

APMC (AGRICULTURE PRODUCE MARKET COMMITTEE) WOMEN'A KNOWLEDGE IN POST-HARVEST ACTIVITIES OF DRY CHILLI

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(Received 6 December, 2022; Accepted 23 January, 2023)

Key words : APMC, Women labourers, Knowledge, Byadgi APMC, Guntur APMC.

Abstract—Chilli (*Capsicum annuum*) is the universal spice in India cultivated almost throughout the country. Andhra Pradesh is known for its spicy Guntur chilli which exports premium quality chilli and is in a high demand all throughout the world for its extreme spiciness. Guntur Mirchi Yard" is the major trade area for Guntur chilli in Andhra Pradesh which is Asia's largest dried red chilli market. Byadgi chilli of Karnataka is equally famous as that of Guntur but this variety is prized for its colour. The current study was piloted in Karnataka and Andhra Pradesh which are unveiled as the prominent chilli growing states for the period of the year 2019-2020. Overall 120 women labourers from both the expand APMCs were selected through purposive random sampling technique. Personal interview method was used to collect the data and analysed through frequency, percentage, correlation and t-test. Results from the study indicated that, with regard to overall knowledge index, majority (86.67%) of Byadgi and three fourth of (73.33%) Guntur APMC women labourers belonged to medium level of knowledge category. Results from the study also indicated that, there was no significant difference in knowledge of Byadgi and Guntur APMC labourers (1.167NS).

INTRODUCTION

Women's role and contribution is no longer a matter of contention because in rural India the percentage of women who depend for their livelihood on agriculture and allied activities is more than 80.00 per cent. In majority of the developing nations including India women play a vital role in post-harvest activities which varies with the different crops and regions according to Sangwan *et al.* (1990); Goyal *et al.* (2003); Slathia *et al.* (2015) and Patil (2015).

Dry chilli production in Andhra Pradesh and Karnataka: Chilli has become one of India's most popular commercial crops, and it is grown in almost every state and union territory. Andhra Pradesh stands first and Karnataka stands second in position in area of chilli cultivation. These two states produce 14.00 percent of the country's output (Patil and Nagnur, 2015). Andhra Pradesh is known for its spicy Guntur chilli which exports premium quality chilli and is in a high demand around the world for its extreme spiciness. "Guntur Mirchi Yard" (Guntur

APMC) is the major trade area for Guntur chilli in Andhra Pradesh which is Asia's largest dried red chilli market. Byadgi chilli of Karnataka is equally famous as that of Guntur but this variety is prized for its colour rather than spiciness. Karnataka's Byadgi APMC is also famous for premium export quality chilli. Byadgi chilli market (Byadgi APMC) is the hub for the less spicy and red coloured Byadgi variety of chilli in Haveri district.

Both these chillies have been assigned the geographical indication tags. Both these markets are vibrant and chilli yards are full of activities especially those dealing with post-harvest activities both at field level and at the chilli markets (APMCs). Women perform chilli cultivation activities such as, sowing/ transplanting to harvesting and various post-harvest activities such as picking, grading, drying, packing etc.. Women at APMCs do cleaning, drying till it reaches the desired moisture content, packing, storing, marketing etc.. Studies have shown that women need to be equipped with knowledge (Patil and Nagnur, 2015) for better work efficiency and safety.

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A recent report (Hindusthan Times, April 22, 2020) has highlighted the plight of migrant labourer families from Chhattisgarh, Odisha who work as labourers in chilli fields during harvesting and post-harvest activities in Telangana and parts of Andhra Pradesh. According to official estimates, around 10,000 workers, majority of them from Chhattisgarh do post-harvest work in chilli fields spread in 10,000-12,000 acres along the Godavari river belt in Vajedu and Venkatapuram mandals and in other parts of Andhra Pradesh and Telangana states. They migrate to these parts during the chilli crop period in February and March to earn their livelihood. But during the study year, as the crop almost reached the harvesting stage, the corona virus pandemic started and thousands of labourers had to hurriedly return to their places which has affected the post-harvesting activities at Chilli fields.

METHODOLOGY

The present study was piloted in Karnataka and Andhra Pradesh which are unveiled as the major chilli cultivating states for the duration of the year 2019-2020. The two states were purposefully chosen since Haveri district is India's leading producer and exporter of most sorts of chiles and chilli powder. Byadgi chilli is well-known all around the world. The major trade location for Byadgi chilli is known as "Byadgi APMC Yard," and it is India's second biggest dried red chilli market. Guntur district in Andhra Pradesh was chosen to compare both Karnataka and Andhra Pradesh since Guntur chiles are well-known worldwide. The "Guntur Mirchi Yard," Asia's largest dried red chilli market, is the main trade area for Guntur chilli. A total of 120 women labourers (60 Guntur APMC, 60 Byadgi APMC women labourers) were selected purposively for the study. Personal interview method was used to collect the data and analysed through frequency, percentage, correlation, t-test. A teacher made knowledge test was designed to evaluate APMC women's knowledge of dry chilli post-harvest operations. Statements on knowledge concerning dry chilli post-harvest activities were developed by interviewing topic specialists in both states and referring to the package of practises book. The knowledge statements were again grouped under different dimensions. These knowledge statements were tested – pre in a non-sample area. Finally, 30 knowledge statements for women labourers working in APMC were determined based on the

testing - prior experience. The women were asked knowledge-related questions. Through interview schedule for correct answer 1 score was given and 0 to the wrong answer. Hence the minimum and maximum scores ranged from 0 – 30 for APMC workers. The knowledge index was calculated by using the following formula based on the individual respondent scores.

$$\text{Knowledge index} = \frac{\text{Scores obtained}}{\text{Obtainable score}} \times 100$$

Furthermore, responses were classed as low, middle, or high based on the class intervals shown below.

APMC women labourers knowledge level

$$\text{Class interval} = \frac{\text{Maximum scores} - \text{Minimum scores}}{3} = 10$$

Women labourers were classified based on the overall scores obtained by each participant.

Category	Range (APMC)
Low	Up to 10
Medium	11 – 20
High	21 – 30

RESULTS AND DISCUSSION

APMC women labourers knowledge in both the districts on various dimensions of post-harvest activities of dry chilli was studied and results are presented in Table 1 and detailed as below.

Women labourers in both APMCs have complete knowledge of the appropriate varieties of dry chilli. All female labourers from both APMCs had knowledge on popular dry chilli varieties. The reason may be, both the Byadgi and Guntur chilli are world famous and known by common people. Hence, the women labourers working in APMCs chilli post-harvest activities are aware of these varieties because of their work experience and knowledge gained while performing post-harvest activities. As shown in Table 1 with respect to knowledge on drying methods and standard moisture content, hundred per cent of both APMC women laborers had knowledge of traditional sun drying. Only (03.33 %) of Byadgi APMC and (10.00%) of Guntur APMC women laborers know about mechanical drying. Whereas, not any one of the women laborers from both the APMCs had awareness about solar drying and standard

Table 1. Knowledge of APMC women labourers on post-harvest activities of dry chilli

		n = 120		
Sl. No.	Knowledge Statements	Byadgi APMC (n1=60) F (%)	Guntur APMC (n2=60) F (%)	Total (n=120) F (%)
A	Recommended variety for dry chilli			
1.	Mention the variety recommended for Haveri district/ Guntur district under dry chilli?	60 (100)	360 (100)	120 (100)
	Knowledge index of recommended variety	100	100	100
B	Drying methods and standard moisture content in dry chilli			
1	Traditional sun drying	60(100)	60(100)	120(100)
2	Solar drying	-	-	-
3	Mechanical drying	02(03.33)	06(10.00)	08(06.66)
4	Mention standard moisture content in dry chilli?	-	-	-
	Knowledge index of drying methods and standard moisture content	25.83	27.50	26.66
C	Weighing and Bagging of dry chilli			
1	Bagging protects quality and quantity of dry chilli	60(100)	60(100)	120 (100)
2	Bagging prevents spoilage during transportation and storage	40(66.66)	46(76.66)	86(71.66)
3	Bagging protects from adverse effects from outside (weather, chemical, wrong handling etc.)	34(56.66)	38(63.33)	72(60.00)
4	Bagging materials should be biodegradable	12(20.00)	16(26.66)	28(23.33)
5	Others (It must be suitably lined with moisture proof lining)	06(10.00)	14(23.33)	20(16.66)
6	Mention standard weight for bagging of dry chilli at APMC yard?	60(100)	60(100)	120 (100)
	Knowledge index of weighting and bagging	58.88	64.99	61.94
D	Criteria for grading and sorting of dry chilli			
1	Based on colour, size, moisture and stalk of the pods	60(100)	60(100)	120(100)
2	Seed and fruit (pod) ratio	08(13.33)	14(23.33)	22(18.33)
3	Seed size and hardness	16(26.66)	22(36.66)	38(31.66)
4	Pungency	06(10.00)	10(16.66)	16(13.33)
	Knowledge index on criteria for grading and sorting of dry chilli	37.49	44.16	40.83
E	Different methods of grading for dry chilli			
1	Manual grading	60(100)	60(100)	120(100)
2	Mechanical grading	-	-	-
	Knowledge index of methods of grading	50.00	50.00	50.00
F	Packaging of dry chilli			
1	Gunny bags	60(100)	60(100)	120(100)
2	Polyethylene film pouches	22(36.66)	30(50.00)	52(43.33)
3	Do you know about vacuum packaging for storage of chilli/ chilli powder?	-	-	-
	Knowledge index of packaging of dry chilli	45.55	50.00	47.77
G	Different storage structures			
1	Mention different types of storage facilities?	52(86.66)	56(93.33)	108(90.00)
2	Community storage(Rural Godowns/ Mandi Godowns)	44(73.33)	50(83.33)	94(78.33)
3	Commercial storage (cold storage/ central warehousing/state warehousing)	36(60.00)	44(73.33)	80(66.66)
4	Do you know standard temperature followed in cold storage?	-	-	-
5	Do you know important pests which are causing damage at storage?	10(16.66)	14(23.33)	24(20.00)
	Knowledge index of storage structures	47.33	54.66	50.99
H	Products prepared by processing dry chilli			
1	Chilli powder	60 (100)	60 (100)	120 (100)
2	Red chilli pickle	60 (100)	60 (100)	120 (100)
3	Chilli flakes	14(23.33)	08(13.33)	22(18.33)
4	Red chilli sauce	02(03.33)	06(10.00)	08(06.66)
	Knowledge index of products prepared by dry chilli	56.66	55.83	56.24
I	Marketing			

Table 1. *Continued ...*

		n = 120		
Sl. No.	Knowledge Statements	Byadgi APMC (n1=60) F (%)	Guntur APMC (n2=60) F (%)	Total (n=120) F (%)
1	Do you know the cost of one quintal of dry chilli in both wholesale and retail markets?	48(80.00)	54(90.00)	106(83.33)
	Knowledge index of marketing	80.00	90.00	83.33
	Overall knowledge indices	55.74	59.68	57.52

moisture content of dry chilli.

Most of the women labourers had no knowledge about solar/ mechanical drying and standard moisture content in dry chilli. It might be because in both the states, solar/mechanical drying methods are not well-known and not being used at APMCs. An insight into the Table 1 regarding weighing and bagging of dry chilli revealed that, almost all respondents from both APMCs women laborers know that bagging protects quality and quantity of dry chilli and they had knowledge about standard weight for bagging of dry chilli at APMC yards. Whereas, women laborers from Bydagi APMC with 66.66 per cent and Guntur APMC with 76.66 per cent knew that bagging prevents spoilage during transportation and storage. Whereas (56.66%) Bydagi APMC laborers and (63.33%) of Guntur APMC laborers knew that bagging protects adverse effects from outside

Only (20.00%) of Byadgi APMC women laborers and (23.33%) of Guntur APMC laborers knew that bagging materials should be biodegradable. Very less knowledge was seen viz., (10.00%) and (23.33%) in bagging must be suitably lined with moisture proof lining in Byadgi and Guntur APMC respectively. APMC women laborers were engaged

in removal of chilli stalks and for payment purpose, the chillies are weighted in front of women to know the quantity of chilli stalks removed. Women are also involved in bagging of chilli along with men laborers. So all women know the standard weight for bagging.

Cent per cent of Byadgi APMC women labourers and Guntur APMC women labourers know that grading was done based on colour, size, moisture and stalk of the pods, very few percentage of women ranging from 10-37 per cent know that grading criteria was based on seed and fruit ratio, seed size and hardness and pungency. In APMCs high standard of grading was not done and only first level of basic grading is done where chillies are sorted based on colour, size and moisture only. This might be the reason why most of the women labourers know only about basic grading criteria and not other aspects. All women labourers from both the APMC had knowledge on manual grading. Whereas, none of them knew about mechanical grading. In both APMCs, (100%) of female labourers were engaged in manual grading, with none engaging in mechanized grading. This could be due to the absence of a mechanical grading unit at both districts' APMCs. This might explain why none of

Table 2. Relationship between the Independent variables and knowledge of APMC women labourers

		n = 120		
Sl. No.	Independent variables	Knowledge ('r value')		
		Byadgi APMC (n ₁ =60)	Guntur APMC (n ₂ =60)	Total (n=120)
1	Age	-0.108NS	0.161NS	0.028NS
2	Education	0.375*	0.636**	0.521**
3	Annual income	0.042NS	0.108NS	0.057NS
4	Land holding	0.000NS	0.618**	0.494**
5	Contact with extension agent	0.684**	0.765**	0.695**
6	Social participation	0.798**	0.753**	0.153NS
7	Mass Media participation	0.823**	0.862**	0.844**
8	Organizational participation	0.257NS	0.057NS	0.686**

* - Significant at the 0.05 level **- Significant at the 0.01 level NS-Non significant

the respondents were familiar with mechanical grading.

Cent per cent of the respondents from both the APMC know about gunny bags. A little more than one third (36.66%) of Byadgi APMC women labourers and half of the (50.00%) Guntur APMC women labourers know about polyethylene film pouches and none of the respondents had knowledge about vacuum packaging. An observation of the Table 1 also shows that majority (86.66%) of Byadgi APMC women labourers and great majority (93.33%) of Guntur APMC women labourers had knowledge on different types of storage facilities. Majority (73.33%) of Byadgi APMC labourers and (83.33%) of Guntur APMC labourers also had knowledge about community storage. More than half (60.00%) of Byadgi APMC labourers and nearly three fourth of (73.33%) Guntur APMC women labourers know about commercial storage such as cold storage/central ware housing and state ware housing. Very few women labourers from Byadgi APMC (16.67%) and Guntur APMC (23.33%) know about important pests causing damage at storage and none of the women labourers from both APMCs know standard temperature in cold storage.

Nearly half (47.33%) of Byadgi APMC women labourers and (54.83%) of Guntur APMC had knowledge on different storage structures. Women fill the bags along with men. Through discussion with men labourers at APMCs, women might have gained knowledge regarding storage structures. Hence, most of the women labourers had medium knowledge on storage structures. findings were in consonance with the findings of Shamna *et al.* (2022). Cent per cent of the respondents from both the APMC know about chilli powder and red chilli pickle prepared from dry chilli. Whereas, (23.33%) of Byadgi and (13.33%) of Guntur APMC women know about chilli flakes. Very few (03.33%) of Byadgi APMC women labourers and (10.00%) of Guntur women labourers know about red chilli sause. Preparing food products and cooking is the domain of women. So it is observed that women will know about the products prepared from chillies.

Majority (80.00%) of Byadgi APMC women labourers and great majority (90.00%) of Guntur APMC women labourers had knowledge on cost of one quintal of dry chilli in both wholesale and retail markets. Majority of Byadgi APMC (80.00%) and Guntur APMC (90.00%) women labourers knew the price of one quintal of dry chilli in both wholesale and retail markets.

Knowledge indices of APMC women labourers: It is evident from the table that the knowledge index about varieties of dry chilli recommended to their areas was 100.00 for two districts. The knowledge index about drying methods and standard moisture content of dry chilli was 25.83 and 27.50 for Byadgi and Guntur APMC respectively. The knowledge index regarding weighing and bagging of dry chilli was 58.88 and 64.99 for Byadgi and Guntur APMC respectively. Whereas, the knowledge index about criteria for grading and sorting of dry chilli was little less i.e. 37.49 and 44.16 for Byadgi and Guntur APMC respectively. Regarding grading methods of dry chilli the knowledge index was 50.00 for both Byadgi and Guntur APMC respectively. In Packing of dry chilli the knowledge index is 45.55 and 50.00 for Byadgi and Guntur APMC respectively. The knowledge index regarding Storage of dry chilli was 47.33 and 54.66 for Byadgi and Guntur APMC respectively. The products prepared by processing of dry chilli has shown 56.66 knowledge index for Byadgi APMC and 55.83 for Guntur APMC. The marketing knowledge index was high compared to

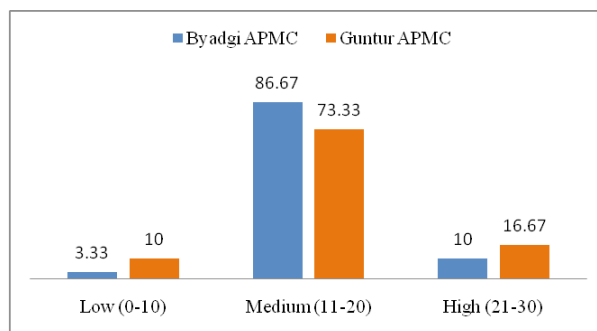


Fig. 1. Distribution of APMC women labourers according to the knowledge level

Table 3. t- test on knowledge of APMC labors and field level women labourers
n=120

Sl. No	Knowledge	Mean	SD	t-test
1	Byadgi APMC	14.866	3.569	1.167NS
2	Guntur APMC	16.066	4.354	

* - Significant at the 0.05 level ** - Significant at the 0.01 level NS-Non significant

other knowledge indices i.e. 80.00 and 90.00 for Byadgi and Guntur APMC respectively. When the knowledge indices of Byadgi and Guntur APMC women labourers were compared, it was concluded that there was no significant difference between these two group. This might due to the similar type of activities done by women two APMCs.

Fig 1. Distribution of APMC women labourers based on knowledge level: With respect to overall knowledge index, majority (86.67%) of Byadgi and three fourth of (73.33%) Guntur APMC women labourers belonged to medium knowledge level category. Only 10.00 per cent of Byadgi and 03.33 per cent of Guntur APMC women labourer belonged to low knowledge category.

Correlation between socio-personal characteristics with knowledge of APMC women labourers: Table 2 depicts the relationship between socio-personal characteristics with knowledge of Guntur APMC women labourers and Byadgi APMC women labourers. With regard to Byadgi APMC women labourers, contact with extension agent (0.684**), social participation (0.798**), mass media participation (0.823**) was found to be positive and highly significant with knowledge at (1.00%) level of probability. Whereas education (0.375*) is significant with knowledge at (5.00 %) of probability, while age (-0.108NS) was negatively correlated. The other variables like annual income (0.042NS), landholding (0.000NS), organizational participation (0.257NS) were not related with the knowledge.

With respect to Guntur APMC women labourers, education (0.636**), land holding (0.618**), contact with extension agent (0.765**), social participation (0.753**), mass media participation (0.862**) were found to be positive and highly significant with knowledge at 1.00 per cent level of probability. Whereas age (0.161NS) was negatively correlated with knowledge. The other variables like annual income (0.108NS) and organizational participation (0.057NS) were not related with knowledge.

The possible reasons could be for the above results are; contact with extension agent, social and mass media participation will boost their knowledge. The women who can read and write can easily gain the knowledge through various sources as compared to illiterates. It motivates to learn more about their day to day activities. The age of women plays very important role. The younger the age, better the knowledge. As the age increases, the women show less interest in learning. The above-mentioned findings were in consonance with the

findings of Adejo (2019), Yadav *et al.* (2018), Hada and Bansal (2017), Aggarwal *et al.* (2013); Soumya *et al.* (2009), Jethi (2008); Yadav *et al.* (2020) and Singh and Sharma (2002).

“t- test” on knowledge of APMC women labourers
It was observed from the Table 3 that, there was no significant difference in knowledge of Byadgi and Guntur APMC labourers (1.167NS).

CONCLUSION

In Indian agriculture, women play multiple roles right from sowing to harvesting. Despite working longer hours than men, they ought to carry out tasks that are consistent with their gender identification. Women employees' voices are not heard due to unequal job duties. Furthermore, although if they possess knowledge, males are given priority in the field and are acknowledged as farmers and labourers, despite the fact that women participate equally at every stage. It is often assumed that the majority of rural women engage in farming activities as part of their home responsibilities. Furthermore, because of their poor income and lack of control over their money, women feel powerless to make their own decisions. Despite the fact that they work as wage labourers in post-harvest operations and receive money, their health and nutritional requirements are ignored. Results on overall knowledge index from the present study indicated that, majority (86.67%) of Byadgi and three fourth of (73.33%) Guntur APMC women labourers belonged to medium knowledge level category. It was also observed from the study that, there was no significant difference in knowledge of Byadgi and Guntur APMC labourers (1.167NS).

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