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Factors affecting the goat producers choice of market place and marketing efficiency in Afghanistan

TAVVA SRINIVAS[1], ADEN AW-HASSAN[2], BARBARA RISCHKOWSKY[3], MARKOS TIBBO[4], JAVED RIZVI[5] and ABDUL HALIM NASERI[6]

International Centre for Agricultural Research in the Dry Areas (ICARDA), Lebanon

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ABSTRACT

This paper aims to assess the efficiency in marketing goats and to identify the factors influencing the choice of market location for goat producers' in Baghlan and Nangarhar provinces of Afghanistan. Goat producers (280) were randomly selected in equal proportions for rainfed and irrigated systems from 28 villages in 4 districts in Baghlan and Nangarhar provinces. Shepherd index of marketing efficiency and binary logit model were used to assess the marketing efficiency and to analyze the goat producers' choice of market respectively. The study indicated that market efficiency was higher in Nangarhar than in Baghlan markets due to lower marketing margins. There is considerable potential for improving the marketing efficiency through capacity building of goat producers in production as well as marketing. Anticipated price per kg live weight of goat, breed, week day, age of goats and production system are influencing goat producers' choice of market location. The study enables the goat producers to plan their goat sales in district markets to fetch high revenue.

Key words: Binary Logit model, Choice of markets, Goats, Market channels, Price spread and efficiency

In Afghanistan, goats are an essential element in the mixed crop-livestock farming under irrigated and rainfed production systems and the livelihoods of rural communities with 7.3 million goats that produced 44,200 Mt of meat and 118,000 Mt of fresh milk (FAO 2012). In the past goats were regarded as backyard animals of little commercial significance partly due to cultural and social prejudices associated with goat husbandry (Devendra 2006). This image has changed in recent years but often the potentials of goats are still underexploited.

Present address: [1]Socio- Economist (s.tavva@cgiar.org), International Center for Agricultural Research in the Dry Areas (ICARDA) - Afghanistan Research Program, P.O.:1355, Kabul, Afghanistan. [2]Program Director (A.Aw-Hassan@cgiar.org), International Center for Agricultural Research in the Dry Areas (ICARDA), Social, Economic and Policy Research (SEPR) Program, ICARDA-Amman, Jordan. [3]Senior Livestock Scientist (B.Rischkowsky@cgiar.org), International Center for Agricultural Research in the Dry Areas (ICARDA), Diversification & Sustainable Intensification of Production Systems (DSIPS) Program, ICARDA-Ethiopia. [4]Food and Agriculture Organization of the United Nations (Markos.Tibbo@fao.org), Regional Office for the Near East. 11 Al Eslah El Zerai St., Dokki, PO Box 2223, Cairo, Egypt. [5]Regional Coordinator (j.rizvi@cgiar.org), International Center for Research on Agro-Forestry (ICRAF), South Asia Regional Office, NAS Complex, Pusa, New Delhi. [6]National Coordinato (abdulhalim.nasery@gmail.comr), Dairy Goat Project, International Center for Agricultural Research in the Dry Areas (ICARDA)- Afghanistan Research Program.

Transaction cost is one of the factors affecting the marketing efficiency of smallholder farmers. A study on transaction costs and market efficiency (Gu 2001) observed that as transaction costs decline, individual's increase their use of the market. Identifying factors affecting market channel decision is important (Anteneh *et al*. 2011). Tsourgiannis *et al*. (2008) opined that factors and farm characteristics that shape the farmers' decision to choose a specific marketing alternative are not well known in contrast to firms in other industries, as most agricultural products are undifferentiated at farm level and most smallholder farmers cannot exploit economies of scale due to the size of their holdings. According to Kotler (1994) distribution channel choice is one in which an organization can achieve its marketing objectives within the framework of its marketing strategy.

For identifying the imperfections in the performance of a market, for improving the market opportunities for goats and to define policies that improve market access as an overall poverty reduction strategy, understanding market structure, efficiency and determinants of smallholder marketing strategies are essential. However, relatively little is known about the marketing of goats as well as goat products in the rural areas of Afghanistan. Therefore, an attempt was made in this study to (i) analyze marketing margins and efficiency in major goats marketing channels in Afghanistan, and (ii) identify the factors affecting the goat producers' choice of market place.

MATERIALS AND METHODS

Goat producers (280) were randomly selected in equal proportions for rainfed and irrigated systems from 28 villages in 4 districts (Baghlan-e-Sannhati, Pul-I-Kumiri, Dar-e-Noor and Achin) in Baghlan and Nangarhar provinces. These provinces were selected purposively where development activities under the goats for women project (To improve the skills and knowledge of rural women in raising dairy goats, processing and marketing surplus products and improving the use of natural resources and their access to technologies, the International Centre for Agricultural Research in the Dry Areas (ICARDA) implemented International Fund for Agricultural Development (IFAD)-co-funded pilot research programme "Rehabilitation of Agricultural Livelihoods of Women in Marginal and Post-conflict Areas of Afghanistan) in Nangarhar and Baghlan provinces of Afghanistan. These two provinces keep 3.3 and 3.2% of the total goat population with 1.8 and 2.2 goats / family, respectively.) are already being implemented. The districts were purposively selected to represent areas where development activities under the Goats-for-Women Project were underway and others where no development activities were implemented. Seven villages from each district were selected randomly after dividing the district into different clusters. Ten households were selected from each village. Traditionally goat rearing in most of the provinces in Afghanistan is done by women in the family (Jean-Paul Dubeuf 2005) while their marketing is done by elders in the family or husband of woman goat producer or young boys above 15 years age in the family. Therefore women were interviewed to collect necessary information regarding production aspects and men provided information related to marketing of live goats.

Butchers (60) and traders (60) or commission agents were interviewed in such a way that 5 of these market agents in each category from the selected villages and 5 each from the district, province and Kabul markets were covered.

Structured and pre-tested questionnaires were used to collect data from goat producers and market agents on transaction costs, marketing margins in goat marketing; and on producer, goat and market characteristics that are expected to influence goat producer's choice of market place.

Marketing channels, margins, price spread and efficiency: Marketing of any commodity in any marketing channel incurs transaction costs. Hobbs (1997) defined 'transaction costs' as the costs involved in exchange or trade (e.g. marketing costs), costs of intangibles (e.g. search for exchange partners), contract monitoring and enforcement. Transaction/marketing costs such as transportation cost, market tax, commission of different market functionaries, etc. involved in the selected goat marketing channels in Afghanistan were calculated. Marketing margins, price spread and marketing efficiency in the selected marketing channels were estimated (Srinivas *et al*. 1999, 2002).

Goat producers' choice of market place using Logistic regression: Generally, little is known about the decision making process of farmers regarding marketing strategy selection, and particularly about the factors and the farmers' characteristics that influence them to choose a particular strategic alternative. Determinants of smallholder marketing strategies allow the policy makers to assist farmers in improving market access. Gong *et al.* (2007) used the model to examine key factors that affect cattle farmers' selection of marketing channels and draw implications for China's beef supply chain development. To determine factors influencing goat producers' choice of market location, binary logit model (Logistic regression or logit model refers to statistical procedures that model choices made by people among a finite set of alternatives and estimate the probability of choosing a particular alternative.) was used.

Selection of variables: The survey showed that producers sold their goats at village, district and provincial markets. Observed price / kg live weight of goats sold in provincial, district and village markets was Afs 164, 149 and 142, respectively, and the price difference between these market places was significant. As very few goat producers (15) were selling at provincial markets in the sample, this market place was not considered and only producers' choice between village and district markets was analysed.

Many potential qualitative and quantitative factors are expected to influence the goat producers' choice causing the price difference between the 2 market locations. These factors are grouped into market, producer and goat characteristics and external factors. Davies (2001) developed a typology regarding the marketing strategies that beef and sheep farmers follow and profiled the farmers that adopted each marketing strategy, regarding their farm and personal characteristics as well as their distribution channel utilization. Similarly Hobbs (1997) reported that age, education and farm profit are also some factors that affect farmers in their marketing channel choice.

Demand for meat was more on Thursdays, Fridays and Saturdays in the district markets as indicated by traders/ butchers and it is likely to influence goat producers' choice of market location. Also, more goat sales were observed during fall anticipating fodder shortages in winter and thus expecting the influence of season on the market choice. Further goat producers from irrigated production system are likely to sell in district markets as heavier goats are likely to fetch high prices per kg live weight and it is evident from the observed data that goats from irrigated production system fetched more price (Afs 146) than from rainfed (Afs 141). Therefore some potential market characteristics such as marketing day, market distance, season of sales and production system were included in the model.

Wealthy goat producers have tendency to select district as their choice of marketing due to their contacts with traders and butchers operating in the district markets. In the present study, number of animals available with the goat producer was taken as proxy to the wealth. Goat producers with production orientation towards fattening of goat kids prefer to sell in the district markets rather than in the village markets due to high market prices. This study considered

goat producer characteristics such as, age of goat producer, wealth, production orientation of goat producers and carrier of goat to market, to influence choice of market. Some studies such as by Mitchell (1976) showed that farmers were influenced in their livestock marketing decisions by publicly available information on prices and supplies. Therefore goat producers' access to market network was also considered as a potential determinant.

Some goat characteristics such as body condition of goat, breed, sex, age were also considered in the study. Project participation which is likely to influence market choice, was not included as it was just 1 year after the training on goat husbandry, dairy processing, etc., was imparted, this market study was taken up and impact is not likely to be reflected within such a short period in the results from the market data collected.

Price in district market is expected to be higher than in the village markets due to more competition between many market players functioning. Tsourgiannis *et al*. (2008) in their study found that sales price, speed of payment and loyalty have a significant influence on a marketing outlet selection by the goat farmers of Macedonia and Greece. Anticipated price per kg live weight of goat was included in the model as potential determinant.

The dependent variable, goat producers choice of market place is a binary variable (1, choice of market is district; 0, otherwise). Five continuous and 11 dummy variables were used as potential factors explaining market choice of goat producers in the analysis.

The following logit equation was estimated in SPSS:

$$\text{Log } [P/(1-P)] = ß_0 + ß_1\, AP + ß_2\, D + ß_3\, W + ß_4\, GPA + ß_5\, Lwt + \Sigma_i ß_i\, F + \Sigma_i ß_i\, MNW_i + \Sigma_i ß_i\, BR_i + \Sigma_i ß_i\, S_i + \Sigma_i ß_i\, GA_i + \Sigma_i ß_i\, BC_i + \Sigma_i ß_i\, PS_i + \Sigma_i ß_i\, Sn_i + \Sigma_i ß_i\, MD_i + \Sigma_i ß_i\, C_i + \Sigma_i ß_i\, B_i + e_i$$

where, log [P/(1-P)], log "odds" of the district markets as goat producers' choice; AP, anticipated price of goat; D, distance from market; W, total number of animals available with goat producer as a proxy to the wealth of goat producer, GPA is producers' age; Lwt, liveweight of goat; F, production orientation of goat producers such as fattening of goat kids; MNW, goat producers' access to market network dummy (with and without access); BR, goat breed dummy (Watani, Gujry and other breeds); S, sold goat sex dummy (male and female); GA, goat age dummy (less than 1 year, between 1 and 2 years and more than 2 years); BC, goat body condition dummy (good and bad); PS, production system dummy (irrigated and rainfed); Sn, season of sales dummy (summer, winter and other seasons); MD, market day dummy (Thursday, Friday, Saturday and other days); C, dummy on carrier of goat to market (husband of goat producer and others); and B, dummy for buyer of goat (wholesaler, butcher and others).

When an observation pertains to a variable in a dummy set, its value is 1; otherwise it is 0; ßs' represent the expected change in the odds of district market as choice of goat producers per unit change in the factor, other things being equal.

Table 1. Identified goat market channels in the selected provinces

Market channel	Per cent of sales
Goat producer-butcher-consumer	60
Goat producer-trader-butcher-consumer	16
Goat producer- neighbouring goat producers - butcher-consumer	13
Goat producer- commission agent -trader-butcher-consumer	11

RESULTS AND DISCUSSION

Market channels for goats: Goat producers in the selected provinces sell live goats in 4 channels (Table 1). They may directly sell animals to butchers or sell to traders or to other/neighbouring goat producers; or may sell animals to commission agents who in turn sell either to traders or directly to butchers. Finally butchers sell to consumers. As goat trading mostly takes place in the first and second channels in these provinces (60% in the first and 16% in the second channel), price spread and market efficiency analyses were restricted to these 2 channels.

Price spread and marketing efficiency analysis: Marketing margins, price spread and efficiency in goat marketing in the selected market channels 1 and 2 are presented in Table 2.

Price spread and marketing margins were estimated using average observed prices and weights of goats sold in channels 1 and 2 in Baghlan and Nangarhar provinces. Ninety per cent of live weight of goat can be obtained as meat. The per kg goat live weight producer prices in the 2 main channels (1 and 2) were Afs 152 and 135 in Baghlan and Afs 148 and 143 in Nangarhar respectively. These price differences were significant and were mainly due to difference in the weight of goats sold in both the channels and provinces. Average weight of goat sold in market channels 1 and 2 in Baghlan was 17 kg and 22 kg and it was 29 kg and 31 kg in Nangarhar markets, respectively.

Marketing margins

Goat producers, butchers and traders are the different market functionaries involved in marketing goats in channels 1 and 2. The margins incurred by these functionaries are given here.

Goat producers: In spite of the demand for goat products an obstacle faced by many goat producers in Afghanistan is access to markets for goat products. Poorly developed transport facilities and hilly terrain of the country adds to the constraints of resource poor goat producers. Producers, marketing cost covers expenditure on transportation, taxes and commissions paid to intermediaries if any which on an average amounts to Afs 296 in Baghlan and Afs 83 in Nangarhar. Other expenses including unofficial payments made by goat producers were to the extent of Afs 136 and 22 in Baghlan and Nangarhar provinces respectively. Marketing cost was high for Baghlan than Nangarhar goat

Table 2. Price spread analysis in goat marketing

Market Agent	Details	Baghlan (Afs)	Nangarhar (Afs)
I. Marketing cost			
A. Goat producer	a. Market Tax	34	28
(1 and 2)**	b. Transport cost	126	33
	c. Other expenses	136	22
	I.A Sub-total (a+b+c)	296	83
B. Trader (2)	a. Market fee/goat head	101	65
	I.B Sub-total (a)	101	65
C. Butcher (1 and 2)	Market channel 1*		
	a. Labour cost of finishing goat	104	54
	b. Labour cost for meat separation from skin (@ Afs	52	44
	c. Other expenses	27	54
	d. Maintenance cost	92	261
	e. Transport cost	10	28
	I.C.1 Sub-total (a+b+c+d+e)	285	441
	Market channel 2*		
	a. Labour cost of finishing goat	134	58
	b. Labour cost for meat separation from skin	68	47
	c. Other expenses	35	58
	d. Maintenance cost	119	279
	e. Transport cost	13	30
	I.C.2 Sub-total (a+b+c+d+e)	369	472
II. Market margin			
A. Trader (2)	@ 18% of the sale price of goat in Baghlan and 6% in Nangarhar	535	266
B. Butcher (1)	@ Afs 10 /kg meat in Baghlan and Afs 9 in Nangarhar in market channel 1	153	235
C. Butcher (2)	@ Afs 10 /kg meat in Baghlan and Afs 9 in Nangarhar in market channel 2	198	251
III. Goat producer sale price in market channel 1		2584	4292
IV. Goat producer sale price in market channel 2		2970	4433
V. Goat producer actual sale price in market channel 1 (III – I.A)		2289	4209
VI. Goat producer actual sale price in market channel 2 (IV- I.A)		2675	4350
VII. Price spread and market efficiency in market channel 1: Goat producer-Butcher-Consumer			
	a. Marketing cost (Sub-total of I A + I C.1)	581	524
	b. Marketing margin (II B)	153	235
	c. Consumer price of meat	3022	4968
	d. Consumer price/kg meat	198	190
	e. Price spread (VII a + VII b)	734	759
	f. Producer's share in consumer's rupee (V divided by VII c)	0.76	0.85
	g. Shepherd Index of marketing efficiency {(VII c/VII e)–1}	3.12	5.55
VIII. Price spread and market efficiency in market channel 2: Goat producer-Trader-Butcher-Consumer			
	a. Marketing cost (Sub-Total of I A + I B+I C.2)	766	620
	b. Marketing margin (II A + II C)	733	517
	c. Consumer price of meat	4173	5487
	d. Consumer price/kg meat	211	197
	e. Price spread (VIII a + VIII b)	1499	1137
	f. Producer's share in consumer's rupee (VI divided by VIII c)	0.64	0.79
	g. Shepherd Index marketing efficiency {(VIII c/VIII e)-1}	1.78	3.83

Note: 1. * Average weight of goat sold in market channel 1 was 17 kg and 22 kg in Baghlan and Nangarhar markets while in market channel 2, it was 29 kg and 31 kg in Baghlan and Nangarhar markets respectively. Meat can be obtained to the extent of 90% of the goat weight. Meat obtained in market channel 1 in Baghlan and Nangarhar was 15.3 and 26.1 kg while in market channel 2, it was 19.8 and 27.9 kg respectively.

2. **Numericals against different market agents correspond to market channels 1 and 2.

3. Average labour cost of killing goat, meat separation from skin, other expenses, maintenance and transport cost in Baghlan was Afs 6.8, 3.4, 1.8, 6 and 0.7 while in Nangarhar, they were Afs 2.1, 1.7, 2.1, 10 and 1.1 /kg meat respectively.

producers due to relatively longer distances of villages from district/provincial markets and also prevailing high unofficial payments.

Butchers: Meat preparation, transport and maintenance of retail shop are the different categories on which butcher is incurring cost. Marketing cost for butchers in Nangarhar was higher compared to Baghlan. The difference in marketing cost between 2 provinces was mainly due to the high maintenance cost of shop in Nangarhar (Afs 10 kg meat sold) compared to that in Baghlan (Afs 6 kg meat

sold). After preparation, carcasses were transported by pickup vehicles, motorbike or bicycle to butchers' premises by incurring on an average Afs 0.67 and 1.09/kg meat in Baghlan and Nangarhar provinces respectively. Butcher charged Afs 10 and 9 / kg meat in Baghlan and Nangarhar, respectively, as profit margin.

Traders: Traders marketing cost include marketing fee and other miscellaneous expenses. Here marketing costs incurred by trader was for selling goats purchased from a goat producer in the district market to a butcher in the same market. Thus there was no transport cost accounted in the estimation of marketing cost for trader. Trader charged 18% and 6% of the value of live goat as profit margin in Baghlan and Nangarhar respectively.

Price spread and marketing efficiency

Market channel 1 (goat producer-butcher-consumer): In this channel, live goats are sold to butcher by goat producer and consumer purchases meat from butcher. Price spread was more in Nangarhar than in Baghlan due to high cost of maintenance of shops at butcher level and also high transport cost of live goats incurred by goat producers from different villages. Of the price spread, marketing cost and margin accounted for 79 and 21% in Baghlan and 69% and 31% in Nangarhar provinces respectively. Producer's share in consumer price was more in Nangarhar than Baghlan market due to less marketing margins. Index of marketing efficiency was thus more in Nangarhar (5.55) than in Baghlan (3.12) markets.

Market channel 2 (goat producer-trader-butcher-consumer): In this channel live goats are routed through trader and butcher from goat producer to reach consumer as meat. With the increase of one market functionary compared to the previous channel, marketing cost and margins increased in this channel. Price spread was high in Baghlan than in Nangarhar in this channel because of high market margins of traders. Of the price spread, marketing cost and margin accounted for 51 and 49% in Baghlan and 55 and 45% in Nangarhar markets respectively. Producer's share in consumer's rupee was more in Nangarhar than Baghlan market due to less marketing cost in Nangarhar market. The high index of marketing efficiency of Nangarhar market can be explained by a lower margin of market agents compared to in Baghlan markets.

Factors affecting the goat producers' choice of market place

The estimated $ß_i$s, their standard errors (SE), significance levels (P) and the odds ratio (Exp($ß_i$)) are presented in Table 3. The chi-square (÷) value was statistically significant implying that the model fitted the data well. The estimated coefficients reflect the effects of the corresponding explanatory variables on the log odds of district market as goat producers' choice.

Anticipated price per kg live weight of goat, Watani and Gujry breeds, goats sold on Saturday, goats with age less than 1 year and production system showed positive and significant influence on log odds of district market as choice of goat producers. The market choice of goat producers planning to sell Watani and Gujry breed goats with age less than 1 year on Saturdays with high anticipated price per kg live weight of goat would be district markets. For one unit increase in the anticipated price, the odds of district market as choice of goat producers increases by 2.5%.

Table 3. Factors affecting the goat producers' choice of market place

Factor	ßi	SE	P	Exp(ßi)
Constant	–9.123**	3.433	0.008	0.000
Anticipated price per kg	0.025**	0.009	0.005	1.026
Liveweight	–0.014	0.040	0.728	0.986
Distance from market	0.026	0.050	0.599	1.027
Fattening goat kids	–0.155	0.692	0.823	0.857
Wealth of goat producer	0.0001	0.003	0.927	1.000
Age of goat producer	0.0001	0.027	0.997	1.000
Sex	0.697	0.543	0.200	2.007
Body condition	–0.669	0.792	0.398	0.512
Goat carrier	0.009	0.451	0.983	1.009
Network dummy	0.413	0.608	0.498	1.511
Production system dummy	1.010*	0.433	0.020	2.747
Watani	0.955*	0.589	0.105	2.599
Gujry	1.587*	0.717	0.027	4.891
Thursday	–0.878	0.729	0.228	0.416
Friday	0.575	0.530	0.279	1.777
Saturday	1.196*	0.740	0.106	3.307
Wholesaler	0.176	0.683	0.797	1.192
Butcher	0.327	0.499	0.512	1.387
Age less than 1 year	1.948*	1.104	0.078	7.014
Age 1 to 2 years	0.454	0.816	0.578	1.575
Summer	0.580	0.672	0.389	1.785
Winter	0.060	0.435	0.891	1.061
-2 Log-Likelihood ratio		174.65		
Chi-square (χ)		69.22**		
Psuedo R^2 (Nagelkarke)		0.42		

Among the goat characteristics, only Watani and Gujry breeds of goat and age of the goat less than 1 year significantly influenced the goat producers' choice of market place. The odds of district as choice increased by 159 and 389% while selling Watani and Gujry goats respectively. Similarly the chances of selling in district markets increased while selling goats with less than 1 year age.

Among the market characteristics, as expected, Saturday selling increased the odds of district market as goat producers' choice. The possibility of selling in district markets is greater for goat producers from irrigated production than that from rainfed. This may be because of anticipation of high sale prices for heavier goats from district sales. Goats gain more weight in a shorter period under irrigated production system than in rainfed conditions due to availability of more fodder and pastures and this encourage goat producers to sell in district markets for getting the benefit of high market price. It was expected

that the distance from market would have negative influence on the odds of district market as choice. However this factor did not show any effect on goat producers' choice. Lack of village markets in Baghlan province probably caused the distance as non-determinant in goat producers' market choice. Some goat producers sell in village markets to avoid transporting live goats and other value added products to market and to get needed cash immediately.

Also this study found that none of the producer characteristics have influence on the odds of goat producers' choice of marketing in districts unlike to the study by Hobbs (1997). As fattening goat kids is an indicator of higher wealth or connections to the value chain actors like traders and butchers, it is expected to influence the choice of market. But in the current study this factor did not have significant influence on the district as choice of market for selling. This may be because the correlation between fattening practice and number of animals with the goat producer as a proxy to the wealth was low (0.10).

Strong technology transfer and information provision exercises should ensure that small goat producers are kept abreast of developments for improving their bargaining power. In Afghanistan, there is no agency that monitors and provides market information. Price information flows on a personal basis and friends and neighbouring farmers were the main source of market information. As goat producers have poor market information networks, network dummy has no significant influence on the odds of district markets as their choice. Devendra (1999) argued that the lack of knowledge of markets and marketing systems combined with the neglect of linking the production of small ruminant to their marketing have resulted in reduced revenue from small ruminants to farmers and made them unable to respond to demand and supply forces.

The study revealed that there is good scope for the goat production sector to contribute more effectively to the Afghanistan economy by improving marketing efficiency through better market intelligence system, reducing marketing margins and capacity building of goat producers in production as well as marketing. The foregoing study enables the goat producers to plan their goat sales in district markets to fetch high revenue.

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