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## Marketing cost and efficiency of arhar in Chhindwara district of Madhya Pradesh, India

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### Abstract

Pulses are known as unique jewels of Indian farming. India is at top amongst all the major pulses producing countries but it is unable to meet out the domestic demand. The yield of pulses is very low in India as compared to global average. Over a period time, Indian government has launched number of programme to enhance production and productivity of pulses in the country. Madhya Pradesh is the leading pulse producing states with contribution of 27 per cent to India's total pulse production. Chhindwara district of Madhya Pradesh was purposively selected for present study because district rank first place in the state for arhar production. Among the 11 development block, Pandhurna development block was selected for primary data collection. The 50 sample farmers from five villages were selected for primary data collection. Three marketing channels for arhar were found in the study area. In marketing channel-I, producers' share in consumer rupee was 78.31 per cent. In marketing channel-II, the producer's share in consumer rupee was 75.24 per cent, whereas in case of marketing channel-III, it was 70.24 per cent. Per quintal price spread in marketing of arhar was Rs 1864.5, Rs 2200.5 and Rs 2767.5 in channel-I, channel-II and channel-III respectively. The marketing efficiency was 3.61, 3.03 and 2.31 per cent for channel-I, channel-II and channel-III respectively. Based on the present study, channel-I was more efficient than channel-II and channel-III. There is potential to increase marketing efficiency of Arhar by reducing the long chain of marketing intermediaries through market integration. Assured support price should be insured to the farmer engaged in this enterprise.

**Keywords:** pulses, marketing cost, marketing efficiency, percentage margin, marketing channel

### 1. Introduction

Pulses are known as unique jewels of Indian farming. India is the leading country amongst all the major pulses producing countries in the world, but it is unable to meet out the domestic demand. The domestic yield of pulses is very low (690 kg per hectare) as compared to global average (909 kg per hectare) and the same situation prevails in case of per capita availability (Martolia, *et al.* 2015) [6]. India's share in world pulse production and area was about 25 and 33 per cent respectively. Among the pulses, chickpea contributed 48 per cent, Pigeon pea 17 per cent, black gram 10 per cent, green gram 7 per cent and other pulses 18 per cent towards total pulses production (FAO, 2016) [1]. The United Nations has proclaimed 2016 as the International Year of Pulses. The Government of India has launched a number of schemes/programmes over a period of time to increase area under pulses and productivity enhancement to increase the pulses production in country. The major initiatives are "Pulses Development scheme (4<sup>th</sup> Five Year Plan), National Pulse Development Project (during 7<sup>th</sup> Five Year Plan), Special Food Grain Production Programme (1989-90), Integrated Scheme of Oilseeds, Pulses, Oil palm and Maize (ISOPOM) in 2004 and National Food Security Mission (NFSM) 2007-08 (India Pulses and Grain Association).

As per Vision-2030 document, the projected demand of pulses in India by 2030 is likely to be 35 million tonnes. This requires an annual pulses production growth rate of 3.59 per cent. To meet the projected requirement and sustain the balanced pulses production in the country, the existing yield gap of 439 kg per hectare shall have to be bridged besides bringing an additional area of five to six million hectare under pulses cultivation. To meet out the projected demand for pulses in country i.e. 35 million tonnes, Indian farmers should need to increase the productivity from 835 kg per hectare to 1030 kg per hectare. The per annum average growth in area and productivity shall have to ensure at 1.7 per cent and 1.95 per cent respectively (GOI, 2018) [4].

Due to increase in population, consumer awareness and enhancing purchasing power of the Indian population, the demand for pulses has increased over the period of time.

Despite the fact that India is largest producer of pulses in the world, India is also largest importer (23-24 million tonnes) and consumer of pulses in the world (GOI, 2018) [4]. To insure the availability of pulses in the country, government is importing pulses about five to six million tonnes per year during 2014-15 to 2016-17. The inflow and outflow of pulses from India to the rest of the world have brought certain important impact on country's economy. Particularly liberalized and subsidized import of pulses of India helps to meet demand-supply gaps, which occurred because of stagnation in the area under cultivation, very slow growth in yield, poor increase in production and speedy increase in population. Due to several measures taken by government, import of pulses during 2017-18 has declined by about 30 lakh tonnes resulting in saving of foreign exchange amounting to Rs 7698 crore.

The major pulses producing states are Madhya Pradesh (33%), Maharashtra (13%), Rajasthan (12%), Uttar Pradesh (9%), and other states (33%) to total pulse production during 2017-18 (GOI, 2018) [4]. India's total area under arhar was 44.59 lakh hectares and production was 41.80 lakh tonnes during 2017-18. The major arhar producing states was Maharashtra (25.33 per cent) followed by Madhya Pradesh (20.07 per cent), Karnataka (17.44 per cent), Gujarat (7.68 per cent), Uttar Pradesh (7.25 per cent), Telengana (6.32 per cent), Jharkhand (5.32 per cent), Odisha (3.05 per cent) and others (7.54 per cent). With the aggressive Transfer of Technologies in the various area, the highest ever productivity of arhar was achieved during 2017-18 with 937 kg per hectare.

Agricultural marketing plays an important role not only in stimulating production and consumption, but in accelerating the pace of economic development also. The better returns, stable price and attractive terms of trade will induce the cultivators to produce more and market a major proportion of what they produce. Existence of better market competition and prevalence of adequate infrastructural facilities in the form of better roads, transportation, storage, market information etc play a decisive role in improving the market structure, conduct and performance and thereby, the economic status of the cultivators. To enhance the remunerative prices of pulses, farmers can put "Mini dal mill" which helps farmers get remunerative price from the pulses. Government subsidy is also available for the installation of Mini Dal Mill same. Farmers, self help group (SHG), small entrepreneur, unemployed youth can leverage this opportunity and can start their own agribusiness (Patil, 2015) [7].

Keeping in the view the above aspects the present study was undertaken to study the marketing channels, marketing cost, marketing efficiency and price spread of arhar; and to study the constraints of arhar production and marketing faced by the farmers in the study area

## 2. Research Methodology

### 2.1 Sampling procedure

Present study was based on the primary data and it was collected through personal interview using pre-tested schedule. Madhya Pradesh state was purposively selected for present study because Madhya Pradesh is the largest pulses producing state in the country. Out of 51 district of Madhya Pradesh, Chhindwara district was selected purposively for the study because it rank first in respect to production of Arhar in the state. Out of 11 blocks of the district, Pandhurna block was selected purposively on the basis of highest area under

pulses. A list of all the villages of the block was prepared and 5 villages were selected purposively on the basis of highest production of pulses. Farmers were selected randomly from the list of farmers provided by revenue department and five per cent of the growers were randomly selected using simple random sampling without replacement technique with lottery method. In total 50 farmers were selected randomly of which 14 were marginal farmers, 18 small farmers, 12 medium farmers and 6 belongs to large category farmers. 10 wholesalers/commission agents from major market of the selected block were selected randomly. The secondary information were collected from Directorate of Economics and Statistics, Government of Madhya Pradesh and Office of Assistant Director of Economics and Statistics, Chhindwara District. The field survey was conducted from 2015 to 2016 for the collection of primary data.

### 2.2 Analytical Tools

#### Average gross margin

The average gross margin for arhar was estimated using following method as suggested by Acharya and Agrawal (2011) [2]:

$$\text{Average gross margin} = \frac{\text{Total sale value} - \text{total purchase value}}{\text{Quantity of produce handled}}$$

#### Absolute margin of the middleman

Absolute margin of the middleman was calculated by deducting the purchase price and cost incurred by him from the sale price (Acharya and Agrawal, 2011) [2].

$$A_m = P_r - (P_p + C_m)$$

Here,  $A_m$  is absolute margin of middleman;  $P_r$  is total receipt per unit (sale price);  $P_p$  is the purchase price of goods per unit (purchase price) and  $C_m$  is cost incurred on marketing per unit.

#### Percentage margin of the middleman

Percentage margin of the middleman was calculated by expressing the absolute margin as percentage of sale price:

$$P_m = (P_r - (P_p + C_m)) / P_r \times 100$$

Here,  $P_m$  is the percentage margin of  $i^{\text{th}}$  middleman;  $P_r$  is total receipt per unit (sale price);  $P_p$  is purchase price of goods per unit (purchase price) and  $C_m$  is cost incurred on marketing per unit.

#### Price spread

It is the difference between price paid by the consumer and price received by the farmer

#### Producer's share in consumer rupee

The producer's share in consumer rupee, price receive by the farmer and prices paid by the consumer was calculated as follows:

$$P_s = \frac{P_f}{P_c} \times 100$$

Where;  $P_s$  is the farmer's share in consumer rupee (Rs/qlt);  $P_f$  is the price receive by the farmer (Rs/qlt) and  $P_c$  is the prices paid by the consumer (Rs/qlt)

**Marketing efficiency**

To study the marketing efficiency, Acharya’s measure of modified marketing efficiency was used (Acharya and Agrawal, 2011) [2].

$$MME = \left( \frac{RP}{MC + MM} \right) - 1$$

Where; MME is the modified measure of marketing efficiency; RP is prices paid by the consumer (Rs/qrtl); FP is the net price receive by farmer (Rs/qrtl); MC is total market cost (Rs/qrtl); MM is total net margins of intermediaries (Rs/qrtl) and RP is FP+MC+MM

**3. Results and Discussion**

**3.1 Marketing Channels**

The three types of marketing channels were used by the sample farmers for marketing of arhar. These marketing channels are:

Channel-I: Producer ➡ Miller ➡ Retailer ➡ Consumer

Channel-II: Producer ➡ Wholesaler ➡ Miller ➡ Retailer ➡ Consumer

Channel-III: Producer ➡ Commission agent ➡ Wholesaler ➡ Miller ➡ Retailer ➡ Consumer

**3.2 Marketing cost and margin**

In the marketing of arhar, marketing cost and market margin received by the different market middleman were analyse and calculated (Table 1). In case of channel- I market margin received by the dal miller was Rs.561.5 and margin received

by the retailer was Rs 845.5. In case of channel- II market margin received by the wholesaler, dal miller and retailer was Rs 498, Rs 455.50 and Rs 626.5 per quintal respectively. In case of channel–III, market margin received by the commission agent, wholesaler, dal miller and retailer was Rs 878, Rs 431.5, Rs 398.5, and Rs 446.5 respectively. In case of channel -I market cost incurred by the producer, dal miller, retailer was Rs 64.5, Rs 338.5, and Rs 54.5 respectively. In case of channel- II marketing cost incurred by the producer, wholesaler, dal miller and retailer was Rs 60.5, Rs 152, Rs 344.5 and Rs 63.5 respectively. In case of channel-III, market cost incurred by the producer, commission agent, wholesaler, dal miller and retailer was Rs 67.5, Rs 22, Rs 168.5, Rs 341.5 and Rs 53.5 respectively. After the marketing of arhar, Per quintal price received by farmer was 6735.5, Rs 6689.5 and Rs 6532.5 through channel- I, II and III respectively and Price paid by consumer was Rs 8600, Rs 8890 and Rs 9300 per quintal through channel I, II and III respectively. In the marketing of arhar, per quintal price spread was Rs 1864.5, Rs 2200.5, and Rs 2767.5 over the channel- I, II and III respectively. Producer’s share in consumer rupee was found to be 78.31, 75.24, and 70.24 per cent over the channel-I, II and III respectively (Table 1).

During the marketing of arhar, average gross margin received by dal miller and retail was Rs 900 and Rs 900 respectively in the marketing channel-I and in marketing channel-II, average gross margin was received by wholesaler, dal miller and retailer was found to be Rs 650, Rs 800 and Rs 690 respectively. In case of marketing channel –III, the gross margin received by commission agent, wholesaler, dal miller and retailer was estimated to be Rs 900, Rs 600, Rs 700 and Rs 500 respectively (Table 2).

**Table 1:** Marketing Cost and margin of Arhar

S. No.	Particular	Channel- I	Channel -II	Channel- III
1	Marketing cost (Rs/q)			
	a. Producer	64.5	60.5	67.5
	b. Commission agent	-	-	22.0
	c. Wholesaler	-	152	168.5
	d. Dal miller	338.5	344.5	341.5
	e. Retailer	54.5	63.5	53.5
	Total cost	457.5	620.5	653
2	Market margin (Rs/q)			
	a. Commission agent	-	-	878
	b. Wholesaler	-	498	431.5
	c. Dal miller	561.5	455.5	398.5
	d. Retailer	845.5	626.5	446.5
	Total margin	1407	1580	2154.5
3	Price received by farmer (Rs/q)	6735.5	6689.5	6532.5
4	Price paid by consumer (Rs/q)	8600	8890	9300
5	Price spread (Rs/q)	1864.5	2200.5	2767.5
6	Producer’s share in consumer rupee (%)	78.31	75.24	70.24

**Table 2:** Average gross margin, Absolute margin and Percentage margin of the middleman

S. No.	Particular	Channel I	Channel II	Channel III
1	Average gross margin			
	a. Commission agent	-	-	900
	b. Wholesaler	-	650	600
	c. Dal miller	900	800	700
	d. Retailer	900	690	500
2	Absolute margin of the middlemen			
	a. Commission agent	-	-	878
	b. Wholesaler	-	498	431.5
	c. Dal miller	561.5	455.5	358.5

	d. Retailer	845.5	626.5	446.5
3	Percentage margin of the middleman			
	a. Commission agent	-	-	11.70
	b. Wholesaler	-	6.72	5.32
	c. Dal miller	7.29	5.55	4.07
	d. Retailer	9.83	7.04	4.80

Absolute margin of the dal miller and retailer was Rs 561.5 and Rs 845.5 respectively in the channel- I. Percentage margin of the dal miller and retailer was 7.29 and 9.83 per cent respectively in marketing channel-I. In case of marketing channel – II, the percentage margin of wholesaler, dal miller and retailer was 6.72, 5.55 and 7.04 per cent and marketing channel – III it was 11.70, 5.32, 4.07, 4.80 per cent for commission agent, wholesaler, dal miller and retailer

respectively (Table 3).

**3.3 Marketing Efficiency**

Marketing efficiency of arhar marketing was calculated using Achary’s modified measure of marketing efficiency and it is presented in Table 3. The marketing efficiency was found to be 3.61, 3.03 and 2.31 for the marketing channel-I, II and III respectively.

**Table 3:** Marketing efficiency of Arhar marketing system

S. No.	Particular	Channel I	Channel II	Channel III
1	Price paid by consumer (Cp)	8600	8890	9300
2	Total marketing cost (MC)	457.5	620.5	653
3	Total net margin of intermediaries (MM)	1407	1580	2154.5
4	(MC) + (MM)	1864.5	2200.5	2807.5
5	Net price received by farmer (Fp)	6735.5	6689.5	6532.5
6	Modified measure of marketing efficiency (MME)	3.61	3.03	2.31

**3.4 Constraints faced by farmers in production of arhar**

During the primary data collection, information related to constraints faced by farmer in production of arhar was collected and it is presented in Table 4. The major problems faced by farmers were lack of irrigation facilities (80 per

cent). Second most problems faced by the farmers were non-availability of fertilizer on time (65 per cent). Nearly 60 per cent farmers reported that high cost of agricultural labour supply. Was major constraints in the production of the Arhar.

**Table 4:** Constraints faced by farmer in production and marketing of Arhar

S. No.	Constraints	Producer (N=20)	Wholesaler (N=10)	Retailer (N=10)
<b>I. Production Constraints</b>				
1.	Non availability of high yielding variety.	6 (30%)	---	---
2.	Non availability of fertilizer in time	13 (65%)	---	---
3.	Lack of irrigation facilities	16 (80%)	---	---
4.	Non availability of labour in time	6 (30%)	---	---
5.	High cost of labour supply	12 (60%)	---	---
<b>II. Marketing problems</b>				
1.	Lack of transportation facilities	8 (40%)	2 (20%)	5 (50%)
2.	High cost of transportation	13 (65%)	6 (60%)	6 (60%)
3.	Fluctuation in market prices	19 (95%)	9 (90%)	9 (90%)
4.	Distant market	9 (45%)	0 (0.0)	8 (80%)
5.	Lack of grading and packaging	11 (55%)	2 (20%)	7 (70%)
6.	Lack of storage facilities	14 (70%)	7 (70%)	7 (70%)
7.	Un-even payment for sale after sale	9 (45%)	3 (30%)	0(0.0)
8.	Lack of market information	11(55%)	1 (10%)	3 (30%)
9.	Lack of financial assistance from any company	6 (30%)	3 (30%)	8 (80%)
10.	Timely supply	-	8 (80%)	7 (70%)
<b>III. Economic constraints</b>				
1.	High cost of transport in planting material	14 (70%)	---	---
2.	High cost of pesticides	16 (80%)	---	---
3.	High cost of labour	18 (90%)	8 (80%)	8 (80%)
4.	Non-availability of credit in time	6 (30%)	6 (60%)	6 (60%)
5.	In adequate credit facility	11 (55%)	5 (50%)	6 (60%)
6.	High cost of borrowing	6 (30%)	7 (70%)	2 (20%)

**3.5 Problems faced by farmer in marketing of arhar**

The major problems faced by farmers in marketing of arhar were fluctuation in market prices (95 per cent), lack of storage facilities (70 per cent), high cost of transportation (65 per cent), lack of grading and packaging (55 per cent), lack of market information (55 per cent), lack of financial assistance from any company (30 per cent) the major problems. And for

the respective problems they expected market information at right time, providing good market prices, more demand of the product, nearness of selling unit/place, and cold shelf facilities during storage of produce and getting contracting arrangements from agencies. Economic constraints faced by the farmers were high cost of labour (90 per cent), high cost of pesticides (80 per cent), high cost of transport in planting

material (70 per cent), and in adequate credit facility (55 per cent).

#### **4. Conclusion and Suggestion**

The marketing efficiency of marketing channel- I was more than channel-II and III. Thus channel- I was more efficient than channel-II and III. It was also found that high cost of labour, fluctuation in market prices and lack of storage facility were major constraints in production and marketing of this crop. There is potential to increase marketing efficiency of arhar by reducing the long chain of marketing intermediaries through market integration. Assured support price should be insured to the farmer engaged in this enterprise.

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