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Perceived effectiveness of millet value chains: An assessment among farmers and other stakeholders

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Abstract

The study was conducted in Telangana state to assess the perceived effectiveness of millet value chains among farmers and other stakeholders. An ex-post-facto research design was adopted with 120 respondents, comprising 90 millet farmers and 30 other stakeholders associated with Commodity-based, NGO-based and FPO-based value chains for jowar and finger millet. Data were analysed using frequency, percentage, mean, standard deviation and ANOVA. Effectiveness was assessed across seven dimensions, namely value-chain governance, mode of agreement, power, decision making, shifting of roles, bargaining power and coordination. The FPO-based value chain recorded a higher proportion in the high category for power (50.00%), decision making (50.00%), shifting of roles (50.00%), bargaining power (50.00%) and coordination (46.67%). It also showed greater formalisation of agreements, with legal agreements accounting for (83.33%). Overall, the FPO-based value chain recorded the highest mean effectiveness score (82.73), followed by the NGO-based (76.00) and Commodity-based (70.10) value chains, with a significant difference among the three value chains ($F = 6.988$). The findings indicate that the FPO-based value chain performed comparatively better due to stronger stakeholder participation, decision making, bargaining power and coordination. The results highlight the role of collective organisation and institutional linkages in improving the effectiveness of millet value chains.

Keywords: Millets, value chain effectiveness, value-chain governance, stakeholder coordination, FPOs, decision making, Telangana

Introduction

Millets have gained renewed importance in Indian agriculture because of their suitability to dryland conditions, nutritional value and potential contribution to food and nutritional security. Rainfed areas account for nearly 55 per cent of India's net sown area and about 85 per cent of the area under coarse cereals, highlighting the relevance of crops such as millets in resource-constrained production systems. (Madhusudhana *et al.* 2025)^[4].

India is a major contributor to the global millet economy, accounting for 38.40 per cent of global millet production during 2022-23 (MOA & FW, 2022)^[3]. The increasing policy and market attention towards millets has encouraged greater emphasis on processing, value addition and market development. Consequently, millet value chains are evolving from largely traditional systems towards more organized chains involving farmers, FPOs, processors, wholesalers, retailers and exporters.

However, the millet sector continues to face fragmented supply systems, high transaction costs, inadequate processing infrastructure and weak market linkages, which may constrain efficient movement of produce and value realization by farmers. The effectiveness of a value chain

therefore depends not only on the activities performed by individual actors but also on the coordination and linkages among them. Since farmers and other stakeholders occupy different positions within the chain, their experiences and perceptions can provide important insights into how effectively the existing arrangements function.

Assessing perceived effectiveness is particularly relevant in the context of emerging millet value chains, where aggregation, processing, value addition and formal market linkages are becoming increasingly important. Such an assessment can help identify areas requiring improvement and provide a basis for strengthening coordination and market performance. Therefore, the present study was undertaken to assess the effectiveness of selected millet value chains as perceived by farmers and other stakeholders.

2. Material and Methods

The study was conducted in Telangana using an ex-post-facto research design. Sanga Reddy district was purposively selected based on its millet production and availability of processing infrastructure, followed by purposive selection of three mandals with substantial millet cultivation and value-chain activities. Three villages were randomly selected from

each selected mandal. The study covered 120 respondents, comprising 90 millet farmers and 30 other stakeholders involved in the millet value chains. Jowar and finger millet were selected as the study commodities and three major value chains, namely Commodity-based, NGO-based and FPO-based value chains, were identified through preliminary assessment, field observations and interaction with key informants and stakeholders. Perceived effectiveness was assessed in terms of value-chain governance, mode of agreement, power, decision making, shifting of roles, bargaining power and coordination using a structured interview schedule developed for the study. Responses were recorded on a three-point continuum with appropriate reverse scoring for negative statements and scores were summed to obtain the effectiveness scores. The data were analysed using frequency, percentage, mean, standard deviation and ANOVA to assess and compare the perceived effectiveness of the selected value chains.

3. Results and Discussion

The effectiveness of the selected millet value chains was assessed across seven dimensions, namely value-chain governance, mode of agreement, power, decision making, shifting of roles, bargaining power and coordination. The three value chains considered for comparative assessment were the Commodity-based, NGO-based and FPO-based value chains. The results for each dimension are presented and discussed below.

3.1 Value-chain governance

It can be seen from Table 1 that the perceived effectiveness of value-chain governance varied across the three selected value chains. In the Commodity-based value chain, the highest proportion of respondents belonged to the medium category (44.00%), followed by high (36.00%) and low (20.00%). Similarly, in the NGO-based value chain, the majority of respondents were in the medium category

(45.00%), followed by high (32.50%) and low (22.50%). In the FPO-based value chain, the highest proportion of respondents was observed in the high category (40.00%), followed by medium (33.33%) and low (26.67%). The comparatively higher proportion of respondents under the high category in the FPO-based value chain indicates relatively better governance arrangements among the stakeholders. These findings were in accordance with the results of Bhavani (2023)^[1].

Table 1: Distribution of respondents according to perceived effectiveness of value-chain governance (n=120)

S. No.	Category	Commodity-based (n=50)		NGO-based (n=40)		FPO-based (n=30)	
		f	%	f	%	f	%
1	Low	10	20.00	9	22.50	8	26.67
2	Medium	22	44.00	18	45.00	10	33.33
3	High	18	36.00	13	32.50	12	40.00
	Total	50	100.00	40	100.00	30	100.00

3.2 Mode of agreement

The results presented in Table 2 indicate that the mode of agreement differed across the selected value chains. In the Commodity-based value chain, written agreements constituted the major form (60.00%), followed by oral agreements (40.00%). The NGO-based value chain also showed a predominance of written agreements (75.00%), while oral agreements accounted for (25.00%). The FPO-based value chain was predominantly characterised by legal agreements (83.33%), indicating a higher degree of formality in agreements among stakeholders, followed by written agreements (16.67%). The greater prevalence of formal agreements in the FPO-based value chain indicates a relatively more institutionalised arrangement among stakeholders. These findings were in accordance with the results of Bhavani (2023)^[1].

Table 2: Distribution of respondents according to mode of agreement in the selected millet value chains (n=120)

S. No.	Category	Commodity-based (n=50)		NGO-based (n=40)		FPO-based (n=30)	
		f	%	f	%	f	%
1	Oral agreement	20	40.00	10	25.00	0	0.00
2	Written agreement	30	60.00	30	75.00	5	16.67
3	Legal agreement	0	0.00	0	0.00	25	83.33
	Total	50	100.00	40	100.00	30	100.00

3.3 Power

As evident from Table 3, the perceived level of power also differed among the selected value chains. In the Commodity-based value chain, the largest proportion of respondents fell under the low category (42.00%), followed by medium (30.00%) and high (28.00%). The NGO-based value chain was predominantly medium (50.00%), while 37.50% and 12.50% of respondents were under low and high categories, respectively. In contrast, the FPO-based value chain recorded the highest proportion in the high category (50.00%), followed by medium (36.67%) and low (13.33%). The relatively higher power perceived in the FPO-based chain may be associated with greater institutional organisation and participation of stakeholders in chain-related activities. These findings were in accordance with the results of Bhavani (2023)^[1].

Table 3: Distribution of respondents according to perceived power in the selected millet value chains (n=120)

S. No.	Category	Commodity-based (n=50)		NGO-based (n=40)		FPO-based (n=30)	
		f	%	f	%	f	%
1	Low	21	42.00	15	37.50	4	13.33
2	Medium	15	30.00	20	50.00	11	36.67
3	High	14	28.00	5	12.50	15	50.00
	Total	50	100.00	40	100.00	30	100.00

3.4 Decision making

It can be seen from Table 4 that the extent of decision-making involvement differed among the selected value chains. In the Commodity-based value chain, the majority of respondents were in the medium category (44.00%), followed by low (30.00%) and high (26.00%). The NGO-based value chain

recorded a higher proportion of respondents in the medium category (47.50%), followed by high (37.50%) and low (15.00%). In the FPO-based value chain, half of the respondents belonged to the high category (50.00%), while 30.00% and 20.00% were in the medium and low categories, respectively. The greater representation in the high decision-making category under the FPO-based value chain suggests stronger stakeholder involvement in chain-related decisions. These findings were in accordance with the results of Bhavani (2023)^[1].

Table 4: Distribution of respondents according to perceived decision-making effectiveness (n=120)

S. No.	Category	Commodity-based (n=50)		NGO-based (n=40)		FPO-based (n=30)	
		f	%	f	%	f	%
1	Low	15	30.00	6	15.00	6	20.00
2	Medium	22	44.00	19	47.50	9	30.00
3	High	13	26.00	15	37.50	15	50.00
	Total	50	100.00	40	100.00	30	100.00

3.5 Shifting of roles

The findings presented in Table 5 suggest that the extent of shifting of roles varied across the selected value chains. The Commodity-based value chain recorded the highest proportion of respondents in the low category (50.00%), followed by medium (30.00%) and high (20.00%). In the NGO-based value chain, half of the respondents were in the medium category (50.00%), followed by low (37.50%) and high (12.50%). In contrast, the FPO-based value chain recorded the highest proportion in the high category (50.00%), followed by medium (30.00%) and low (20.00%). This indicates greater involvement of FPO-linked stakeholders in performing roles beyond their conventional functions within the value chain. These findings were in accordance with the results of Bhavani (2023)^[1].

Table 5: Distribution of respondents according to shifting of roles in the selected millet value chains (n=120)

S. No.	Category	Commodity-based (n=50)		NGO-based (n=40)		FPO-based (n=30)	
		f	%	f	%	f	%
1	Low	25	50.00	15	37.50	6	20.00
2	Medium	15	30.00	20	50.00	9	30.00
3	High	10	20.00	5	12.50	15	50.00
	Total	50	100.00	40	100.00	30	100.00

3.6 Bargaining power

It could be observed from Table 6 that bargaining power of respondents was comparatively stronger in the FPO-based value chain. In the Commodity-based value chain, the highest proportion of respondents belonged to the low category (38.00%), followed by medium (36.00%) and high (26.00%). In the NGO-based value chain, the majority were in the medium category (45.00%), followed by high (32.50%) and low (22.50%). The FPO-based value chain recorded the highest proportion in the high category (50.00%), followed by medium (30.00%) and low (20.00%). The relatively stronger bargaining position in the FPO-based value chain may be associated with collective organisation and greater

negotiation capacity. These findings were in accordance with the results of Bhavani (2023)^[1].

Table 6: Distribution of respondents according to perceived bargaining power (n=120)

S. No.	Category	Commodity-based (n=50)		NGO-based (n=40)		FPO-based (n=30)	
		f	%	f	%	f	%
1	Low	19	38.00	9	22.50	6	20.00
2	Medium	18	36.00	18	45.00	9	30.00
3	High	13	26.00	13	32.50	15	50.00
	Total	50	100.00	40	100.00	30	100.00

3.7 Coordination

The distribution presented in Table 7 reveals that coordination was comparatively stronger in the FPO-based value chain. In the Commodity-based value chain, the largest proportion of respondents belonged to the low category (40.00%), followed by medium (36.00%) and high (24.00%). In the NGO-based value chain, the majority were in the medium category (45.00%), followed by high (35.00%) and low (20.00%). The FPO-based value chain recorded the highest proportion in the high category (46.67%), followed by medium (33.33%) and low (20.00%). The greater representation in the high coordination category suggests comparatively stronger interaction and cooperation among stakeholders in the FPO-based chain. These findings were in accordance with the results of Bhavani (2023)^[1].

Table 7: Distribution of respondents according to perceived coordination in the selected millet value chains (n=120)

S. No.	Category	Commodity-based (n=50)		NGO-based (n=40)		FPO-based (n=30)	
		f	%	f	%	f	%
1	Low	20	40.00	8	20.00	6	20.00
2	Medium	18	36.00	18	45.00	10	33.33
3	High	12	24.00	14	35.00	14	46.67
	Total	50	100.00	40	100.00	30	100.00

3.8 Overall effectiveness

The results in Table 8 demonstrate that the overall perceived effectiveness varied among the three selected millet value chains. In the Commodity-based value chain, the medium category accounted for the highest proportion (44.00%), followed by high (36.00%) and low (20.00%). The NGO-based value chain was predominantly in the medium category (57.50%), followed by high (27.50%) and low (15.00%). In contrast, the FPO-based value chain recorded the highest proportion in the high category (43.33%), followed by medium (30.00%) and low (26.67%). These findings were in accordance with the results of Bhavani (2023)^[1].

The mean scores presented in Table 9 further indicate that the FPO-based value chain recorded the highest mean effectiveness score (82.73), followed by the NGO-based (76.00) and Commodity-based value chains (70.10). The ANOVA revealed a significant difference among the three value chains, with the calculated F-value (6.988) exceeding the tabulated value (3.07) at the 5% level. Thus, the FPO-based value chain exhibited comparatively higher overall perceived effectiveness. These findings were in accordance with the results of Bhavani (2023)^[1].

Table 8: Overall perceived effectiveness of the selected millet value chains (n=120)

S. No.	Category	Commodity-based (n=50)		NGO-based (n=40)		FPO-based (n=30)	
		f	%	f	%	f	%
1	Low	10	20.00	6	15.00	8	26.67
2	Medium	22	44.00	23	57.50	9	30.00
3	High	18	36.00	11	27.50	13	43.33
	Total	50	100.00	40	100.00	30	100.00

Table 9: Mean effectiveness scores of the selected millet value chains

S. No	Category	Mean values			F Cal value	F tab
		Commodity-based	NGO-based	FPO-based		
1	Effectiveness	70.10	76.00	82.73	6.988*	3.07

*Significant at 5 per cent level of probability

4. Conclusion

The study revealed that the effectiveness of millet value chains varied across the selected value-chain arrangements. The FPO-based value chain emerged as comparatively more effective, particularly in terms of stakeholder power, decision-making, shifting of roles, bargaining power and coordination. Its relatively organized structure and collective functioning appeared to facilitate stronger participation and interaction among chain actors. The findings highlight the importance of organizational structure, collective action, formal linkages and effective coordination in improving the functioning of millet value chains. Strengthening FPOs and promoting better linkages among farmers and other value-chain stakeholders can contribute to more effective and farmer-responsive millet value chains.

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