References
[1] M. Ghazi, D. Hulme, and J. Turner (2005) The Future for Working Equines, The Fifth International Colloquium on Working Equines.
[2] Charities Evaluation Services (2002) The First Steps in Monitoring and Evaluation.
[3] Carter McNamara Basic Guide to Program Evaluation.

THE CHALLENGES OF WORKING WITH SMALLHOLDER FARMING COMMUNITIES KEEPING LARGE RUMINANTS: EXPERIENCES FROM THE CENTRE FOR LIVESTOCK AND AGRICULTURE DEVELOPMENT (CELAGRID), CAMBODIA

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Introduction

In the last few years, the growth in gross domestic product (GDP) in Cambodia has been more than 10% per year but this still leaves about 30% of the population under the threat of poverty. The country is predominantly agrarian, with agriculture representing 35% of GDP in 2003 [1]. At least 70% of the rural population are directly dependent on agriculture for their livelihoods. Besides crop production, animal raising plays a key role in the provision of dietary protein for Cambodians. Livestock contribute 14% of the agricultural GDP in the country of which smallholder farmers keep the majority of animals [2].

Livestock are a key component to most rural development projects in Cambodia because they can support the livelihood of poor people in many diverse ways, simultaneously fulfilling several different functions. Cattle and buffalo are a central component of the farming system, as they provide draught power and manure, a means of allowing the poor to capture private benefit from common property resources, a means of transport, a means for meeting social and cultural expectations and requirements, as well as a 'saving account'. In 2000–1, 87% of the rice fields were ploughed and harrowed by cattle and buffalo [3]. The situation is much the same today as few farmers can afford to invest in motorised power.

So far, little has been done to improve cattle and buffalo production in Cambodia. Some NGOs have provided a calf/cow to communities but not much has been done to improve the production process. During the last 5 years, the Centre for Livestock and Agriculture Development (CelAgrid) has carried out a series of research studies and run development projects to improve management and feeding systems for ruminants in order to raise the contribution to livelihood that can be gained from ruminant production.

Large ruminant production in Cambodia

Cattle and buffalo raising in Cambodia have not been developed although these animals are extremely important to the 80% of the rural population that keep them.

Production systems

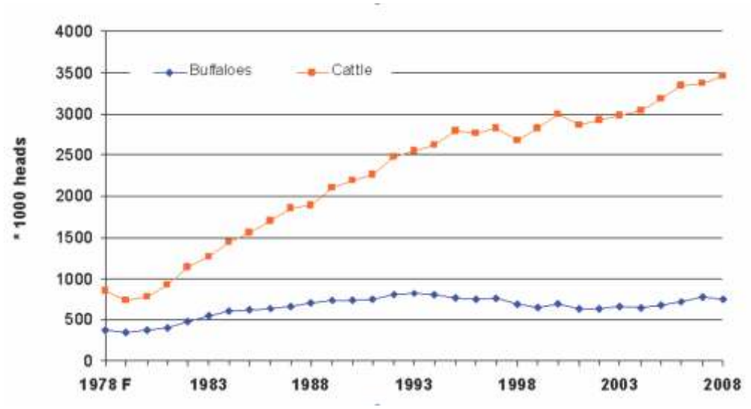
Most cattle and buffalo in the country are kept in subsistence production systems [3]. The animals are concentrated in the rice-growing areas, because cattle and buffalo are predominantly kept in Cambodia to provide power for soil preparation, weeding, harvesting, for transport, and for manure rather than for meat production. About 66.9% of farmers own 2.37±0.24 (1–5 heads) and 15% kept 0.50±0.06 (1–3 heads), of cattle and buffalo respectively [4]. Generally, cattle and buffalo are kept in pairs, and are used for ploughing and harrowing, and a cow or a female buffalo is kept for calves to replace old cattle or buffalo. Cattle or buffalo are sold for money only at times of necessity or when the numbers increase beyond the needs or ability to raise or care for the animals.

Small private cattle farms consisting of not more than 100 heads exist in the country [3]. In 2007 there were only 8 semi-commercial cattle farms, which contained a total of 2,726 head [5]. Since then there have not been any significant investments put into commercial cattle raising and there are no large-scale buffalo production systems in Cambodia up to this date.

Livestock development in the cattle and buffalo sectors

According to MAFF data, cattle and buffalo production has increased gradually in the last 15 years. Household animal raising reported for 2006 suggested there were 3,344,712 cattle and 724,378 buffalo; 1,740,616 of these animals were used for draught power [5]. Numbers of the large ruminant population compared to other livestock in Cambodia are presented in Figure 1.

Figure 1.



Source: FAO statistic 2010 (update June 2009); F = FAO estimated number

Breeds

There are 3 types of cattle breed in Cambodia: the Khmer cattle (Kor Khmer), the Haryana, and the Brahman. The Haryana was introduced to Cambodia in the 1960s from India; the Brahman was introduced in the 1980s with the support of the Lutheran World Service. The Haryana is quite well adapted to the land along the Mekong river due to the year-round availability of grass, forages, and agricultural by-products. Khmer cattle are found throughout the country except in Kandal province [3].

The 2 types of swamp buffalo raised by farmers are the mountain buffalo and the plain buffalo. The mountain buffalo are raised along the water's edge, jungle edge, and those areas that have a mild, cold climate such as the north-east provinces and the coastal area of the country. The plain buffalo is seen mainly in the lowland area in the middle, south-west, and south-east parts of the country [3].

Constraints and government policy in animal production

Animal production in Cambodia is managed mostly under the mixed farming system in which the cattle, buffalo, chicken, ducks, and other poultry are integrated together with crop production. Although small and relatively undeveloped these livestock systems continue to play a major role in the supply of farm power and food for local needs. However, the productivity of cattle and buffalo production in Cambodia is low due to the following constraints:

- High mortality and morbidity rate due to disease
- Low productive breeds
- Poor government services and extension work
- Poor technical knowledge of both extension staff and farmers/producers
- Lack of credit support for animal production

Although core issues to achieve significant livestock development have been recognised, livestock policy formulation and implementation have only just started. Priority issues of the Cambodian government are animal health services and disease prevention and control. A government decree to enforce vaccination and control of animal movement has been implemented but achievement is still small due to lack of fiscal financial allocation from the government. Furthermore, the government allows private veterinary service operation and supports the establishment and training of village animal health workers. Animal feed and breeding improvement have been identified as further areas of concern. However, it is still not clear what policies the government intends to adopt to foster these objectives [6].

Examples of development projects implemented by CelAgrid

Improving the food security and income of small farmers through livestock-based activities and integrated rural development

Under financial support from the Heifer Project International (HPI-KH), CelAgrid implemented a 3-year project of 'Integrated Livelihood Development for Small Farmer Families in Takeo' in 2007–10. There were 340 farm families (232 women) in 8 villages of 2 communes in Tramkak district who participated in the project. Among other resources such as piglets, fingerlings for fishponds, and bio-digesters, the project distributed 130 cows (1 in each family) to the villagers. Passing on the Gift (POG), which is an important part of the Heifer Project International philosophy, was applied during the project. The first recipients pass on offspring of the animals given by the project to help others get started. Among 130 cows distributed, 8 were passed on, 34 gave birth with 28 female calves, and 40 are pregnant.

A similar principle was adopted in a project supported by FSIF/CIDA and HPI-KH and implemented in Kravanh district, one of the poorest districts in Pursat province. Here, 454 farm families from 16 villages of which 61% were women were identified to be involved in the project. Besides piglets, chickens, and fishponds, 92 heifers were distributed. This number increased up to 145 cattle after 2 years. At the same time, farmer communities were established and their leaders were elected in each community. Self-help groups were formed in each community to facilitate members' saving. Each member paid an amount based on their resources affordable per month. Community members can borrow money from the savings for emergencies with a low interest rate compared to the private credit system. Non-formal education using Farmer Field School (FFS) methodologies were used in training, combined with the gifts of livestock. The topics of the training sessions involved livestock keeping, including care, feeding, and management; integrated farming models were introduced through the bi-weekly/monthly training following the cycle of the animal production.

In partnership with CARE under the Integrated Rural Development and Disaster Management programme, farmers and Village Animal Health Workers (VAHWs) from 216 villages in Prey Veng, Svay Rieng, and Pailin provinces were selected to implement training and demonstrations on chicken-, cattle- and pig-raising improvements. This project aimed to increased productivity and incomes of the rural poor through food security and disaster preparedness activities. The key activities in this project included VAHW and farmer training; establishment of demonstration sites (demos) and cross-visits; farmer association set-up; and development of booklets/leaflets to distribute to farmers. Cattle plus home forage option is one of the topics for VAHW and farmer training. There were 3 demos per village (2 set up by farmers and 1 by the VAHW) in 75 villages with 72 demos on cattle. Each demo farm used its own resources with some support from the project to set up. For cattle demos, king grass, cassava stem, urea to treat rice straw, and the costs of constructing cattle houses were subsidised by the project. Cross-visits were organised to allow all participating farmers, especially VAHWs, to gain practical knowledge and experiences from best performance demo farms. The POG model was also applied on each demo site.

Capacity building in livestock and ruminant production

Through a collaboration of institutions in Cambodia, Vietnam, Indonesia, and the UK with the financial support from Development Partnerships in Higher Education (DelPHE) of the British Council, a project on 'Capacity Building in

Ruminant Livestock Production in Smallholder Farming System' was implemented in order to improve the knowledge of extensionists, scientists, students, and farmers keeping ruminant livestock about feeding, management, and use. The main project activities were the development of manuals and booklets, extensionists training, farmer training, demos, and cross-visits.

A manual for extensionists on care, feeding, and management of cattle and buffalo which emphasised the working animal was produced in both English and the local language (Khmer). The content of the manual included rural cattle/buffalo keeping and its important, common diseases, care and management, breed selection and breeding, and nutrition and local feed resources for ruminants. Booklets in Khmer for farmers were abstracted from the manual and simplified into simple messages for ease of use by the farmers. The booklets' topics were breed and breeding, health care and diseases, and feeding management. Field staff and students who were going to be the extensionists in this project and others were trained on care, feeding, and management of the cattle and buffalo together with the training of trainer (TOT) topic. The FFS and demo farms were set up in 6 communities in Prey Veng and Takeo provinces to illustrate and provide examples of best practice in cattle raising. Selected villagers gathered together monthly for a training event and other social meetings about activities of the project. The 6 demos about urea treatment of rice straw were established: each demo received 10kg of urea to treat 200kg of the community's own rice straw. By the end of project, 2 cross-visits had been conducted. The commune councils, village chief, and VAHWs were invited to contribute, give advice, and exchange experiences.

Experiences gained in helping smallholder farmers keeping ruminants for work

Most farmers are hesitant to use any given calf/cow from the projects for draught power while they have the obligation to take care of them until their offspring are passed to another farmer. To some extent, the projects usually purchase young animals, therefore there is little time to see how these animals have any life-changing impact in terms of farm power before project end. In many cases farmers prefer to keep the cows for reproduction rather than put them to work unless they do not have male cattle at a suitable age to work.

Cattle are the preferred animal by most of the participating farmers but their output takes time to achieve, resulting in a delay in solving food insecurity problems particularly for the poorest farm families, although farmers can immediately used cow manure to fertilise their crops. More often, it has been quite difficult to convince farmers due to the limited resources, cattle are not the joy for food security project. However if request for cattle can not be avoided upon agreement with community members and the local authority from district, commune and village, the lucky draw is used to choose the beneficiaries among those who met the selection criteria.

In some demo sites, farmers lack resources and capital to buy materials to improve their farm; they might also lack water to irrigate the forage feed crop during the dry seasons. This provided a bad impression on the community members as well as other farmers in the village, who were not involved in the project. Although, cattle and buffalo are valued everywhere in the country, price instability means the project participants pay less attention to the care of the animals when prices are low than they would when the animal prices are good.

References

[1] AusAID, 2006. Cambodia Agriculture Sector Diagnostic Report. Agrifood Consulting International and CamConsult, pp 35.
[2] EC, 2003. Support to Veterinary Service in Cambodia, Main report.
[3] Suon S., 2003. Domesticated Animal Genetic Resources in the Kingdom of Cambodia. FAO-DAHP, Phnom Penh.
[4] Borin K., 2008. Training Students in Sustainable Agricultural Practices. 22nd World Poultry Congress, Brisbane, Australia.
[5] MAFF, 2007. Annual Conference 2007 on Agriculture, Forestry and Fisheries (Taking stock of 2006–2007 performance and setting direction for 2007–2008). MAFF, Phnom Penh, p 2.
[6] Sen S., 2002. The Strategy and Policy for Livestock Development in Cambodia. Kingdom of Cambodia Ministry of Agriculture, Forestry and Fisheries, Phnom Penh.

REASONS FOR AND METHODS OF IMPLEMENTING THE PROTECTED-CONTACT SYSTEM FOR CAPTIVE ELEPHANTS AND HUMANE CONTROL PRACTICES FOR WORKING BULLOCKS

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Abstract

Captive elephants and working bullocks endure a range of abusive practices that are used to control the animals' behaviour and force them to comply. Implementing humane alternatives to traditional methods can alleviate these animals' pain and suffering, advance animal husbandry, and improve public safety.

Introduction

Protected contact for elephants is a carefully conceived, well-researched formal system of elephant management that does not utilise physical punishment. First developed in 1991, protected contact has grown to become the preferred method of elephant management in North American zoos – more than half of them have begun to use it. In protected contact, a barrier – such as bars, a metal screen, or a restraint chute – always separates the elephants and the handlers. Ropes, chains, and bullhooks are not used. Another important element of the management system is that handlers do not assume or maintain a position of social dominance over the elephant but instead operate from a position of relative equality. Aggressiveness and other non-compliant behaviours are never punished but instead are simply ignored. Protected contact is a far safer and more humane method with which to manage captive elephants.

In methods other than protected contact, elephants are conditioned through physical punishment – typically through the liberal use of bullhooks (or ankuses) – to keep the animals fearful and obedient. An ankus is a rod with a sharp hook on the end; it is designed to puncture skin and inflict pain (see Figure 1). One of the scientists involved in the development of protected contact calls the ankus 'a control and command tool that functions through the use of negative reinforcement'. Mahouts beat elephants in the most sensitive areas on their bodies: behind their knees and ears and on their faces. Because of the immense size and strength of elephants, there is a perception that their skin is tough and thick. However, elephant skin is actually so sensitive that the elephants can feel the sting of an insect bite. Wild elephants dust themselves daily with loose dirt to protect themselves from sunburn and insect bites.

Figure 1. A passive elephant is hit with an ankus

Chaining elephants for extended periods of time is also a practice used in management methods other than protected contact (see Figure 2). Chaining does not allow for any freedom of movement for a species that is meant to roam dozens of kilometres every day. Foot problems and arthritis – which are caused by a lack of exercise and by standing for long hours on hard, unsanitary surfaces – are exceedingly common ailments in chained or restricted elephants. Elephants that are chained are unable to protect themselves from the elements or insect bites because the small area in which they are confined quickly becomes compromised by impacted urine and faeces.

Figure 2. An elephant is chained by two legs

Bullocks that are used to pull carts that contain sugar cane, kerosene, bricks, oil tanks, and other oversized loads are often controlled by ropes that are inserted through the nasal septum (see Figure 3). A sharp, pointed object is driven through an animal's septum, and a 5–8mm rope is pulled through the resulting hole and secured behind the animal's horns. This procedure is performed without any veterinary assistance or pain relief. Ropes are pulled, yanked, and jerked, which causes the animal immeasurable pain and suffering. Over time and because of constant pulling, the holes grow larger, requiring ropes that are larger in diameter to be inserted. Other crude and cruel methods are also employed to control bullocks, such as using nail-spiked yokes that have their sharp tips pointing inward at the animal (see Figure 4 and 5). Many bullocks suffer from painful injuries – including galls, abrasions, and chafing – because yokes or tack are fitted improperly (see Figure 6). These injuries usually go untreated by a veterinarian.

Figure 3. Working bullocks are controlled by ropes inserted through their nasal septum

Figure 4. A bullock with a nail-spiked yoke

Photo courtesy of Animal Rahat

Figure 5. Thin, exhausted bullocks froth at the mouth

Figure 6. A bullock suffers from a painful yoke gall

Photo courtesy of Animal Rahat

The use of a morkee (halter) rather than a nose rope as a means of controlling bullocks is a simple, inexpensive and humane alternative now being advocated. The ultimate goal is the abolition of bullock-drawn carts altogether. PETA gathered evidence of abuse and neglect of bullocks forced to pull heavy kerosene carts, including being denied food, water, and veterinary care. We presented the evidence to the Government of Maharashtra and were able to persuade officials to phase out bullock-drawn kerosene carts and replace them with vehicles powered by non-animal alternative methods. We are now pushing the Ministry of Food and Civil Supplies to enforce that ban.

Methods
Elephants managed by protected-contact systems are trained using operant conditioning to allow caretakers to safely and humanely perform routine husbandry and medical procedures. The initial sessions are short as elephants learn gradually, at their own pace, to become accustomed to various instructions. The training is carried out in incremental, tiny steps called 'successive approximations', which are small movements that build upon each other until a full-fledged behaviour is accomplished. Cooperative behaviours are rewarded with treats in conjunction with a sound, such as a clicker or a whistle. Eventually, the animals associate the sound with positive interactions – this is called operant conditioning. The elephants are taught to voluntarily participate, even in procedures that may cause them some discomfort (such as routine foot care), and they suffer no consequences if they choose not to cooperate.

Many progressive zoos have implemented protected-contact methods for elephant management. The new 'Elephant Odyssey' exhibit at the San Diego Zoo, for example, is designed strictly for protected contact. The elephants at the zoo and its ancillary operation, the San Diego Zoo's Wild Animal Park, have learned nearly three dozen behaviours – everything from opening their mouths for dental checks to lifting their feet for routine podiatry to lying down. Each behaviour makes it possible for zoo keepers to conduct the various examinations or procedures that are necessary for the elephants' health without actually going inside the animals' enclosures.

The use of morkees (halters) on bullocks is a simple remedy that eliminates the cruel practice of nose ropes. Handlers must also be instructed on how to control bullocks through positive training, verbal commands, and properly fitted tack and yokes.

PETA works to reach out to handlers, drivers, and herders to help them understand that bullocks may not immediately understand a command or can be distracted or frightened and may need a moment or two before responding. These people must be encouraged to take the time to adjust harnesses and yokes properly and to give animals enough food, water, and rest. We work to teach handlers that cattle can be skittish and fearful about things that may not bother people, such as loud noises or even a piece of trash blowing around, and that the animals often need just a minute to adjust before obeying a command.

PETA India supports Animal Rahat ('Rahat' means relief), an organisation that alleviates the suffering of working bullocks, as well as donkeys, ponies, and horses, and occasionally other animals, by treating emergency injuries and illnesses. Part of the programme includes giving (if necessary, paid) rest to lame, exhausted, or injured animals. This helps the handlers as well because they are often too poor to allow time for their bullocks to rest or recuperate or to provide the animals with wholesome food or the medicine necessary to maintain the animals' health and strength.

PETA also promotes public awareness about the importance of reporting abuse and of stepping in to stop it. We educate people about the hands-on direct action they can take, including providing water and shade to obviously hot, distressed, and struggling animals and alerting authorities to abuse. Many celebrity supporters – including John Abraham and Hema Malini – have joined PETA in calling on authorities to take action to stop the abuse and neglect of working animals. A PETA petition calling on the Controller of Rationing to ban the use of bullock-drawn carts in Mumbai was supported by many celebrities, including Akshaye Khanna, Rahul Khanna, Raveena Tandon, Eesha Koppikar, Arjun Rampal, Rahul Dev, Avanti Birla, and Sandiip Sikcand. Following PETA's complaints, even many oil companies issued letters to the Controller of Rationing (through the Maharashtra state-level coordinator) asking for bullock-drawn carts to be banned.

Conclusions
Zoos that have switched to protected contact tell PETA that the freedom the management system has allowed for elephants to make choices about their own lives has dramatically impacted the animals' emotional well-being.

Elephants at zoos that employ protected-contact methods are far more relaxed and content.

Protected contact is far safer for zoo employees as well. The risk of human injury or death is nearly eliminated because there is little actual contact with the elephants.

Replacing nose ropes with morkees is a simple, inexpensive, and humane way to prevent the pain and suffering of bullocks. Animal handlers must also be educated about the benefits of treating bullocks with kindness and patience rather than yelling at, hitting, kicking, and pushing them. Giving an animal a kind word or a gentle touch can make it less anxious, skittish, or confused. We urge all animal handlers to remember that patience pays.

THE PARTICIPATORY APPROACH FOR CAPTIVE ELEPHANT HEALTH CARE AND MANAGEMENT

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Introduction

Elephant keeping in the state of Rajasthan, India dates back to 18th century when Maharajas maintained elephants for hunting, war, ceremonial processions, etc. After Indian independence, new exploits were found for the elephants. Rich business owners now use them commercially for tourist purposes (such as rides at Amber Fort and the Elephant Festival conducted by the Rajasthan Tourism Department), wedding processions, film-shooting, polo games, and other ceremonial procedures (see Figure 1).

Figure 1.

At present there are 113 elephants in the Jaipur tourist camp. Of these, 108 are cow elephants, 3 are tuskless males, or 'makhnas', and 2 are calves. There was no scientific veterinary care of elephants in Jaipur before 1998: the animals were treated by local practitioners with no veterinary qualification. The elephants have been purchased at a special fair held at Sonepur, Bihar or from the states of Delhi, Uttat Pradesh, and Kerala. In 2000–1 veterinary surgeons from the government and Help In Suffering (HIS) became involved in treating elephants. Elephant Family (EF) and Help In Suffering (HIS) together with Rajasthan State Government initiated a programme in 2003 to oversee the welfare of these captive elephants in addition to the welfare of mahouts and elephant owners. This programme ran for the 6 years, 2003–9.

Background

Jaipur elephants are prone to different types of veterinary disorders, such as infectious diseases, impaction, foot rot, corneal opacity, etc. and wounds, such as rope sores, saddle sores, sun burn, abscesses, and nail cracks. These result from faulty, improper, and inadequate healthcare and upkeep (see Figure 2, 3, and4).

Figure 2.

Figure 3.

Figure 4.

During the initial stages of the EF–HIS (2003–5) project all the elephant stables and resting facilities at Jaipur lacked shade or drainage. Availability of hygienic water supply for drinking as well as bathing was inadequate. During the tourist season elephants were worked without breaks. One of the serious issues was a lack of strong, bonded relationships between the mahouts and their elephants, and regular changes in mahouts were observed. This not only developed stress in the elephants but also caused mishandling and abuse by the new mahouts leading to fear, aggression, and also traumatic wounds. Evaluation of the treatment records of 2004–5 revealed that out of the total number of treatments, the major health issue was wounds from different origins (see Table 1).

Table 1. Number and type of treatments, 2004–5

Type of ailment	Number of treatments
Wound – misuse of ankush	586
Wounds – saddle contact area	165
Wounds – leg chain contact area	47
Wound – saddle rope contact area	466
Bed sore	495
Other wounds (lacerations, septic, etc.)	152
Wounds due to harmful local treatment method	33
Emergency (colic, impaction, etc.)	17
Foot problems (foot rot, cracked nails, etc.)	79
Ophthalmologic problems	37
Otitis	18
Total no. of treatments	2,095

Objective of the project

- Promote preventive measures against various problems, and provide free veterinary treatment and care
- Educate owners and mahouts about better animal care and management and introduce community participation for future sustainability
- Provide various resources – shade, shelter, water for drinking and bathing, etc. – with the participation of the community
- Conduct research on better design of saddle, stable (Than), restraining equipment, and light reflectors for travel during the

Action plans and methods of approach

The project targets for each year during the period of 2003–9 were different, each having a clear vision.

Providing free veterinary treatment and care

EF–HIS launched a 24-hour mobile veterinary ambulance service with a trained elephant veterinary surgeon and two veterinary assistants. The team visited each elephant at its stable and the elephants which needed attention were provided with free medicines and veterinary services. In the initial stages of the project (2003–4) the team trained owners and mahouts in wound dressing and disease management by visiting each stable individually and demonstrating the scientific approaches. The mahouts were also taught about maintaining self-hygiene as well as hygiene inside the stable. All the elephants were regularly dewormed against endoparasites. The trained mahouts were encouraged to educate their counterparts and newly recruited mahouts in Jaipur. Proper records of each veterinary case were maintained by the team. Along with the free veterinary care the project installed water troughs to supply fresh water at all the elephant stables (se Figures 5 and 6).

Figure 5.

Figure 6.

Coordinating participating government authorities

The Forest Department, Tourism Department, and Animal Husbandry Department were the 3 major government authorities concerned with elephant activities in Jaipur. EF–HIS were instrumental in coordinating these departments in monitoring the issues associated with Jaipur elephants. In the first stage, all the elephants of Jaipur were micro-chipped and a proper record of each elephant was maintained. Annually, 2 elephant camps were organised involving these government organisations, thus monitoring the health status as well as records on a regular basis. The mahouts were encouraged to use bamboo sticks to guide and control their elephants. The best mahout of each year was identified and honoured with cash award. The majority of these activities were implemented in the year 2004–5 (see Figure 7).

Figure 7.

Conducting awareness and educational programmes

With the help of the Government of Rajasthan the project conducted an awareness-raising programme for the elephant owners and mahouts of Jaipur. The programme included inviting experienced elephant veterinary surgeons and mahouts from other parts of the country to Jaipur to share their knowledge with the Jaipur mahouts. Basic elephant veterinary conditions were taught using examples collected from the case studies of their own elephants. There was street play involving schoolchildren and in which the owners and mahouts were trained on

issues such as hygiene, humane treatment of elephants, welfare concerns, and their impact on their livelihoods and alternative livelihood programmes, etc. This sort of programmes was conducted throughout the project's whole activity period (2003–9) (see Figures 8 and 9).

Figure 8.

Figure 9.

Participatory approach

Issues such as insufficient shade at the workplace and stable, unlimited elephant rides meaning the animals being over-worked, and unnecessary overuse of the ankush were discussed with owners and they were encouraged to come up with solutions. The most suitable solutions were brought to the attention of the appropriate government body for implementation. A committee of representatives of the Forest Department, Tourism Department, and Animal Husbandry Department, the elephant owners' association, and EF–HIS was formed in the 2005. This committee inspected each elephant stable and surveyed the animals' living and working conditions, and also experience and family status of their mahouts: recommendations/regulations were passed for immediate implementation. The project's main task during 2005–9 was to implement and monitor the recommendations listed below.

1. Build a shade facility with a minimum height of 18 ft from the ground
2. Improve the diet of elephants by incorporating more green and mineral supplements
3. Reduce the elephants' workload by restricting rides in the summer (April–July) to only 2 rides within the time period 7–10am and in the winter (August–March) to only 5 five rides.
4. Reduce the number of people sitting on each elephant from 4 to 2, and prohibit the return journey with tourists
5. Restrict the use of the iron ankush and promote the uses of bamboo sticks
6. Register all the mahouts with the Tourism Department and issue identification cards/licences
7. Increase the salary of the mahouts from 900/- to a minimum wage of 3000/-
8. Issue a sick elephant a daily allowance of 300/- so it is able to rest
9. Increase the ticket price for each elephant ride from 570/- to 1000/- per ride
10. Promote the use of a radium reflector light at the elephant rear to prevent accidents during times of poor visibility

Salient findings

By the beginning of 2006 all the elephant owners of Jaipur had built new shade facilities for all their elephants at their stables. The drainage facilities were improved with more hygienic measures. All the mahouts were paid an improved salary by the owners and they were provided with an identification card. The workload of the elephants was limited by controlling the number of rides in the summer and winter (see Figure 10). Now all the elephants of Jaipur are microchipped and an efficient record-keeping system is maintained by the Forest Department. The use of ankush or bamboo stick is still a matter of argument, but the use of the iron ankush has been reduced to a great extent (Figure11).

Figure 10.

Figure 11.

EF–HIS officially withdrew its free treatment programme from Jaipur in June 2009, and encouraged the owners to support themselves by forming an NGO with stakeholders and supporters, such as the tour operators, Forest Department, Tourism Department, and the Animal Husbandry Department of Jaipur. Permanent welfare measures have been implemented and enforced and are still followed by the elephant owners and mahouts. But there are some compromises and there are still negotiations between the owners and mahouts about the use of the ankush and elephant workload. The local NGO Help In Suffering is working in collaboration with the Government of Rajasthan to find a permanent solution for this.

Conclusion

With the joint efforts of Elephent Family, Help In Suffering, the Government of Rajasthan, and the elephant owners of Jaipur a proper protocol for the upkeep and management of captive elephants of Jaipur has been established. The key to the success of the programme lies in the participatory approach towards management.

Further reading

Jacob V. Cheeran, 2009.
Jaipur Elephants Welfare Status, submitted to Government of Rajsthan.Noida, 2001.
Occasional report 2, Captive Concerns, Wild Life Trust of India. Smt. Parbati Barua, 2005.
Report submitted to Government of Rajasthan. Khyne U. Mar et al. 2005. Welfare Assessment of Jaipur Elephant, updated 2007.
Department of Forest and Wildlife, Government of Rajasthan, 2007. Guidelines on Captive Elephants.

WORK PERFORMANCE, PHYSIOLOGICAL AND BEHAVIOURAL RESPONSES OF WORKING CAMELS

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Abstract
This study determined the maximum load in relation to heart rates, speed and behavioural responses of camels when pulling loaded carts and sledges in agricultural fields in Kenya. The study investigated three dromedary camels, two of them crossbreed of "Pakistani" and "Somali" (PXS1 & PXS2) and a pure "Pakistani" breed (PB). During the experiment, heart rate and speed were measured and animal behaviour was observed. The camels pulled loads for 15 minutes to 3 hours on 300m-13.6km farm tracks before they refused to move. When the camels started pulling, their average heart rates increased from 50 bpm to 73-111 bpm (an increase of 44-178%). When loads were removed, heart rates dropped to 50 bpm within 8-15 minutes. The maximum load of 562 kg pulled was 119, 124 and 143% of the live weights for PXS1, PXS2 and PB, respectively. The load to live weight ratios of the camels were 83-143% and 33-64% for cart and sledge, respectively. Average pulling speed ranged from 1-1.8 m/s. As loads increased over test distances and days, animal behaviour altered through reduced speed, refusal to walk, frequent sitting, palliating, sweating, urinating, vocalization and defecation.

Introduction
Camels are important draught animals that adapt excellently to harsh and desert conditions, where they efficiently travel long distances [1], [11]. Africa accounts for 73% of the world total of 20 million camels. Somalia and Sudan hold 65% of African and 48% of the world camel populations [4]. Use of draught camels for ploughing, harrowing, dredging ditches, dam-scooping, pulling artillery, lifting well water, ore crushing, grinding, cart pulling, dancing, fighting and riding varies from place to place [9]. Researchers agree that because camels are used for transport all year round they are more cost effective and efficient to keep than a pair of oxen or donkeys [8], [2], [11].

In Kenya where the study was carried out, camel herds are managed under nomadic and semi-nomadic pastoral systems. Carts pulled by a single camel are popular to carry water [16]. It was reported that a camel died in Kenya while pulling 865 kg load, but it was not clear whether death was due to load, age or dehydration suffered in the process [10]. An important investigation on physiological responses of camels to varying loads from 1200 to 1800 kg used camels of three breeds [12]. The load variations increased respiration, pulse rate and rectal temperature by 67-267%, 38-70% and 2.1-3.45 °C respectively, over the resting state. The increased pulse and respiration rate when using carts and wagons were 69% and 125%, and 38% and 71%, respectively. In a Kenyan study, [10] found heart rate (HR) is closely related (R^2 = 0.92) with energy expenditure in the one-humped camel, and concluded HR could indicate energy expenditure. The objective of the study was to determine work performances in relation to physiological and behavioural responses of camels when pulling loads with carts and sledges in agricultural fields without inducing harmful stress on the animals.

Materials and methods
The study was undertaken in semi-arid central Kenya, near Nanyuki town (0° 01'N and 37°04'E). Three healthy dromedary male camels 4-5 years old, two crossbreeds of "*Pakistani*" and "*Somali*", coded PXS1 and PXS2, respectively and one of pure "*Pakistani*" breed, coded PB, were used during the experiment. Weight estimates for PXS1, PXS2 and PB were 472, 454, and 392 kg, respectively. A loaded sledge and cart were used for the experiments (Figure 1). Harnesses were made from rolled-up sisal sacks.

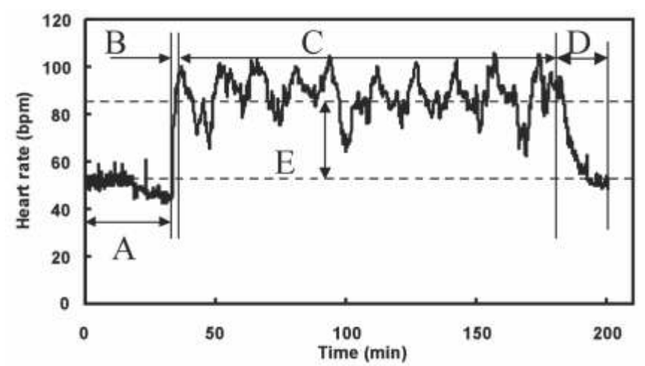
Figure 1. Pulling a loaded sledge and cart during the field experiment

Average pull angles were 20° and 30° for the sledge and cart, respectively. Pulling forces were measured with a tri-axial extended octagonal ring dynamometer mounted on the pulling line. Design principles and performance characteristics of the dynamometer were described in detail by [6]. Coefficients of friction and rolling resistances under the sledge and the cart wheels were determined using known loads pulled with the dynamometer. Distance and time were measured with a pulse-generator mounted on a wheel and stop watches.

Animals' heart rates at rest, work and recovery were measured to estimate the physiological response to stress induced by external loads. The Polar® 610i Accurex instrumentation (Polar Electro, Oy, Finland) was used. Behavioural alterations of the camels became complementary studies of the animals' welfare. Speed reduction was taken for tiredness or stress. Refusal to walk, lying down or sitting, sweating, palliating and vocalizations were behaviour and welfare indicators. The animals were given water and feed overnight and their rights as spelt out in the mandatory five freedoms were not violated and animals were kept free to express normal behaviour. Data was analysed using analysis of variance (ANOVA) using the General Linear Model (GLM) procedures in Statistical Analysis System (SAS) [14]. Statistical significance was set at $P<0.05$.

Results and Discussion
Heart rate profile: The typical heart rate profile with four distinct stages for PXS1 pulling a loaded sledge is shown in Figure 2. All three animals showed similar heart rate profiles. The stages are the initial resting condition (A), a dynamic state showing a rapid rise when the load was applied (B), a steady state when the increased load did not increase the average heart rate (C), and a recovery or no-load state when the load was removed (D).

Figure 2. Typical heart rate profile of PXS1 pulling a loaded sledge.



The initial average heart rate of 50 bpm rose rapidly within 4-5 minutes during the dynamic stage when the camel started pulling the load, before attaining a steady state. The steady state heart rate varied between 62-106 bpm, with an average of 88 bpm. The heart rates dropped rapidly from the peak of 93 bpm to 50 bpm within 8-15 minutes when pulling stopped, showing the animal was stressed. The average increase in heart rate from resting condition through the dynamic state to the steady state (E), was 44-178% and 73-112% for the cart and the sledge, respectively for all the three animals. This varied from 70-74%, 79-179%, and 67-125% for PXS1, PXS2 and PB, respectively. This camel heart rate variation follows a similar pattern found for Brahman heifers [13].

The average steady state heart rates for the camels in pulling loaded cart varied as illustrated in Figure 3. The heart rate for PXS1, during the second day increased by 20% over the first day's value in line with a 15% increase in the load. Similarly, the heart rate variability on the first day for PXS1 was lower (4%) than the second day (8%).

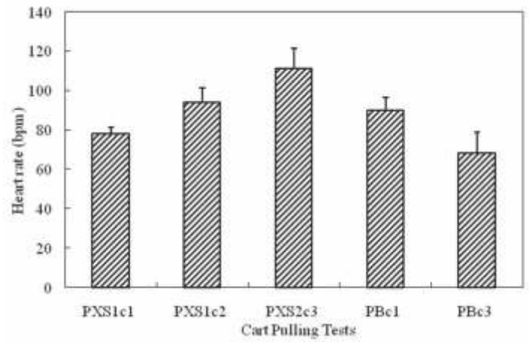


Figure 3. Mean steady state heart rate of camels pulling a cart. Load identifications c1, c2 and c3 show pulling of loaded cart on consecutive experimental days, and the corresponding pulling forces were 1282, 1605, 1849, 1282, 1849 N, respectively

In Figure 4, the mean heart rates for pulling a loaded sledge varied from 86-118 bpm, for all load levels and distances covered. Sledge heart rate variabilities are 4-13% higher than the average for pulling carts. This indicated more comfort in pulling carts than sledges, even for lower sledge loads. This could be influenced by the lower rolling resistances under the cart wheels compared to the higher frictional coefficients under the sledges.

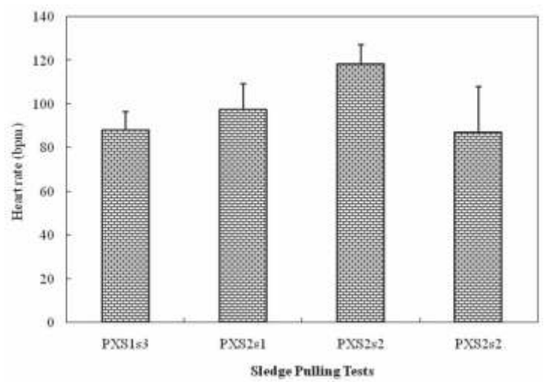


Figure 4. Mean steady state heart rate for pulling a sledge. Load identifications s1, s2, and s3, show pulling of sledges on consecutive experimental days, and the corresponding pulling forces were 833, 752, 1265 and 1265 N, respectively.

Behaviour and welfare

The animals showed different behavioural symptoms for speeds, sweating, refusal to walk, palliating, vocalizing and sitting. For the same loads with the same implements but on different days, the three animals covered different distances from 6.5-30 km, and exhibited similar behaviours at the end of each pulling exercise. PXS1 covered the highest total distances of 30 km. The animal refused to walk after covering 10, 11.2 and 8.8 km for the first, second and third days respectively, and lay down. PXS2 pulled the heaviest sledge load (249 kg) over 2.5 km at a speed of 1 m/s, and developed the highest steady state heart rate of 118 bpm. The fastest speed of 1.8m/s was developed by PXS2 when pulling the heaviest loaded cart (562 kg) on the third day after previously pulling sledges. PB pulled the loaded cart of 390 kg on the first day after covering 13.6 km at a speed of 1.2 m/s but did not show signs of tiredness. However, when pulling sledge in the second day afternoon at a speed of 0.8 m/s, it refused to walk after covering 700 m compared to 2.5 and 8.8 km covered by PXS2 and PB. The animals exhibited loud vocalizations as signs of tiredness and refusal to walk or work at certain stages of the experiment.

The maximum load (5620 N) pulled with a cart over a distance of 300 m was 143% of the live weight for the smallest animal PB, compared to 124% of live weight for the crossbreed PXS2 over a distance of 1.6 km. When pulling carts, because of wheel rolling resistance, this maximum load became 47% and 41% of the pull-live weight ratios of PB and PXS2, respectively. For continuous work, camels could pull 15-20% of their body weights [5], [15]. Our findings of 29-51% pull/live weight exceeded the above results by almost 100%. The maximum load pulled with the sledge was 2490 N, and this was 64% of the live weight of PB over a distance of 700 m compared to 55% for PXS2 over a distance of 2.5 km. All the animals reacted negatively to the maximum loads of 5620 N and 2490 N with carts and sledges, especially in the hot afternoon.

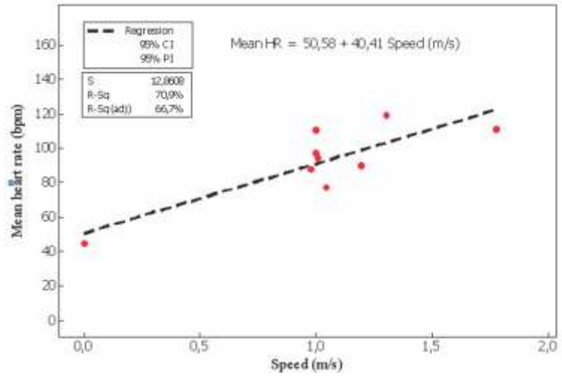


Figure 5. Steady state mean heart rate plot showing the estimated regression line.

In figures 5 and 6, speed correlates ($R^2 = 0.71$) with heart rates. The ANOVA result shows that for all the variables considered, it was only speed that significantly ($p \leq 0.01$) influenced the heart rates of the animals in our study, in agreement with the findings that heart rate and energy expenditure increased with speed [10].

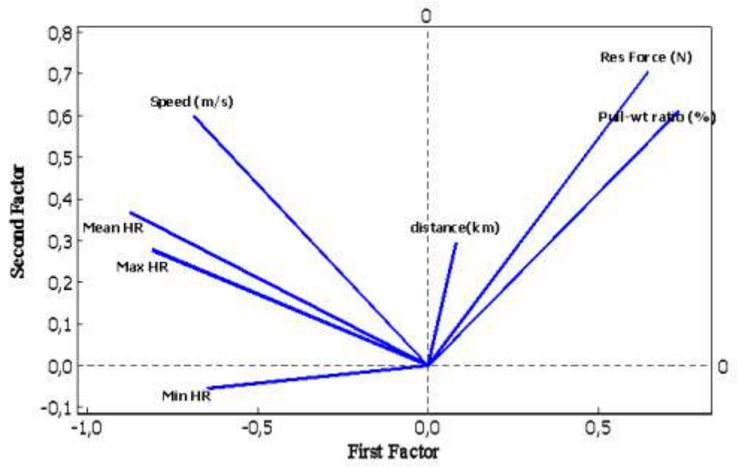


Figure 6. Principal Component Factor plots of the relationship among the major factors and mean HR of the three camels pulling.

Principal component analysis (PCA) of field data

Distance has very minimal effect on HR, confirming the camel as a long distance traveller, and the distances covered during the experiments were within the animals' manageable travel zones. The above factors could also contribute to make camels more cost effective to keep in terms of maintenance and nutritional requirements than a pair of oxen or donkeys [2], [11].

Conclusions

1. The maximum loads pulled by camels with carts and sledges during the experiment were 5620 N and 2490 N, respectively.
2. The maximum load-live weight ratios for PXS1, PXS2 and PB were 119%, 124% and 143% with cart, and 53%, 55% and 64% with sledge, respectively.
3. In the limits of average rolling resistance of 0.31 for carts and coefficient of friction of 0.45 for a sledge on the field track, the average pull-weight ratios for the three camels ranged from 29-51% and 15-30% for cart and sledge, respectively.
4. At travel speeds from 1 to 1,8 m/s, the animals generated steady state heart rates from 78-111 bpm for cart and 88-113 bpm for sledges, an increase of 44-178% and 73-111%, respectively over the initial rest heart rates for all the three camels.
5. Speed is a very significant factor ($p \leq 0.01$), which correlates strongly with heart rates of camels.
6. As loads increased over test distances and days, animal behaviour changes regarding speed, refusal to walk, sitting and display of palliating, sweating, urinating, vocalization, and defecation were observed.

References

[1] Abdurahman O Sh; Cooray R; Bornstein S (1992). The ultrastructure of cells and cell fragments in mammary secretions of camelus bactrians.
[2] Bhakat C; Chaturvedi D; Sahani M S (2001). Camel versus bullock carting and it's [sic] economics in the hot arid regions of the Thar Desert. *Draught Animal News,* 37, 21-26.
[3] FAO (2007). http://www.fao.org/ag/againfo/resources/en/pubs_aprod.html (A*ccessed,06/03*/2010)

[4] Gariachkin V P (1968).Cobranye Cochitanye tomIV (Collected Works, volume IV), Moscow, Koloc.
[5] Gebresenbet G (1989). Multi-component dynamometer for measurement of forces on plough bodies. *Journal of Agricultural Engineering Research*, 42:85-96.
[6] Khanna N D; Rai A K (2000). Investigation of work potential of Indian camel. *Camel Newsletter*,17, 15-22.
[7] Köhler-Rollefson I U (1992). The Raika camel pastoralists of Western India. *Research and Exploration*, 8, 117-119.
[8] Maloiy G M O; Rugangazi B M; Rowe M F (2004). Heart rate and energy expenditure at rest and exercise in the domestic donkey and one-humped camel. Research report supported by Leverhulm Trust Funds London and NORAD KEN 046 Project.
[9] Mohammed I; Hoffmann I (2006). Management of draught camels (*Camelus dromedarius*) in crop-livestock production systems in Northwest Nigeria. *Livestock Research for Rural Development, Volume 18 (1).*
[10] Rai A K; Khanna N D (1990). Studies on draughtability in Indian camels at the National Research Centre on camels, Bikaner. *Draught Animal News,* 12: 1-4.
[11] Richards J I; Lawrence P R (1984). The estimation of energy expenditure from heart rate measurements in working oxen and buffalo. *Journal of Agricultural Science*, 102: 711-717.
[12] SAS Institute Inc. 1999. SAS/STAT® Software. SAS User's Guide: Statistics, Release 9.1. SAS Institute, Cary, NC.
[13] Wilson R T (1978). Studies on the livestock of Southern Darfur, Sudan. V. Notes on camels. *Tropical Animal Health and Production,* 10:19-25.

CAPACITY BUILDING IN SMALLHOLDER LIVESTOCK SYSTEMS USING ANIMAL POWER IN VIETNAM

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Introduction

In the Red and Mekong river deltas of Vietnam increased availability of motorised tractors and good prices for rice have meant that working buffalo and cattle have largely been replaced by 2-wheeled tractors. However, buffalo and cattle continue to provide the main source of power for cultivation in the hilly and mountainous areas. Much of the rice produced for home consumption and for export is produced on small farms powered by buffalo. The working buffalo is very often a female, and is also required to produce a calf every 2 years.

In 2003 the National Institute of Animal Sciences (NIAS) and Edinburgh University received a grant from the British Council Higher Education Link programme to work with people to improve the health care and management of working buffalo and cattle in Vietnam. The objective of the project was to improve the knowledge and skill of extensionists, farmers, and also scientists.

Activities

Meeting with some international organisations to exchange ideas and experiences

A meeting was organised at Chiangmai University for staff working in the project to exchange ideas and experiences with scientists and farmers in Thailand who work with draught animals. Later on in the project, discussions were also held with institutions in Indonesia specialising in buffalo and cattle production to form the basis of future collaboration within the region.

Organising training courses for extensionists and farmers

Extensionists within Vietnam help farmers practise better farming methods. Four training courses were organised in North Vietnam for 160 extensionists from 4 provinces (Thai Nguyen, Ha Tay, Vinh Phuc, and Nghe An provinces) to improve their general knowledge on the use of draught animals and factors affecting productivity. They learned to calculate animal requirements for maintenance and work, how to meet these requirements by improving their skills in feeding and management, and also disease and injury prevention measures to keep the animals healthy and fit for work.

Sixteen training courses were organised for 840 farmers from the above 4 provinces. The aim of these courses was to provide farmers with the knowledge to practise better livestock feeding, daily management, and more effective use of draught animals on their farms. The courses included establishing priorities for each class of livestock during the year, ways of planning to ensure feed availability throughout the year, particularly at the times when animals are needed for work, disease and injury prevention, good management and working practices when using draught animals, and ideas to improve their skill in meeting feed requirements of their working animals.

To reinforce the training sessions, 2 handbooks on feeding, management, and use of draught animals were printed (a pictorial book for farmers and a handbook for technicians and extensionists). With the help of funding from the British Government Department for International Development, 2,000 copies of each handbook were distributed in the 4 provinces, and people who were unable to attend the courses could also receive copies. After 1 year, staff on the project returned on a follow-up visit to some of the extensionists and farmers who had received books, and interviewed them to ask about the usefulness of the information provided.

Demonstration through research

To strengthen the research capability of NIAS on working animals, young researchers within the institution undertook 2 small research projects, concerning issues identified by farmers and extensionists. The results are given here.

Investigation of the draught capacity of local swamp buffalo on different soil types

The experiment was conducted over 3 weeks. Each buffalo ploughed on 3 sequential days (3 hours in the morning and 3 hours in the afternoon with half hour rest in the middle). The results showed that male buffalo had a higher ploughing speed and area ploughed than female. There was a difference in speed and area ploughed between the 2 soil types. Male buffalo were stronger than females and a swamp rice field is more difficult to plough than a dry (irrigated) rice field. See Table 1.

Table 1. Ploughing capacity of buffalo on different soil types

Items	Dry (irrigated) rice field		Swamp rice field	
	Male	Female	Male	Female
Number of animals	5	5	5	5
Age	6–7	6–7	6–7	6–7
Body weight (kg)	369[a]	324[b]	362[a]	335[b]
Ploughing speed (m/s)	0.61[a]	0.56[b]	0.46[c]	0.42[d]
Average area ploughed per hour (m2)	318[a]	299[b]	261[c]	243[d]

[a,b] Means in the same row with different superscripts differ at P<0.05

Supplementation to improve working capacity of local swamp buffalo

An experiment was conducted with 12 adult male buffalo in 2 seasons (wet and dry) on an irrigated rice field to evaluate the effect of feed supplementation on the work output of buffalo. The animals were divided into 3 groups (4 per group). All were grazed freely and given urea-treated rice straw at night ad libitum. The first group was not supplemented (CT), the second group was supplemented 1kg of cassava root meal per day (CRM), and the third group was supplemented 0.5kg cassava root meal plus 0.5kg cassava leaf meal per day (CRLM). The supplementation was started 1 month before and the ploughing period was 2 continuous weeks. There were no significant differences in speed and area ploughed between the supplemented groups, but both worked better than the non-supplemented group. Supplementation of cassava root meal and cassava leaf meal increased speed and area ploughed. Cassava root meal and cassava leaf meal can be used to supplement working buffalo for improving working capacity. See Table 2.

Table 2. Speed of ploughing and area ploughed in 120 minutes

	CT	CRM	CRLM	SE
Wet season				
Speed of ploughing (m/s)	0.67[a]	0.76[b]	0.79[b]	0.02
Area ploughed (m2)	610[a]	662[b]	678[b]	8.43
Dry season				
Speed of ploughing (m/s)	0.56[a]	0.67[b]	0.69[b]	0.01
Area ploughed (m2)	524[a]	592[b]	606[b]	10.61

[a,b] Means in the same row with different superscripts differ at P<0.05

Observations and lessons learned

Early planning meetings both in Vietnam and Thailand with scientists and with farmers enabled the content of the training courses and the information provided in handbooks to meet the needs of the farmers and the extensionists. The emphasis during the training sessions was participation by the attendees. The aim was not to dictate but to discuss, see, and do. Feedback from farmers and extensionists was positive, suggesting their needs had been met. Involving the junior staff from the beginning in training and hence contact with the farmers and their needs meant that their research projects were developed from questions posed by the farming communities.

Vietnam has a good village structure which makes it relatively easy to contact farmers and collect people together for meetings. There was always a good turnout on the farmer training days. Farmers were happy to take time away from their farms for a half day, but were not prepared to be away longer, even with a financial incentive. Each received a small per diem (US$1–2) for attendance to compensate them for their time away and/or loss of earnings. The maximum number for each session was 40 because many of the exercises involved participation. Extensionists were able to take 3 days over a course. Many recognised the value of the draught animal to the communities they worked with, but had little specific knowledge to advise farmers on feeding and management for work.

The handbooks are small (about 50 pages). It was felt that anything larger would deter people from using them. In the follow-up after distribution, all the recipients spoken to had found the books useful and many had suggestions to improve layout and content, and had ideas for other topics. There is a high level of literacy in Vietnam and people wanted the books to reinforce the courses. Most felt they could read them when they had spare time, and refer back to them when necessary. Few farmers were interested in the more detailed books provided for the extensionists, mainly because they said they would be harder to refer to. Extensionists found the books useful to help them in guiding farmers. Some people had photocopied their books for neighbours who had not been able to obtain them.

The involvement of young scientists in research projects involving draught animals did help raise the profile of research in this area and gave them the skills to develop projects of their own.

The meetings in Thailand and Indonesia led to the setting-up of a regional project in 2007 to extend the programme, with a wider remit to improve production, management, and health of large ruminants kept for meat, milk, and/or work within south-east Asia. This would not have been possible without the British Council-funded project.

REPORT FROM A MOBILE ELEPHANT CLINIC AND AN ELEPHANT HOSPITAL

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Introduction

For at least 4,000 years elephants have been tamed, so they can work for people. A hundred years ago, about 100,000 domesticated elephants lived in Thailand, in 2010 there are about 3,500, and the population at present seems to be stable. Formerly the elephants were used for war, transport, and ceremonies; now they are primarily used for transport of tourists, and work in the forest [1].

After a ban on logging of teak in 1989, a large number of logging elephants became jobless, and the situation opened up for overseas support for the elephants. In 1998 a mobile elephant clinic (MEC) and an elephant hospital were established at the National Elephant Institute (NEI). The MEC was sponsored first by the Royal Society for the Prevention of Cruelty to Animals, UK, then by the World Society for Protection of Animals, London; in 2009 the Danish Society for Animal Welfare took over its sponsorship. The MEC covers 70,000km a year, providing free veterinary services for domesticated elephants in Thailand.

Results

Table 1 shows the diagnosis or reason for treatment at the MEC of 1,368 elephants during the 3-year period 2005–8; for comparison the same information is given for 464 elephants in 1999–2001.

Table 1. Diagnosis or reason for treatment of elephants at MEC

Condition	**2005–8[1]**	**1999–2001[2]**
	%	%
Wound and abscesses	19.1	19.2
Poor condition, weak, and dehydrated	17.6	23.1
Ecto-parasites	14.9	32.5
Eye problems (conjunctivitis, corneal ulcer, opacity, cataract)	14.1	7.6
Musculoskeletal problems (lameness, bone fracture)	9.8	0
Gastrointestinal problems (constipation, diarrhoea, colic)	7.8	5.6
Tusk infection	4.1	2.4
Skin problems (fungus allergy)	3.6	0
Reproduction problems (must, dystocia, abortion, infections)	3.5	2.6
Food problems (cracked nails or pad, nail overgrowth)	3.1	3.7
Other causes	2.1	0

[1] 1,368 elephants; [2] 464 elephants

Table 2 shows the conditions of the 283 cases from 2005–8 which were so severe that the elephants were brought to the NEI hospital. Of all the elephants, 25 died during the 3 years; of these 11 (40%) had digestive problems, 6 (21%) died from wound infections; and 4 females and 1 baby (20%) died during labour.

Table 2. Diagnosis of elephants treated at the NEI hospital, 2005–8

Condition	%[1]
Gestational-intestinal problems	24.0
Wound and abscesses	21.2
Poor condition	14.1
Musculoskeletal problems	13.8
Reproductive problems	5.7
Eye problems	5.7
Tusk infection	3.9
Ecto- parasites	3.5
Foot problems	3.2
Skin problems	2.5
Growth (cysts papilloma fibromas)	1.8
Urinary problems (kidney failure, blood in urine)	0.7%

[1] 283 cases

Explanations for problems

- Wounds and abscesses are mainly caused by the tools used for controlling the elephants, and by the harness. Severe wounds and tail biting is seen when elephants are attacking each other.
- Poor condition is seen when elephants, mainly the ones involved in illegal logging, are overworked.
- Ecto-parasites include warbles coming out through the skin; the condition is of more concern for the mahout than for the elephant.
- Eye problems often occur when the elephants are exposed to direct sun, dust, or mechanic trauma in the eyes. The animals never die, but often they become blind in one or both eyes.
- Muscle pain and lameness, including fractures, are seen among the overworked elephants in the forest, in elephants falling down in hilly areas, or when elephants fight
- Diarrhoea or constipation can be caused by wrong, contaminated, or too much food or plenty of fresh food in the beginning of the rainy season.
- Infections in the tusks are often caused by trauma or if the tusks are cut too close to the nerve, by the owner or by thieves, who want the ivory.
- Skin problems are seen especially when elephants do not get proper skin care, including a daily bath.
- Reproduction problems include dead foetuses, labour trouble, and mortality among the newborn.
- Foot problems seen in western zoos are not common; the most severe cases are those seen in elephants that have stepped on landmines.

Discussion

The 1,368 elephants seen by the MEC represent about 40% of all the domesticated elephants in Thailand, and the findings, similar at the beginning of the project, are believed to be representative of the suffering among domesticated elephants in Thailand. At first, we thought the primary job of a veterinary consultant was to improve veterinary skills and treatment, but when looking at the tables it can be seen that most of the suffering is caused by the way the elephants are used: their problems are caused by humans. And the most efficient way to cause improvement is education of the people working with the animals.

So we did. First, we wrote the Mahout Care Manual [2] which was published in the Thai language. Then we developed a first-aid kit for elephant keepers, the so called mahout box, which contains simple tools, like a broom, soap, iodine, etc. for treatment of simple cases in the field or before the veterinarian has arrived. We then started arranging training for the elephant keepers, the mahout workshops. With good documentation it was possible to get money from the Danish East Asia Company for the workshops, and by the end of 2010 more than 150 mahouts will have attended them.

After 12 years as a vet consultant for NEI, I do not see fewer cases or less need for veterinary activity. However, it appears that the elephants are now in better condition than before, and the cases presented are less severe than when we started.

Conclusions

For advisers and chief veterinarians it is important to be open-minded and do systematic recording, which shows which direction the work should take and, most important, if the conditions and welfare of the elephants could be improved. This includes other working animals. The approach is not better veterinarians, nor sophisticated equipment, but close regular contact with the people involved with the animals, and education integrated as part of all activities within a mobile clinic.

Acknowledgement

This paper is based on Angkawanish, T. et al. (2009): Elephant Health Status in Thailand: The Role of a Mobile Elephant Clinic and an Elephant Hospital. Gajah 31, pp.15–20.

References

[1] Lair, R.C. (1997): Gone Astray. FAO Regional Office for Asia and the Pacific. Bangkok, Thailand.
[2] Phuangkum, P. et al. (2003): Elephant Care Manual for Mahouts and Camp Managers. Forest Industrial Organization and FAO Regional Office for Asia and the Pacific. Bangkok, Thailand.

WELFARE ISSUES OF WORKING BULLOCKS AT CHINCHALI AND SOLUTIONS

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Abstract

Chinchali is a village in the southern state of Karnataka. Animal owners and farmers of Sangli, Kolhapur, and Solapur districts use bullock carts to attend Chinchali fair, which is about 80km from Sangli, a 2–3 day journey (Figure 1). On this journey the bullocks suffer muscle strain and wounds, and undergo stress and dehydration. To overcome these problems concerning animal welfare issues Animal Rahat makes arrangements for rest, water, shelter, and free treatment for animals on the way to the fair. Animal Rahat also arranges for buses to take animal owners to the fair so their bullocks can rest.

Introduction

The bullock cart forms the backbone of the transport system in our villages and small cities and will remain so for a long time to come. This is because the villages are mostly connected with *mandis* (local markets) and sugarcane factories through *kutcha*, roads which are often narrow, uneven, and unfit for use by mechanical means of transport. The unit of farming being small and the marketable surplus per household being small, the bullock carts are more suitable and economical than mechanised transport. Even the nature of farming sugarcane demands use of bullock carts when it needs to be ploughed at waist length crop height [1].

There is scanty information about the suitability of all the major Indian breeds of cattle, buffalo, and pack animals, including cross breeds, as draught animals. A major research programme has been undertaken on milch animals. Draught characteristics have been studied in limited breeds. Physiological norms for continuous working of animals without undue fatigue are not available. As a result animals are subjected to drudgery [2].

Figure 1. Animal owners use bullock carts to travel to the Chinchali fair

Welfare issues and steps of redressal

We address the 5 freedoms for animals.

Freedom from hunger and thirst

Freedom from discomfort

It is very common to see bullocks with poor body condition scores (see bullock pulling second cart in Figure 1) trudging along without much needed rest on the road to Chinchali. Though they are fed it is hard to say their nutritional needs are met. Severe exhaustion and lameness, both common here, affect the animals' health

Animal Rahat arranges a camp on the journey, at Mahishal village, where the owners take their last stop before Chinchali. Here arrangements are made for the animals to rest. Fresh water is provided and also shelter (see Figure 2). At the same time owners are made aware of the need for their bullocks to rest. Refreshments are also given to the animals owners to reinforcing the idea that timely rest, feed, and water make the journey less stressful.

Figure 2. Animal Rahat supplies water for the animals on the way to Chinchali

Freedom from pain, disease, and injury

The gentle bullocks often suffer from untreated sores, especially yoke galls (see Figure 3). Many owners also beat them, causing wounds. Various types of lameness are also very common.

Free treatment to sick animals is provided by the Animal Rahat team at this resting place in transit. If a bullock's health is severely affected and hospitalization is needed Animal Rahat admits it to its temporary retired bullock home for proper treatment and care. Information about the primary health issues of working bullocks and their care is also given to the owners.

Figure 3. Bullock with yoke gall used for pulling cart to travel to fair

Freedom from fear and distress

Ignorant and insensitive owners use various crude methods to control the animals. The use of nails as shown in Figure 4 is an example. Use of the nose rope instead of *morki* also leads to wounds and a few times the ends of the nostril are cut and the rope digs in further causing immense pain to the animal.

The Animal Rahat team removes and confiscates any means of cruelty such as these nails from the owners. The Rahat team also tries to sensitize such people on issues of animal welfare and mental well-being of the animals.

Figure 4. Use of nails to control animal

Freedom to express natural behaviour

It is not uncommon to find horses in similar conditions, sometimes we find 2 horses harnessed to a bullock cart or a horse and bullock together (see Figure 5); being of uneven size the cart has lopsided.

Animal Rahat takes these issues very seriously and even threatens to go to police and file a case against the owners. However, we do try first to resolve such issues amicably with the owners and help them find alternatives, rather than abusing animals by putting them in unnatural working styles.

The Animal Rahat bus is an example of such an alternative which aims at relieving animals from stress by giving people an alternative mode of transport to the fair (see Figure 6).

Figure 5. A cart pulled by 1 bullock and 1 horse

Figure 6. Buses take animal owners to the fair so their animals can rest

Conclusion

Animal Rahat (Rahat means relief from pain) is a non-profit organization which was created to make a difference in the lives of working bullocks, donkeys, ponies, and horses. Animal Rahat's aim is to alleviate the suffering of these animals by giving rest to the lame and offering relief to the sick and injured. Our work at Chinchali Fair is a step in this direction and we aim to take it more extensively next year so that more working bullocks receive our care and their welfare enhanced.

References

[1] K.N. Ramanujam, Rural Transport in India, Mittal Publications, New Delhi, 1993.
[2] G. Singh, Draught Animal Energy Research in India; www.atnesa.org.

CHANGING PRACTICES WITH WORKING BULLOCKS: USING THE MORKEE INSTEAD OF THE NOSE ROPE

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Abstract
Use of the nose rope in bullocks is prevalent in the Sangli and Solapur districts of Maharashtra. With the use of nose rope some welfare issues are compromised. We are giving animal owners an alternative: the morkee *can be used in place of the nose rope. People are reluctant to start this new practice. With our consistent efforts we are trying to bring happiness to animals.*

Introduction
One of the common sights in India is that of a bullock trudging along in the heat, straining under a heavy yoke, pulling an overloaded cart, being nudged with nose ropes. It is significant that the nose rope hardly ever remains simply a means for communication to be used to give directions: rather, in uneducated hands it becomes a means of pulling, jerking, confusing, inflicting pain, and controlling the animal and compromising its welfare (see Figure 1). To secure the animal a halter (*morkee*) is a better choice (see Figure 2).

In many regions the control of bullock is accomplished by good training, well fitted yokes, traces, and verbal commands (1). However, in Maharashtra it is a common belief that bullocks are ferocious and a nose rope should be used to control them. The Animal Rahat's team focus is to bring change by setting examples themselves, and this paper shows how they do this.

Figures 1. Bullocks with nose rope





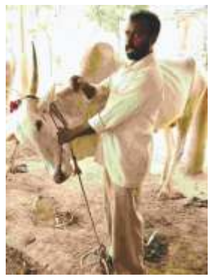

Figure 2. Bullocks with *morkee*



Figure 3. Treatment and examination of bullocks


The 5 freedoms for animals
- Freedom from hunger and thirst
- Freedom from discomfort
- Freedom from pain, injury, and disease.
- Freedom to express normal behaviour
- Freedom from fear and distress

Table 1 shows how these freedoms are compromised by the use of the nose rope.

Freedom	Nose rope	Morkee
Discomfort	Compromised	Not compromised
Pain, injury, and disease	Compromised	Not compromised
Express normal behaviour	Compromised	Not compromised
Fear and distress	Compromised	Not compromised

The nose rope: prevalent practice in the area
At a young age an animal suffers extreme pain when a nose rope is fitted. With the help of a sharp pointed object a small hole is made in the nasal septum. Through this hole a rope of 5–8mm diameter is passed and it is tied behind horns. This whole procedure is performed without any veterinary help. One can imagine the tremendous pain and

suffering the animal is going through. As age advances the diameter of the nose rope increases until it becomes 1–1.5cm. Over a period of time this rope has to be changed because of its bad condition. While putting in a new rope the animal is handled very badly and no sedatives or veterinary help are given. This nose rope remains in place until the death of the animal.

There are many disadvantages with the nose rope:

- Pain associated with wound in nose
- Injury to nasal septum
- May cause injury to eye while handling
- Unclean rope leads to maggots in wound
- Fungal infections around ear (because of rubbing near ear)

The *morkee*

When we consider the *morkee*, there is no painful procedure involved. It is very simple to apply and use, and it can be removed when the animal is not working, which is not possible with the nose rope. In this way we reduce the animal's pain and discomfort, and the animal can experience its normal, natural behaviour.

Success with the *morkee* depends on the following factors:

- Atmosphere in which the animal grows up
- The animal owner's attitude (careful/rough)
- The attitude of the animal's handlers (including women and children)

Training animals for traction involves an understanding between the trainer and the animals. The animals need to trust the trainer. For that the trainer should be patient and reward good behavior [2]. While changing from the nose rope to *morkee* if these factors are compromised then repeated efforts are needed.

Conclusion

Animal Rahat is a non-profit organization which was formed to make a difference in the lives of working animals. Educating owners to change their practices is one of our core objectives. And to change the mindset of people we have to show them and lead by example. In our day-to-day work of providing free veterinary aid (see Figure 3) we try always to handle the animals gently, with the *morkee* along with love and respect, instead of the nose rope, and encourage owners to do the same. In our temporary retired bullock home all the bullocks are tied with the *morkee*. In future we plan to take bullock owners to see this home and reinforce the idea of using an animal-friendly method of securing the animals to enhance their welfare (Figure 4).

Figure 4. 'I am very happy with *morkee*'

References

[1] J.K. Campbell, Dibble Sticks, Donkeys and Diesels: Machines in Crop Production.
[2] Manual of Training for Animal Traction, developed by VSF-Spain, HOSU, BMCS, and the National Agricultural Research Organization (NARO)

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