The Impact of Farmer Producer Organization on Socio -Economic Conditions of Small and Marginal Farmers in Uttar Pradesh

Abstract

Submitted to
Babasaheb Bhimrao Ambedkar University, Lucknow in fulfilment of Requirement for the Award of Degree of

Doctor of Philosophy

in

ECONOMICS

BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY
LUCKNOW
प्रज्ञा शील करूणा
ESTABLISHED 1996

Submitted by

Supriya Gautam

Enrolment No. 1374/18

Under the Supervision of

Prof. L.C. Mallaiah

DEPARTMENT OF ECONOMICS
SCHOOL OF ECONOMICS & COMMERCE
BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY
(A CENTRAL UNIVERSITY)
(ACCREDITED 'A^{++}' GRADE BY NAAC – 2023)
VIDYA VIHAR RAEBARELI ROAD
LUCKNOW- 226025, UTTAR PRADESH, INDIA

2024

Abstract

In India, during the past decades the agriculture sector mainly concentrated on improving food security and increasing agricultural output. This strategy involved such as increasing the productivity through use of quality seeds, agro chemicals, fertilizer, irrigation and subsidies on farm inputs and remunerative prices for crops. The country went through a shortage of food during the mid-1960s. The green revolution in India paved the way to overcome the shortage of foods for the last half a century. India's population increased by 2.55 times while the food production multiplied by 3.7 times, which has made India a self-sufficient country in the food industry and able to export the net food to other countries. The strategy did not have any impact on the raise of income of the farmers and did not have any measure for the welfare of the farmers. The experience shows that growth in output should bring increase in farmer's income, but in many cases, the farmer's income did not grow with the increase in output. The net result showed that farmer's income remained low, from the incidence of poverty among farmer household. The green revolution in the agrarian industry paved the way to increase the productivity, but it did not help the farmers increase their income. Farmers' income remained low when compared to those working in the non agriculture sector.

Therefore, the Government of India (GOI) have announced in the Union Budget 2016 to double the income of farmers by 2022. The steps to be followed in reaching the same are through technology, policy reforms and institutional building. Various grassroots institutions are existing in India such as self-help groups, farmers group, farmer's interest groups, cooperatives, joint liability groups, common interest groups and Farmer Producer Organization (FPO). Indian agriculture is dominated by large amount of fragmented land holdings. Eighty-five per cent of these land holdings are owned by small and marginal farmers. Being unorganized, the farmers are unable to reap high value for output. These smallholder farmers were hindered from innovating and participating in agri- food value chains due to low investments in markets systems and infrastructure. These problems will be alleviated by organizing them into the Farmer Producer Organization (FPO). The FPO concept was started in the year 2011-2012 to provide end-to-end services to small farmers, covering all aspects of agriculture from input supply to technical services to processing and marketing. Thus enabling

better income for the producers through an organized system of their own. Recognizing the importance, the year 2014 is being observed as the "Year of Farmer Producer Organizations (FPOs)" by the Government of India. Both Central (SFAC and NABARD) and State Governments are emphasizing on promoting Producer Organizations. GOI has suggested FPO as a tool to mobilize the farmers and bring under one umbrella to reach the target and double the farmers' income. However the model should be sustainable one in order to achieve the target set by the GOI.

Hence, On the basis of a thorough review of previous research work concerning Farmer Producer Organization, it has been found that there is plenty of literature support in the context of Farmer Producer Organization. However, the impact of Farmer Producer Organization on socio-economic conditions of small and marginal farmers in Uttar Pradesh is rare in the existing literature. The prime and foremost aim of this study is to fill this lacuna and extend the existing literature by undertaking an analysis of farmer producer organization on socio-economic conditions of small and marginal farmers in Uttar Pradesh. In other words, the study has substantially contributed by extending the existing literature from theoretical to empirical prospects.

Objectives of the Study

The major objectives of the study are to examine:

1. To study the Performance of FPOs in terms of production activities, marketing activities, financial activities and Organizational activities.
2. To study the impact of FPOs on the Socio-Economic conditions of small and marginal Farmers in Uttar Pradesh particularly in terms of production, productivity, employment, savings, profit, consumption and annual income of the FPO members and non-members farmers.
3. To analyze the constraints of member farmers and to suggest suitable strategies for the effective functioning of Farmer Producer Organizations in India.

1.5 Hypothesis of the Study

To achieve the above-mentioned objectives, the present study has tested the following hypothesis:

1. There is a significances on contributing to the success and sustainability of the performance of Farmer Producer Organization

2. There is an impact of the Farmer Producer Organization on the socio-economic conditions of small and marginal farmers in Uttar Pradesh.

Research Methodology

Present study is based on the primary and secondary data. The main purpose of the study is to analyse the impact of FPOs on the socio-economic condition of small and marginal farmers in Uttar Pradesh. The study is based on primary and secondary data. The study is conducted purposively by selecting the Central Zone of Uttar Pradesh as this Zone gives the universal representativeness in the state of Uttar Pradesh with reference to the FPOs and selected only three districts namely Lucknow, Raebareli and Kannuaj on the basis of the maximum number of FPOs working in these districts. The list of FPOs in Uttar Pradesh is collected from the Department of Agricultural Marketing and Agri-Business, Government of Uttar Pradesh. Three such FPOs namely Navjyoti Kishan Producer Organization (Gosaiganj Block) of Lucknow District, Hindkishan Agro Farmers Producer Organization (Chhibramau Block) of Kannauj District, and Churuwa Farmer Producer Organization of Raibareli District (Bacharawan Block) were selected for the study. These three organizations are registered during the period (2013 to 2021) and continue their activities. Each FPO's is associated with a cluster of villages. Accordingly, the number of small and marginal farmers covered by FPOs in each of these villages. The villages were arranged in descending order based on the number of small and marginal farmers and the first five villages with more small and marginal farmers were considered for the study. Further, the same villages are considered for the selection of non-members.

In view of the study objectives, FPO members and non-members possessing small and marginal farm holdings were considered. From among the five selected villages of each block, it is decided to select a fixed sample of 10 members of FPOs from each of the selected villages based on a random sampling method. Similarly, 10 non-members are selected at random from the same villages wherein the FPO members are selected. Thus, a total of 300 respondents comprising 150 FPO members and 150 non-members belonging to fifteen villages were the sample respondents for the study to compare the socio-economic characteristics and their land holdings.

A few statistical tools are used to analyze primary and secondary data. For the analysis of primary data we used descriptive statistics, percentage analysis,

commutative frequencies, mean, average, Standard deviation, Effectiveness of major activities, CAGR, Likert scale t test, correlation, multiple linear regression analysis and Garret ranking technique. Further, to support the secondary data regarding FPOs collected from Research reports, literature published by various government/ non-government agencies and data regarding number of FPOs in state and country has obtained from SFAC, NABARD and NSSO. The selection of variables included in the study is done based on an extensive review of literature related to the subject and from previous studies related to the topic. The data collected from the respondents through interview schedule are coded, tabulated analyzed and presented in the form of tables in order to make the findings meaningful and easily understandable.

The present research work is compartmentalized into seven chapters.

First Chapter of the study titled as ***"Introduction"*** is divided into three major parts. The first section deals with India's agricultural scenario, background of FPO and the role of the Farmer Producer Organization in India. The second section deals with the detailed review of literature has been carried out for understanding the ongoing research work and conceptual knowledge. The review of literature is aligned in a systematic hierarchy. Third section focus on the significance of the study, objective and hypothesis formation has been given. At last, the chapter discussed the adopted methodology for the conduct of research.

Second Chapter titled ***"Theoretical Framework of the Study"*** The main focus of this chapter is on theoretical and conceptual underpinnings of Farmer Producer Organizations in literature. Consequently, this chapter is divided into five sections: First section deals with the introduction which reveals the FPO's historical legacies.The second section deals with review of economic growth theories, it comprises all essential instruments that trigger the agricultural advancement and the outlines of some of the most relevant theories for explaining the relationship between farming organizations and agricultural development in developing economies like India. The third section covers the evaluation of the Farmer Producer Organization in India, which explains the various models of farming systems that are adopted for the development of Indian agriculture and a number of alternative models of agricultural organization that have been in vogue in different countries with varying degrees of success. The fourth section

covers the programs and policies for agricultural development particularly for Farmer Producer Organization. The closing paragraph covered the conclusion.

Third chapter entitled ***"Scenario of Farmer Producer Organizations in India."*** This chapter is divided into four sections. The first section discusses the land use pattern and trends. Second section discusses the Genesis, growth and progress of Farmer Producer Organizations in India, third section discusses the state-wise comparison of Farmer Producer Organizations in India, the Fourth section discusses the status of Farmer Producer Organizations in Uttar Pradesh and the last section deals with the conclusion.

Fourth Chapter entitled ***"Profile of the Field Study Area"*** is a requisite pre-survey exercise of the field study area for the accomplishment of predetermined aim as stated in first, second, and third objectives of the study. Thus, this chapter holds a crucial place and therefore this chapter describes the detailed examination of the demographic, geographic and other institutional factors of the three districts have been carried out in this chapter. There are primarily four sections in this chapter. The foremost section is Introduction. The second section portrays an overview of Uttar Pradesh. Third section describes the profile of the study area and the conclusion is covered in the fourth section.

Fifth chapter entitled ***"Performance Assessment of Major Activities of Farmer Producer Organizations in Uttar Pradesh."*** in line with the study's first objective and to full fill the first objective of the study this chapter is based on field survey. It analyses the effectiveness of major activities of the FPO beneficiaries on certain dimensions. Based on these dimensions the chapter has been sub categories into seven sections. The first section portrayed the basic profile of selected farmer producer organization. Second section portrayed the Performance of Farmer Producer Organizations. Third section portrayed the awareness about the farmer Producer Organizations. Fourth section portrayed the reason for joining the Farmer Producer Organizations (FPO). Fifth section portrayed the Perception of farmers towards farmer-producer organizations. Sixth section portrayed the major activities of Farmer Producer Organizations. Seventh section portrayed the conclusion of the present chapter.

Sixth chapter is entitled ***"The Impact of Farmer Producer Organizations"*** To full fill the third and fourth objectives of the study, this chapter is based on field study. It analyze the socio-economic aspect of the FPO members or non-members beneficiaries.

Based on these dimensions the chapter has been sub categorized into six sections. After Introduction, the first section portrayed the profile characteristics of members and non-members of farmer-producer organizations. Second section explains the impact of farmer-producer organizations on the socio-economic conditions of small and marginal farmers. The third section depicts with the association between the profile characteristics of members and non-members with their knowledge level, adoption level, and annual net income. The fourth section analyses the constraints faced by the FPO members and non-members in the adoption of recommended wheat cultivation practices. Fifth section explains the suggestions offered for the effective functioning of FPO's and at last the conclusion are presented in the sixth section.

Major Findings

The study finds that the Gini coefficient has consistently declined from 0.651 for 1970-71 to 0.567 for 1990-91and further to 0.478 in 2018-19 suggesting a general reduction in the degree of inequality. Nevertheless, the numerical values of the co-efficient continue to remain high above the generally accepted norm of 0.33 or even 0.50 except in the last two years of 2015-16 and 2018-19. This indicates that the country as a whole has not achieved any worthwhile level of equality in the distribution of land operations. The only trend has been some decline in the inequality from very high levels. The scatter plot for the Lorenz curve for all five farm categories (marginal, small, semi-medium, medium and large).It has been observed that the highest inequality in land distribution within marginal farms compared to small, semi-medium, medium, and large farms. Overall, the Lorenz curve indicates significant inequality across all farms, with a Gini coefficient of 0.58. So, it highlights the persistent unequal distribution of land particularly among marginal farms.

The growth wise analysis of the of FPO shows that the number of FPO's in India shows that the most FPOs are registered under the Companies Act or the Cooperative Society Act. There are 15891 Producer Companies registered that work in agricultural and related fields. NABARD claims to have promoted almost 2063 FPOs in various states out of all the promotional organizations, with the majority being Producer Companies and the remaining 10 to 15 percent being Co-operative Societies. Approximately fifty percent of all producer companies were concentrated within merely three states, namely Maharashtra, Uttar Pradesh, and Tamil Nadu. This notable concentration can be attributed to the fact that half of the Farmer Producer Companies

that have been established in the last biennium were effectively established within just two states, with 33 percent in Maharashtra and 12 percent in Uttar Pradesh. The state of Maharashtra boasts the highest number of producer companies, with 5216 entities, surpassing the combined total of the following three states Uttar Pradesh, Tamil Nadu, and Madhya Pradesh collectively represent around half of the producer companies registered.

The state-wise analysis of FPO reveals that Karnataka leads the state with 836 farmers per FPO, followed by Tamil Nadu (797 farmers per FPO), West Bengal (750 farmers per FPO), Madhya Pradesh (692 farmers per FPO), Odisha (672 farmers per FPO), Maharashtra (662 farmers per FPO), Chhattisgarh (654 farmers per FPO), Manipur (649 farmers per FPO), and Uttar Pradesh (643 farmers per FPO). States similar to Karnataka, West Bengal, Maharashtra, Rajasthan, Tamil Nadu, and Uttar Pradesh have a significant presence of promoting institutions accounting for 9.62 percent, 8.7 percent, 7.56 percent, 6.52 percent, 6.18 percent, and 5.84 percent of the total promoting institutions respectively. The percentage of FPOs over 8 years old across different states it is higher in Madhya Pradesh, Gujarat, Rajasthan, and Tamil Nadu. The average membership number within an FPO is around 470. Within regions such as Haryana, Odisha, Rajasthan, Karnataka and Tamil Nadu, the median shareholder figure varies from 100 to 500. A significant portion specifically 47 percent of the FPOs fall under the small-sized category, having fewer than 100 farmer-members, while 28 percent are classified as large more than 500 members. Therefore, states like West Bengal, Tamil Nadu, Maharashtra, Karnataka, and Uttar Pradesh exhibit an especially high prevalence of large FPOs.

District wise distribution of FPOs across districts in Uttar Pradesh reveals that NABARD has promoted the highest number of FPOs at 116, followed by SFAC at 57, with other institutions contributing to 126 FPOs. Consequently, the total number of registered FPOs in Uttar Pradesh stands at 296. Almost half are in operation across fourteen specified districts, with Lucknow district leading the number at 16 FPOs, followed by Raebareli with 13 FPOs, Kannauj and Prayagraj with 12 FPOs, Fatehpur and Lalitpur with 11 each having varying numbers. The top 14 districts collectively account for 49 percent of the total FPOs in Uttar Pradesh, while the remaining districts have 140 FPOs. Only 182 FPOs are currently active within Uttar Pradesh. Based upon comprehensive analysis, it can be inferred that a significant proportion of FPOs are

inactive. District-wise analyses indicate the promotion of 296 FPOs, with a cumulative linkage of 178,816 farmers to these organizations. On an average, each FPO is associated with a substantial number of farmers, with 605 farmers linked per FPO. The district-wise analysis further indicates that Gautambudh Nagar leads with 12,508 farmers per FPO, followed by Mainpuri (2065), Unnao (1232), Kannauj (1049), and Hardoi (1002) farmers per FPO among others.

Selected District wise Performance assessment of FPO analyses through grades indicate that as per the total score obtained, the FPOs were categorized into four grades A, B, and C. One FPO were in grade A, which indicates that their performance was very good and they were ready for credit linkages. Based on the total score, Navjyoti Farmer Producer Organizations was in Grade A and required capacity building prior to credit linkage, with a score of more than 90 percent. It was found that Churuwa Farmer Producer Organizations were in Grade B with a score of 74 percent with Credit linkage after capacity building, this FPOs require capacity building. Lastly, Hindkishan Agro Farmer Producer Organizations, with a score of less than 55 percent with need further capacity building was in Grade C. This indicates that it requires detailed assessment and intensive capacity building.

The percentage analyses of the factors responsible for joining the FPO finds that the main reason for becoming a member of the FPO is motivated by FPOs benefits (92.00 percent) and better credit linkages with institutional (86.66 percent) and another second important reason was to increase family income (83.33 percent) and economies of scale of purchase (83.33 percent), and the third reason (82.00 percent) to buy input at a lower cost as compared to the market.

The analyses of effectiveness of major activities of farmer producer organizations result finds that the respondents were requested to mention their level of effectiveness towards the enabled major activities of FPOs. The rank wise distribution is based on the effectiveness score of each dimension, which reflects to the mean effectiveness score of the enabled major activities of the Farmer Producer Organization at 77.43 per cent. It is that Capacity building/Community development activities with 85.16 per cent occupy first rank and another major activities are Organizational activities with 76.16 per cent respectively secured second rank, Marketing activities with 76.09 per cent secured third rank, Production Activities with 75.60 per cent respectively, secured fourth rank and last activities is Financial Activities with 74.16 per cent secured fifth

rank. With scores ranging from 85.16 percent to 74.16 per cent, the activities benefit users as effective and very effective. The activities related to financial ranked last ranks with the score of 74.60 per cent respectively.

Based on the socio-economic profile analyses of FPO members and non-members finds that more than half 83.00 percent of the FPOs members belonged to middle age category, whereas 80.00 per cent of the non-members belonged to middle age category. 91 percent farmers are male and 9 percent farmers are female. Almost more than half of the FPO-members that is 60 percent and the maximum number of non-members that is 68 percent belonged to the SC category. Maximum respondents are having four to six members in a family and the minimum respondents have family size of above six member. 32.00 percent of the FPO members were upper primary level of education, in case of non-members category, 34.67 per cent of the respondents were upper primary level of education. More than half 54.67 per cent of the FPO members had only farming as an occupation. Similarly, 49.00 per cent of the non-members had only farming as an occupation. Nearly half i.e 48.00 percent of the FPO members and 44.67 per cent of non-members had medium level of farming experience. The majority of the FPO members approximately 71.33 percent were involved with more than one organization, whereas only 4 percent of non-members were associated with more than one organizations.44 percent of the FPO members exhibited a significant degree of interaction with the extension agency, ranging from high to medium and only 16.67 percent of non-members have high level of extension agency contact. FPO members tended to have a higher level of mass media exposure ranging from high to medium, as opposed to non-members who were more inclined towards medium to low levels of exposure to mass media. All FPO members possess their own land and among the non-members, 61.33 percent have their own land, while 38.67 percent have taken lease land. Having land is a fundamental criterion for farmers to join FPOs, and those who do not possess land are considered ineligible. The majority accounting for 79.67 percent are classified as marginal farmers, while 17.67 percent fall under the category of small farmers, with only 2.67 percent categorized as semi-medium farmers. Particularly, none of the farmers in the study have large landholdings. A significant proportion of FPO members possess marginal land holdings, largely attributable to land fragmentation.80.00 percent of the FPO members and 78.00 percent of the non-members possessed land holdings below 2.5 acres in land size for agricultural purposes,

commonly known as Marginal farmers. 58 percent of FPO members inhabit semi-pucca residences, with a parallel 52 percent of non-members households residing in similar semi-pucca house. Moreover, 62.00 percent of FPOs members were classified under the medium income group, whereas 58.00 percent of non-members fell into the same category. Minority of FPO members (20.00 percent) were in the low income group, while a significant proportion of non-members (30.0 percent) were also in this category.

The Annual expenditure of the respondents (in Rupees) upon some major heads. Among the respondents annual expenditure has the majority upon food with mean expenditure of Rs. 72213.34 with 65.5 percent. The per capita expenditure of FPO members is Rs.45289.7. In the scenario of non members, it shows that annually spending has majority upon food with mean expenditure of Rs. 74153.34 with 65.5 percent. The per capita expenditure for non member is stood at Rs 46437.03 comparatively higher as compare to the FPO members. While overall percapita expenditure appear to be Rs. 45863.3 per year. A larger portion of members 26.00 percent are classified in the high savings group in contrast to 12.67 percent of non-members. This inequality indicates that being a member of FPO is linked to higher savings.

Impact of Farmer Producer Organization on its members finds that regarding the *Service Impact*, the data illustrates that FPO membership offers significant advantages across diverse services compared to non-members. FPO members exhibit higher percentages of enhancement in product and marketing services, financial resources, technology dissemination, capacity development, value addition and subsidy awareness. This demonstrate the effectiveness of FPOs in aiding and enriching agricultural operations and the general welfare of their members, highlighted the benefits of FPO involvement. Concerning *Economic Impact*, it has emphasized the positive impacts associated with FPO membership, leading to a stronger economic standing for FPO members compared to non-members farmers. The FPO were average performance in terms of economic impact because the advantages provided by FPOs and farmer associations are not effectively reaching small and marginalized farmers, as only those farmers with political and social connected farmers are able to access the benefits of these services. Concerning *Social Impact*, finds that FPO members enjoy substantial advantages in various crucial domains, such as technology acceptance, leadership and decision-making skills, participation in extension programs, social

responsibilities, marketing efficiency, women's empowerment, networking, and access to financial and soil health services.

With respect to Knowledge level, the 76.00 percent of the FPO members shows a high level of knowledge and 60.67percent of non-members were found to possess a medium level of knowledge on recommended wheat cultivation practices. The mean percentage of knowledge on recommended Wheat cultivation practices among FPO members is shown as 88.03 percent. In the scenario of non- member's category, the overall mean percentage of knowledge concerning recommended techniques for cultivating wheat is 69.25 per cent. Hence, the knowledge level of the FPO members are found to be more than the non-members.

With respect to Adoption level, the proportion of FPO members, accounting to almost half around 47.33 per cent exhibited a high level of adoption of recommended wheat cultivation techniques, with medium around 46.67 percent and low 6.00 per cent adoption level of wheat. Similarly, among non-members around 54.00 per cent were classified under the medium adoption level, with low level of 39.33 percent and high level of 6.67 per cent of adoption level respectively. The level of adoption of recommended practices among the members of the FPO was significantly higher in comparison to non-members. The overall mean percentage of adoption of recommended wheat cultivation practices among FPO members is 67.73 per cent. Similarly, the mean percentage of adoption of recommended wheat cultivation practices among non-members is 63.07 percent. Furthermore, the exposure to recommendations and the availability of inputs at lower costs compared to market prices likely facilitated the adoption process.

The Benefit-Cost Ratio (BCR) indicating the ratio of net benefits to costs. The average costs incurred and returns obtained by wheat farmers pertain to both FPO members and non-members. BCR of FPO members is Rs 224.87 and for non-members is Rs 165.79. The net benefit of FPO member is Rs 58506.49 and net benefit of non-members is Rs. 47252.19. The net benefit is also higher of FPO members as compared to the non-members. The average gross returns in Rupees per Hectare were particularly higher for FPO members to Rs. 84895.00 as compared to non-members.

With respect to productivity and annual net income from wheat cultivation, more than half 53.33 per cent of the FPO members exhibited high-level productivity in wheat cultivation, while in case of non-members, the majority almost 37.33 per cent

demonstrated low-level productivity. 46.67 per cent of FPO members demonstrated a high level of annual net income from wheat cultivation. While within the non-member category, 44.67 percent had a low level of annual income. This significance difference shows that FPO member's conditions are better as compared to non- members.

The mean percentages of knowledge (85.84), adoption (77.09), productivity (Kg/ha) (5584), and annual net income (Rs.58507) among the members of FPO were observed higher than those of non-members, which stood at 52.21, 48.10, 4775, and Rs. 47253 respectively. Moreover, a substantial increase of 64.42, 60.28, 16.91, and 23.82 per cent was observed in knowledge, adoption, productivity, and annual net income, respectively. Therefore, the adoption of improved wheat cultivation practices has positively influenced the FPO members. FPOs have undeniably affected their members in terms of enhancing knowledge, adoption rates, productivity levels, and annual net income by 47.36 per cent.

To test the variability of means of knowledge, adoption, productivity and annual net income of FPO members and non-members. The mean percentage of knowledge regarding recommended wheat cultivation practices was 85.84 for FPO members and 52.11 for non-members. The calculated 't' value of 5.38 is discovered to be statistically important at the 0.01 level of probability. The mean percentages related to the adoption of recommended wheat cultivation practices among FPO members and non-members stood at 77.09 and 46.52 respectively. With a 't' value of 4.95, significant at the 0.01 level of probability, it is observed that FPO members exhibited a markedly higher adoption rate of recommended wheat cultivation practices compared to non-members. The mean percentage concerning wheat productivity by FPO members and non-members were (5582 Kg/ha) and (4775 Kg/ha), respectively. A 't' value of 5.14 is observed, signifying significance at the 0.01 probability level. This suggests especially higher productivity level in the FPO members category compared to non-members. The mean percentage pertaining to annual net income from wheat crop by FPO members and non-members were (Rs. 58,507) and (Rs. 47,253), respectively. A 't' value of 4.39 is calculated signifying significance at the 0.01 probability level. This points towards a significantly higher annual net income among FPO members as compared to non-members.

Relationship of profile characteristics of the FPO members and non-members with their impact. Association and contribution of characteristics of FPO members and non-members with their knowledge on recommended wheat cultivation practice. Association of characteristics of FPO members with their knowledge. Among the twelve independent variables, training programme (X_7), extension agency (X_{10}), mass media exposure (X_{11}), and awareness about FPO (X_{12}) were found to be significant associations with knowledge level at 0.01 per cent level of probability. The remaining variables, including age (X_1), educational status (X_3), land holding (X_5), social participation (X_8), farming experience (X_9) were found to be significant association with knowledge level at 5 per cent level of significance. Contribution of characteristics of FPO members with their knowledge. The regression coefficient of variables namely training undergone (X_8), mass media exposure (X_{11}) and awareness about FPO (X_{12}) shows positive regression coefficients, significantly influencing the knowledge level of FPO members at the 0.01 percent probability level. Moreover, variables like age (X_1), educational status (X_3), social participation (X_8), and land holding (X_6) also exhibited positive coefficients, significantly contributing to the knowledge level of FPO members at the 5 percent probability level. Hence, the null hypothesis (H_0) which stated that there will be no significant relationship between the independent variables with their knowledge level was rejected. The alternate hypothesis which stated that there will be a significant relationship between the independent variables with knowledge level was accepted.

Association and contribution of characteristics of non-members with their knowledge. Association of characteristics of non-members with their knowledge, out of twelve independent variables studied, Educational status (X_3), Occupational status (X_4), Farming experience (X_9) had shown a positive and significant association with knowledge level at 5 per cent level of probability. Contribution of characteristics of non-members with their knowledge the regression co-efficient of the variables such as age (X_1), gender (X_2), educational status (X_3), occupational status (X_4), Family size (X_5), Land holdings (X_6), Training Programme (X_7), social participation (X_8), Farming experience (X_9), Mass media exposure (X_{11}) and Awareness about FPO (X_{12}) was also found to be positive and had significantly contributed towards the knowledge level at 5 per cent level of probability. Hence, the null hypothesis (H_0) which stated that there will be no significant relationship between the independent variables with their

knowledge level was rejected. The alternate hypothesis which stated that there will be a significant relationship between the independent variables with knowledge level was accepted.

Association and contribution of characteristics of FPO members and non-members with their adoption of recommended wheat cultivation practices. Association and contribution of characteristics of FPO members with their adoption. Among the twelve independent variables examined, variables like farming experience (X_9), training programme (X_7), land holding (X_6), and awareness about FPO (X_{12}) showed a significant positive correlation with adoption level at a 1 per cent level of significance. Conversely, variables including age (X_1), educational status (X_3), and interaction with extension agencies (X_{10}) shows a positive and significant association with adoption level at a 5 per cent level of significance. Contribution of characteristics of FPO members with their adoption. The regression co-efficients of the variables, specifically training undergone (X_8) and awareness about FPO (X_{12}), exhibited a positive effect and made a significant contribution to adoption at a 1 percent level of probability. Furthermore, the elements like age (X_1), educational status (X_3),and farming experience (X_5) were also found to have a helpful effect, significantly aiding in the acceptance of recommended wheat cultivation practices at a 5 percent level of probability. The null hypothesis (Ho) claiming no significant relationship between the independent variables and adoption was rejected as a consequence, while the alternative hypothesis asserting a considerable relationship between the independent variables and adoption was accepted.

Association and contribution of characteristics of non-members with their adoption Association of characteristics of non-members with their adoption. Among the twelve independent variables, the variable farming experience (X_9) demonstrated significance at the 1 percent probability level. Moreover, the correlation coefficients of educational status (X_3), and extension agency contact (X_{10}), were significant at the 5 percent probability level. Contribution of characteristics of non-members towards adoption .The regression coefficients of certain variables, such as educational status (X_3),and farming experience (X_9), were positively associated with the adoption level at the 5 percent level of significance. The null hypothesis (Ho) suggesting no significant relationship between the independent variables and adoption level was rejected, while the alternative hypothesis indicating a significant relationship was accepted.

Association and contribution of characteristics of FPO members and non members with their productivity. Association of characteristics of FPO members with their productivity. Among the twelve independent variables, three variables, specifically farming experience (X_9), and mass media exposure (X_{11}), showed significance at the 1 per cent probability level. The correlation coefficients of educational status (X_3), land holding (X_6), and awareness about FPO (X_{12}) were also significant at the 5 per cent probability level. Contribution of characteristics of FPO members towards crop productivity. The regression coefficient associated with the variables such as educational status (X_3), farming experience (X_9), mass media exposure (X_{11}), and awareness about FPO (X_{12}) showed positive impacts and significantly influenced productivity at a probability level of 5 per cent. Therefore, the null hypothesis (Ho) suggesting no significant relationship between the independent variables and productivity was rejected. Similarly, the alternative hypothesis proposing a significant relationship between the independent variables and crop productivity was accepted.

Association and Contribution of Characteristics of Non-Members with their Productivity**.** Association of characteristics of non-members with their productivity. Out of twelve independent variables, only one variables such as, age (X_1) were found to be significant at 1 per cent level of probability. The correlation values of occupational status (X_4), farming experience (X_9) and were found to be significant at 5 per cent level of probability. Contribution of characteristics of non-members with their crop productivity. The regression co-efficient of the variables viz., age (X_1) were found to be positive and had significantly contributed towards the productivity at 1 per cent level of probability. The variable viz., occupational status (X_4), farming experience (X_9) were found to be positive and had significantly contributed towards the productivity at 5 per cent level of probability. Hence, the null hypothesis (Ho) stating that there will be no significant relationship between the independent variables with productivity was rejected. The alternate hypothesis which stated that there will be a significant relationship between the independent variables with productivity was accepted.

Association and contribution of characteristics of FPO members and non-members with their annual net income. Association of characteristics of FPO members with their annual net income. Out of twelve independent variables only two variables

viz., age (X_1), and awareness about FPO (X_{12}) were found to be significant at 1 per cent level of probability. The correlation values of farming experience (X_9), and training programme (X_7) were found to be significant at 5 per cent level of probability. Contribution of characteristics of FPO members towards annual net income. the regression coefficient of variables namely age (X_1) were found to be positive and had significantly contributed towards the annual net income at 1 per cent level of probability. The variables such as training programme (X_7), farming experience (X_9), and awareness about FPO (X_{12}) was also found to be positive and had significantly contributed towards the annual income of FPO members at 5 per cent level of probability. Hence, the null hypothesis (Ho) stating that there will be no significant relationship between the independent variables with annual net income was rejected. The alternate hypothesis which stated that there will be a significant relationship between the independent variables with annual net income was accepted.

Association and contribution of characteristics of non-members with their annual net income Association of characteristics of non-members with their annual net income. among the twelve independent variables, only farming experience (X_9) exhibited significance at the 1 per cent probability level. Significance was also noted in the correlation values of farming experience (X_9) at the 0.05 per cent probability level. The regression coefficient of variables namely farming experience (X_9), was found to be positive and had significantly contributed towards the annual net income at 5 per cent level of probability. Hence, the null hypothesis (Ho) suggesting that there is no significant relationship between the independent variables and annual net income was rejected. Similarly, the alternative hypothesis suggesting a significant relationship between the independent variables and annual income was accepted.

Garrett's ranking method has been used for measuring the constraint experienced by the FPO member. Lack of skill was considered to be the major constraint expressed by 78 per cent of the FPO members and ranked first, were the major technical constraints. In the category of marketing constraints, Perishable nature of product was considered to be the major constraint experience by 90.00 percent of FPO members and ranked first. In the category of economic constraints lack of finance were considered to be the major constraint experienced by 56.67 percent and ranked first. Among the organizational constraints, members have insufficient time for joining the

organizational activities was consider to be the major constraints experienced by the 61.33 percent of the FPOs members and ranked first. Among the Labour related constraints major constraints experienced around 76.67 percent of FPO members face Lack of technical skills of labours and ranked first. The study finds that the constraints as experienced by the FPO members and non-members in the adoption of recommended wheat cultivation practices. Among the FPO Members, Labor shortages and the high cost of labor pose the most substantial constraints for FPO members, occupying the top rank with 76.00 percent and unexpected rainfall during the crop harvest period is ranked second at 72 percent. Non-members are faced with a significant challenge in terms of exploitation by intermediaries, standing at a remarkable 87.33 percent and Labor shortages and high expenses, which rank second at 81.33 percent, are identified as critical constraints for non-members.

This study concludes that the FPOs is playing a significant role for the development of small and marginal farmers in Uttar Pradesh in terms of increasing farmer's income, employment and production. It also plays an important role in setting up more number of FPOs across the districts of the state.

Recommendations

1. A significant proportion of members identified FPOs members were recognized as middle-aged individuals involved in agricultural activities. As, it is recommended that governmental assistance be channeled towards implementing organizations to attract young individuals residing in rural areas to participate in collective initiatives and community development projects, thus ensuring the sustainable progression of agriculture.
2. The majority of FPO members were male, highlighted the critical need to ensure equal opportunities for female farmers to actively engage in FPO activities. Organizations dedicated to resources should involve female farmers by establishing connections between Self-Help Groups (SHGs) and FPOs. Moreover, there is a requirement to boost awareness among male participants regarding women's empowerment and the blending of gender perspectives.
3. The storage and processing facilities provided by FPOs were perceived as inadequate by their members. Hence, there is an urgent requirement for the government to establish sufficient infrastructure for the storage and processing

of agricultural produce, in addition to raising awareness about the services offered by warehousing corporations.

4. The emergence of a substantial membership fee poses a significant challenge hindering farmer participation in FPOs. Therefore, the government should explore alternative measures, such as providing initial financial assistance to FPOs or reducing the registration fees. FPOs with a membership surpassing 1000 farmers are yet to receive the government subsidy of Rs one lakh, highlighting the urgency for swift government intervention in such instances.
5. To enhance farmer enrollment and emphasize the advantages of a collective approach, the government should recommend that FPOs and resource institutions organize meetings at least once every three months, enabling members to exchange the benefits they have accrued through FPO participation.
6. Despite the considerable levels of training among FPO members, the majority of training sessions were conducted within the operational areas of the FPOs themselves due to financial limitations, restricting the scope in terms of members and locations covered. Thus, it is imperative for the government to guarantee sufficient funding for FPOs to routinely arrange educational training and exposure visits for all members. A thorough assessment of FPO organizational frameworks revealed the necessity for each village within an FPO to have at least one Agriculture Business Associate (ABA) and a retail shop.
7. Regular updates on training and technical competencies are imperative for the Board of Directors (BOD), technical staff and FPO members to effectively address their capacity building needs. Hence, training institutions such as KVK, and other state-level bodies should adequately educate the management board.
8. The positive influence of functional elements such as a supportive environment, group sustainability and enhancing knowledge and adoption levels of agricultural practices within FPOs highlights the necessity for the government to formulate strategies that enhance sustainable development through efficient group dynamics.
9. The FPOs should focus more on output services rather than input services.
10. In this modern era where the internet and smart technologies are creating wonders, there should be a digitalized network for FPOs.

Limitations of the study

1. The study possesses a limited sample size, potentially impacting the generalizability of the results to all small and marginal farmers in Uttar Pradesh. The conclusion made may not fully represent the entire farmer population in the area.
2. The study is concentrated on a particular in Uttar Pradesh, which could possess distinct socio-economic and agricultural attributes. The outcomes may not be transferable to other areas with differing circumstances, thereby constraining the broader relevance of the findings.
3. The study might not fully consider ongoing or future economic and policy modifications that could impact the operations of FPOs and the socio-economic situation of farmers. External developments could influence the study's findings, making it need to incorporate these aspects in the analysis.

Future Research Areas

1. In this study, only FPOs supported by SFAC were utilized for operational and impact evaluation. Subsequent research endeavors may concentrate on examining FPOs managed a variety of entities such as NGOs, governmental bodies, and private establishments, thereby allowing for broader generalization and suggestions.
2. It is possible to carry out an extensive longitudinal analysis by incorporating a larger set of personal, demographic, and socio-economic factors along with additional group process variables serving as independent elements.
3. Certain measurement instruments utilized in the present study demonstrate potential and convenience, it is essential to evaluate their effectiveness on a broader scope and validate their reliability through comparison with other similar assessments.