

## Section 11

# **Workshop Synthesis and Recommendations for Future Research**



# Workshop Synthesis and Recommendations for Future Research

Recommendations for research emerged from the group discussions held after each of the 8 sections of the workshop. These groups were divided into anglophone and francophone sections who in most cases presented their results separately. In addition, a guest speaker, Dr Yves Bigot\* of CIRAD, provided an overview on the last day.

## 1. Technology Transfer

The group confined its discussions to situations where a well-proven technology which already exists can be applied on a much wider scale. They recommended research in the following areas :

- A focus on socio-economic, technical, ecological and agronomic factors which facilitate or hinder the transfer of technology
- On-station and on-farm research into these factors
- Ways in which extension services can be improved
- Channelling new techniques in a given area through innovative farmers
- The encouragement and effects of rural credit schemes and other incentive packages on technology transfer.

## 2. Diversified Uses of Animal Traction

Leaving aside activities which 'already receive due research attention', the anglophone section gave top priority to research on methods for

- Crop establishment including sowing and fertiliser application
- Transport
- Water-lifting
- Post-harvest operations including threshing, winnowing, shelling, extraction of oil etc. Lower priority was given to harvesting and land preparation.

The deliberations of the francophone group were more detailed. They concentrated on the perceived

constraints to the diversification of animal traction rather than on making specific recommendations to improve matters. Their analysis was based on the different agro-ecological zones in the region, viz. the Soudanian, the Sahelian, the Saharan and the Soudano-Guinean. The constraints listed were:

- Soudanian zone: Lack of animal feed, lack of training for farmers, the high cost of implements and poor animal health care
- Sahelian zone: Total lack of modern equipment e.g. for the processing of crops and drawing water, lack of animal feed and health care, lack of involvement of women in animal traction and lack of information on improved and proven techniques used elsewhere in the region
- Saharan zone: Difficulty in finding implements suited to local breeds of draught animal and the high cost of clearing land before cultivation can begin
- Soudano-Guinean zone: Lack of animal feed and health care, lack of research and extension efforts to provide and test implements.

The group concluded that there were thus many opportunities to improve matters in all zones both by reinforcing existing research and by investigating new areas for diversification.

## 3. Animal Health

The anglo- and francophone groups submitted a joint report which recommended research on

- The effects of stress on working animals, including heat, poor nutrition and workload
- The optimal use of locally available feeds
- The effects of work on reproduction and productivity in cows
- The efficacy of traditional health care practices.

## 4. and 5. Nutrition and Management

The recommendations from the Nutrition and Management sections are presented below together as, to a large extent, they overlapped and complemented each other. Research needs were classified under various headings :

---

\*CIRAD, BP 5035 34032, Montpellier Cedex, France

a) **The animal itself**

- Basic research into efficiency of use of male and female animals as draught animals,
- Research into water requirements particularly in the Sahelian region and for animals used for hard work.

b) **Feeds and characteristics**

- Standardisation of analytical methodology especially for fibre (replace Crude Fibre as a parameter with the Van Soest method), nitrogen content of feeds and individual minerals including Na, P, Ca, Fe and Mn.
- The availability of feed and its use for improving production.
- Alternative feed resources
- Improving feed quality by processing
- The use of biotechnological techniques, particularly those involving fungi.

c) **Animal x feed interactions**

- Feed utilisation and energy requirements for work and other production processes
- The relationships between under-feeding, weight loss, poor performance and predisposition to disease
- The nature and composition of weight losses caused by work, and weight gains during subsequent re-alimentation.

d) **Economics of draught animal use**

- The economic trade-off between work, growth rate in young animals, and milk production and reproductive efficiency in cows
- The economics of keeping draught animals for transport.

The group stressed that research needs were not identical across the region and that priorities were not the same. Once priorities had been identified, the methodology of investigation should be standardised, in particular the methods of feed analysis and research into alternative feed resources.

## 6. Harnessing and Implements

This group concluded that fundamental research on designs and materials for implements was best done by research centres from developed countries,

principally because of the cost of carrying out such research.

More appropriate, adaptive research should be focused on the following areas:

- The development of lighter, more easily handled implements with fewer specialised fastenings
- More efficient animal-drawn weeders including weeders suitable for intercropping
- Better axle bearings and wheels for carts
- The designs of pack saddles for use in areas inaccessible by carts
- The design and propagation of information on harnesses for single animals. It was concluded that present designs of harnesses for paired animals did not require further research.

## 7. Socioeconomic Aspects of Animal Traction

This group decided that research was necessary

- To establish the long term gains which accrue from the use of animal traction
- To evolve implements and introduce animals more suited to the cropping patterns in specific regions.

The group also stressed that research and development priorities differ from one agro-ecological zone to another.

Many other aspects of animal traction were discussed by this group, including land tenure, tsetse fly control and trypanotolerance, cultural practices, infrastructural problems, institutional support and gender issues, but few of these were considered researchable issues.

## 8. Research Methodology

In the field of animal traction research, the following recommendations were made. There should be

- Standardisation of methods for measuring feed intake, draught force, distance travelled and other physical parameters
- Standardisation of methods for collection of survey data such as farm income and labour usage
- Specification of the precision required of instruments to measure physical parameters such as force, work, body temperature with due consideration as to cost

- Specification of procedures for the collection of data to include appropriate experimental designs and standardisation of questionnaires.

In addition,

- Research stations should adapt instruments and methodologies for the gathering of data on farms

especially for studies on nutrition, performance and work stress

- WAATN should promote complementarity and compatibility of research carried out by its members by providing a standardised approach to information collection and transmission.

## Workshop synthesis

### Y. Bigot\*

Dr Bigot gave a wide-ranging discourse on the week's discussions. He stressed that animal traction (AT) was not new technology, and there was always a need to learn from the past. Some research-development programmes in West Africa appeared to have been designed as if nothing had taken place before and yet in sub-Saharan Africa there had now been over a century of lessons from successful and unsuccessful introduction of AT technology. In addition to learning from the past, there was a need to capitalise on experiences from around the world. There was no need to repeat research already carried out elsewhere.

The Network clearly has an important role to play in making national programmes aware of the experience and expertise that already exist. In some ways this is what the present workshop had been doing. Although the aim of the workshop had been to identify research topics, most of the time had been spent in exchanging experiences. In this respect the workshop had been valuable, but had not achieved its stated aim.

Dr Bigot reviewed the changes in AT in West Africa since the inception of WAATN in 1985. One of the main features was that AT had become politically acceptable in West Africa, and politicians did not go out of their way to hinder AT initiatives, as had happened during the 1960s and 70s. Equally important was the realisation that AT technologies are often local-specific. Little is now heard about the generalised prescriptions and blanket recommendations that characterised AT publications in the 1950s, 60s and 70s. This important change should not be underestimated for it represents a fundamental change of attitude to both research and development and people are no longer looking for or advocating universal solutions.

AT has become integrated with farming systems, and the farming systems approach that the Network

has espoused is having an effect throughout the research/development process. This can also be seen in project planning and economic modelling. Projects are no longer being based on rigid economic and financial models of AT use. The multidisciplinary approach has also been important in bringing animal scientists and livestock specialists into AT research and development. At this workshop, a large number of participants were animal production specialists and many of the discussion topics concentrated on the animal. A few years ago, a workshop such as this would have been dominated by agricultural engineers. Again this change represents progress. The Network should be aware of the slight danger that the current resurgence of interest in AT could obscure the importance of the complementary roles of human and motorised power.

Dr Bigot believed the discussion groups had concluded that there was no need for fundamental research on implements. There still appeared to be an unresolved conflict between the various advantages and disadvantages of multipurpose and single-purpose implements and this would eventually be resolved on a case by case basis. While basic research on equipment seemed unnecessary, there was a need to study the supply side of AT implements and the distortions caused by project interventions, single suppliers and the neglect of the artisanal, informal sector.

There seemed little justification for research on economic issues or modelling. On the animal side there did seem to be scope for further basic research although there was some controversy as to whether on-station 'gas-mask' type of research was needed or whether all research could be carried out in the target farming systems. There were inherent problems in experimenting with animals and there was a clear call for standardisation of experimental routines. Animal-orientated research should not

simply deal with individual animals but should include analyses of the whole livestock sector and crop–livestock interactions.\*

One of the main conclusions of the workshop was that fundamental research was seldom required and that applied action research was more appropriate. Existing technologies could be adapted to different farming systems in an interactive process. Many technologies were specific to ecological zones and more attention needed to be given to exchange of experiences within ecological zones.

From this analysis Dr Bigot concluded that the Network should pay more attention to the different ecological zones in West Africa and structure future workshops accordingly. People working on AT in similar conditions should be brought together in order to allow more detailed site-specific discussions that could lead to more precise research recommendations. Nevertheless the Network should not emphasise AT research itself; rather it

should concentrate on providing a clear international source of information. It should endeavour through training and exchanges to strengthen the capabilities of its individual members who should be encouraged to engage in clearly-defined diagnostic studies within their own countries. AT research needed the right type of people and so projects should be flexible to allow people and resources to move from country to country. Consideration might be given to ways in which there could be competitive tendering for research programmes to ensure the best thematic research teams obtained the necessary support.

Comments from the floor had emphasised the potential danger of concentration on research as an end in itself and thereby neglecting small farmers. There was also a danger in concentrating on AT from the male perspective and neglecting the potential of animal power to assist women.