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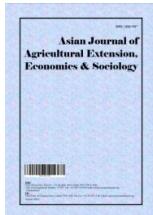
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## **Working Equids: Their Conditions, Invisible Earning and Challenges- A Review**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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### **ABSTRACT**

Working equids play vital role in pastoral economy nationally as well as globally and their role is very significant in providing livelihood to households of their owners through direct and indirect financial contribution. This review aims to analyze their conditions, constraints and their invisible income. Working equids contribute for both direct and indirect income to large number of households and provide draught energy to a large human population nationally and internationally. They are important components of livestock and as per the livestock census done by Department of Animal Husbandry, Dairy and Fishery, Government of India, equine contribution in livestock population was 0.39% in 1997 , 0.32% in 2003, 0.22% in 2007, 0.22% in 2012 and it came down to 0.10% in 2019. Though being comparatively less number in total livestock population, their roles are important in particular section of landless and marginalized human population engaged in rearing of these animals. Working equids are facing negligence, poor health and malnutrition. Excessive use of automobile, their declining contribution in agricultural GDP and some social issues are major constraints for declining trends in their population.

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## 1. INTRODUCTION

Role of livestock is very important in Indian economy. Around 20.5 million households directly depend on livestock sector for their livelihood. More than 16% small farm households and 14% rural households depend on livestock and on an average two-third rural community depends on livestock sector. 4.11% of total GDP and 25.6% of total agriculture GDP is contributed by livestock sector and provides employment to 8.8% Indian population [1].

Similarly role of working equids is also important and contribution of equine is also important in Indian economy. Having four sub groups i.e. horse and pony (*Equus caballus*), donkey (*Equus asinus*) and mule (*Equus mulus*), equines have played a vital role not only in Indian continent but also globally [2]. In China they are most recurrent animals known as symbol of speed, courage, integrity, diligence, perseverance, power, energy, leadership, and success and they have played every important role in history of China [3]. Being comparatively less in number, their contribution is noticeable. They work every day for providing livelihood to large section of human population. Their role is very vital in production chain of various enterprises including; agriculture, transportation, construction, sports, tourism, recreational and ceremonial activities. They have been called “beasts of burden” and are power engine of rural India and also for other developing countries but generally they remained invisible in national and global policies. Though they are a component of livestock population but not considered as such a part of livestock by policy makers, because they are not direct source of animal based food chain. Though working equids do not contribute directly to food security system, but they provide draught energy to a socially and economically deprived group of human population and they provide direct and indirect help to increase the financial impact of their owners. Globally working equids population is approximately 112 million and directly or indirectly helping 600 million people throughout the world [4].

It was also emphasized in Fourth International Conference on Working Equines, in Hama, Syria in 2002 that “Working equids are found worldwide and represent a potential power source, equine power is equal to engine power and their presence influence cultural, socio-

economic and political situation and animal population, health and nutrition, they have been suggested replacement of oxen in agricultural operations, represent a vast power resource of which only a small proportion has been used currently in agriculture. Worldwide tractor is used for agriculture operation, but its use is limited to rich farmers due to economic reasons. Livestock power is used to replace as a substitute of tractor. However equine power can be used in agricultural operations and if there is a situation of draught or outbreak of disease specific to non-equine livestock, which is difficult to control, in that situation equine power, especially donkey power, can be more suitable in agricultural operations. Harness and implements should also be updated and there is a need for improved design of harness and implements” [5].

### 1.1 Aims and Objectives of the Review

This review study aims to provide analysis and first hand information on conditions, constraints and contribution as invisible earner of working equids. Indeed current study is based on review of research literature previously published by other researchers and by analyzing data available on official sites of government organizations and NGOS. Available data is not in comprehensive form about invisible role of working equids in India. Present review study aims to fill up this research gap by analyzing their conditions, constraints and role as an invisible earner in India.

## 2. METHODOLOGY

Basically it is a study based on review of research literature previously done by other researchers and by taking secondary data available on official sites of government organizations and NGOS.

### 2.1 Global Status of Working Equids

Working equids population is approximately 112 million and directly or indirectly serving to 600 million people throughout the world. Even after their contribution, working equids are facing ignorance nationally as well as globally. Steps taken for their welfare seem to be inadequate.

### 2.2 Ethiopia

Role of working equids in Ethiopian economy has been well mentioned. Equines are involved

in various activities like transportation of agricultural products, building material, wooden, and water and equines play an important role for developmental activities in rural as well as urban area and most of the evidence indicate that previously, donkeys were used for transportation, carrying water from well and goods from local market and play an important role in socio-economic matters of small stakeholders by sale of donkey manure and its offspring to earn money [6].

No proper care has been given for welfare of equines and it remained neglected as compared to other livestock. Working equids are facing lack of proper harness, feed and proper management of disease epidemic. They are underutilized and managemental conditions are poor. There is no government policy on welfare of equines. Lacks of information on their keeping, scarcity of feed and water, lack of money to expand business and poverty have been observed. It has been suggested that government should include working equids husbandry in future livestock policies in Ethiopia. Government should initiate equine welfare training sessions to change attitude of people toward equines. The misuse, mistreatment, and lack of veterinary care for equines have contributed enormously to early death, and currently working life expectancy is 4 to 6 years. However, in countries where equine welfare is in practice, their life expectancy reaches up to 30 years [7].

Based upon above review, it is evident that equine, especially donkeys play a key role in transportation activities and contribute in livelihood of households in Ethiopia and still they are neglected and need governmental welfare policies.

### **2.3 China**

Contribution of equine has been duly acknowledged in China also. Horses have played every important role in history of China. It is most recurrent animal, symbol of speed, courage, integrity, diligence, perseverance, power, energy, leadership, and success. In addition to the contributions in transportation and farming, horses were also an important part of China's military forces and a determining factor of many changes in the country's territories and borders. Due to some religious reasons, declining contribution in GDP, mechanization and lack of governmental policies, working equids has been marginalized and their

population has declined significantly. Besides, above factors agricultural mechanization, decrease of their share in agricultural GDP, urbanization, improvement in road transportation, decreasing land availability and lack of economic returns from horses are also factor responsible for their declining trends [8].

Keeping in view above findings, it is clear that equines play a major role in national GDP, forces, and equine, especially horse population is declining due to mechanization and their declining role in agriculture in China.

### **2.4 Bangladesh**

In Bangladesh, horse owners having cart pulling as a main occupation. Income from cart pulling contributes in livelihood of households and varies from season to season. It was also observed that horses are suffering from malnutrition and this reduce their productive and reproductive performance [9].

### **2.5 Nigeria**

Contribution of equine has been duly acknowledged in Nigeria. Donkeys are used in urban and rural area. Working hours are more for working equids in urban area than rural area and as a result income is also more in urban area and they, especially donkeys, are liked due to low price and less maintenance cost and used for meat purposes, transportation, luggage carrying and also for commercial use; thus play an important role in poverty eradication. Donkey milk is also used for medicinal use in Nigeria. Donkeys are generally used by tribes and dung is used as farm manure and working equids keepers are facing lack of information, money, and indifferentness of policy makers in rearing of working equids in Nigeria [10].

Based on above review, it is clear that role of donkeys is important in Nigeria, but still facing ignorance.

### **2.6 Africa**

Working equids, especially donkey, have been commonly used by human population and their use has been regarded as synonymous with backwardness, under developed and low status. They are said to be originated in north- east Africa and then spread to other parts of the world. Because of low cost for maintenance, donkeys have played an important role in the

lives of people who have been marginalized by wider development policies and practice. It is a symbol of humility and poverty [11].

### 3. STATUS OF WORKING EQUIDS IN INDIA

Equines play a crucial role in socio-economic aspects of millions of households in rural as well as in urban sector in India. They play a visible role in agriculture, construction, tourism, safari, public transport, transportation of goods, mining, carting, carriage, tonga, police and military/paramilitary forces. Equine population is declining rapidly since 1997 in India.

As per livestock census in India livestock population (including equines) was 485.39 millions in 1997, 485.00 millions in 2003, 529.70 millions in 2007, 512.06 millions in 2012 and 536.76 millions in 2019 and equine population was 1.93 millions in 1997, 1.58 millions in 2003, 1.25 millions in 2007, 1.15 millions in 2012, and 0.54 millions in 2019. In this way total contribution of equine in total livestock population was 0.39% in 1997, 0.32% in 2003, 0.22% in 2007, 0.22% in 2012 and it came down to 0.10% in 2019 (Table 1).

Role of working equids has been duly recognized. Some social factors, mechanization and invisibility of equines in governmental policies are major constraints responsible for declining population and as well as their declining use.

In Himachal Pradesh equine plays an important role in economy of the state and a compound growth rate of 2.57 percent per annum has been observed in equine population during the period 1966- 2003. Equine contribution was found 40 percent in gross household income of equine farmers in Himachal Pradesh. Mule rearing has been observed profitable. Road linkages from village to village, disliking by younger generations, non availability of locally bred mules and advancement in education have been observed major threats to equine rearing activities [12].

In Kashmir, working equids are mainly used for transport, tourism, safari and ceremonial purposes. They have played an important role in socio-economic livelihood of households, are the source of direct income for many households and mainly owned by socially and economically deprived landless, marginal and small farmers.

From the evidence; it is clear that still equine is considered as neglected animal in Kashmir. It has been called "the Beast of Burden." Role of poor quality harness is also there which is made by untrained workers. Miserable condition of equines has been described in Kashmir [13]. Focus given on health of equines in capital city of Kashmir (Srinagar) seems to be inadequate. Therefore, evidence says that, equines are facing problems due to negligence of government policies. Hence, all the above activities, creates a decline in equine population in Kashmir [14]. Therefore, it is suggested that effective and affordable technology should be provided at village level for betterment of equines and its keepers. It has also been suggested for establishment of a equine center in Kashmir with multidisciplinary facilities. Public awareness campaigns should also be organized throughout the year for familiarization of this animal and polo game in Ladakh. Use of automobile should be minimized in deep forest area. Equine courses should be made essential in veterinary education with practical exposure.

In Haryana, equines, especially mules, are used for carrying luggage and pulling carts and are reared by landless, marginal and minority near banks of Yamuna and Ganga rivers. However literacy rate observed very low and poverty rate noted very high among mule farmers. Mule owners prefer AI (Artificial Insemination) for mule production and it is due to non-availability of good quality donkey stallion, which is required for breeding purpose for mule production. Participation of female members of family in mule rearing has also been acknowledged [15]. In Haryana, equines play a crucial role in women empowerment and provides livelihood to many households of marginal farmers and they play a vital role in growth of agrarian economy. Being very less in number, equines play important role in socio-economic aspects of their owners in Haryana [16]. While examining ICAR-NRCE annual reports, it has been observed that equines are mainly used for riding, pleasure/ceremonial activities, load carrying, carting, tonga, transportation of people/ goods and agricultural operations in Haryana and majority of equine farmers, especially donkey and mule farmers, are of middle age and belong to minority, other backward class and schedule caste and they are engaged in earthen pot making along with other livestock rearing. Equine farmers are facing constraints due to non-availability of proper pasture land for grazing of their equines. Mechanizations and social issues

generally observed major factors for decline in equine population in Haryana [17]. Donkey milk can be recommended for cosmetic, as it has moisturizer properties. Having dietetic properties, donkey milk may be suggested for human consumption. It can be an alternate of milk from other dairy animals. Its composition differs from other dairy milk and it has less fat and easy to digest [18].

After review of above studies, it has been observed that contribution of working equids has been acknowledged in India, they remain a source of livelihood for millions of households, they are being reared to increase direct and indirect income of household. By-products are also used by human population, they are multipurpose and their role and impact are well known and they are generally invisible in government welfare policies and are not properly recognized in livelihood related policies. It is also clear that they still remain neglected nationally as well as globally.

#### 4. CONTRIBUTION OF WORKING EQUIDS IN VARIOUS SECTORS

Working equids contribute directly and indirectly to household of their owners. They play a role of money earner as well as money saver for their owners. They directly contribute to agriculture and dairy farming sectors in transportation of agriculture products and carrying material for dairy animals. Working equids contribute in various other sectors like; agriculture, construction, tourism, safari, public transport, transportation of goods, mining, carting, carriage and tonga. They help human in domestic as well as commercial activities. Working equids provide draught power as well as non food related by-products such as; fiber and manure. The support they provide is probably most obvious and best recognized in agriculture sector. Their

**Table 1. Statistical analysis of equine contribution in total Livestock population in India**

Sr. No	Year	Total Livestock Population (in millions)	Equine Population (in millions) including equines	Total Contribution of equines in Livestock population (in %)
1.	199	485.39	1.93	0.39%
2.	200	485.00	1.58	0.32%
3.	200	529.70	1.25	0.22%
4.	201	512.06	1.15	0.22%
5.	201	536.76	0.54	0.10%

importance in urban area has also been recognized [19].

#### 5. WORKING EQUID: AN INVISIBLE EARNER

Working equids are source of income for millions of households through various operations nationally and globally. They also provide help in reducing workload, mental and physical stress to households. They contribute in daily activities and also help in saving time and money. Role of working equids is acknowledged not only in India, but it has been recognized globally. Contribution of equines is omnipresent. After reviewing the situation, it is clear that equine has played a crucial role for benefit of humanity.

#### 6. DIRECT INCOME FROM WORKING EQUIDS

Direct income is generated by sale of the animal, sale of by-product obtained from equines. Direct income is also generated when working equids are hired to provide services like; hiring in ceremonies, transportation of goods, safari, sports, recreational activities and transportation of labour and material to and from market. Direct income is also generated when working equids are used as source of employment, for direct income generation equids are used for transportation of wood, fodder and crops in every community and another method of income generation is hiring for a fee for tourism and breeding, as many households are dependent on working equids. Though equids are not used to obtain loans or credit, but equids gave security to their masters as they can be sold quickly if there is need of money and equids are considered short-term contingency measure for their owners [20].

1.	199	485.39	1.93	0.39%
2.	200	485.00	1.58	0.32%
3.	200	529.70	1.25	0.22%
4.	201	512.06	1.15	0.22%
5.	201	536.76	0.54	0.10%

Source: Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Krishi Bhawan, New Delhi – 110001 sites

## **7. INDIRECT INCOME FROM WORKING EQUIDS**

Working equids act as money savers and source of indirect income by providing services to their owners in India and in other countries also like; transportation of families members, carrying fodder for dairy animals, carrying other household material and lending to neighbors and relatives in their need; otherwise they have to spent money for hiring of working equids for these activities from others. "Working equids draught power enables households to save money on transportation and other expenses as they would have to spend if they do not have equids. These are financial asset which generates indirect income and supporting women in carrying out social functions, lending their equines to relatives and neighbors in time of need, increasing social status in society" [21]. There are app. 100 million equids and mostly reared in low to middle income countries and their role is important in livelihoods, generating incomes and supporting households and equids provide a social lifeline, provide resources, financial security and income diversification to many households including women, marginalized communities and for those who are in extreme poverty [22].

## **8. BASED UPON ANALYSIS OF ABOVE SAID STUDIES, FOLLOWING SUGGESTIONS ARE GIVEN FOR WELFARE OF WORKING EQUIDS**

### **1. Veterinary services should be made available for this animal at door step**

Working equids are generally reared by landless and marginalized farmers and livelihood of millions of households depends on earning from these animals and if this animal is sick, it becomes unproductive and owner has to spend his reserved amount for its treatment. Hence it is suggested that free veterinary care and treatment facilities should be provided at doorstep, because it is difficult and expensive to transport sick and large animal and not possible to afford by poor owner. Focus should be given to improve veterinary services for these animals.

### **2. Working equids should be included in governmental livestock policies and welfare programmes**

Working equids should be included in government livestock policies and programmes

at national as well as international level. They should be defined as animal of economic importance in pattern of other livestock, if they are not defined as livestock these should be at least defined as working animals and their welfare activities should be addressed accordingly in developmental activities. Sector specific policies such as transport, agriculture, construction and rural development should be made as per working equids friendly.

### **3. Working equids to be promoted in other sectors also**

Tourism and recreational activities should be promoted. Tourism, safari, recreation and sports sector can provide opportunities in retaining equine population.

### **4. Effective and affordable technology be made available**

Effective and affordable technology should be made available at end users level. Public awareness campaigns should be organized throughout the year for familiarization of this animal. Use of automobile should be minimized in deep forest area. Equine courses should be made essential in veterinary education with practical exposer. If possible, mini equine research centre should be opened at different places.

### **5. Systematic breeding policy**

Systematic breeding is essential in welfare of working equids. It has been observed that equine farmers are practicing unsystematic breeding due to non availability of either good quality stallions or Artificial Insemination facilities. Hence it is suggested that there should be a systematic breeding policy not only on national level, but it should be globally. True to breed stallions should be made available. It has been reported that foals produced through artificial insemination (AI) are getting good prices. Hence artificial breeding should be promoted, where it is possible by providing superior quality germ-plasm. Farmers should be educated for adoption of systematic breeding policy. These practices should be private as well as public level.

### **6. Good managemental practices**

Good managemental practices should be developed and necessary guideline should be developed covering all management aspects like; health, nutrition, exercise, hoof care and

harnessing etc. Focus should also be given on capacity building by providing training to equine health workers. Those practices should be developed as per the possible internationally recognized relevant standard and should be implemented at both levels; private as well as public level.

## 7. Financial issues

It has been observed that working equids industry facing financial scarcity. It is also suggested that special monetarily provision should be made available for welfare of working equids at every possible level. Special provision for financial compensation should be made available on every possible level on sudden death of the animal as this animal is only source of earning for millions of households nationally and globally. Insurance policies should be made available at nominal premium as being practiced for other livestock species.

## 9. CONCLUSION

Working equids play a significant role in generating livelihood for millions of households not only nationally but globally. They play important role in women empowerment, poverty eradication, and employment opportunities. Equines play a vital role in transportation of goods or human, construction material, agriculture products and daily household material. Equines are source of direct as well as indirect income for their owners, but these are invisible in governmental developmental policies nationally and internationally. Feeding and managemental practices are affecting health of this sentient species and these practices are to be addressed properly at government level as well as public level. Equines should be considered in a category of a true livestock. Courses for working equids should be made compulsory at school as well as university level in their academic curriculum. For welfare of equines provision for special financial packages should be made by policy makers as they remained neglected in various governmental welfare policies. It is concluded that on the basis of above observations working equids are invisible earners not nationally but globally.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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