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Challenges of animal traction in the 21st century: the experiences from various projects in the North Central Division of Namibia

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Abstract

The main challenge for the 21st century is how to strategically promote animal traction. Namibia has in the recent years gained experiences with regard to participatory approaches and introduction of DAP technologies. Gratitude is due to the government through the Ministry of Agriculture, Water and Rural Development which has provided comprehensive environment with a supportive policy. Also to be acknowledged is the support provided by various projects (Northern Namibia Rural Development Project – NNRDP; Rural Development Support Project – RDSP; Northern Regions Livestock Development Programme – NOLIDEP). Various lessons have been learnt, among them being that the introduction of DAP in rural communities must be well planned and discussed with farmers. This will help change their farming practices and the whole organisation at the farm level. The approach must be integrated within an inclusive strategy, including animal husbandry, nutrition, healthcare, training, etc. Failure has previously resulted where introduction attempts have failed to promote a comprehensive approach and focused only on the introduction of new technologies or improved management systems. The experience gained has shown the approach to be chosen must be participatory (involving beneficiaries at the onset), integrated (farming system approach) and multidisciplinary (involving extension, engineers, research, training, health specialist, etc.).

The introduction of DAP in rural communities needs to be integrated into a master plan at national level, for efficiency. Once the technology has proved itself and has been accepted, communal farmers must have easy access to the implements (development of local traders) and to spare parts (development of blacksmith enterprises for instance), easy access to preventive and curative animal healthcare services and easy access to training and demonstrations (efficient and up-to-date extension services). Entrepreneurship for animal healthcare, to market equipment, improved animal feed, needs to develop. Credit provision is bound to assist.

Introduction

Animal traction technologies were introduced in the North Central Division (NCD), Namibia, in 1995. The Division comprised four Regions (Omusati, Ohangwena, Oshana and Oshikoto).

Ploughing is traditionally done either by hand or with tractors provided mainly by the Directorate of Extension and Engineering Services (DEES), Ministry of Agriculture, Water and Rural Development (MAWRD). Weeding is traditionally done using a hand hoe. Unlike the plough, which was readily found in communities animal powered weeders were not common in the area.

Various projects, namely the Northern Namibia Rural Development Project (NNRDP - France), the Rural Development Support Project (RDSP – European Union) and the Northern Regions Livestock Development Programme (NOLIDEP - IFAD) have been involved in the promotion of DAP technologies in the North Central Regions.

From the approach used and the problems encountered, various lessons have been learnt. Namibia has gained in recent years experiences as regard participatory approaches (development of Farming System Research and Extension (FSR-E) Units) (Adolph 98, Nantanga 98, Talavera 98) and introduction of DAP technologies. A more comprehensive strategy can now be developed.

A case study: introduction of DAP in the North Central Division

Introduction of the cultivator

In 1995, Participatory Rural Appraisals (PRA) conducted in the NCD by the NNRDP showed that weeding was a major constraint in the area. Rural farmers used to weed using a hand hoe, a tedious process that needed children who were in school.

The introduction of the cultivator was then suggested in order to tackle this problem. The NNRDP bought Senegalese cultivators to introduce them in the NCD. Various tests were conducted in various communities. Farmers were enthusiastic and the innovation was well appreciated. However, various

constraints were identified (McKee *et. al.*, 1995). These included :

- Weakness of the animals.
- Absence of cattle in some farms (only donkeys).
- Poor ability of animals to work.
- Diseases (especially in an area where liver fluke was known to affect animals).

On-farm research

In order to tackle those problems, various solutions were effected:

- Test of various equipment, especially light tools (to allow donkeys or weak cattle to perform the work).
- Training for farmers and training for animals.
- Test of various supplementary feed for draught animals.
- Test to tackle some diseases (notably worm infections and liver fluke infections).

Test of various equipment

The RDSP bought various tools from Zimbabwe, among them some light cultivators and ploughs. All equipment were tested in various communities first by the NNRDP and RDSP (1996-97) and secondly by the North Central Division (NCD) FSR-E Unit (1997-98 and 1998-99). All tools were tested against a set criteria selected by both technicians and farmers. Among the selected criteria were the depth and width of the groundnut opening, the lightness of the tool, and how easy it was to change parts and to adapt the duck-feet (Naunyango *et. al.*, 1996, Quill *et. al.*, 1997, Rigourd, 1998).

From those tests, the best tools have been selected and posters, leaflets, video, etc. have been prepared for extension use.

Training of animals and training of farmers
The NNRDP has initiated training for farmers and training for animals. Various schemes have been tested. The idea was to train farmers for them to become trainers for fellow farmers. The training appeared to be efficient in the sense that animals were able to work properly. However, results have not been as good as expected with regard to trainees becoming trainers for fellow farmers.

Test of various supplementary feed for draught animals
Feeding of draught animals had been identified as a major bottleneck. Therefore, three types of tests were carried out:

1. Urea treatment of millet straws: initiated by the NNRDP in 1996. Tests included the feasibility of the treatment, using plastic sheets and later on traditional pits. Results have been, from a practical point of view, positive (McKee *et. al.*. 1996, Goby, 1996, Goby *et. al*., 1997).

2. Use of improved lickstones: various improved lickstones were tested to assess their effect. Licks were well appreciated by farmers, but their cost remained high. An attempt to commercialise them through a farmers' co-operative, the Northern Namibia Farmers' Union (NNFU) failed (Talavera, 1998).

An on-station test, initiated by the NOLIDEP proved that the cost:benefit ratio was better with the urea treatment of millet straws, compared with the one of improved lickstones. Based on this, extension messages to promote the use of urea treatment of millet straws have been prepared.

3. Use of cowpea residues: Cowpeas are commonly sown in the NCD. Residues are usually left in the field and eaten by goats. Tests to cut, roll and store them have been initiated by the NNRDP first and later, the NCD FSR-E Unit. It is a very simple technique which has proven to be successful and extension messages have been produced (Rigourd, 1998).

Tests to tackle some diseases
Initiated by the NNRDP, with the support of the Directorate of Veterinary Services, tests to assess the effect of drugs against liver fluke, in the Eunda area (Omusati Region) have been conducted. Results are positive and the promotion of deworming drugs in the area have been promoted (Talavera, 1998).

Another survey, initiated by NOLIDEP in other parts of the NCD, reported low infestation of cattle and goats by worms. Systematic deworming of all animals has therefore not been extended (Vidon, 1997).

New research topics
While working on the above mentioned topics, new constraints have arisen:

- The effect of systematic ploughing of fields using the plough and light plough on the soil. A survey was initiated by the NNRDP to address this issue in 1996 (Rigourd *et. al.*, 1998). The Plant Science Project (PSP) is also investigating the soil fertility in the area.
- The effect of weeding on the weed pressure and weed species survey was initiated by the NNRDP to address this issue (Rigourd *et. al.*, 1998).
- Selection of cowpea varieties. Cowpeas are cultivated for human consumption and must therefore provide beans in good quantities and with a good taste. However, they can also be promoted for their residues. Therefore an on-station researcher is selecting varieties with

good performances (a lot of beans with an accepted taste) and able to let enough residues.

Extension

Extension was carried out in 2 to 8 communities. In order for the whole Division to benefit, extension messages were prepared and this raised new constraints. Two examples will be developed:

Extension for the cultivator and plough
Some tools have been identified as relevant, and their promotion has been organised. However, various problems soon arose:

1. The Senegalese cultivator and the Zimbabwean cultivator were imports bought at first by the NNRDP, DanChuchAid and RDSP, and sold through the Agricultural Development Centre (ADC) by the Agriculture Extension Technician (AET). This was not sustainable, as the projects came to an end (1998 – RDSP and 1999 – NNRDP). The private sector has now been approached, but is still reluctant to embark on such a scheme because it is a huge investment and they are not sure to sell the stock quickly. There is very little marketing data to show how many farmers could be interested to buy cultivators and other implements. Marketing is therefore not in place, and is a serious bottleneck in the extension process.

2. After a few years parts can break, or need to be replaced. There is therefore a need to develop a market for spare parts and to create or support local blacksmith businesses. It is again a wide process, which must be initiated at large scale. There is also a lack of needs information such as how many spare parts, at which price ? etc.). This is a bottleneck as well in the whole process.

Extension of the veterinary drugs
The survey carried out in Eunda has proven the usefulness of deworming campaigns. Therefore the use of appropriate deworming drugs has been promoted within the area. However, drugs can be bought only in the main centres. This is yet again a serious bottleneck in the extension process.

In order to tackle this problem, various schemes have been tried:
- Training of Community-based Animal Healthcare Agents initiated by the NNRDP and adopted by DVS (Goby *et al.*. 1998)
- Development of Veterinary Rural Extension Centre initiated by NOLIDEP and adopted by DVS.

Lessons learnt

The approach must be participatory

The introduction of DAP in rural communities must be well planned and discussed with the communities. It is not just a matter of bringing an equipment. Broader farming practices do change:
- Before the ploughing season the draught animals must be prepared through a proper training, a proper feeding and medical scheme. Therefore farmers must make sure they will be in a position to feed their animals (and must collect cowpea residues or millet straws or purchase lickstones for instance) and, when needed, treat them after purchasing veterinary drugs.
- During the ploughing season farmers must have access to the tools and spare parts and must supplement their animals.
- In order not to damage the soil, the depth of ploughing and the frequency of ploughing (every year or every second year?) must be integrated into a comprehensive plan.
- As a bigger field will be prepared and weeded, a high harvest can be expected. Such a scheme must be integrated with the use of soil fertility techniques such as fallow periods, use of leguminous etc. Furthermore, the use of the surplus must be properly prepared to include marketing of millet, diversification of crops etc.

Therefore the approach, at the farm level, must be:

Discussed in depth with farmers:
Beneficiaries must be involved at an early stage, in both the
- Research process: tests can fail and the whole protocol must be elaborated with farmers.
- Extension process: demonstrations will be successful only if farmers witness the whole process (tools, feeding, husbandry, etc.)

The approach must be integrated:
The introduction of DAP in a rural community will have effects, among others, on :
- The livestock production (some livestock will be used as draught animals)
- The crop production (larger fields can be planted, weed species will change in time, etc.)
- The soil (effect on the soil structure)
- The social structure where fewer household members will be needed to carry out the work, especially during the weeding time. It will therefore be easier for children to go to school. However, more work will be needed during harvest and threshing time, as a higher production is expected.
- The economic structure where a higher production will allow most of the households to

become self-sufficient and some households to produce a surplus. This can generate income, and change the economic structure of the household).

Therefore the introduction of DAP in rural communities should be thought about in a farming system perspective, connecting all production systems, agro-ecological systems and socio-economic systems together.

The approach must be multi-disciplinary
In the NCD the following disciplines worked together:

- Agronomists : introduction of the tools, effect on the weed pressure, effect on the crop production.
- Veterinarians: investigation into livestock diseases and livestock productions.
- Livestock production specialists: improvement of animal feeding.
- Soil scientists: effect on soil structure.
- Researchers: preparation of on-farm protocol with farmers.
- Engineers: improvement of the tools and equipment.
- Trainers: training of farmers, training of animals.
- Extension staff: extension of tools, extension of supplementary feeding techniques.

The experience has proven that the following staff should have been involved as well:

- Social scientist: to assess the effect of the innovation(s) at the household and community level (emergence of early adopters and new leaders in some communities).
- Micro-economist: to assess the effect of the innovation(s) at the household and community level (production and use of the surplus).
- Macro-economist: to assess the market opportunities at the NCD level.

The approach must be integrated into a master plan
The introduction of DAP in rural communities cannot be effective if not integrated into a master plan at regional or national level.

Once the technology has proven to be efficient and has been accepted by communal farmers, they must have an easy access to the implements and to the spare parts. Therefore, local markets must be developed, and business people approached to develop them. A marketing survey should be initiated to assess the market opportunities. Private entrepreneurs should be supported by Extension Services. Extension staff cannot promote the use of DAP equipment if they cannot explain to farmers where to buy them.

Furthermore, spare parts must be easily accessible. Some broken parts can be repaired. Therefore some blacksmiths can be trained to develop such skills. A training programme should be initiated to support local blacksmith enterprises.

The various stakeholders should co-ordinate their efforts

- If various projects are working on the topic, they must follow a comprehensive plan of action. Such a plan of action should be drafted by the concerned country or region. For instance from the beginning the NNRDP, RDSP and NOLIDEP projects have been working comprehensively on the topic. Their action has been enhanced by the creation of the Namibian NCD FSR-E Unit.
- The various Directorates should work hand-in-hand. Researchers should initiate comprehensive protocols, with the support of Veterinarians, Soil specialists, Engineers, Socio-economists, etc. and with farmers as equal partners. They should come with comprehensive results and develop comprehensive extension messages for the proper use of Extension staff. Extension staff must have access to all results, must involve themselves in the process and support the communities (demonstrations), the private sector (access to equipment) and the Division of Training (training of farmers, training of blacksmith, etc.).

Conclusion

To benefit from Animal Traction communal farmers must have access to up-to-date technologies and information, improved management systems and proper training. The challenges for the 21st century are :

- To promote a participatory approach (with farmers as equal partners).
- To promote a multi-disciplinary approach, involving extension staff, research staff, livestock specialists, soil specialists, social scientists, economists, etc.
- To promote an integrated approach (farming system approach).

The development of Animal Traction in the 21st century should therefore be integrated into a masterplan, involving public and private sectors, foreign and local experts, bank and access to credit, micro and macro economic analysis. A comprehensive strategy must be developed with all stakeholders, including farmers, research, extension and veterinary services, creditors' representatives and representatives from the private sector.

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