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RESEARCH PAPER

Quantifying the Performance of Farmer Producers Organization: An Insight on Index Development Approach

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ABSTRACT

This research employs a comprehensive methodology to develop a performance index for Farmer Producer Organizations (FPOs) in the agricultural sector. The study identifies and prioritizes 8 key dimensions viz., governance, infrastructure, legal services, financial services, production services, capacity and skill building, marketing and technical services. The selection and weighting of these dimensions are determined through a ordinal rankings into weightage. The scoring pattern has been suggested for different sub-indicators, and that would normalized through the FPO water formula after obtaining the data from the stakeholders. The paper concludes with a detailed analysis of the weighted dimensions, offering insights into the performance of FPOs in agriculture.

HIGHLIGHTS

- Performance index developed in the present investigation has 8 dimensions & 77 sub-indicators crafted through one of the most robust Alfares approach.
- Out of 8 "capacity and skill building" dimension hold paramount importance with an 88.13 weightage
- Performance index value will range from 0-1 after normalization of the proposed score of different sub-indicators.

Keywords: Alfares approach, Dimensions, Farmer Producer Organization (FPO), Sub-indicators, Performance Index

Agriculture is not merely an economic activity; it is a cornerstone of sustenance for nations worldwide (Gorai *et al.* 2022). Within this intricate tapestry, Farmer Producer Organizations (FPOs) emerge as key players, acting as catalysts for socio-economic development in rural areas (Adhikari *et al.* 2021). The efficiency and performance of these organizations are crucial not only for the livelihoods of farmers but also to promote farmer-to-farmer extension (Sajesh *et al.* 2018). Recognizing the multifaceted nature of FPOs, this research undertakes a meticulous exploration of their performance dimensions. The selected dimensions viz., spanning governance, infrastructure, legal services, financial services, production services, capacity and skill building, marketing services, and technical services, represent a holistic view of the factors influencing FPO performance. The uniqueness of this study lies in its methodological approach. Drawing on the collective wisdom of knowledgeable judges, the dimensions are not only identified but also weighted. The Alfares approach (Alfares & Duffuaa, 2009; Lal *et al.* 2017) known for its efficacy in ordinal ranking and multi-criteria decision-making, is employed to convert rankings into nuanced weightage, capturing the relative weightage of each dimension at the pan-

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India level. The goal of the present investigation was to accomplish the following objective:

(i) To delineate and standardize comprehensive FPO performance measurement index.

MATERIALS AND METHODS

In this document, the 8 dimensions of performance index were selected using the review of literature method i.e., governance, infrastructure, legal services, financial services, production services, capacity and skill building, marketing services, technical services. The weighting of the various performance index indicators was determined by taking the judges' ranks into consideration (who were familiar with the know-how). A performa with eight dimensions whose suggested rank from 1 to 8 was mailed to or physically delivered to forty-five judges to gather replies; thirty-six of them replied within the allotted time. The Alfares approach (Alfares & Duffuaa, 2009), which was based on ordinal ranking, or cardinal weights in multi criteria decision making, was used to conver ranks into weightage in the current paper. Alfares plotted the slope values in order to ascertain the link between the slope (S_n) and the number of criterion n, in the model. He plotted the values of (S_n) and articulated a decreasing nonlinear curve which recommended an inverse model slope S_n as a function of n. Alfares created the following model by using least squares regression on S_n vs n:

$$S_n = 3.19514 + \left(\frac{37.75756}{n}\right) = 3.19514 + \left(\frac{37.75756}{8}\right) = 7.914835$$

Consequently, for each collection of n ranked dimensions of a given index (in the current paper n represents, 8 dimensions of performance index) assuming that 100 percent weightage will be given to the first rank (most important) factor, if all judges ranks that dimension as first. The percentage weight of a dimension which is ranked as r is given by,

$$Wr,\ n = 100 - S_n\ (r-1),\ \text{or}\ ,\ Wr,\ n = 100 - (3.19514 + 37.75756/n)\ (r-1),\ 1 \le r \le n,\ r \text{ and } n \text{ are integer}$$

In Alfares and Duffauaa proposed method that was published in 2009, they have shown their superiority over linear weights with fixed slope Stillwell *et al.* (1981); centroid weights Barron 1992 and geometric weights Lootsma (1999) model. While Lal *et al.* (2017) has shown its superiority over 5 different methodology viz., Garrett's (1979) methodology; Narain *et al.* (1991) methodology; Pal *et al.* (2015) methodology; Guilford (1954) method; Alkire and Foster's (2011) methodology of the Oxford Poverty and Human Development (OPHD).

Normalization of the sub-indicator scores and computation performance index

The scores has to be "normalised," or placed on the same scale value, to combine in order to merge the sub-indicators of performance index that had been based on several units of measurement. The formula provided in the FAO water working paper (Sullivan *et al.* 2006) is suggested to use in this publication to determine the scores for each sub-indicator (Lal *et al.* 2016).

$$Z\ ind_i = \frac{X_i - X_{\min}}{X_{\max} - X_{\min}}$$

Where,

$X_i - X_{max}\ X_{min}$ are the original values for indicator i, for the highest value and for the lowest value respectively.

Sullivan *et al.* (2006) proposed that the computation of the complementary score of PI included multiplying the score of a certain dimension by its corresponding weight.

$$J = n$$
$$\Sigma W_i Zind\ i_J$$
$$PI_J = \frac{j=1}{j=n}$$
$$\sum_{j=1} W_i$$

Z ind i_j = value of normalized indicator i for the j respondent

$\sum W_i$ = Summated value of weightage of all i indicator. The equation can be emphasized as:

$$PI_j = \frac{W_{Gov}\,Gov_j + W_{Inf}\,Inf_j + W_{LS}\,LS_j + W_{FS}\,FS_j + W_{PS}\,PS_j + W_{CSB}\,CSB_j + W_{MS}\,MS_j + W_{TS}\,TS_j}{W_{Gov} + W_{Inf} + W_{LS} + W_{PS} + W_{CSB} + W_{MS} + W_{TS}}$$

Where,

Gov = Governance dimension value for respondent *J*

Inf = Infrastructure dimension value for respondent *J*

LS = Legal service dimension value for respondent *J*

PS = Production service dimension value for respondent *J*

CSB = Capacity and skill building dimension value for respondent *J*

MS = Marketing service dimension value for respondent *J*

TS = Technical service dimension value for respondent *J*

RESULTS AND DISCUSSION

A summary of several research on the assessment and performance evaluation techniques for agricultural organisations, with a particular emphasis on Farmer Producer Organisations (FPOs), is given in Table 1. Analytical hierarchy process (AHP)is used by Vachnadze (2016) to rank KPIs, KRIs, and CSFs in a single hierarchy of importance, where to measure effectiveness of FPO Mukherjee *et al.* (2019) had used 7 dimensions and only 39 sub-indicators. (Amitha *et al.* 2021; Madhu *et al.* 2021 and Roy *et al.* 2022 have employed the Guilford Index to assess performance. But as propounded by Lal *et al.* 2017 Guilford index has certain weakness i.e., the inability to discriminate between the ranks. In order to properly interpret the data, researchers utilizing the Guilford Index might have to rely on a "ranks corresponding to C-scale values chart". Balance score card method was used by (Kumar *et al.* 2020) to identify key performance indicators (KPI) where no weightage was given to the indicators. **(**Navya *et al.* 2021) utilizes Principal Component Analysis (PCA) to assess FPO performance based on managerial services, farmer satisfaction, HRD, marketing, networking, and input services.

Out of 8 dimensions of performance index (Table 2 and Table 3), Capacity and skill building (88.128 with 17 sub-indicators) has the maximum

Table 1: Assessment of varied performance index vis-à-vis agriculture

Sl. No.	Authors	Methodology	Description
1	Vachnadze (2016)	AHP	Within the framework of a single hierarchy, the organization's critical success factors (CSFs), key performance indicators (KPIs), and key result indicators (KRIs) are prioritized using the Analytic Hierarchy Process (AHP) pair-wise comparisons and hierarchic composition approach.
2	Mukherjee *et al.* 2019	AHP	FPO effectiveness index 7 dimensions, 39 sub indicators. Functional efficiency, increase in income, Share in consumer rupee, Inclusiveness, Sustainability, Satisfaction, Empowerment
3	Madhu *et al.* 2021	Guilford Index	Farmer's Perception index towards input dealers 4 dimensions, 21 sub indicators. Information, Quality of services, Transfer of technology, DAESI as a para extension model
4	Kumar *et al.* 2020	Balanced score card	Performance index of producer companies 6 dimensions, 28 sub-indicators. Mission statement of FPC, Internal process/Governance, Financial indicators, Learning and growth indicators, Customer perspective, Supplier perspective
5	Amitha *et al.* 2021	Guilford index	Performance index of FPO 5 dimensions Marketing services, financial services, technical services, Networking services, Input supply services.
6	Navya *et al.* 2021	PCA	Performance index of FPO 6 dimensions Managerial services, Farmer satisfaction, HRD, Marketing services, Network linkages, Input services
7	Roy *et al.* 2022	Guilford method	FPO role performance index 7 dimensions,47 sub indicators Social mobilization, Capacity building, Production support, Marketing support, Technical support, Financial support ,legal compliances

Table 2: FPO Performance Dimensions - Judges' Ranking and Weighted Values

Rank	Gov.	Infra	L.S	CSB	FS	PS	MS	TS	W_{rn}
1	11	2	1	7	9	2	3	1	100
2	3	3	2	13	6	5	2	2	92.085
3	2	8	7	8	5	2	3	1	84.170
4	5	6	2	7	2	3	8	3	76.255
5	4	3	10	1	7	4	1	6	68.341
6	5	4	2	0	3	14	3	5	60.426
7	2	7	4	0	4	4	9	6	52.511
8	4	3	8	0	0	2	7	12	44.596
Σf	36	36	36	36	36	36	36	36	
$\Sigma W_{rn} f$	2784.772	2555.242	2396.945	3172.599	2895.58	2476.093	2381.115	2159.5	
$1/\Sigma f$	0.0278	0.0278	0.0278	0.0278	0.0278	0.0278	0.0278	0.0278	
W	77.355	70.979	66.582	88.128	80.433	68.780	66.142	59.986	
CR	**III**	**IV**	**VI**	**I**	**II**	**V**	**VII**	**VIII**	

S_n = 3.19514 + (37.75756/8) = 7.914835; M_c(Mean of W) = 72.29808; Standard Error for M_c = 3.214345; CR = Computed Rank

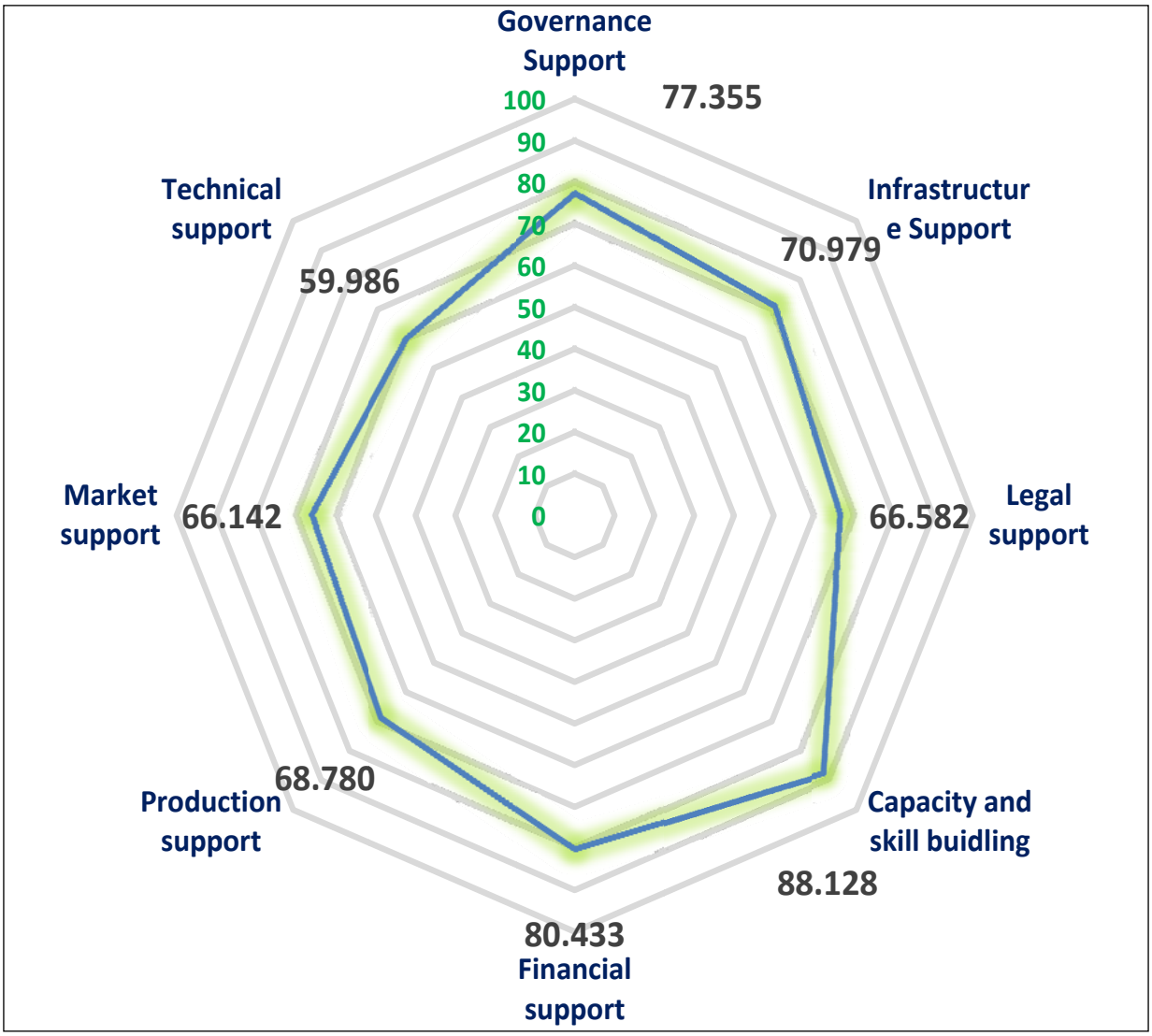

Fig. 1: Octa-dimensional FPO performance Index

Table 3: Selection of sub-indicators and scoring pattern for measuring performance of FPO

Sl. No.	Dimensions	R_w	Scoring pattern
1.	**Governance**		
(i)	FPO duration (Base year 2023)	0.917	≥5years=5 4 years=4 3 years=3 2 years=2 ≤1 years=1
(ii)	Membership of FPO **(** ≤50; Between 50 to 100 ; Between 101 to 200; Between 201 to 500; Between 501 to 1000; More than 1000)	0.852	>1000=6 501 -1000=5 201 -500=4 101-200=3 50-100=2 ≤50=1
(iii)	Composition of the FPO board (no blood relatives, representation of women, Small Farmer, and Marginal Farmer), professional background and expertise of board members, F.P.O.	0.806	Professional and expertise=5 Members from MF=4 Members from SF=3 Representation of women=2 No blood relatives=1
(iv)	The level of strategic backing provided by the promoting agency or organization to the FPO.	0.824	Fully =2 Partially=1 Not at all=0
(v)	Regular board meetings and quorum maintenance.	0.879	Yes=1 No=0
(vi)	Agenda, conversation, and decision-making quality.	0.852	Fully=2 Partially=1 Not at all=0
(vii)	Professional full-time CEO availability; non-professional part-time CEO availability; FPO members' part-time CEO availability; and part-time CEO below the tenth standard.	0.833	Professional full-time CEO availability=4 Non professional part-time CEO availability=3 FPO members' part-time CEO availability=2 Part-time CEO below the tenth standard=1
(viii)	Accessible paid personnel.	0.713	If yes,1 No=0
(ix)	Employee Experience and Training	0.824	Less experienced to high experienced=1 to 5
(x)	Transparency in different monetary transactions.	0.806	If yes,1 No,0
2.	**Infrastructure**		
(i)	Distinct office space/owned/rented	0.870	Distinct-3 Owned-2 Rented-1
(ii)	Other infrastructure (Computers, Printers ,Laptop ,Scanner)	0.778	Fully-2 Partially-1 Not at all-0

(iii)	Infra-structure for food processing.	0.806	Fully-2 Partially-1 Not at all-0
(iv)	Soil testing based nutrient recommendation.	0.75	Yes=1 No=0
(v)	Provide value addition facility.	0.861	If yes,1 No,0
3	**Legal Support**		
(i)	Encourages the use of Farmer's Producer Groups (FPGs) as a foundational element of FPOs.	0.852	Yes=1 No=0
(ii)	Equitable ownership of corporate shares among members.	0.824	Yes=1 No=0
(iii)	Distribute the patronage bonus to the company's current participants.	0.796	Yes=1 No=0
(iv)	Appropriate policy framework for financing FPGs under the purview of FPC in accordance with their needs.	0.787	Yes=1 No=0
(v)	Encourages appropriate upkeep of the company's records, balance sheets, and profile, among other things.	0.824	Yes=1 No=0
(vi)	Appropriate handling of the business's shared assets, such as land, water resources, and agricultural equipment	0.815	Fully appropriated=2 Partially appropriated=1 Not appropriated=0
4	**Capacity and skill building**		
(i)	Arranges several programs for members' awareness regarding different agricultural practices.	0.861	No awareness=0 Partial awareness=1 Full awareness=2
(ii)	Arranges member exposure trips to highlight successful FPOs.	0.899	Yes=1 No=0
(iii)	Demonstrates new technologies and agricultural practices to the members.	0.879	Yes=1 No=0
(iv)	Developing skills in various livelihood activities for diversifying income.	0.778	Yes=1 No=0
(v)	Training of board members (a) All members are trained (b) >80% of board members trained (c) >70% of board members trained (d) >50% of board members trained (e) >10% of board members trained (f) <10% of board members trained	0.861	<10%=1 >10%=2 >50%=3 >70%=4 >80%=5 100%=6
(vi)	Advisory assistance to enhance member farmers' market orientation.	0.797	Fully assisted=2 Partially assisted=1 Not at all assisted=0
(vii)	Arrange exposure trips to highlight successful FPOs.	0.935	
5	**Financial support**		
(i)	Availability of financial assistance from lending institutions	0.935	Regularly=2 Occasionally=1 Never=0

(ii)	Turnover (Annual) (₹ lakh) (≥50 LAKHS; Between 25 to 49 lakhs; Between 10 to 24 lakhs; Less than 10 lakhs; No business)	0.806	≥50lac=4 25-49lac=3 10-24 lac =2 <10 lac=1 No business=0
(iii)	Percentage of all participants that contribute to share capital (>90%;>70%;>60%;≥50%;<50%)	0.861	>90%=5 >70%=4 >60%=3 ≥50%=2 <50%=1
(iv)	Total amount of share capital received (in rupees) (>6 lakh; 3-5 lakh; <3 lakh)	0.843	≥6 lac=3 3-5lac=2 <3 lac=1
(v)	Encouragement of a savings mindset among participants.	0.815	Yes=1 No=0
(vi)	Knowledge of official credit sources.	0.815	Yes=1 No=0
(vii)	Timely payment following the purchase of products from the farmers.	0.861	On time=2 Lag payment=1 Delayed=0
(viii)	Credit for farm mechanization	0.833	Regularly=2 Occasionally=1 Never=0
(ix)	Members' loan disbursements without collateral.	0.861	Yes=1 No=0
(x)	Encourages ties between lending institutions and the FPO to guarantee access to loans at market rates.	0.861	Yes=1 No=0
(xi)	Utilizes the advantages of several government initiatives for the well-being of farmers.	0.861	Yes=1 No=0
(xii)	Creating a bankable business plan	0.843	Yes=1 No=0
(xiii)	Mobilizes the company's share capital	0.843	Yes=1 No=0
(xiv)	Establishment of market connections with corporate buyers, processors, etc.	0.824	Fully =2 Partially=1 Not at all assisted=0
(xv)	Members are depending on local markets.	0.824	Regularly=2 Occasionally=1 Never=0
(xvi)	Managing funds for different types of development.	0.731	Yes=1 No=0
6	**Production support**		
(i)	Members' timely acquisition of input	0.759	Delayed=1 On time=0
(ii)	Acquisition of Quality Inputs	0.879	Poor=0 Average quality=1 Better quality=2

(iii)	Purchasing materials in bulk at a lower cost	0.833	Yes=1 No=0
(iv)	Timely distribution of inputs (such as seeds, fertilizer, animal feed, etc.) among participants.	0.833	Delayed=1 On time=0
(v)	Promotes community-based irrigation system	0.852	Yes=1 No=0
(vi)	Lowers the total cost of production.	0.787	Regularly=2 Occasionally=1 Never=0
(vii)	Consultancy services on standard production procedures to preserve produce quality	0.852	Yes=1 No=0
(viii)	Advisory services in risk management.	0.824	Regularly=2 Occasionally=1 Never=0
7	**Market support**		
(i)	Purchasing products in bulk from members	0.815	Yes=1 No=0
(ii)	Collection of produce from farm gate	0.861	Yes=1 No=0
(iii)	Making arrangements for the market's produce transportation facility	0.843	Yes=1 No=0
(iv)	Prompt dissemination of information on current market trends and prices	0.898	Regularly=2 Occasionally=1 Never=0
(v)	Directly market the produce by channelizing it to the mandis .	0.898	Yes=1 No=0
(vi)	Establishes a single point of contact for members to market their products.	0.843	Yes=1 No=0
(vii)	Basic processing, such as cleaning, drying, and grading the produce	0.806	Yes=1 No=0
(viii)	Produce standardization, labeling, packaging, and brand development.	0.815	Yes=1 No=0
(ix)	Eliminating the intermediary from the value chain	0.852	Yes=1 No=0
(x)	Establishing appropriate market connections	0.879	Yes=1 No=0
(xi)	Marketing expenses related to transportation are reduced.	0.852	Yes=1 No=0
(xii)	Obtaining a higher price for the produce.	0.861	Less price=0 Somewhat more=1 Higher =2
(xiii)	Mitigation of market hazards	0.806	Yes=1 No=0
(xiv)	Creating connections for marketing purposes with businesses or government agencies	0.815	Yes=1 No=0
(xv)	Encourages trade of members' produce on online marketplaces such as e-NAM and NCDX	0.778	Yes=1 No=0

(xvi)	Make sure producer members don't engage in distressed sales	0.861	Yes=1 No=0
8	**Technical Support**		
(i)	Percentage of members availing services (input supply/ extension and other services to members) (Over 75%; Over 50%; Over 25%; Over 10%; Less than 10%)	0.824	>75%=5 >50%=4 >25%=3 >10%=2 <10%=1
(ii)	Advice on package of practice of crops as per demand.	0.852	Regularly=2 Occasionally=1 Never=0
(iii)	Follow package of practice of crops to maximize input utilization.	0.815	Yes=1 No=0
(iv)	Custom hiring services for farm machineries.	0.824	Yes=1 No=0
(v)	Assistance with crop protection advice	0.843	Yes=1 No=0
(vi)	Providing weather advisory services	0.806	Yes=1 No=0
(vii)	Advisory services related to crop planning as per requirement.	0.797	Yes=1 No=0
(viii)	Operating as a distributor of input companies	0.778	Yes=1 No=0
(ix)	ICT based agricultural platform	0.787	Yes=1 No=0
Relative weightage (R_w) of each sub indicator is more than 0.7			

weightage, followed by Financial support (80.433 with 8 sub indicators), governance (77.355 with 10 sub indicators), infrastructure (70.979 with 5 sub indicators), capacity and skill building (68.780 with 6 sub indicators), legal service (66.582 with 6 sub indicators), marketing service (66.142 with 16 sub indicators), technical service (59.986 with 9 sub indicators). In this approach, the maximum possible score of weightage of the Rank 1 dimension is 100, so there is no loss of maximum possible score.

A thorough assessment of the literature was used to determine the statements that corresponded to each specific sub-indicator of the performance index. The final selection of statements for each dimension was determined by the judges based on their recommendations.

CONCLUSION

The per capita income of Indian farmers is less than the actual average income of non-Agriculture populace thus farmer producers organization can play a key role in empowering small and marginal farmers by enhancing their capacity and skill. By reviewing all the indexes FPO performance index is considered to be one of the most comprehensive and holistic index to quantify the performance of FPO. The findings highlight the critical importance of capacity and skill building, financial support, and governance in determining the effectiveness of FPOs. These dimensions, along with others, form a robust framework for evaluating and thus improving the performance of FPOs, ultimately contributing to the socio-economic development of rural areas. The present investigation concludes that there are several research on FPO to measure the performance. But most of the researches have certain flaws in terms of methodology, and dimensions or it is not holistic. So, this methodological approach gives a more reliable way to measure performance through its 8 dimensions and 77 sub indicators, following the Alfares and Duffauaa method and that would later be normalized through FAO water

method after receiving the response from concerned staakeholders.

REFERENCES

Adhikari, A., Pradhan, K. and Reddy, S. 2021. Factors associated with the sustainability of farmers' producer organizations (FPOs). *Indian Res. J. Ext. Edu.,* **21**(4): 145-148.

Alfares, H.K. and Duffuaa, S.O. 2009. Assigning cardinal weights in multi-criteria decision-making based on ordinal ranking. *Journal of Multi-criteria Decision Analysis,* **15**(1): 125-133.

Alkire, S. and Foster, J. 2011. Counting and multidimensional poverty measurement. *Journal of Public Economics,* **95**(7-8): 476-487.

Amitha, C.D., Savitha. B., Sudha Rani, V. and Laxminarayana, P. 2021. Evaluation of performance of Farmer Producer Organizations (FPOs) in Medak District of Telangana. *Indian Res. J. Ext. Edu.,* **21**(4): 24-29.

Barron, F.H. 1992. Selecting a best multi-attribute alternative with partial information about attribute weights. *Acta Psychologica,* **80**(3): 91 - 103.

Garrett, H.E. 1979. Statistics in psychology and education. Sixth edition, Valdis, Feffer and Simons Ltd., Mumbai, India.

Gorai, S.K., Wason, M., Padaria, R.N., Rao, D.U.M., Paul, S. and Paul, R.K. 2022. Factors contributing to the stability of the farmer producer organisations: A study in West Bengal. *Indian Journal of Extension Education,* **58**(2): 91-96.

Guilford, J.P. 1954. *Psychometric Methods.* Tata Mc-Graw Hill Publishing Company Ltd. Bombay-New Delhi.

Kumar, R., Pandey, A., Kumar, S. and Sivaramane, N. 2020. Identifying key performance indicators (KPIs) for farmer producer companies in India. *Indian Journal of Economics and Development*, **16**(4): 591-597.

Lal, S., Kadian, K.S., Jha, S., Abebe, W. and Lokhande, J.P. 2017. A methodological pathway to quantify livelihood security of the farmers: A confluence of alfares and FAO approach to frame an index. *Indian Journal of Economics and Development*, **13**(2a): 772.

Lal, S.P., Mohammad, A., Ponnusamy, K. and Kale, R.B. 2016b. A methodological pathway to quantify perception of the participants of animal fairs with relevance national dairy *mela* at NDRI Karnal, India. *Journal of Animal Research,* **6**(3): 437-444.

Lootsma, F.A. 1999. *Multi-criteria decision analysis via ratio and difference judgment.* Kluwer Academic Publishers, Dordecht.

Madhu, L., Kadian, K.S., Meena, B.S., Manjunath, K. and Meena, D. 2021. Development of an index to measure the farmers' perception towards input dealers as para extension workers. *Indian Res. J. Ext. Edu.,* **21**(4): 92-98.

Mukherjee, A., Singh, P., Rakshit, S., Priya, S., Burman, R.R., Shubha, K., Sinha, K. and Nikam, V. 2019. Effectiveness of poultry based Farmers' Producer Organization and its impact on livelihood enhancement of rural women. *Indian Journal of Animal Sciences,* **89**(10).

Narain, P., Rai, S.C. and Sarup, S. 1991. Statistical evaluation of development on socio-economic front. *Journal of Indian Society of Agricultural Statistics,* **43**(3): 329-345.

Navya, D. 2022. A Study on Performance of Farmer Producer Organisations in Telangana state. *Indian Research Journal of Extension Education*, **22**(4): 112–117.

Pal, V., Shiyani, R.L. and Ardeshn, N.J. 2015. Dynamics of agricultural development in Gujarat a district level analysis. *Indian Journal of Economics and Development,* **1**(1): 351-358.

Roy, H., Jirli, B. and Maji, S. 2022. Measuring the Role Performance of Farmer Producer Companies: An Index Development Perspective. *Indian Research Journal of Extension Education,* **22**(3): 49-57.

Sajesh, V.K., Padaria, R.N. and Sadamate, V.V. 2018. Pluralism in agricultural extension in India: imperatives and implications. *Economic Affairs*, *63*(4): 1017-1025.

Stillwell, W.O., Seaver, D.A. and Edwards, W. 1981. A comparison of weight approximation techniques in multi attribute utility decision making. *Organizational Behavior and Human Performance,* **28**(1): 62-77.

Sullivan, C.A., Cohen, A., Faures, J.M. and Santini, G. 2006. The rural water livelihoods index, working paper of FAO water. Retrieved on August 5, 2015 from www.fao.org. World Economic Forum. (2016). *The Global Risks Report 2016*,77811th Edition of World Economic Forum, framework of the Global Competitiveness and Risks Team, Geneva. Retrieved on November 10, 2016 from bttp,//wef.cb /risks2016

Vachnadze, R.G. 2016. Prioritization of performance measures using analytic hierarchy process. *International Journal of the Analytic Hierarchy Process*, **8**(3).