

PN-ACM-376



# Using Cattle for Draft Power and Transport



ILRI Slide Series

International Livestock Research Institute

FIN-ACM 276

# Using Cattle for Draft Power and Transport

ILRI Slide Series 2

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ISBN 92-9146-051-6

Correct citation: Ibrahim H. 1999. *Using Cattle for Draft Power and Transport*. ILRI Slide Series 2. ILRI (International Livestock Research Institute), Nairobi, Kenya. 36 pp.

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# Preface

The use of animals for traction is common in many parts of the world. It is an appropriate, affordable and sustainable technology. Traction animals assist in intensifying agriculture and hence improve the welfare of the smallholder farmer.

Apart from in Ethiopia, animal traction is a recent technology in sub-Saharan Africa (SSA) relative to other regions of the world. Ethiopia has a long history of using draft animals.

This series is directed at young animal scientists with BSc or MSc degrees. It also serves senior animal scientists by providing slides for seminars or lectures in educational institutions. The series is made up of slides and a booklet that contains pictures and text.

I acknowledge Woizero Menbere W/Giorgis for the photographic work. I acknowledge Ms Anne Marie Nyamu for editing the text of the booklet and the staff in the ILRI Publications Section for design, layout and printing.

Habib Ibrahim  
Training Materials Specialist

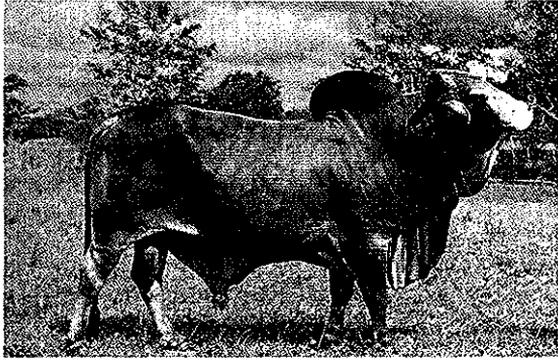
# **Cattle for draft and transport**

This is a slide set on 'Using Cattle for Draft Power and Transport' which is part of a series produced by the International Livestock Research Institute (ILRI). Farmers in the developing world still find it economical to use animals for draft and transport. This slide series will enable you to:

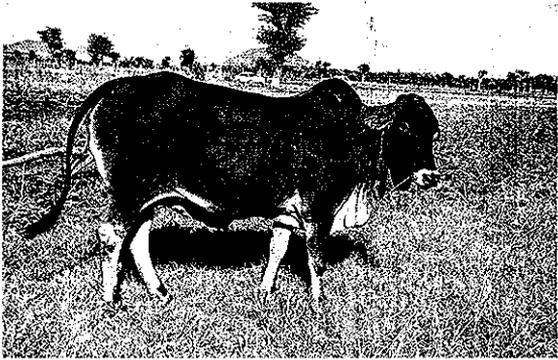
- describe equipment used for ploughing the soil, weeding and planting seed using cattle
- list the optimal treatment to manage animals used for draft
- name equipment used to monitor animals during research on draft animals.

1. An ox at the ILRI Research Station, Debre Zeit, Ethiopia. Farmers in the African highlands use oxen for draft power and transport.
  
2. A cow at the ILRI Research Station, Debre Zeit, Ethiopia. Farmers are encouraged to use cows for draft. In addition to draft power, cows also provide milk and meat.
  
3. A crossbred cow in Ethiopia. Farmers are concerned that if a cow is used for draft work, its ability to produce milk and calves will be reduced. Research has shown that crossbred cows can perform draft work and still efficiently produce milk and calves.

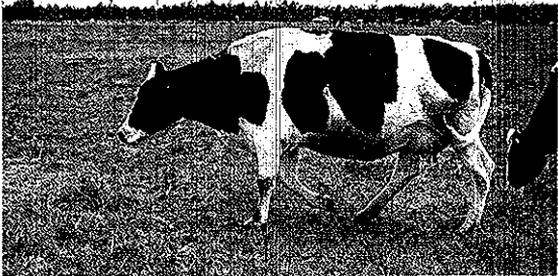
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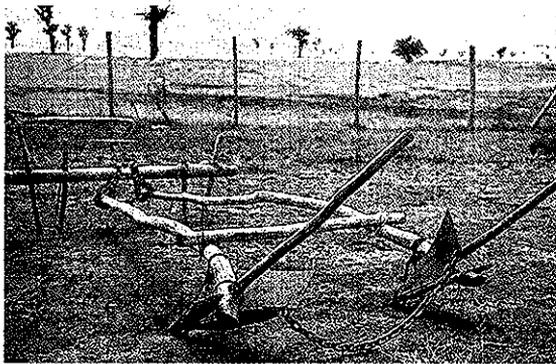
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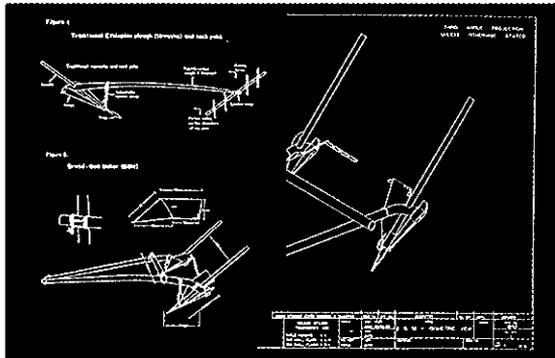
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## Cattle for traction

4. The *maresha* is the traditional plough in the Ethiopian highlands. Farmers in sub-Saharan Africa use cattle to pull implements to plough and weed their fields.
  
5. A broadbed maker (BBM) at the ILRI Research Station, Debre Zeit, Ethiopia. Waterlogging is a serious problem for plant growth on the deep black clay soils known as Vertisols in the high rainfall areas of the Ethiopian highlands. Because of waterlogging, farmers wait until the excess water drains and hence plant late. The best way to overcome this problem is making broadbeds to drain excess water. Researchers developed a BBM to meet the needs of the resource-poor farmers of Ethiopia.
  
6. This drawing shows the specifications of a *maresha* and a BBM.

7. The *maresha* is a pointed, steel-tipped tine attached to a draft pole at an adjustable angle. Narrow wooden wings are attached on each side of the tine to push soil to either side. The *maresha* is a light implement, not exceeding 25 kg, and is entirely home-made. The farmer can easily carry the *maresha* to and from fields.
  
8. An important part of the *maresha* is the wooden neck yoke. The animals exert a pulling force to move the *maresha*. This yoke exerts force on the shoulders of the pair of animals.
  
9. A farmer ploughing his land using cattle drawing a *maresha* in the Ethiopian highlands.

7.



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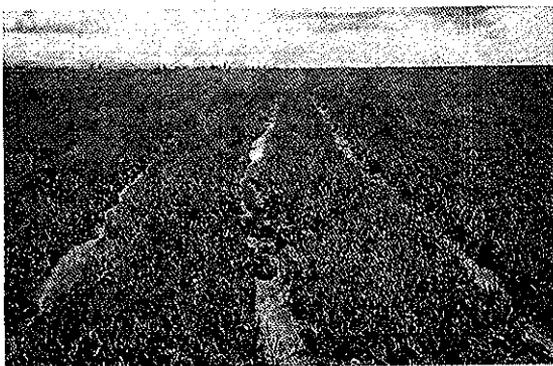
16.



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18.



16. Cattle ploughing land using a BBM in the Ethiopian highlands.

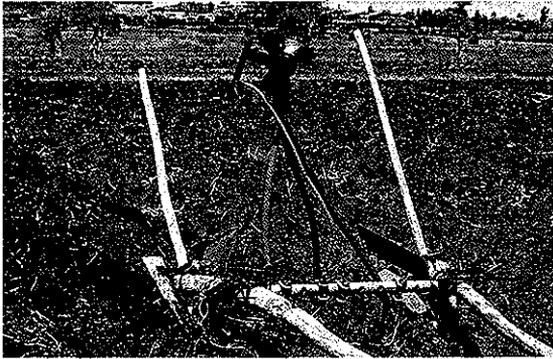
17. Broadbeds and furrows made using a BBM.

18. The furrows drain excess rain water.

19.



20.



21.





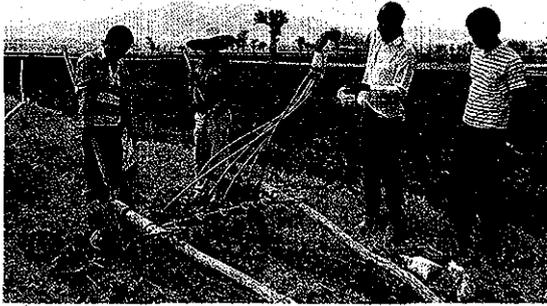
22. Technicians adding seeds to the planter at the ILRI Research Station in Debre Zeit, Ethiopia.

23. A planter drawn by cattle at the ILRI Research Station in Debre Zeit, Ethiopia.

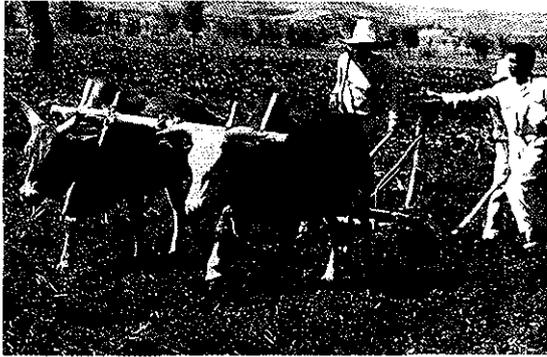
## **Cattle for transport**

24. Cattle drawing a cart with traditional wheels in the Ethiopian highlands. Farmers transport their produce from the farm to their homesteads or to the market. They use cattle and other animals to perform this task.

22.



23.



24.



25.



26.



27.



25. Progressive farmers fix rubber tires to the wheels of the cart.

## **Management of draft animals**

26. A farmer in the Ethiopian highlands feeding forage supplements to his cow. Cattle used for draft and transport must be fed a diet that is nutritionally balanced.

27. Cattle that are poorly fed or those that suffer from diseases will perform poorly if used for draft or transport.

28. To get optimum productivity from cattle used for draft, farmers need to manage the animals' health properly.

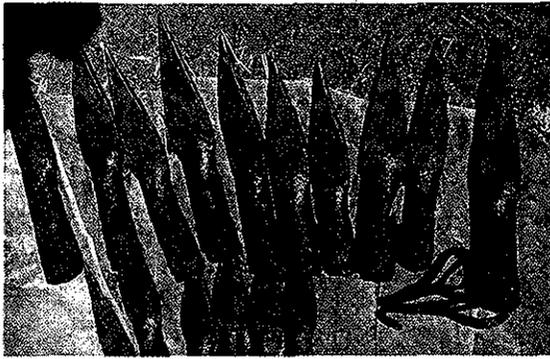
## **Supply and distribution of implements**

29. Metal tines of the *maresha* displayed for sale in the market in Debre Zeit, Ethiopia. Even if the draft and planting equipment prove useful, the technology will not be widely adopted unless the equipment is readily available to farmers. In the Ethiopian highlands all the parts of the *maresha* are available in local markets.
  
30. Farmers bargaining for a metal tine.

28.



29.



30.



31.



32.



33.





34. A worker selecting metal pieces to make a BBM.

35. Making the steel wings of a BBM in the implement workshop.

36. The owner of the enterprise explaining the BBM technology to farmers. The combination of availability of equipment and information on how to use the equipment led to the successful spread of the BBM among farmers in the Ethiopian highlands.

34.



35.



36. MOISTURE  
ETHIOPIA



37.



## Equipment for draft research

37. Oxylog equipment mounted on an ox at the ILRI Research Station in Debre Zeit, Ethiopia. The oxylog is used to measure oxygen consumption. It is a portable breath-by-breath analyser. It is important to conduct research on the use of cattle for draft. This is especially important when cows are used.

## **Conclusion**

The use of cattle for draft and transport has been found to be ecologically sound and sustainable. It increases production, reduces human drudgery and improves the quality of rural life.

## Recommended reading

- Lawrence P.R., Lawrence K., Dijkman J.T. and Starkey P. (eds). 1993. *Research for Development of Animal Traction in West Africa. Proceedings of the Fourth Workshop of the West Africa Animal Traction Network held in Kano, Nigeria, 9-13 July 1990*. Published on behalf of the West Africa Animal Traction Network by the International Livestock Centre for Africa (ILCA), Addis Ababa, Ethiopia. 306 pp.
- Starkey P., Teklu S. and Goe M.R. 1991. *Animal Traction: An Annotated Bibliographic Database*. ILCA (International Livestock Centre for Africa), Addis Ababa, Ethiopia. 203 pp.
- Starkey P., Mwenya E. and Stares J. (eds). 1994. *Improving Animal Traction Technology. Proceedings of the First Workshop of the Animal Traction Network for Eastern and Southern Africa (ATNESA) held 18-23 January 1992, Lusaka, Zambia*. CTA (Technical Centre for Agricultural and Rural Co-operation), Wageningen, The Netherlands. 490 pp.