Content list available at http://epubs.icar.org.in, www.kiran.nic.in; ISSN: 0970-6429

Indian Journal of Hill Farming

June 2019, Volume 32, Issue 1, Page 84-91

Critical analysis on exploration of pre-production to marketing system for market-led extension approach

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ARTICLE INFO

Article history:
Received 2 July 2018
Revision Received 30 December 2018
Accepted 10 February 2019

Key words:
Market – led extension, Preproduction, Production, Processing, Marketing

ABSTRACT

The agricultural production of the country has increased dramatically in the last sixty years but could not translate into better remuneration to the farmers. Poor efficiency in the marketing channels and inadequate marketing infrastructure are believed to be the cause of not only high and fluctuating consumer prices, but also little of the consumer rupee reaching the farmer. Therefore extension functionaries need to play a major role to build the capacity of the farmers to meet the emerging challenges and make the farmers to realize better prices to their farm produce. This transformation of Extension is termed as Market – led extension, and so far it is not much discussed issue in the extension scenario. Hence the extension focus should extend from mere production to market led extension on end-to-end basis. In this regard, the present study were conducted with the objective to delineate the pattern of pre-production to marketing value chain of milk with 240 respondents in the Bihar state through well -structured interview schedule. The results showed that there were the need of professionalism in dairying as the farmers were not select the dairy farmer site scientifically and there were also the lack of labour due to migration. It was also observed that there were the lack of good breeds with high production and farmers use to sell their milk in raw form as compared to the processed product. Apart from that, there was the need of marketing related training for the prosperity of the dairy farmers.

1. Introduction

Indian agriculture has grown tremendously since independence. The gradual transformation of Indian agriculture from "begging bowl" to "self-sufficiency" in food grain production is the testimonial of India's agricultural success. This success also proved wrong the theories of Malthus and economists who said that India would suffer on account of poverty and technological backwardness. The glorious agricultural data also verify this fact, which signify that, the food grain production that was 82 MT in 1960-61 has touched 264 MT by 2013-14, during the same period the rice production increased from 34 MT to 100 MT and the wheat production which was 11 MT is now over 90 MT. At national level the average productivity of rice which was 1013 kg per ha. is now above 2500 kg per ha. Similarly, the productivity of wheat also has gone up from 850 kg/ha to over 3000 kg/ha in the corresponding period. Thereafter, Indian agriculture witnessed an all round development as a result of which horticulture production is now over 280 MT, milk production about 140 MT, fisheries 9.5 MT and eggs are about 73 billion (Anonymous, 2013). These achievements have placed India among the leading producer of these food items. The credit for this path breaking success can't be bestowed on agricultural scientists only, but it was a team effort where the intelligence of scientists who evolved the technology, extended at the field level by the extension professionals, implemented through the hard work of farmers and finally coordinated by the conducive policy of the policy makers.

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Extension agencies played very crucial role in bridging the road for production related technologies from research institutes to the farmer's fields. The production has increased dramatically but could not translate into better remuneration to the farmers. The share of farmers in the consumer rupee in Ahmedabad was 41.1 to 69.3 percent for vegetables and 25.5 to 53.2 percent for fruits. In Chennai KFWVM, the farmers' share was 40.4 to 61.4 percent for vegetables and, 40.7 to 67.6 per cent for fruits (Gandhi, n.a.). Poor efficiency in the marketing channels and inadequate marketing infrastructure are believed to be the cause of not only high and fluctuating consumer prices, but also little of the consumer rupee reaching the farmer (Kaul 1997, Ashturker and Deole 1985). The producers and the consumers often get a poor deal and the middlemen control the market, but do not add much value. There is also massive wastage, deterioration in quality as well as frequent mismatch between demand and supply both spatially and over time (Subbanarasiah 1991, Singh M *et al.,* 1985). Add to this, the Indian farmers have to face challenges of global force that are affecting or are likely to affect Indian agriculture. This assumes greater significance in the light of the new international trading regime under WTA and the export opportunities being opened up. Therefore extension functionaries need to play a major role to build the capacity of the farmers to meet the emerging challenges and make the farmers to realize better prices to their farm produce. This transformation of Extension is termed as Market – led extension, and so far it is a peripheral issue in the extension scenario. Hence the extension focus should extend from mere production to market led extension on end-to-end basis.

Market – led Extension

With globalization of the market, farmers need to transform themselves from mere producer – sellers in the domestic market to producer cum seller in a wider market sense to best realize the returns on their investments, risks and efforts. In order to achieve this goal, farmers need to know answers to questions like what to produce, when to produce, how much to produce, when and where to sell, at what price and in what form to sell their produce. Farmers have received most of the production technologies from the extension system. The extension systems now need to be oriented with knowledge and skills related to the market.

Definition

- Market led Extension is the market ward orientation of agriculture through extension includes agriculture & economics is the perfect blend for reaching at the door steps of farming community with the help of appropriate technology. (Kaleel, 2007)
- Market led Extension is market oriented extension system which informs, stimulates and guides the farmers right from selection of an enterprise to marketing of the produce with the purpose to get optimum return out of the enterprise.

It will play a twin role, catering on one hand to the farmers/ producer needs for information and technology in the realm of production and marketing and on the other hand, providing valuable feedback to the quarters having a stake in their development- research institution, development department (Govt. and non-Govt.) Whereas, the agriculture extension has contributed greatly to the increase in agriculture production in the country, agriculture marketing has been a prerogative solely of the farmers/ producers and to a little extent of the Government machinery playing a role of regulator and controller of the markets as well as providing for the physical market infrastructure, market facilities *etc.* Marketing extension forms a two way bridge, providing linkage between farmers and research & development on one side and consumer/ market on the other.

Statement of the problem

Farmers are getting 25-30% of consumer price for the produce (DMI, 2010). Burdened by the usury imposed by Pre Harvest Contractors (PHCs) and Commission Agents (CAs), the grower ekes out a marginal income despite the end-user in Delhi, Mumbai and Bangalore buying the product at three times the cost. Per litre cost of milk production varied from Rs. 10.12 for crossbred cows to 13.90 and 13.57 for buffalo and local cows, respectively. Dairy farmers are selling their milk to local vendors at Rs. 15 to 18 per litre. The ultimate consumers are buying this milk at the price varying from Rs. 28 to 35 per litre (Singh *et. al.* 2012). Farmers are the ultimate looser in the marketing scenario. Farmers are not getting proper remuneration of their produce due to their poor marketing skill, low position in the marketing chain, lack of knowledge about the market, unreliable marketing intelligence and so on. This crisis raises one of the basic requirement to understand the farmer's pattern of milk from production to marketing. By keeping this view in the mind the present study were conducted with the objective to delineate the pattern of pre-production to marketing value chain of milk.

2. Research Methodology

The present study were conducted in Bihar with 240 respondents, which were selected randomly from three districts of three agro climatic zones of the state, followed by three blocks from each district and then, two villages from each blocks randomly and finally forty respondents from each village were selected randomly. Respondents were selected from those who should be involved in selling minimum five litre of milk per day throughout the year to various marketing channels. 'Production to Marketing system' operationalised as "the entire chain of activities from preproduction of milk through various stages of intermediate processes, to the marketing of the final product".

A basic principle underlying the PMS is the differentiation of the system into subsystems. PMS were divided into four subsystem for this study *viz.*

1. Preproduction
2. Production
3. Processing
4. Marketing

3. Results and Discussion

Each component of Production to Marketing system were divided into sub-components and then data were collected for each sub-components from the respondents. The component wise results were presented below in tables.

1. Pre-production

The pre-production refers to the activities undertaken by the farmers before the starting of the dairying. It includes; selection of dairy farm site, labour availability, capital requirement *etc.*

A. Selection of Dairy farm site

Table 1, gives a glance on different criteria for the selection of dairy farm site. As it is evident from the table that average distance of dairy farm, from the market for the dairy farmers is 13 km, and its distance from the residential area is around 100 m. It simply indicates that, most of the farmer established their dairy farms near to their home.

Table 1. Distribution of respondents on Selection of Dairy farm site

Sl. No.	Particulars	Average	Number	Percentage
1.	Distance from market	23 km		
2.	Distance from residential area	0.10 km		
3.	Condition of road			
	I. Good		240	**100.00**
	II. Bad		-	-
4.	Availability of chilling facility			
	I. Yes		24	10.00
	II. No		216	90.00
5.	Collection center facility			
	I. Yes		228	95.00
	II. No		12	5.00
6.	Distance of collection center from production site	4 km		
7.	Promoting agency of collection centre			
	I. Sudha Dairy		142	59.16
	II. Amrit Dairy		18	7.50
	III. Raj Dairy		13	5.42
	IV. Local Vendors		50	20.83
	V. Ganga Dairy		17	7.09
8.	Topography of land			
	I. Even		21	8.75
	II. Uneven		219	91.25
9.	Drainage Facility			
	I. Good			
	II. Bad		240	100.00
10.	Electricity facility			
	I. Good		84	35.00
	II. Poor		156	65.00

It is also viewed from the table that cent percent farmers have unanimously responded that the condition of roads are good. Most of the farmers (90.00%) also supported the criteria for availability of chilling facility, whereas, 95.00 percent farmers responded positively for the collection centre facility provided by the different milk cooperative societies, as well as milk vendors. The collection centre of different agencies including local vendors were only 4 km from the production site. As per the response observed from the different dairy farmers, most of the farmers (59.16%) responded that, Sudha dairy were the main promoting agency of the collection centre, followed by the local vendors (20.83%). Most of the farmers (91.25%) have uneven topography of land on the dairy farm site, due to which cent percent farmers responded about the poor drainage facility at the dairy farm site. Around 65.00 percent farmers have given the positive nod for the electrical condition at the dairy farm site.

B. Labour availability

It can be visualized from the table 2, that family labour were the most preferable type of labour involved in the dairy, which were also supported by 84.58 per cent of the respondents. There were only 10.42 per cent respondents involving the hired labour. With regard to the number of hired labour, 64.00 per cent respondents have hired a single labour, whereas, two labours were hired by the 36.00 per cent farmers. As, most of the farmers involve family labour in their dairy farm, around 64.04 per cent dairy farmers engaged more than two , whereas, two family labour involved in 32.52 per cent respondents.

Table 2. Distribution of respondents according to the labour availability

Sl. No.	Particulars	Number	Percentage
1.	Type of Labour		
	I. Self	12	5.00
	II. Family	203	**84.58**
	III. Hired	25	10.42
2.	Number of hired labour		
	I. One	16	64.00
	II. Two	9	36.00
	III. More than two		
3.	Number of family member involved		
	I. One	7	3.44
	II. Two	66	32.52
	III. More than two	130	**64.04**

C. Capital requirement

It is very much clear from the table 3, that, most of the respondents (73.75%) have invested their own money in the dairy farm, whereas loan facilities were availed by only 26.25 per cent dairy farmers. Local money lenders were the main agency in providing the loan to the farmers, as half (50.79%) of the respondents assessed their loan from them only. Rest 25.39 per cent and 23.82 per cent respondents were getting their loan from Cooperative and Banks respectively. As most of the loan were provided by the money lender, so their interest rates were also high *i.e.* more than ten percent, asserted by the more than three-fourth (76.20%) of the respondents. It can also be interpreted from the table that cent percent farmers are assessing the loan for the purpose of purchasing animals only.

Table 3. Distribution of respondents according to Capital requirement

Sl. No.	Particulars	Number	Percentage
1.	Money invested in dairy		
	I. Owned	177	**73.75**
	II. Loan	63	26.25
2.	Agency for providing loan		
	I. Money lender	32	50.79
	II. Cooperative	16	25.39
	III. Banks	15	23.82
3.	Interest rate		
	I. 4%	6	9.52
	II. 7%	9	14.28
	III. More than 10%	48	76.20
4.	Purpose of loan		
	I. Purchasing animals	63	**100.00**
	II. Constructing shelter	-	
	III. Purchasing machinery for dairy	-	

D. Housing facility

It is evident from the table 4, that, none of the animal houses are pucca in the study area. Around half (58.34%) of the respondents animal sheds are kutcha, whereas, 41.64% animal houses are semi pucca. It is also visualized from the table 90.42 per cent respondents were having loose system of housing, as compared to less than ten per cent (9.58%) of open system of housing. Floor of the animal shed is an important criteria in the housing of animals, but most of the respondents (94.17%) were having kutcha flooring in their animal sheds.

Table 4. Distribution of respondents according to Housing facility

Sl. No.	Particulars	Number	Percentage
1.	Type of house		
	I. Kutcha	140	**58.34**
	II. Semi pucca	100	**41.64**
	III. Pucca	-	
2.	System of housing		
	I. Loose	217	90.42
	II. Open	23	9.58
3.	Floor of the cattle /buffalo shed		
	I. Concrete Flooring	14	5.83
	II. Kutcha flooring	226	**94.17**

2. Production

A. Breeding

It is very much evident from the table 5, that about half (50.83%) of the respondents having low awareness on breeding practices. Only 38.34 per cent belongs to the medium category, followed by 10.83 per cent with high category. It can be concluded from the result that most of the farmers are not aware about the breeding practices such as, pedigree information of the semen during the A.I. practices, proper timing of the A.I. practices. It has also been observed during the study that, there were a lack of availability of good quality semen due to the poor infrastructure of the semen bank maintained by the government. But, in the recent time, due to the combined effort of breeding policy of the Bihar and complementary effort of COMFED, helped in improving the breeding scenario of cattle and buffalo in the state, which were also reflected in the score of medium and high category.

Table 5. Distribution of respondents according to Breeding

Category	Frequency	Percentage
Low (< 60)	122	50.83
Medium (60-80)	92	38.34
High (>80)	26	10.83

A. Feeding

The condition of feeding practices among the dairy farmers of Bihar were not very encouraging, which were also reflected in their score of the table 6. As table suggest that, near about three fourth (70.00%) of the respondents have low score on feeding aspect, followed by the medium (23.33%) and high (6.67%). There were not much dearth of either green or dry fodder in the study area, but the major concern were about balanced feeding to the animals, feeding pregnant cows/buffaloes with extra ration during advance pregnancy and providing right amount of mineral mixture to the cattle and buffalo. Very recently COMFED have established some of the feed plants in the state, which supply the concentrates to their members on a reasonable rate, and its popularity were gaining momentum, due to which demand exceeds the supply. By considering this situation the COMFED have decided to establish few more feed plants in the state.

Table 6. Distribution of respondents according to Feeding

Category	Frequency	Percentage
Low (< 45)	168	70.00
Medium (45-69)	56	23.33
High (>69)	16	6.67

B. Healthcare practices

It can be viewed from the table 7, that near about half (47.50%) of the dairy farmers belong to the medium category, followed by 39.17 per cent of low and rest 13.33 per cent of high category on healthcare aspect. As most of the respondents belong to the medium category, which were the satisfactory response in the study area. The improvement in the healthcare practices were due to the effort of state government in developing the infrastructure of the state. One important initiative in this regard were the recruitment of veterinary graduates as the veterinary doctors at block level as well as “pashu mitra” at panchayat level. It helped in improving the animal health scenario of the state.

Table 7. Distribution of respondents according to Healthcare Practices

Category	Frequency	Percentage
Low (< 48)	92	39.17
Medium (48-65)	114	47.50
High (>65)	32	13.33

A. Management practices

It can be recognized from the table 8, that a little more than half (54.17%) of the respondents fall under the low category, followed by high with 25.00 per cent and 20.83 per cent respondent accounting for 20.83 per cent. The reason for low value on management practices were mainly due to improper maintenance of animal records, irregular deworming practices and unhygienic practices followed during the milking of animals. It was also observed during the study that, an individual were hired for milking the animals by respondents in the study area and this individual use to milk

the entire animals of the study area without cleaning his hand after each milking. The cases of mastitis were also observed in the study area. The reason were mainly due to knuckling method of milking followed by milking man. It was also came to know that, last year in the study area there were heavy attack of foot and mouth disease, mainly due to unhygienic management practices followed by the respondents.

Table 8. Distribution of respondents according to Management practices

Category	Frequency	Percentage
Low (< 50)	130	54.17
Medium (50-69)	50	20.83
High (>69)	60	25.00

3. Processing

A. Processing of milk

It is evident from the table 9, that more than two third (69.16%) of the respondents process their milk for producing different milk products, whereas rest 30.84 per cent were not processed their milk. It can be concluded from the result that people start understanding the worth of processing, as it gives more return than the selling of liquid milk.

Table 9. Distribution of respondents according to Processing of milk

Sl. No.	Processing of milk	Number	Percentage
1.	I. Yes	74	30.84
2.	II. No	166	**69.16**

B. Product processed from milk

It can be viewed from the table 10, that ghee were the most preferred processed product from the milk, followed by dahi, paneer and peda. Ghee were produced one kg per day with the sale price of Rs. 375 per kg. The other processed product such as dahi, paneer and peda were produced at the rate of ten kg/day, 3 kg/day and 150 pieces per day respectively. The selling price for dahi were Rs. 75 per kg, followed by paneer Rs. 250 per kg, whereas peda used to sold Rs. 5 per piece.

Table 10. Distribution of respondents according to Product processed from milk

Sl. No.	Products processed from milk	Qty. (kg /day)	Sale price (in Rs. Per kg)
1.	Ghee	4	375
2.	Dahi	10	75
3.	Paneer	3	250
4.	Peda	150 pieces	5/piece

C. Waste generation from processing

It can be viewed from the table 11, that, mainly two by by-products generated from processed milk product. These were, whey from paneer and "khakhori" from gee, but they were unutilized in the study area. The quantity of whey, khakhori and butter milk generated were o.5 litre per litre of milk, 50 g per litre of milk and 0.3 litre per litre of milk. It can be concluded from the results that, these waste were unutilized in the study area, so there were the need of proper training on waste utilization by the training institute for the dairy farmers.

4. Marketing

A. Sale of milk & milk products

It can be interpreted from the table 12, that three fourth (75.42%) of the respondents sell their milk as raw to the different buyer's at Rs. 30 per litre. On an average a respondent use to sell 12 litre per day to different agencies including to customers directly. Apart from selling of raw milk a little less than one fifth (15.42%) and a little less than one ten (9.16%) of the respondents sell their milk in the processed form of paneer and peda respectively. Paneer were produced around 4 kg per day and sold at the rate of Rs. 250 per kg, whereas peda were produced around 150 piece per day and sold at the rate of Rs. 5 per piece. It can be inferred from the result that, there were lot of opportunity for processing of milk and sold in the processed form for more remuneration to the dairy farmers. There were also the need to analyse the cost of production of these processed products, so that the farmers can calculate their profit and accordingly fix the price of their products.

Table 11. Distribution of respondents according to Waste generation from processing

Sl. No.	Processed Product	Waste generated after processing	Quantity of waste	Utilization of waste
1.	Paneer	Whey	0.5 lt/lt of milk	Not used
2.	Ghee	*"Khakhori"*	50g/lt of milk	Not used
3.	Ghee	Butter milk	0.3 lt/lt of milk	Not used

Table 12. Distribution of respondents according to Sale of milk & milk products

Sl. No.	Products	Quantity	Selling price (Rs.)	Number	Percentage
1.	Raw milk	12 lt/day	30	181	**75.42**
2.	Paneer	4 kg/day	250/kg	37	15.42
3.	Peda	150 piece/day	Rs. 5/piece	22	9.16

B. Buyer's Scenario

It can be visualized from the table 13, that nearly two fifth (39.78%) of the respondents sell their raw milk directly to the local consumers followed by local vendors (23.77%), Sudha Cooperative (22.09%) and to the other dairy (14.36%) such as Raj dairy, Ganga dairy and Amrit dairy. The selling price of the buyers also varied from Rs. 25 to Rs. 35. The selling price for the local consumers were the highest with Rs. 35, followed by local vendors (Rs. 30), whereas it were lowest in the case of Sudha and other dairy. Apart from the selling of raw milk, paneer was the other product sold by the dairy farmers. Here, the buyers were mainly local consumers (18.92%) and local vendors (81.08%). The selling price for the paneer were Rs. 250 for the local consumers and Rs. 230 for the local vendors. Other than, raw milk and paneer, peda was another product sold by the dairy farmers of the study area. As the Table showed that, local tea shop were the major buyer of the peda, as, it constitute more than three fifth (63.64%) of the buyers followed by local vendors (27.27%) and local consumers constitute nearly ten per cent (9.09%). The selling price of the peda were Rs. Five per piece for the local vendors and local tea shops, whereas, for the local consumers, it were Rs. Six. It can be interpreted from the result that, unorganised sector still constitute the major part of the buyer which includes local vendors as well as consumers. The major reason for this shift were the immediate need of cash, which can be easily met by the local vendors and consumers. Other than that, local consumers and local vendors provide higher price of milk, as compared to Sudha cooperative and other dairy. It was also observed from the study that, paneer were produced by the farmers on demand basis, as it has less day to day consumption.

C. Fixing the price of milk and milk products

It can be observed from the table 14, that price for the raw milk were mainly fixed by the cooperative (36.46%), followed by vendors (23.75%) and market survey (20.99%). A little more than ten percent (12.15%) and more than five per cent (6.63%) of the respondents fix their raw milk price based on word of mouth and cost of production respectively. The price for the peda were mainly fixed on the basis of market survey (45.45%) followed by cost of production (36.36%) and word of mouth (18.18%). In the case of paneer, market survey (83.78%) and cost of production (16.22%) were the major mode for fixing the price of paneer. It can be concluded from the result that, farmers have very less authority in fixing the price for milk and milk products. Still, the cooperative have the dominating hand in fixing the price of raw milk. Apart from that, market survey were the other mode for fixing the price of milk & milk products. There were the need to develop some easy economic methodology for the farmers to calculate the cost of production of milk and milk products.

Table 13. Distribution of respondents according to Buyer's Scenario

Sl. No.	Products	Name of the buyers	Selling Price (Rs)	Number	Percentage
1.	Raw milk	1. Sudha	25	40	22.09
		2. Local vendors	30	43	23.77
		3. Local consumers	35	72	**39.78**
		4. Other dairy	25	26	14.36
2.	Paneer	1. Local vendors	230	30	**81.08**
		2. Local consumers	250	7	18.92
3.	Peda	1. Local vendors	5	6	27.27
		2. Local consumers	6	2	9.09
		3. Local tea shops	5	14	**63.64**

Table 14. Distribution of respondents according to fixing the price of milk and milk products

Sl. No.	Products	Based on cost of production	Market survey	Word of mouth	Decided by the cooperative	Decided by vendor
1.	Raw milk	12 (6.63)	38(20.99)	22(12.15)	66(36.46)	43(23.75)
2.	Peda	8 (36.36)	10 (45.45)	4 (18.18)	-	-
3.	Paneer	6(16.22)	31(83.78)			

Table 15. Distribution of respondents according to Transportation

Sl. No.	Products	Mode of transportation	Number	Percentage
1.	Raw milk	Cycle	86	**47.51**
		Motarcycle	43	23.75
		Train	37	20.44
2.	Peda	Cycle	10	45.45
		Motarcycle	8	36.36
3.	Paneer	Cycle	17	45.94
		Motarcycle	13	35.13

D. Transportation

It can be evident from the table 15, that, a little less than half (47.51%) of the respondents transport their raw milk through cycle, followed by motorcycle (23.75%) and train were used by around one fifth (20.44%) of the respondents. Rest (8.3%) were the local consumers who used to come at the door step of the farmers for taking the raw milk. In case of peda, for more than two fifth (45.45%) of the respondents cycle were the major mode for transportation followed by motorcycle (36.36%). A little less than one fifth (18.19%) of the respondents have responded that the local vendors and consumers were used to come at their home for buying the peda. Apart from raw milk and peda, paneer were mainly transported by cycle as responded by 45.94 per cent of the respondents. Motorcycle was the other source for transportation for more than one third (35.39%) of the respondents.

Conclusion

Indian agriculture came to very long distance in agricultural production, so the dairy also. But, on the share of farmers in the consumer price front, still it has to go a mile. Due to the lack of marketing information and intelligence, the farmers have to sell their produce in the haphazard manner, without proper understanding of the market behaviour. In, this regard there were the need of extension mechanism, which can consider the production as a system starting from the pre-production to marketing of the produce. Market led extension is such type of the system which consider the production in a system mode and committed to provide the right remuneration to the farmers for their produce. Market led extension in dairying consider it as a system starting from the selection of dairy farm site followed by proper breed selection, value addition of milk and finally reaching the consumers and ultimately farmers will get the optimum amount of share in consumers price. If, such type of system were followed by the dairy farmers, their livelihood can be secured on a sustainable basis and their standard of living can also be enhanced.

Acknowledgments

The authors would like to acknowledge Department of Science & Technology (DST), Ministry of Science & Technology, Government of India for providing INSPIRE fellowship for completion of Ph.D.

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