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Selected Intervention Strategies to Improve Health and Welfare of Working Donkeys in Kenya: A Narrative Review

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Authors' contributions

This work was carried out in collaboration between both authors. Author MNG designed the study, and participated in the desktop review and wrote the first draft of the manuscript. Author OO participated in reading and improving the manuscript and also approved the final manuscript. Both authors read and approved the final manuscript.

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ABSTRACT

Aim: To comprehensively review the interventions made to address health and welfare challenges faced by working donkeys; to systematically analyze the reasons for failure; and triangulate them with donkey health and welfare.
Study Design: A comprehensive desktop narrative review.
Methodology: A systematic review of selected intervention strategies which included: (i) Knowledge change; through training donkey owners on donkey welfare, handling, feeding, working conditions, routine health checks and basic first aid skills for their donkeys. (ii) Refresher trainings to animal health service providers to enhance their capacity in handling equine diseases and conditions; (iii) Donkey health services provision (iv) Improvement of husbandry practices (v) advocacy and (vi) legislation.

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Results and Discussion: Some positive changes were recorded in health and welfare of donkeys. However, low adoption of knowledge and skills to change practice, unsustainable approaches which led to delayed treatment due late disease reporting and unwillingness to pay for health services, emerging challenges which complicated ongoing intervention efforts; were identified as the reasons for the persistent health and welfare challenges.
Study Significance: The findings would provide policy makers and implementers at county and national level with information they can use to ensure interventions are done in a manner that promotes sustainability of donkey welfare projects; ultimately improving the livelihoods of the donkey owners and users. Lessons of this study will also help project implementers to prioritize areas of intervention in light of the ever changing challenges affecting working donkeys.

Keywords: Health and welfare interventions; stakeholders; sustainability; working donkeys; welfare projects; delayed treatment; unsustainable approaches; donkey.

1. INTRODUCTION

Domestication of the donkey from the African wild ass, which was estimated at about 6,000 years ago, transformed ancient transport systems in Africa and Asia and the organization of early cities and pastoral societies [1]. Since ancient times, donkeys were essential for transport in arid, rugged, and poorer regions of the globe [2]. Animal welfare remains an area of consistent public concern [3]. Donkey welfare was a complex, multifaceted, international and domestic public policy issue with scientific, ethical, economic, legal, religious and cultural dimension as well as important trade policy implications [4]. Donkey welfare was intrinsically related to other government concerns such as public health, food safety, and long-term socioeconomic environment. It was a shared responsibility among governments, communities and the animal owning communities [4]. In recent years animal welfare, had become an issue of increasing concern in several countries worldwide, including countries in Africa. It was defined as the state of how an animal was coping with the conditions in which it lived. It referred to the state of the animal. The treatment that an animal received was covered by other terms such as animal care, animal husbandry, and humane treatment [5].

Over 7 million people were estimated to benefit directly [6] from an estimated 1.1 million working donkeys in Kenya [7]. Working donkeys are kept under different production areas in the pastoral, rural and peri-urban areas of Kenya. They are used for income generation for many households. Donkeys were more popular choice of work animals for small-holder farmers [8]. Their versatility and dependability as a source of animal traction exposed them to different health and welfare challenges most of which were related to their working environment. As such, specific management practices needed to be devised in order to fully maximize their work output. Some challenges affecting their health included diseases such as African Horse Sickness [9], Toxoplasmosis [10], Parasitic infections [11], Wounds [12], Trypanosomiasis [13], dental problems [14]. inadequate or inappropriate nutrition [3] also shown in Fig. 1, feed shortages [15,16], inability of donkey owners and users to recognize, and manage basic welfare issues (such as pain or behavioral problems), lameness, chronic or endemic health issues [3], overloading, overworking [14,16], inhumane handling [17], inappropriate harnessing [14,16] and working in poor roads [15] among others.

There had been considerable social scientific interest in the health and welfare of farmed animals; including donkeys [18]. This had led to numerous intervention approaches to address the health and welfare challenges of working donkeys in Kenya. This was enabled through joint efforts by the Kenyan government in partnership with the private sector including Non-governmental Organizations (NGOs) to implement donkey welfare initiatives for more than twenty years. Some NGOs such as Kenya Network for Dissemination of Agricultural technologies (KENDAT) (kendat.org) Brooke East Africa, International Fund for Animal Welfare (IFAW), (Africa Network for Animal Welfare (ANAW), Donkey Sanctuary (DS), Caritas, Kenya Society for the Protection and Care of Animals (KSPCA), Kenya Veterinary Association (KVA), World Animal Protection (WAP), Practical Action and World Society for the Protection of Animals (WSPA).

Fig. 2, shows different counties of interventions by different NGOs. KENDAT (in Nairobi, Kirinyaga, Meru, Kiambu, Nyandarua, Kericho,

Tharaka Nithi); Practical Action (in Wajir); Caritas in (Kitui); ANAW (in Narok and Kajiado); FSK (in Nakuru, Narok, Bomet and Baringo); AWAPH (in Kisumu); SPANA in (Narok) and KSPCA (in Nairobi, Naivasha, Nanyuki and Mombasa).

Fig. 1. Donkeys feeding on vegetable trimmings after delivering farm produce to the market

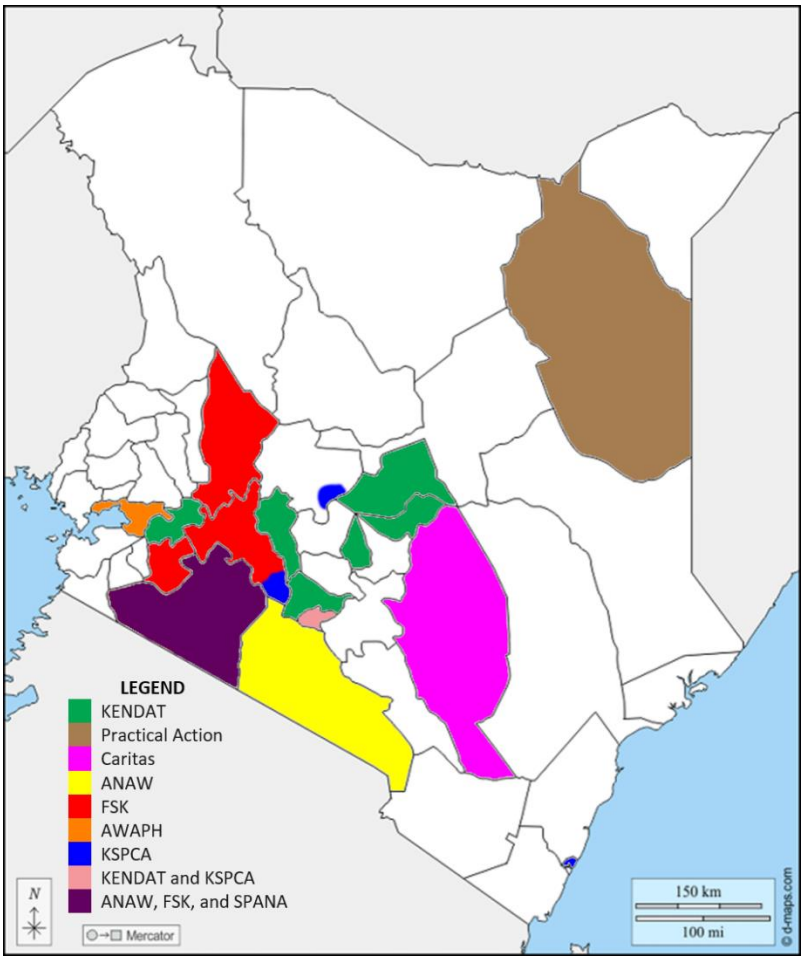

Fig. 2. Map of Kenya showing counties of intervention by different NGOs

The approach by these NGOs ensured the safety of donkeys through ensuring good donkey health, good shelter though construction of lockable housing, availability of feed and water, appropriate load, carts and harnesses. Additionally the NGOs were involved in advocacy, research, training, creation of awareness and communication campaigns, refresher training on equine health and management to veterinary surgeons and veterinary paraprofessionals as well as through legislation and development of strategies at regional and national levels.

The intervention seemed to yield some results as depicted by knowledge change by donkey owners, local animal health practitioners, and the general community of highlighting welfare issues. However, some donkey owners had not utilized the gained knowledge and skills to care for their donkeys. As such, there were some donkeys that still suffered diseases, some were neglected due to these diseases, some donkey owners continued to overload the donkeys, excessively whip them, failed to provide adequate feeds and water; all of which affected their welfare. For Instance, Kielland et al., [19] reported that farmer's perception and attitude directly relate to human – animal interactions and these attitudes and perceptions affect farmers' behaviors towards animals in terms of the type of feed they feed and the duration that animals spend working.

It was therefore necessary to conduct a comprehensive review to evaluate the intervention strategies previously applied in order to determine if those strategies were useful, applicable and sustainable. It was also important to identify the gaps that could have led to persistence in health and welfare challenges among the working donkeys. This would advise future interventions on adoption of more sustainable measures. Adoption of less sustainable intervention measures created dependency among the donkey owners hence fluctuations in health and welfare and consequently lowering their productivity. When working animals are in a state of good health and welfare, they live longer, are productive and are able to increase their work output hence increased household income earned by owners [20]. Therefore, this study was conducted with the objectives of reviewing the intervention strategies previously applied to address health and welfare challenges among working donkeys; as well as to identify the gaps that could lead to persistence in health and welfare challenges among the working donkeys.

The findings would provide policy makers and implementers at county and national level with information that they could use to ensure development is done in a manner that promotes sustainability of donkey welfare projects; ultimately improving the livelihoods of the donkey owners and users. Lessons of this study will also help project implementers to prioritize areas of intervention in light of the ever-changing challenges affecting working donkeys.

2. METHODOLOGY

The study was conducted through a systematic review of the interventions made and triangulating them with the changes in health and welfare and therefore the productivity of the working donkeys though livelihood analysis. The results of other relevant published studies alongside future sustainability, economic and logistical considerations informed the selection of intervention strategies [21]. The following intervention approaches were reviewed.

2.1 Knowledge Change

Training of donkey owners in Kenya occurred through the private extension system mainly delivered by non-governmental organizations or private companies [22,23]. The government's role in extension services was often in monitoring and quality control [24]. The NGOs used training as a sustainable intervention approach within their areas of operation [24], to quickly transfer knowledge, skills, new technologies to farmers [25]. Training donkey owners builds their capacity in animal health and welfare [26,27].

The trainings offered were often short term, lasting approximately between 2 days to 2 weeks [28]. The availability of the donkey owners for multiple days was a challenge [24], given that any day spent in training meant a potential loss of daily income. As such, the attendance to the trainings was often inconsistent and low especially when the trainings were prolonged [28].The content of these trainings was on routine health checks, early disease reporting, basic first aid [16] as well as basic hoof care and trimming (kendat.org) among others. This content was guided by a training needs analysis of the donkey owners [29]. The scope of the content was guided by the veterinary service regulation in Kenya. The delivery methods applied in the trainings was often participatory

[29]. A combination of group-based and individual activities was found to be effective in content delivery [30]. Other modes of delivery such as adult learning techniques [31] and e-learning for the literate category of donkey owners were also be utilized to transfer knowledge [32]. Literacy and education levels for the donkey owners was very varied [16,28,33]. Stringer et al., [27], compared knowledge change among participants at different literacy levels and found that knowledge change was greater among participants with higher levels of formal education, while participants with lower literacy levels had reduced ability for knowledge acquisition from knowledge-transfer interventions requiring literacy. In light of this, it was recommended that short term trainings to donkey owners was effective; while utilizing delivery methods that provided the maximum transfer of knowledge [30]. Grace et al., [34] evaluated whether knowledge on a specific subject decrease over time and recommended that; in order to reduce this knowledge fade at longer time intervals, the information for owners should be made readily and continually available to farmers, as learning could decay unless reinforced.

Despite the fact that several initiatives had been put in place to train owners and users on the importance of taking good care of donkeys, the uptake of these initiatives remained low among donkey owners and users. An understanding of adoption of knowledge transferred to donkey owners as well as change in practice was crucial. It was important to integrate different perspectives and knowledges as a way of understanding and responding to animal health and welfare concerns [35]. A previous study to investigate animal welfare knowledge, attitudes, and practices among livestock holders revealed a clear disparity between knowledge and practices of animal welfare [36]. This discrepancy between knowledge of action that should be taken and the actual implementation of change was a well-recognized phenomenon [35,37,38]. The process of introducing changes to routine behaviours was difficult [37], and presented many challenges when trying to work with farmers to knowledge gained to implement welfare improvement [37]. The fact that donkey owners could recognize diseases affecting their donkeys and report the same was a step towards the right direction [21].

For efficiency of knowledge transfer to donkey owners as an animal health intervention; it was proposed that formal education and literacy levels, shorter durations or trainings which should be strengthened with refresher trainings on relevant topics, combined with participatory content delivery methods centered on adult learning techniques should be considered when structuring the trainings. Due to the limited government funding on extension, collaborations with the private sector such as NGOs could be a viable solution to keep the owners informed. The NGOs were also more efficient in extension service delivery [24].

2.2 Refresher Training to Existing Animal Health Providers

The impact of donkey health and welfare interventions could be overstated [39]. Preserving donkey health and welfare was key to sustaining the livelihood of many populations across the world [40]. The capacity of animal health providers to handle equine cases was low [26]. This could be due to limited training on equine management from the education institutions in Kenya as seen in curricula of training institutions teaching certificate, diploma and degree in animal health and veterinary sciences. This challenge in knowledge and skill levels led to disparities in case-loads by local animal health professionals when treating donkeys compared to other livestock [26]. Access to essential medicines was also a challenge affecting health and welfare due to their high cost [41]. NGOs had intervened through training of animal health providers and linking the donkey owners to trained animal health providers. These animal health providers were trained on equine behavior, handling and restraint, management of equine diseases, equine drugs, pain relief etc. The Donkey Sanctuary Kenya' approach, for example, was through provision of technical and practical based trainings and support to animal health service providers on donkey diseases and husbandry to enable them provide vet care to donkeys (www.thedonkeysanctuarykenya.org, www.spana.org). Curran et al., [20] evaluated the impact of this approach and found that donkeys within the intervention areas were significantly healthier and more productive than those in non-intervention areas. These findings were similar to Onono and Kithuka, [26] who highlighted significant differences on level of knowledge of animal health providers in donkeys in operation areas where donkey welfare projects were being implemented compared to non-operation areas.

A study by Onono and Kithuka [26] highlighted significant differences on level of knowledge, on types of medicines used for treating health conditions in donkeys. In regions where welfare campaigns were done, the animal health services providers had better knowledge on veterinary medicines used for treatment of donkeys in addition to presence of more veterinary practices which were regulated by the KVB [26]. This positive change due to training was therefore encouraged as a way to ensure sustainable service provision to donkeys. Strategies such as subsiding retail prices for medicines had been tried [41], but the sustainability of this approach was questionable.

2.3 Donkey Health Services Provision

Many of the health problems in donkeys were traumatic, mechanical as well as infectious in origin, resulting from the environmental causes and ill-treatment by owners and from critically considered attaches of the working apparatuses [42]. Delivery of veterinary services in Kenya had evolved through different stages since the era of structural adjustment programmes (SAPs) in the late 1980s. The privatization and subsequent devolution of veterinary services from the national government, together with challenges in the human resource capacity of the DVS, were major constraints to provision of animal welfare services in Kenya [43]. According to Okwiri et al. [44], privatization of veterinary services resulted in rapid expansion and growth of private veterinary delivery system. The challenges relating to donkey health service provision included unavailability and high cost of equine specific drugs in agro-vets (shops selling agricultural inputs including veterinary drugs) such as those used for pain relief, lack of proper regulations, including selling of veterinary medicines without proper advice on route of drug administration and correct dosages [45]. Outlets which sold veterinary medicines within the smallholder farming systems, which were properly regulated, were instrumental for supply of veterinary medicines to farmers [46].

Attempts to intervene in health provision by NGOs had been through direct free or subsidized treatment of donkeys in medical camps (www.thedonkeysanctuary.org) as well as mass treatment and vaccination of donkeys in a medical camps [47].

This, however, resulted in a perceived undue competition between NGOs and animal health providers working in the regions. This may have caused a ripple effect such as reducing the reliability of the animal health providers in project areas when called to treat donkey diseases. Onono and Kithuka, [26] recorded a lower reliability of animal health providers of 57% in operation areas compared to 71% in non-operation areas when there was no competition. Sustainability of direct treatment could also be evaluated by willingness and actual payment for treatment of donkey diseases. In a study by Onono and Kithuka, [26], approximately 80% of donkey owners in intervention areas recognized the need to pay for donkey treatment services compared to 94% in non-intervention areas. The actual willingness to pay according to animal health providers was 39% in intervention areas compared to 42 % in non-intervention areas. These results suggest that even though donkey owners had been sensitized on the need to pay for treatment of their donkeys, only a few were actually willing to pay; further emphasizing the sustainability of intervention gaps; unless donkey owners were assured of other benefits of paying for health services [48]. Other challenges associated with direct free or subsidized treatment of donkeys were delayed reporting of sick cases, neglecting and abandoning sick donkeys keeping sick donkeys by the road until they were rescued, died or presented for a mass treatment camp [49].

2.4 Improvement of Husbandry Practices

Animal husbandry was defined as the science of breeding, feeding, and tending domestic animals, especially farm animals (www.thesaurus.com). In this study, husbandry implied the aspect of handling and restraint, feeding and watering, housing as well as breeding of donkeys. Donkeys were always managed less than other livestock [50]. Inadequate care remains an issue in donkey husbandry in the developing world [51].

Improper handling was considered as a major stressor, adversely affecting farm animals [52,53]. It exerts deleterious effects on health, well-being, behavior, performance and production quality [54]. The NGOs have focused on humane handling and restraint of donkeys through training donkey owners on the use of halters made from sisal ropes, avoiding the use of nylon ropes, proper control of the donkeys when working by avoiding excessive whipping, proper loading and offering time for resting the donkeys. Although there had been some

changes noted in the handling, some poor management continued to be seen through the presence of hobbling wounds associated with the use of nylon ropes, skin lesions due to excessive whipping and abnormal aggressing in some donkeys due to harsh treatment. Working donkeys do not usually show aggressive behaviour towards people [55]. The reason attributed to persistence of the poor management practices was the slow adoption of acquired knowledge and skills [35,37], hampered by the owner's 'perception' on welfare [33]. There was also an observed high turnover of donkey owners and users; such that those who had been trained had ventured into other income generating activities, leaving people who were not previously untrained to work with donkeys. As such trainings were highly recommended to continue [34]. During the trainings the donkey owners would be persuaded that by taking care of their donkeys better, it will not only benefit the donkeys but also themselves. Indeed, a healthy donkey is a more hardworking donkey [56].

Improper harnessing, overloading and overworking were identified as common animal welfare problems affecting donkeys [14]. Improper harness and saddles are associated with discomfort, external lesions and fatigue on donkeys [49,57].

Feeding and watering was an important aspect in the husbandry of donkeys. It required knowledge of the feeding behavior and nutrient requirements of animals for specific production functions, for instance work [58]. Donkeys were commonly fed with poor-quality feed. They suffered chronic under-nutrition conditions especially during the dry season which coincided with the time of agricultural and work operations that require most of the work production from the donkeys [42]. Greater ability to tolerate thirst, lower water needs compared to other livestock, re-hydrate rapidly and maintain appetite could give donkeys a survival advantage during times of drought over less thirst-tolerant animals [8,58]. In nature, donkeys were able to adapt to grazing on forages for long periods of time [59]. They maintained a low level intake of dry matter relative to their body size. This level of intake was relatively independent of diet quality [8]. Proper feeding of donkeys enabled them to resist better to disease, had a higher rate of reproduction to provide replacement animals and live longer. During feeds and feeding trainings by the NGOs, the practices which were emphasized to the donkey owners included appropriate nutrition, fodder preservation, as well as watering the donkeys (kendat.org). The evaluation of the good feeding as a welfare principle remains multi-faceted and complex [60].

Various efforts have been directed towards proper loading. For example, it was recommended that a donkey should not carry more than one third of its body weight by pack, approximately between 40-80 kg, [57], however most donkeys carry weights exceeding these limits. Additionally, it was recommended that donkeys be worked during the cooler parts of the day and also be provided shaded rest during the day when the temperature was high [61]. However, it was common to find donkeys working throughout the day when their demand was high. It was therefore apparent that some recommendations aimed at improving welfare of donkeys, either, do not actually reach to donkey owners or are not implemented [56]. A system of unpacking research information to the consumers was vital. This could be done through feedback workshops or through public awareness forums. Indeed, Blokhuis et al., [62] emphasized that feedback along with practical advice and alternative strategies could help the farmer to improve the animal welfare through informed decisions.

Donkeys were provided a form of enclosure at night which was either a simple shed or sometimes housed together with cattle [56]. Some donkeys were also tethered within the homestead without being enclosed. The enclosures often lacked shade leaving them to be exposed to hot sun or rain. Donkey housing continued to receive less attention, and they were kept in an open backyard [16]. The limited rescue centers in Kenya do not allow for rehabilitating abandoned donkeys. Donkey housing remains an area of concern that should be addressed to increase their comfort and safety.

2.5 Legislation

There were over 25 laws governing the animal resource subsector in Kenya. All those many laws were old, outdated, fragmented and difficult to implement and enforce animal welfare standards. The Prevention from Cruelty to Animals Act CAP 360 (Amended, 2012) [63] despite being one of the most comprehensive animal welfare legislations in Kenya, is equally outdated and not fully compliant with the WOAH animal welfare standards, some of which were

adopted as recent as 2016 (welfare of working equids) KNAWS, [43]. The prevention of cruelty to animal act- CAP 360 also failed to mention donkey specifically [63]. Other legislation in Kenya animal which were concerned with welfare included the National Livestock Policy (2008), the Wildlife Management and Welfare Policy (2015) and the Draft Veterinary Policy (2015). Although working equids technically fell under the definition of livestock, they were often not considered as such by policy makers probably because they were not food producing animals. Further, there existed policy and legislation gaps that had been identified in animal welfare; which included weak institutional frameworks for implementation of animal welfare, particularly following devolution of veterinary services, animal husbandry and animal welfare services to the county governments, the lack of formally appointed government structure for providing animal welfare governance at national and county levels. There was inadequate coordination, collaboration and partnerships for animal welfare. Although two laws (Prevention of Cruelty to Animals Act CAP 360 and VSVP Act CAP 366 mandated the Ministers to develop animal welfare regulation, there was no explanation for the lack of animal welfare regulations in Kenya. Subsequently, there were no animal welfare standards, guidelines or codes of practice to guide programs and through priorities. This confirmed a weak policy and legislative framework for animal welfare in the country that required strategic intervention. Lack of animal welfare legislation was also a constraint in improving the welfare of working donkeys in Ethiopia [56]. It is expected that, with continued advocacy, animal welfare legislation will be changed and the working environment for donkeys will be better.

2.6 Advocacy

NGOs had significantly contributed to advancing animal welfare programmes through advocacy, awareness and communication campaigns [43]. Animal advocacy was defined as the pursuit for humane treatment of animals and the prevention of their suffering [64].

Advocacy was a strong focus point for organizations to influence policy and governmental decision making [65]. In advocacy, collaborations were made among varied stakeholders with a common interest in donkey health and welfare such as regional and international NGOs including the KALRO, animal welfare organizations, AU-IBAR, World Organization for Animal Health (WOAH), the World Bank, the United Nation (UN), the Food and Agriculture Organization of the United Nations (FAO) and the European Union. For example, at an advocacy campaign held in the year 2022 themed “Donkeys in Africa: Now and in the Future”, stakeholders who were drawn from the regional and international bodies involved in animal welfare agreed to safeguard the donkey which is threatened by overexploitation in the skin trade (panafricandonkeyconference.org).

The World Organization for Animal Health (WOAH, founded as OIE) developed communication programmes to provide governments, the agri-food sector, veterinarians and other professionals, including farmers, with accurate, accessible and up-to-date information on animal welfare. It also worked with governments, international and regional organizations, and the private sector to promote its animal welfare standards and made information available to the general public to raise awareness and promote progress on animal welfare issues (woah.org). Communication of animal welfare information in Kenya was currently not well coordinated in the country (fao.org). The collaborative pooling of experience across different NGOs could help make welfare communication more effective and provide a framework for NGOs in other fields to learn from each other’s collective knowledge [65]. Communication of research finding was often unavailable or inaccessible to farmers such as donkey owners [66]. Communication methods for animal welfare content had largely been through the use of print and electronic media, including radio, television programmes and newsletters, magazines, newspapers and social media (email, face-book, twitter and whatsapp) depending on the age and social categories of society.

To illustrate the successful impact of advocacy, we refer to donkey slaughter case. In Kenya, the donkey was gazetted as a food animal in the year 1999 [67] with the aim of curbing backyard slaughter, improving food safety. Donkey slaughter was then legalized in Kenya in 2012. This led to the establishment of four export donkey slaughterhouses. Since the donkey population in Kenya was decreasing, and the abattoirs were slaughtering very many donkeys a day, much more than naturally the donkeys can replenish, unscrupulous businessmen turned to

donkey theft, of slaughtering of underage donkeys, of cross-border smuggling of donkeys. This threatened the communities whose livelihoods are dependent on donkeys. Indeed, the Kenya National Bureau of Statistics [7] indicated a decrease in donkey population over a 10 years period, from 1.8 million donkeys in 2009 to 1.17 million in 2019. There was then advocacy by donkey owners and animal welfare organizations petitioning the state to ban donkey slaughter [68]. In response, the government instituted a ban of donkey trade and slaughter in Kenya in April, 2020 through The Legal Notice 63 of 2020 published in the Kenya Gazette of 20th April, 2020. (http://kenyalaw.org/caselaw/cases/view/213022) . However, the owners of the four donkey slaughterhouses in Kenya appealed this ban stating that it was a violation of the rights of the proprietors of the abattoirs. Kenya's High Court lifted a ban on the slaughter of donkeys for both meat and hide for medicine in the Asian market in March 2021. Advocacy was therefore highlighted as an important tool to drive changes that promote donkey health and welfare.

3. DISCUSSION

The welfare of donkeys is crucially important not only for the health and survival of those animals, but also for the livelihoods of those people dependent on them [13]. Prioritization of animal welfare issues could help identify which areas most require research funding and raise awareness of best practices [3]. An understanding of the contribution of donkeys to households, local and national economy could help to mainstream donkeys with other livestock. Stakeholders responded differently with donkeys when compared to other animal species [35]. The generation of a firm action plan and subsequent implementation of identified action points can be seen as key stages towards the target of reducing health and welfare challenges. The process requires the appreciation of the varied income benefits of owning donkeys and keeping them healthy and in a good state of welfare [48]. Donkey owners need support in starting and sustaining this process. It is important to note that the process of introducing changes to management practices, strategies and routine behaviours is not easy [37]. There needs to be a paradigm shift in addressing health and welfare challenges. Importantly, the recognition that management of donkey health welfare required a multidisciplinary approach. For example, social sciences were increasingly being integrated to help resolve contemporary crises. A paradigm of 'behavioural change is providing apparent solutions to animal health policies [69]. This could prove beneficial for animal health and vets: it may lead to more effective design of knowledge transfer mechanisms, for example, to help improve animal health [70].

There were limited studies documenting intervention strategies to address donkey health and welfare in Kenya; and the impacts thereof. Majority of the evaluation studies were drawn from other developing countries such as Ethiopia, Ghana, Botswana, Pakistan and Somalia, due to limited work on working donkeys in Kenya. These countries are largely comparable in terms of the context of working donkeys.

It would be valuable to also assess the specific issues affecting donkeys according to the different production areas as the issues and the methods of addressing them could be diverse Geiger et al., [71]. A study conducted in Ethiopia [54] revealed that; even though donkeys' requirements are similar everywhere, some differences in welfare are seen between those kept in the rural versus the peri-urban areas.

Both the health and welfare and hence the working ability of donkeys could be greatly improved with simple interventions, such as improvements in nutrition, water availability, proper harnessing, and/or balancing loads in carts or on packs [72]. It was important to appreciate that most welfare problems and remedies were thought to be mediated by human. The way humans manage their animals in different parts of the world was a synthesis of cultural norms, experience, learning, received wisdom and trial and error. It was also dependent on income and access to resources [33]. In this regard, addressing donkey welfare problems was about changing human behaviour. The interventions on donkey health and welfare was largely affected by donkey owners' perceptions and myths concerning their care. The notion that donkeys were regarded as 'the beast of burden' resulted in them being overloaded and overworked; notwithstanding the fact that donkeys needed to rest so that they could be more productive/ efficient [73]. Other myths that 'donkeys did not get sick, and if they did, they die' which was probably derived from the fact that donkeys were regarded as sturdy animals, also prevented the owners from seeking early veterinary intervention for their sick donkeys.

4. CONCLUSION AND RECOMMENDATIONS

The success of donkey welfare interventions was hampered by constraints such as emerging theft of donkeys for slaughter due to the rising demand of donkeys to supply the slaughterhouses for their eventual export, low adoption and implementation of acquired knowledge and skills from sensitization trainings on animal welfare, as well as lack financial capability to provide donkeys with proper care. Therefore, long-term economic and financial gains from the use of donkeys should be established. Identification of suitable and relevant intervention strategies for working donkeys well-matched to the agro-ecologies and socio-economic needs of specific regions should also be developed. It was possible to improve the performance of donkey welfare by conducting continued sensitization and training their owners and users as a longer term activity. Effective knowledge-transfer methods and materials for adult learning for donkey owners should be designed and developed. There should be continued multi-disciplinary research conducted to improve donkeys' health and welfare. The findings of these research should be incorporated in extension material and disseminated in structured methods ensuring.

ETHICAL APPROVAL

Animal Ethics committee approval has been collected and preserved by the author(s)

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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