual

The per cent position of each rank was converted into scores referring to the table. For each factor, the scores of individual respondents were added together and divided by the total number of the respondents for whom scores were added. These mean scores for all the factors were arranged in descending order, ranks were given and most important problems were identified.

RESULTS AND DISCUSSION

Problem identification: PRA technique was employed to find out the constraints in agricultural growth. Findings of various PRA tools are summarized and discussed under the following heads:

1. Inaccessibility of canal for irrigation- Uttar Pradesh is rich in water resources with many perennial rivers flowing through it. Karsanda village receives water through a canal of the Gomati River. But due to inequitable distribution, the southern part of the village was not having access to canal water. Tube-well was also not being used for irrigation as it's comparatively higher cost makes it economically inefficient. Because of this around 15 per cent area of the village was having very

low productivity. This area was having alkaline soil and lack of irrigation water makes its reclamation even more difficult. Some farmers in these areas were taking single crop in a year whereas others had simply left it fallow. Thus, government support and policy interventions are required for better access to irrigation water which will ultimately lead to reclamation of degraded land and upliftment of the farmers. Pandey *et. al.*[3], also recommended public investment in irrigation for enhancing farm productivity in Uttar Pradesh.

2. Poor crop yields- Major crops cultivated in the village were- Paddy, Sorghum, Wheat, Mustard, Tomato, Potato and Mentha. Almost 98 per cent area in the Kharif season was under Paddy which was being cultivated under irrigated condition. Still, the average paddy yield was found to be low (42 q/ha) which was due to lack of adoption of improved technologies. Most of the farmers were growing rice cultivars which were not recommended for that particular region. About 20 % farmers of Karsanda were growing moderate yielding rice varieties like Sita and Moti.

Same scenario was found with Rabi crops also. Wheat and mustard accounted for around 72 and 15 per cent of the total cropped area, respectively. Broadcasting method of sowing mainly contributed to very low yield of wheat (38 q/ha). Although, the village was not very interior still the farmers had not started practicing line sowing. This shows how big extension gap exist between our lab and land. Awareness regarding benefits of line sowing is sine qua none if we want farmers in cereal growing areas to earn good income. Moreover, skills need to be imparted to use modern equipments like ferti-seed drill which will not only ensure proper spacing but will also help in timely completion of the operations. In the same village there were few progressive farmers who were obtaining good yield of Paddy (60 q/ha) and Wheat (50q/ha) which shows that average productivity of the village can be improved by reducing the yield gap.

For Brassica cultivation farmers were still using old varieties like T 42 and Varuna. Year to year farmers were facing huge loss due to aphid attack and frost in mustard but they were not aware about aphid resistant varieties. Farmers were earning good income from mentha in short period but over time decline in its yield were also reported due to poor maintenance of planting materials and lack of proper fertilizer management. Awareness regarding suitable varieties and proper management practices are required for better yield.

Table 1: Basic details of the sample village

1.	Number of households	130	
2.	Population (Number)	Male- 320	Female-350
3.	Social Group (Number of households)	OBC- 80	General- 0
		SC- 50	ST- 0
4.	Literacy Rate (%)	Male- 64.91	Female- 43.75
5.	Net cultivated area (ha)	101.4	
6.	Category of households by land holding (Number)	Large (>4ha)- 0	Medium (2-4 ha)- 2
		Small (1-2 ha)- 10	Marginal (< 1ha)- 118
		Landless (0 ha)- 0	
7.	Source of irrigation (% of irrigated area)	Tubewell- 71.43	Canal- 28.57
8.	Number of households with livestock	120	

3. Low market price- Presence of large number of middlemen in the agricultural marketing channels is often found to be the main reason for the low income of farmers. In the case of Karsanda also the farmers were getting lower price for their produce due to the prevalence of middlemen. Procurement centre for rice and wheat was located at a mere distance of 9 km from the village, still the farmers

were selling the produce to middlemen at a place called Sarai Gopauli, located 3 km away from the village (Table 2). Due to this the price that the farmers were getting for their produce was even lower than the Minimum Support Price. Every year the average price received by the farmer for each quintal of the cereals was Rs. 250-300 lower than the Minimum Support Price. Similarly, mentha which was a major income generating crop was being sold to middlemen in Madarpur Chowraha (2 km from village) at Rs. 10-20 per liter lower than the price prevailing at government operated mill in Amethi (9 km away from the village). Potato was being sold at Amethi wholesale market (9 km away from the village) whereas tomato was sold directly at Kesarbagh mandi in Lucknow city (37 km). In the case of tomatoes, middlemen were charging Rs. 30 per carat as commission which they use to increase in the case of price rise.

Table 2: Mobility Table

Sl. No.	Place	Distance (in km)	Mode	Purpose
1.	Kewali	1.5	Bike, Cycle, Rickshaw	Post office, Bank (United Bank of India), Community Health Centre, FPO, Hospital, Vegetable Mandi (Wednesday and Sunday)
2.	Madarpur Chowraha	2.0	Bike, Cycle, Rickshaw, Tractor	Fertilizer and seed shop, sale of Mentha oil to middlemen, Vegetable mandi for sale of potato, pea and chilli (every Tuesday and Saturday)
3.	Sarai Gopauli	3.0	Tractor, Hired Tempo, Bike	For selling produce (paddy, wheat and mustard) to middlemen.
4.	Baghauli	3.5	Bike, Cycle	Gram Panchayat
5.	Hardoiya	6.0	Bike	For purchasing vegetables and for shopping.
6.	Amethi	9.0	Bike, Tractor, Car, Auto	Daily need requirements, Market for Potato, Seeds of vegetables.
7.	Gosaiganj	15.0	Bike, Auto Tractor	For purchasing seeds, fertilizers, pesticides, petrol, diesel and daily requirements, Government Seed counter.
8.	Gangaganj	15.0	Bike, Auto Tractor	For repairing and purchasing of accessories of tractor and machineries, Veterinary Hospital.
9.	Nagram	16.0	Bike, Auto	Police Station
10.	Mohanlalganj	22.0	Bus, Auto, Tractor	Tehsil, Land Development Bank, cold storage
11.	Lucknow	37.0	Bus, Hired Truck	For selling Tomato, for working as daily wage labor.

Verma *et al.*[4], recommended erection of robust procurement system of wheat and paddy ensuring the Minimum Support Prices to the farmers but it can be observed from above findings that when it comes to choice of agricultural marketing channels presence and distance of direct marketing facilities are not the only deciding factor. Farmers readily sell their produce to middlemen at lower prices mostly to escape cumbersome formalities. Due to lack of awareness regarding grading and standardization practices farmers find it difficult to sell produce at procurement centres. Another reason for hesitation of farmers in selling the produce at procurement center was delay in payment. One solution for this problem can be collective marketing. Krishi Navjot Company, a Farmers' Producer Company (FPO) was formed in the village in the year 2014. The FPO was procuring fertilizers in bulk from IFFCO and selling it to the farmers at concessional prices. FPO can expand its activities and do grading and standardization of the farmers' produce collectively before selling which will help them in fetching better prices. At the same

time, government needs to ensure timely payments and farmer friendly procedures at the procurement centres.

4. Poor institutional linkages- Venn diagram (Fig. 1) was used to study the linkage of the farmers with various institutions.

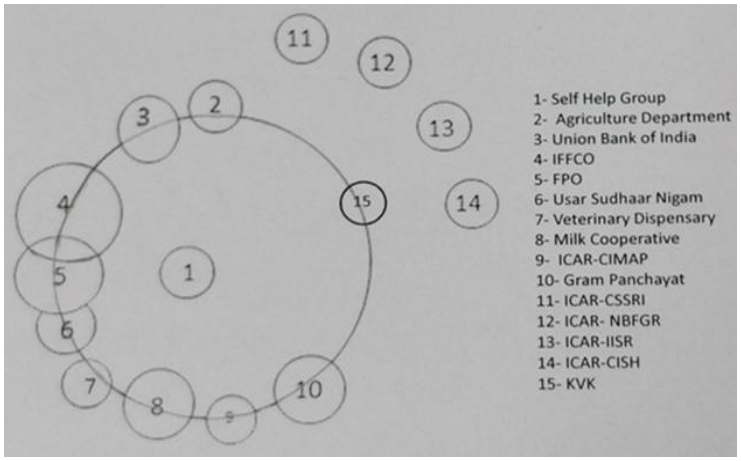

Fig. 1 Venn diagram used in the study

As the study village was well connected to the district headquarter, the farmers had an opportunity to have new agricultural technologies and technical knowledge from the line departments but still this opportunity was underutilized. As a result farmers were not aware about the on-going schemes and facilities available to them.Only few progressive farmers were in contact with KVK. Farmers were not well connected with the agriculture department also but but from Kharif, 2017 a farm school had been set up in the village. There were 28 beneficiaries of the program. Successful implementation of such initiatives can go a long way in fostering linkage of farmers with the line departments which is important for dissemination of correct information.

5. Groundwater depletion: Karsanda village has 130 households with 135 hand pumps and 200 tube wells. Being a part of Gangetic plains ground water used to be abundant in the village. But due to continuous over-exploitation water table is continuously falling in the village. According to the farmers, earlier water table used to be at 10 feet which has now fallen down to 20 feet. Falling water table pose serious sustainability issues. Other than this it raises the cost of cultivation thus decreasing the profit margin of farmers. Farmers in the area have already stopped sugarcane cultivation so at present major proportion of water is being used for mentha, paddy and vegetables. Promotion of drip irrigation and water saving technologies particularly in the case of mentha and vegetables can help the farmers in this regard.
6. Imbalanced use of agrochemicals- Farmers often complain about high cost of cultivation. One of the major reasons behind this is indiscriminate use of fertilizers and agro chemicals. Most of the farmers in the village were not seeking any technical advice regarding application rate of the chemicals. Use of fertilizers was also completely based on their own will and was mostly on the higher side. Mostly farmers were applying entire bag (50 kg) of Urea and DAP irrespective of their farm size. Use of insecticides was specifically very high in the case of tomatoes. Heavy use of fertilizers and chemicals lead to land degradation on the one hand and on the other hand they also increase the cost of cultivation of the farmers. Awareness regarding soil health card and its use for deciding fertilizer dose can be helpful in ensuring balanced fertilizer application. Farmers should also be made aware about

alternatives means available for pest control such as physical control, agronomic practices etc. which are cost effective as well as eco-friendly.

7. Insufficient storage facilities- For realization of better prices proper storage facilities are must for agricultural commodities. It becomes more important in the case of vegetables which are perishable and face frequent price fluctuations. Potato was one of the main vegetable crops being cultivated by the farmers in the study area. Nearest cold storage facility for Karsanda village was located at a distance of 22 km from the village. Taking crop to the cold storage and bringing back small quantities for sale intermittently added more to the cost than profit because of which most of the times farmer used to sell the entire lot at low prices rather than storing it. Small storage facilities built nearby the village can be more helpful for the farmers to increase their profit.
8. Post-harvest loss- Around 10-15 per cent post-harvest loss was reported by the farmers in tomato. They were not aware about value addition and processing alternatives available. Training and support for value addition will not only save the farmers from post -harvest loss but will also help them in getting higher price for the processed products. Moreover, proximity to Lucknow city will help them in easily getting market for their processed products.
9. Labor shortage- Wage rate prevailing in Karsanda village was less than even Rs. 200/day for agricultural operations. As better employment opportunities were available in the Lucknow city many people used to go there for work due to which there was shortage of agricultural labor in the village. The problem was more prominent during paddy transplanting and harvesting of wheat. Shortage of labor often delays various agricultural operations which further decrease the profit. Moreover, even the farmers who were aware of the benefits of line sowing had to opt for broadcasting method in wheat as labor was not available easily. This shows there is a need of mechanization in the village. The village was not having basic machines like ferti-seed drill, combine harvester and paddy transplanter. Proper support and information should be provided to the farmers so that they can collectively purchase machineries. This can be done through FPO which is already operating in the village. Then farmers can custom hire these machineries which will ensure timely agricultural operations and will also provide a solution for labor shortage. Use of seed drill will also help in maintaining correct seed rate and spacing in the fields.
10. Low productivity of milch animals- Dairy has emerged as a major source of income for the farmers all over the country. But in the case of Karsanda dairy sector was not receiving sufficient attention. Average number of cattle per household was only two. Moreover, most of the cows were non-descript due to which the average milk yield was quite low (2 l/day). Milk yield of crossbred cattle (5 l/day) was higher than the indigenous breed but was lower than the potential yield. Some households were also rearing buffaloes but due to lack of proper care and management their milk yield (8 l/day) was also low. AI was mostly not done by trained practitioners. Poor hygiene, lack of proper housing structures, improper feeding practices were the main constraints that needs to be taken care of. The agro-climatic condition of the area is suitable for rearing high milk yielding indigenous cattle breeds such as Sahiwal and Tharparkar. Replacement of non-descript breeds with these breeds can help in increasing milk yield. There is also scope of increasing the herd size maintained on an average by a household. Proximity of the village to milk processing plants (PARAG and AMUL) and Lucknow city is an advantage which can

lead to higher income with little more efforts in dairying.

11. Loss due to wild animals and stray cattle- Farmers were facing huge loss due to blue buck (neelgai), monkey and stray cattle. Major problem was there in the case of Potato and Tomato. Animals used to enter into the field and wipe the entire crop in few hours. Fencing demarcating the village area from forest area can help in minimizing losses.
12. Policy gaps: Subsidized seeds were being provided to the farmers through agricultural department in alternate years. But often the seeds which were provided at subsidized rates were different from the ones that were in demand in the market. Like in the case of tomatoes subsidized seeds were usually of long type varieties whereas there was no market for it.

Problem prioritization: Following paragraphs discuss the relative importance of the identified problems as perceived by the farmers. Table 3 shows the result obtained through Garrett's ranking technique. The problems are arranged in descending order of their priority for the farmers.

Table 3: Garret score and rank for the major factors stalling the agricultural growth

Sl. No.	Problems	Score	Rank
1.	Low market price	73.23	I
2.	Poor crop yields	68.87	II
3.	Inaccessibility of canal for irrigation	65.10	III
4.	Loss due to wild animals and stray cattle	56.17	IV
5.	Insufficient storage facilities	51.37	V
6.	Labour shortage	48.80	VI
7.	Post-harvest loss	46.70	VII
8.	Poor institutional linkages	46.60	VIII
9.	Low productivity of milch animals	43.10	IX
10.	Policy gap	42.07	X
11.	Groundwater depletion	31.87	XI
12.	Imbalanced use of agrochemicals	26.13	XII

The sample farmers ranked low market price as the topmost problem followed by poor crop yields and inaccessibility of canal water for irrigation. Farmers knew that they were getting lower price for their produce and direct selling can increase their share in the consumer's rupee. But they find selling the produce at procurement centres or wholesale market on their own as quite cumbersome and time consuming. They believed that there will be a drastic improvement in the crop productivity if irrigation facilities are made available in the southern part of the village. Problems such as groundwater depletion and imbalanced use of agrochemicals were ranked low. The reason behind this can be lack of awareness among the farmers regarding indirect effects of agrochemicals and water depletion on cost of production and sustainability.

CONCLUSION

In order to boost agricultural growth it is important to identify the various problems faced by the farmers at micro-level. Farmers of Karsanda village were having most of the resources but they lagged behind in their proper utilization. Better access to irrigation, awareness regarding improved varieties and technologies, collective grading and standardization, collective marketing, strengthening of institutional network and infrastructural facilities for storage and transport are the major factors which can enhance the productivity. Recently, there has

been a hike in minimum support price but along with this government needs to ensure that procurement procedures are farmer friendly and timely payments are made to the farmers and that can be accelerated by providing MSP centers to Farmers Producer Organizations. In nutshell, by bridging the extension and policy gaps it is possible to augment the income of farmers to a considerable extent even with existing level of knowledge and technology.

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