Original Research Article

Causes and Constraints in Equine Rearing in Haryana, India

Abstract

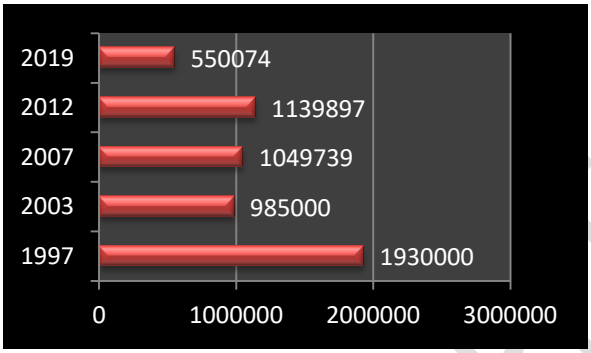
Present study was aimed to identify causes and constraints in equine rearing in Haryana, India. The study was descriptive in nature and survey based. Structured interview schedule was adopted for data collection and data analysis was done by adopting Statistical Package for Social Sciences (SPSS) version. In the current study, majority of respondents delineated in their feedback that veterinary services are not satisfactory for equines in Haryana. These services either are not available, staff is reluctant towards treatment of equines or lack of expertise is there in equine health and management. Only 33.7% responded that government veterinary services are available for equines in the state. Majority of respondents reported that loan facilities (67.7%), insurance facilities (70.3%) and artificial insemination (AI) services (57.1%) are not available for equine in Haryana. ~~As~~ The major causes and constraints ~~in~~ for equine rearing reported are, ~~concern, 29.7% respondents that~~ 1. excessive use of automobile (29.7%), 2. higher input cost ~~is more~~ than out-put cost (9.9%), 3. closure of equine fairs (10.2%), 4. social taboo (9.9%), ~~respondents~~ 5. lack of enthusiasm among younger generation toward equines (5.3%), and 6. ignorance of government policies (10.6%). The ~~As~~ suggestions given for improvement are availability of 1. loan facilities at ~~on~~ subsidized rates ~~concern,~~ (42.4%), 2. expert government veterinary services (24.6%), 3. adequate insurance facilities (6.6%), 7.3% restart of equine fairs (7.3%), 4. arrangement of adequate work for equines (2.0%) and 5. organization of 1.3% awareness camps (1.3%) by Haryana government authorities. The current study is very significant and will be helpful to visualize and address the situation in changed scenario.

1. Introduction:

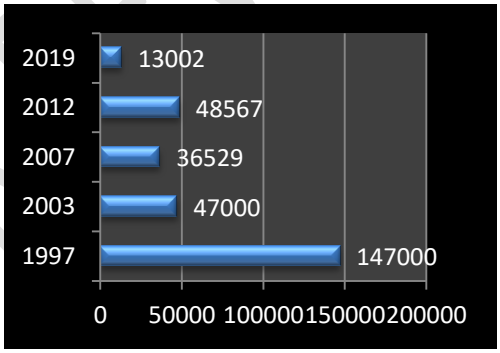
India has been blessed with various species of livestock. This sector is a source of wealth and power and approximately two-third families of farming communities are associated with any one species of livestock to earn their livelihood through sale of livestock and sale of their by-products or utilizing their draught powers. In India, livestock sector is one of the largest sectors in the world and its equines population is 1.4% of world's equines population. Livestock are considered as a walking bank and insurance for family [1]. The present study was aimed to identify causes and constraints of respondents in equine rearing in Haryana, India. Respondents are equines farmers engaged in equine rearing profession since ages; their livelihood depends on equine rearing and it is an integral part of farming sector in Haryana.

Equines help in generating direct and indirect income of their owners. Equines are major components of livestock; play an important role in socio-economic aspects of households engaged in their rearing and their contribution is crucial for livelihood of these households in Haryana [2]. Equines are herbivores, monogastric, non-ruminant and sure footed animals. There are further four sub groups of equines i.e. horse and pony (*Equus caballus*), donkey (*Equus asinus*) and mule (*Equus mulus*) [3]. In India, equines are generally reared by landless, small and marginalized farmers and these farmers are dependent on earning of these animals and multiple tasks are taken from equines [4 &5]. It was observed that equine population is in declining trend during last few decades in India and in Haryana as well (Image-1)

Image 1: Graphic presentation of trend of equine population in Haryana and India [23]:



In India



in Haryana

2. Methodology:

2.1 Study area:

The study was conducted in four districts (Provinces) of Haryana; Hisar, Bhiwani, Jind and Rohtak and it was ~~conducted~~ in rural and urban area as well. Haryana is surrounded by National Capital New Delhi from three sides. Contribution of Haryana is significant in national GDP. There are 22 districts and as per national census-2011, human population of the state is approximately 25.3 million [16].

2.2 Data collection:

Structured interview schedule was adopted for data collection containing questions designed especially as per the requirement of the study. Multistage random sampling method was applied for data collection and personal interview method was adopted.

2.3 Sample size:

Selection of respondents was done by simple random sampling method at sampling site. Overall 303 respondents took part in study and out of these 88 were from Hisar district, 77 from Bhiwani district, 73 from Jind district and 65 from Rohtak district.

2.4 Data management and analysis:

Interview schedules were arranged district and category wise. List was prepared and all filled interview schedules were examined thoroughly; missing digits were updated by contacted respondents through telephonic conversation. Editing and post coding was done and classification was done to convert raw data into a meaning full. Data entered in Microsoft office excel worksheet. Statistical analysis was done by using IBM Special Package for Social Sciences (SPSS) version

3. Result and discussion:

3.1 Assessment of government services available for equines in Haryana:

It was observed that equines are still source of earning for many households in Haryana and they play a significant role in generating livelihood, poverty eradication and women empowerment. But respondents are still facing constraints in equine rearing. Tabular presentation of availability of government services for equines in Haryana is given below:

In current study, it emerged out that government veterinary services are not satisfactory for equines in Haryana and majority of respondents reported that these services are not available/staff is reluctant toward treatment of equines or lack of expertise is there in equine health and management. Only 33.7% responded that government veterinary services are available for equines in the state. It was found that services are better in Rohtak district, where 64.6% respondents reported that government veterinary services are satisfactory for equines and in Bhiwani district situation was worse where 61% responded that services are not available for equines. Insurance and loan facilities to expand equine rearing business are not satisfactory and majority of respondents reported that either these facilities are not available/not attractive or they are not aware about availability of these facilities. Breeding facilities are not satisfactory in the state and majority of respondents reported that neither good quality stallions are available nor Artificial Insemination facilities are available for equines

and they have to take theirs mares for breeding to a long distance and this exercise involves lots of time and money. Grazing/pasture land is not available in their locality and majority of respondents responded that pasture area is not available in their locality and they do not take their equines for open air grazing. Due to absence of grazing, additional feed/fodder for their equines have to purchased [Table 1].

Table 1: Tabular presentation of assessment of government services for equines in Haryana:

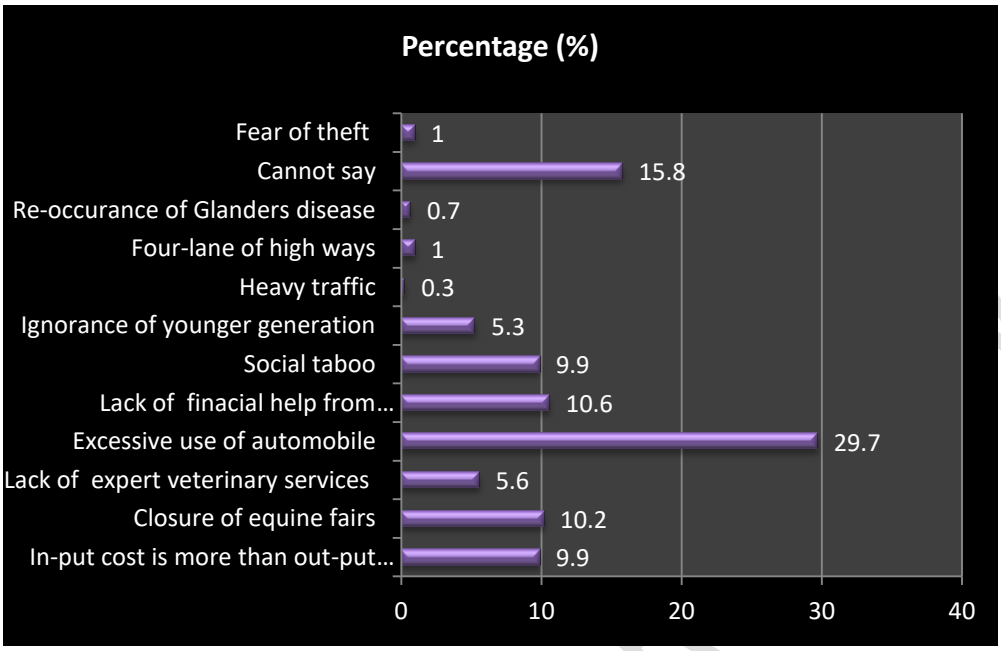
Variables	Frequency (percentage)					
	Responses	**Hisar (n-88)**	**Bhiwani (n-77)**	**Jind (n-73)**	**Rohtak (n-65)**	**Overall (n-303)**
Veterinary services	Not available	8 (9.1%)	47 (61(%)	17(23.3%)	3 (4.6%)	75 (24.8%)
	Available	25 (28.4%)	15 (19.5%)	20 (27.4%)	42 (64.6%)	102 (33.7%)
	Staff is reluctant	22 (25%)	6 (7.8%)	7 (9.6%)	1 (1.5%)	36 (11.9%)
	Lack of expertise	33 (37.5%)	9 (11.7%)	29 (39.7%)	19 (29.6%)	90 (29.7%)
loan facilities	Not aware	30(34.1%)	21(27.6%)	20 (27.4%)	8 (12.3%)	79 (26.1%)
	Not available	49 (55.7%)	51 (66.2%)	53 (72.6%)	52 (80%)	205(67.7%)
	Available	00 (0.0%)	00 (0.0%)	00 (0.0%)	00 (0.0%)	00 (0.0%)
	NA	9 (10.2%)	05 (06.5%)	00 (0.0%)	5 (7.7%)	19 (6.3%)
Insurance facilities	Not aware	29 (33%)	20 (26%)	20 (27.4%)	11(16.9%)	80 (26.4%)
	Not available	54 (61.4%)	54 (70.1%)	53 (72.6%)	52 (80%)	213(70.3%)
	Available	00 (0.0%)	00 (0.0%)	00 (0.0%)	00 (0.0%)	00 (0.0%)
	NA	05 (5.7%)	03 (3.9%)	00 (0.0%)	2 (3.1%)	10 (3.3%)
Availability of good quality stallion	Available	01 (1.1%)	02 (2.6%)	07 (9.6%)	00(0.0%)	10 (5%)
	Not available	53 (60.2%)	49 (63.6%)	21 (28.8%)	28 (43.1%)	151 (49.8%)
	NA	34 (38.6%)	26 (33.8%)	45 (61.6%)	37 (56.9%)	142 (46.9%)
Artificial insemination facilities	Available	01 (1.1%)	00 (0.0%)	00 (0.0%)	00(0.0%)	1 (0.3%)
	Not available	53 (62.5%)	55 (62.5%)	34 (46.6%)	24 (36.9%)	173 (57.1%)
	NA	32 (36.4%)	32 (36.4%)	38 (53.6%)	41 (63.1%)	129 (46.6%)
Pasture land	Available	4 (4.5%)	6 (7.8%)	1(1.4%)	6 (9.2%)	17 (5.6%)
	Not available	84 (95.5%)	71(92.2%)	72 (98.6%)	59 (90.8%)	286 (94.4%)
Hiring of private veterinary services	Yes	44 (50%)	48 (64.4%)	47 (64.4%)	12 (8.5%)	135 (44.6%)
	No	27 (30.7%)	26 (34.2%)	25 (34.2%)	51 (78.5%)	133 (43.9%)
	Use of ITK*	14 (15.9%)	4 (1.4%)	1 (1.4%)	2 (3.1%)	32 (10.6%)
	NA*	3 (3.4%)	00 (0.0%)	00 (0.0%)	00 (0.0%)	3 (1.0%)

ITK* - Indigenous Technical knowledge.

NA* - Not applicable**.**

3.2 Causes and constraints in equine rearing in Haryana:

Figure-1: Graphic presentation of causes and constraints in equine rearing in Haryana:



In the current study, every respondent was asked to delineate a major constraint in his feedback being faced by him in equine rearing. While analyzing the feedback, the following major causes and constraints were emerged out and presented below in graphic presentation:

3.2.1 In-put cost is more than out-put cost:

Due to non-availability of adequate government veterinary services and breeding facilities for equines, respondents have to hire private veterinary services and stallion for breeding of mares on high rates. Respondents have to purchase additional feed/fodder due non-availability of pasture area. Respondents are not getting adequate work for their equines. As a result, rearing cost is increasing in comparison to out-put cast in equine rearing and 9.9% respondents marked in their feedback that this is one of the cause and constraint in equine rearing in Haryana [Figure-1]. The current study agree with the study conducted in Banswara district of Rajasthan that lack of pasture land is a major constraint in livestock rearing and it has a high ranking of RBQ value 98.34 [6]. It was observed that increased cost of feed/fodder in livestock sector due to non-availability of pasture land and lack of grazing ~~and it was found~~ as one of the major constraints in livestock rearing [7].

3.2.2 Closure of equine fairs:

Equine fairs are the places where equine breeders, equine lovers and equine experts meet and interact with each other at one place. Here trading of equines are done on a large scale. Beri (Jhazzar) and Kapalmochan (Yamuna Nagar) are famous equine fairs in Haryana and a large number of equines farmers visit these fairs with their equines for trading [8]. These fairs were discontinued since last few years, previously due to re-occurrence of Ganders disease in India and recently due to COVID-19 pandemic and lockdown. Due to closure of equine fairs, trading of equines is affected and respondents are facing monetarily loss in equine trading and 10.2% responded that closure of equine fairs is also one of the cause and constraint in equine rearing [Figure-1].

3.2.3 Lack of expert veterinary services for equines:

Government veterinary services are not satisfactory for equines in Haryana and 5.6% respondents delineated in their feedback that this is the major cause in equine rearing in Haryana [Figure-1]. If government veterinary services are not available, equine farmers are compelled either to hire private services on payment of high charges or they have to use their own ITK for treatment of their equines. Equines are very sensitive animals and treatment is required immediately, if it is sick and its movement is not possible to veterinary clinic for its treatment [3]. The current study agree with study which was conducted in purposively selected Jaipur district of Rajasthan and it was found that 58.33% constraints in livestock rearing are due to less availability of experts and 54.16% due to non-availability of emergency treatment at doorstep, 62.50% due to hiring of private veterinary services on high cost [9]. This constraint exists globally in livestock sector and it was revealed out in study conducted in Ethiopia that government veterinary clinics have scarcity of adequate facilities to handle clinical cases and lacking adequate equipment's [10].

3.2.4 Lack of breeding policies for equines:

It was found that breeding facilities are not satisfactory in the state and majority of respondents reported that neither good quality stallions nor Artificial Insemination (AI) facilities are available for equines and they have to take theirs mares for breeding to a long distance and this exercise involves lots of time and money. The current study agree with the study which was

conducted in purposively selected Jaipur district of Rajasthan and it was found that 79.6% constraints are due to less availability of AI facilities at doorstep [9].

3.2.5 Lack of adequate work for equines due to excessive use of automobiles:

Previously, equines were exclusively used as a major source of operation in agricultural sector, transportation sector, bricklins and construction sector [11]. Equines use has decreased drastically in these sectors and automobiles are preferred. In current study 29.7% respondents reported that demand of work for equines has decreased due to excessive use of automobile and this is one of the cause and constraint in equine rearing [Figure-1]. It was observed that demand of work for equines is decreasing due to mechanization and excessive use of automobile [5].

3.2.6 Lack of financial help from government of Haryana:

As per financial help from government is concerned, 10.6% respondents reported that lack of financial help like; loan/ insurance as one of the constraint in equine rearing [Figure-1]. Always there is need of capital to expand any business and insurance coverage for its successful running. It was observed that no financial provision is there for loan facilities for equine farmers in Haryana. Insurance facilities are either not available or not attractive for equines [12]. Ignorance of policy maker is responsible for decline of equine population in Haryana [2].

3.2.7 Social issues:

As social issues are concern, 9.9% respondents pointed out that social taboo and 5.3% responded that ignorance of younger generation toward equines is one of the constraints in equine rearing [Figure-1]. This study agrees with review study conducted in Haryana that social taboo, ignorance of younger generation and cultural constrains are responsible for declining trend of equine population in Haryana [5]. This study also agrees with the study which was conducted that Himachal Pradesh that advancements in education have been observed as the major threats to equine rearing activities [13].

3.2.8 Heavy traffic, four lane and construction of fly-over:

Equines were the prime means of transportation before the increase of popularity of automobiles; riding of horses and horse driven vehicle were common on roads and equines were the primary source of transportation until automobiles took over as transportation

medium. There are advancements and automobiles are used for transportation, but equines are still used in some area as transportation in day to day work [Wikipedia, equestrian use of roadways]. But due to increasing trend of automobiles, load of traffic has increased on road; four-lane and fly-over have enhanced speed of traffic. In the current study 1.3% respondents reported that present roads, fly-over and heavy traffic are not suitable for walking of equines and this is one of the cause and constraint in equine rearing [Figure-1].

3.2.9 Re-emerging of Glanders diseases in India:

Glanders is a contagious, zoonotic and highly fatal disease of equines. It is caused by the gram-negative bacteria known as Burkholderia mallei. Human is accidental host and the disease usually results from occupational contact and its treatment is difficult and it is a notified disease worldwide and in India as well, under Glanders and Farcy Act 1899. The occurrence of the disease leads to international trade restrictions. Recently, reports show re-emergence of the dreaded disease in India [14]. In the current study 0.7% respondents reported that they are afraid of this disease and are reluctant to expand equine rearing [Figure-1].

3.2.10 Fear of theft, especially for donkeys:

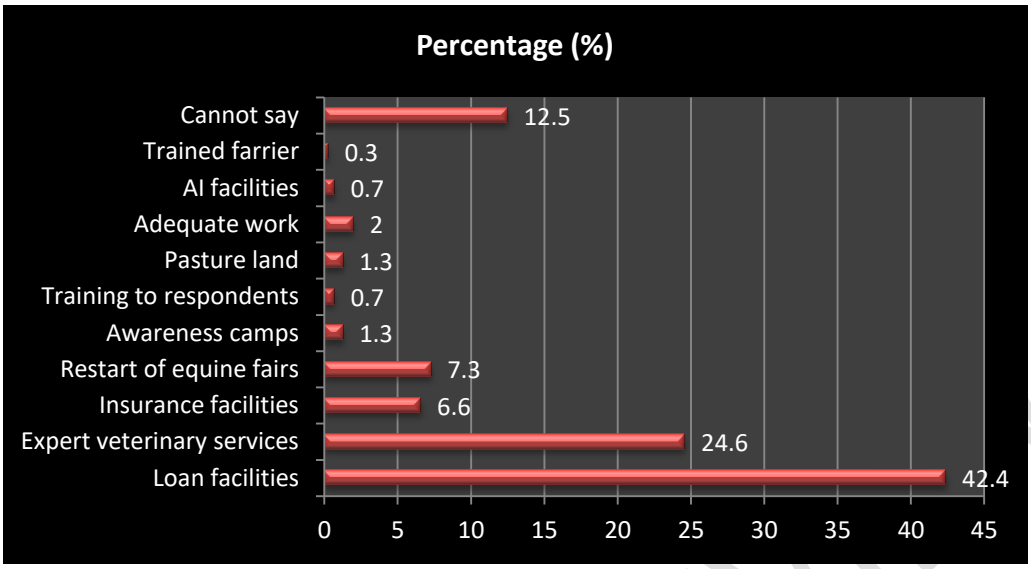
Reports of donkey theft have been received and 1% respondents delineated in their feedback that they are afraid of theft of donkey and equine population, especially donkey population, is declining in the state [Figure-1]. As a result demand of donkey has increased and also there are reports of donkey theft in Haryana and Rajasthan [15]. This constraint is also very important and respondents are reluctant to maintain equines, especially donkeys.

3.2.11 Cannot say:

In the current study, 15.8% respondents delineated in their feedback that they are not able to comment on causes and constraints being faced in equine rearing in Haryana [Figure-1]. This group is very important and while study it was personally felt that basically this group of respondents is on boarder line and thinking about shifting from equine rearing to some other profession and looking for other source of income due to causes and constraints in equine rearing and don't want to comment on the topic.

3.3 Suggestions to improve equine husbandry in Haryana:

Figure-2: Graphic presentation of suggestions as per feedback from respondents:



In the current study, every respondent was asked to delineate at least one suggestion in his/her feedback to improve equine husbandry in Haryana. While analyzing the feedback of respondents, the following suggestions were emerged out on different variables and furnished below:

3.3.1 Analysis of loan facilities was done and 42.4% respondents delineated in their feedback that loan facilities should be provided for equines rearing in Haryana [Figure-2]. Therefore, it is suggested that provision of fund for loan for equines may be made in annual budget in Haryana on subsidized rates for equines as these are being provided to other livestock and poultry.

3.3.2 As expert government veterinary services for equines in Haryana are concern, 24.6% respondents demanded in their feedback that these services should be made available at village level [Figure-2]. It is understood that equine population is scattered in the state and it seems impractical to depute equine experts at every stage. Therefore, it is suggested that an ambulatory and mobile equine clinic services should be initiated by Department of Animal Husbandry, Haryana on block/subdivision or every possible level. Regular training programmes and refresher courses in equine health and management should be organized for existing Veterinary and Para-veterinary staff of Animal Husbandry Department of Haryana in coordination with State Veterinary University and ICAR-NRCE.

3.3.3 In the current study, 6.6% respondents responded that insurance facilities are not adequate for equines [Figure-2]. Therefore, it is suggested that insurance facilities should be made available on low premium with adequate risk cover for equines, as these are being provided to other livestock and poultry by Department of Animal Husbandry.

3.3.4 Equine trading is adversely effected due to closure of equine fairs and 7.3% respondents delineated this incident in their feedback [Figure-2]. It is suggested that equine fairs should be re-organized on regular basis as early as possible with participation of government departments.

3.3.5 As awareness camps are concern, 1.3% respondents pin pointed in their feedback for awareness camps [Figure-2]. It is suggested that equine health and awareness camps should be organized on regular basis. These camps should be organized by Department of Animal Husbandry, Haryana in coordination with National Institutes, State Veterinary Universities and Non-Government Organizations (NGO's).

3.3.6 In the current study, 0.7% respondents mentioned in their feedback that formal trainings should be provided to respondents on equine husbandry (Figure-2]. Hence, it is suggested that special drives should be organized for formal/professional training on equine rearing for respondents on every possible level by Department of Animal Husbandry, Haryana in coordination with National Institutes, State Veterinary Universities and Non-Government Organizations (NGO's).

3.3.7 In the current study, 1.3% respondents mentioned in their feedback that common land should be demarcated for equines [Figure-2]. It is suggested that special land should be allocated for grazing of equines at every possible level.

3.3.8 In the current study, 2% respondents submitted in their feedback that adequate work should be made available for equines [Figure-2]. Equines use has decreased drastically in agricultural sector, transportation sector, bricklins and construction sector and automobiles are preferred. It is suggested that equine power should be utilized as per the prevailing work requirements in following way:

3.8.9 As an alternate in agriculture operations and other transportations: Being light weight, equines use can be promoted in agriculture and dairy farm for transportation of material/public and goods as a replacement of non-equine species and tractor power, especially in hilly region, desert and remote area [24].

3.8.10 As an equine-entrepreneurship: Equine industry can be promoted as equine husbandry based agri-entrepreneurship. Following can be the area to promote equine husbandry as an agri-entrepreneurship [22]:

- Eco-tourism.
- Equine Safari.
- Equines riding school and sports activities.
- Ceremonial activities.

3.8.11 Proper utilities of equine by-products:

- **Equine dung:** Equine dung can be promoted for use in vermin-composting and mushroom cultivation etc [11].
- **Donkey milk:** Equine milk, especially donkey milk, has tremendous medicinal value as curative agent for metabolic and allergic diseases [17 & 18]. Equine husbandry can be enhanced promoting donkey dairy and utilization of donkey milk for various purposes.
- **Equine meat:** Due to some misconceptions, equine meat is not consumed in India [19]. In future, if governmental policies permit, equine husbandry can be enhanced through export of equine meat.
- **Equine bone:** Equine bones are comparatively thick and dense [20]. This sector needs further exploring to boost as entrepreneurship.
- **Equine leather:** Presently due to some social issues and misconceptions skin is not recovered from carcass of equines. [19]. These issues are to be addressed on government and social level and in future this leather industry can be a good source for income for equine farmers.
- **Donkey skin:** Donkey skin is not used in India for commercial purposes due to some social issues and these issues are to be addressed on government and social level

and this can be helpful to enhance income through donkey rearing. Donkey rearing is practiced in some countries, especially China, to recover their skins to produce Ejiao (a medicinal gelatin) [21].

3.8.12 Good quality stallion and AI facilities should be made available at village level to enhance equine population in Haryana [Figure-2].

3.8.13 Farriery work is a very specialized job for maintenance of foot of equines. In the current study, it was found that there is lack of trained farrier and number of respondents mentioned in their feedback that a trained farrier should be made available [Figure-2).

4. Conclusion:

Equines play an important role in socio-economic livelihood of millions of households in rural and urban as well. Output cost is decreasing in comparison of input cost from equine rearing and their owners are not getting adequate income from equine rearing and as a result, equine farmers are shifting from equine rearing profession to other animal rearing or some another profession. Hence above mentioned causes and constraints need to address by Haryana government and output cost of equine farmers need to be enhanced. Equine industry needs to be taken as an entrepreneurship and every by-product of equines should be treated as a product for sale. It is concluded that more study should be undertaken on equine related issues and entrepreneurship covering economical and statistical aspects of equine husbandry. The current study is very significant in current situation when equine farmers are migrating from equine rearing and exploring new source of income. This study will be helpful for policy makers in addressing causes and constraints of equine farmer's community in Haryana.

Ethical Statement:

Present study was a survey-based study and did not require any ethics committee approval. However, prior to start interview, respondents were explained about the study and their consents were taken to conduct interviews.

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