Senegal

Willingness to Pay More for Better Tools

There was a general willingness by groups to pay more for better tools. However, it was stressed that they would really have to be better.

C. Conclusions

Constraints and Opportunities

The determinating factors governing improved production technology for women in Burkina Faso fall under three main categories: socio-cultural, economic and technical.

Socio-Cultural Factors

Women's lowly place in rural society brings with it many related problems. Especially important is women's lack of formal access to land rights: they do most of the work, but they are basically unpaid farm labour on the land assigned to their husbands and thus have very limited access to cash or credit. In addition, they are seldom part of any decision-making in the community, and men even take the final decisions regarding the farm tools to be used by the women.

This situation seems to be so entrenched that it is beyond the ability of individual women to change it. Empowering women through effective groups would appear to be the only solution, especially since recognized groups obtain access to land, even if it is not the best.

1. The introductory and descriptive opening sections of this report are based on information gathered during training sessions in qualitative research methods with the national staff who were to conduct the study (all of whom had a thorough knowledge of the rural situation), on information collected during individual interviews, and on available literature. Some general information has also been lifted from the results of the FGDs with rural people when it was considered that it would best fit in these opening sections.

2. The information provided here is only an outline. For a more detailed account, see the Senegal Case Study On Gender and Agricultural Engineering, FAO/AGSE occasional paper, December 1996.

It is important to note, however, that men were found to be generally in favour of seeking improvements in the production technology available to women, so any attempts to do so would not necessarily be working in a hostile environment.

The work already being done by NGOs and various institutions in the area of women's groups clearly must be continued and expanded. These groups recognize that access to resources, e.g., land and credit, is crucial for their success, as is education to mobilize and empower them and to sensitize men to women's capacities and needs.

Women see animal traction as the solution to their production problems. However, the only avenue for making it available to them is through the promotion of viable women's groups, especially when such groups have an activity in cash crops, such as horticulture, as in some parts of the Central Plateau. Animal-traction packages could be made available to groups on credit; and if the group responsibility concept pioneered by the Grameen Bank in Bangladesh were followed, there would be a high probability of good loan recovery rates. It would be worth carrying out a more detailed study on how animal traction could be made more accessible to women in Burkina Faso.

As an example of unexpected and unwanted reaction to the introduction of new technologies, there is the Senegal case of an improved groundnut lifter that left less groundnuts in the soil. This implement was resisted by the women because it would reduce their income from gleaned groundnuts.

Whatever the specific and independent access by women to animal traction in the future, the tradition of giving first priority to the family field will surely remain in force. This means that animal traction for weeding, even if used by men, could considerably reduce women's workload in the family plots. In general, farmers who use animal traction in Burkina Faso cultivate up to four times more land than those using hand tools only; so unless animal-draught weeding is part of the technology used, the hand-weeding task for women is greatly increased. Conditions in the Central Plateau may not lend themselves at all times and in all places to the use of animal-drawn planters but, where they generally do, any promotion of animal traction should include these planters and inter-row cultivators. Where they do not, expansion of the existing practice of hand-planting along lines scratched by simple row markers should be energetically encouraged so that animal-draught weeding can follow.

The issue of longer handles for hoes – often assumed by outsiders to be the key to improved posture and less fatigue – appears to be decided by cultural conditioning and tradition in the Central Plateau. The people seem to believe that work can only be done properly if they are bent double and use a short hoe. Given the relatively heavy and stony soil conditions, this may in fact be true but can only be verified through practical experiments with women in the field. A project such as the IFAD-supported one that provided the field research for this study could easily bring in a few long-handled hoes from the Peul areas to the north, or long-handled push-pull hoes of the sort widely used in Senegal, and conduct comparative field trials with women's groups. It seems possible that a long-handled hoe might be

suitable for overall weeding and for inter-row weeding after an animal-drawn cultivator has been used.

3. It was not posible to determine the origin of this name. One might speculate that it is a French spelling of the English hiller, which is used to describe a certain type of tine fitted to cultivators. The other local names provided in this report are in Wolof.

Economic

At least in the Central Plateau where most of the country's farmers live, the agricultural economy is so poor that hardly any investments in production technology, other than traditional hand tools, can be envisaged. The situation may be different in the cash crop (mainly cotton) areas in the west of the country, but the general conclusion must be that extreme poverty, coupled with erratic rainfall, makes any improvement extremely difficult if it involves higher costs. This is especially so given the widespread opinion that even credit for animal traction is not economically viable in the Central Plateau, at least for individual farmers.

In such a situation of subsistence agriculture with almost no cash income, even when a farmer recognizes that a tool is of higher than normal quality and will perhaps last twice as long, he simply cannot afford the initial outlay. This could be the reason why virtually all animal-traction implements seen in the field during the study were the relatively cheap ones built by blacksmiths, although it is not certain that farmers would buy better-quality items even if they had the money available.

Technical

The request from women that their hand tools be lighter does not seem practical because blacksmiths already use as little steel as they can when making them. And higher-quality steel that could be forged into thinner, stronger blades is not available.

The potential for improving the design of hand tools, in terms of their shape and form, appears limited. However, the same is not true for their quality and durability. Certainly, the lack of quality raw materials is a major constraint, but even without them, better production techniques could improve the working efficiency and durability of tools.

With regard to the possible introduction, production and maintenance of improved or more complicated tools, the blacksmiths' skills and their present technology would be generally insufficient to support them. Hence, any attempt to introduce new tools would need to be entrusted, at least initially, to a semi-industrial concern such as CNEA, working closely with the Division of Mechanization of the Department of Crop Production.

Both for improved hand and animal traction tools and possible new tools and implements, past training programmes for village blacksmiths need to be improved, intensified and expanded.

With regard to the possible introduction of hand-operated implements such as planters, wheeled hoes and the like, the Division of Mechanization might devote some resources to this. As the Department is testing and copying animal-drawn equipment developed in other countries, it could do the same with manual equipment. Just to cite a few examples, plunger or jab-type hand-planters, manually-drawn seeders and wheeled hand-hoes are in production and use in many countries, including Thailand, Zimbabwe, India and Brazil[3]. However, for this approach to be successful, the field tests and any modifications to the equipment would need to be

done in the closest collaboration with the intended users. Participatory qualitative research techniques, such as those used for this study, would be essential.

Appendix

Members of the Field Research Team

The coordinator for the study was **Mr Fimba Julian Lompo**, Director of the IFAD-supported Special Programme for Water and Soil Conservation and Agroforestry in the Central Plateau.

The research team was made up of the following persons, all of whom are field staff of the Special Programme:

Mr. Mamadou Barry
Ms. Noëlie Bauda
Mr. Joseph Kiendrébéogo
Ms. Sié Orokia
Ms. Fousséïna Ouédraogo
Ms. Rosalie Ouedraogo
Mr. Jean Chrysostome Pizongo
Ms. Blandine Tiemtoré

A. The Scenario[1]

Context of the Study, Its Scope and Methods

"There is not much point trying to improve production technology for women if they don't have access to land."
Member of field research team during Focus Group Discussion training

The study was conducted within the context of two IFAD projects in Senegal: the *Village Organization and Management Project*, and the *Agro-Forestry Development Project*. Field work was conducted in the areas around Kaolack and Diourbel, to the south-east and east of Dakar, respectively.

Both areas are in the country's groundnut basin, where the soils are generally light and even sandy. According to IFAD project documents, this is the part of the country most threatened by environmental degradation and desertification. It is densely populated and annual rainfall declined from 700 mm in 1956 to 400 mm in 1985.

The field research for the study was conducted with an eight-member team – four women and four men, field workers from the Agro-Forestry Development Project and Village Organization and Management Project. The team received two days of formal workshop-type training followed by two days of supervised work in the field around Kaolack, after which it divided into two groups of two couples each. One group remained in the area around Kaolack and the other went to Diourbel.

In all, 25 FGDs were conducted, 18 with women, and seven with men, for a total of more than 250 people. The participants in the group discussions were always asked to bring their production tools to the meetings.

After the training and supervision of the field researchers, the team leader and the APO held detailed discussions with blacksmiths in Kaolack and with others encountered on the roadside. They also held interviews with industrial producers of animal-draught equipment and hand tools; NGOs, government staff concerned with agricultural development and women's interests; the Senegalese Institute for Agricultural Research (ISRA); the National Agricultural Credit Organization (CNCA), and an importer of agricultural equipment.

The Agricultural Production System and Women's Role Within It[2]

The agricultural economy in the area of the study is based on groundnut production as a cash crop, with millet, sorghum and maize as the staple grain crops. Minor cash crops are water melon and sesame.

Typically, there is a *family plot* of land, controlled by the head of the household, on which all the members of the family contribute their labour. In addition, women normally have smaller individual plots allocated to them by their husbands on which they grow produce for home consumption and sale. They may also have small vegetable gardens for year-round cropping when water is available. In some cases, it is the male head of the household who determines what the women grow on their plots.

The whole family must give priority to working on the family plot, and if there

is another male member of the household, for instance, an adult son, his plot is second in line; and it is only after this that the women's plots may receive attention. The men prepare and seed the plots with animal traction, starting with the plot of the first wife when there is more than one. This system means that, in effect and when timeliness is so important in the short cropping cycle, the women's plots may be worked later than would be ideal.

Formally recognized women's groups may be allocated a *collective plot* to work. However, they are normally assigned poor land that may be distant from the village; and it is only allocated to them for a season or so at a time for were they to cultivate the same plot for three seasons they would acquire the right to do so permanently.

More than half the farming families cultivate land holdings in excess of 6 ha. On average, there are 10 people in each family and the size of family holdings is decreasing because of population pressure. In recent years, farm incomes have been declining because of poor and irregular rains.

Concerning the contribution of women in farm production, according to several interviewees, there are 'two Senegals': in the south, the women are far more active than the men, whereas in the centre-north, men play the predominant role. In the south, rice growing is the exclusive domain of women. However, even in the centre of the country where the field research took place, women were also very much involved and their role is constantly increasing as a result of an accelerating male exodus from rural areas. Some 15% of rural families are estimated to be headed by women.

There is generally a division of labour between the sexes. Land clearing is carried out by the men for it is seen to call for greater strength. Seedbed preparation – which normally involves a single pass with a cultivator to scratch the surface – and seeding are done by the men using animal traction. Inter-row cultivation is done by men or male children, while the hand-hoeing that follows is done by both men and women. However, from general observation in the central part of the country, men appear to predominate in this work.

Women play a particularly important part in the harvest, especially of groundnuts. After a man passes an animal-drawn groundnut lifter, the women gather the crop into small piles for collection by the men. Once it has been left to dry for some time, the women thrash and winnow it by hand, a particularly arduous task which also depends on there being a suitable wind. In addition, the women spend further time gleaning in the soil with their hands for any groundnuts still left. These gleaned groundnuts are theirs to consume or sell.

As is usual in Africa, women are also responsible for the poultry and small ruminants normally kept by the family.

Within a typical rural family, the men control the financial resources, and the women's only direct income is from the sale of surpluses from their individual plots or from groundnut gleanings.

The Production Tools Encountered and Their Use

The tools encountered in each group were basically the same (photographs are provided in Annex 6).

Animal Traction

All groups had animal-traction implements that included hoes, seeders and groundnut lifters. In the main, unless they had been built by blacksmiths, they were extremely old, for reasons that will be explained in the next section.

Two basic types of cultivators are the most common: a spring-tine cultivator, known as the *houe sine*, fitted with either chisel points or duckfoot sweeps; and a rigid-tine cultivator fitted with duckfoot sweeps, known as the *houe occidentale*. In the area where the study was conducted, only horses and donkeys are used as draught animals whereas, in the south, oxen are also used.

Hand Tools

Among the hand tools, three types of hoes were encountered:

- ***Hilaire***[3]. This is by far the most common hoe. It has a kidney- or heart-shaped blade attached to a very long handle, and is used standing upright and with a horizontal pushing and pulling movement. It is used exclusively for weeding in light sandy soils and is seldom used in the heavier soil conditions of the south. According to verbal reports, the *hilaire* was introduced to Senegal some 55-60 years ago. Before that, all weeding was done, bent double or squatting, with short-handled tools.

  The handle for the *hilaire* is the only one made by the farmer with wood from a suitable tree. Virtually all the other hand tools have crafted wooden handles that are made by the country's carpenter caste, known as the Laobé. Tools, apart from the *hilaire*, are therefore bought complete with handles.
- ***Sokh-sokh***. This hoe is used in a deep squatting position or bent double. It has a horizontal action like the *hilaire* but it has a very short handle with a crafted pistol-like grip at the end. The flat blade is oval. This hoe is used exclusively by men, particularly the weaker and the elderly, because the squatting position is not considered suitable for women. The *sokh-sokh* is considered effective for dense weed growth. Today, it is far less common than the *hilaire*; in fact, while travelling around the countryside, only one person was seen using a *sokh-sokh*, whereas hundreds of people were seen using *hilaires*.
- ***Ngos-ngos*** is a small hoe in the form of a traditional African hoe but with a very short handle, usually made of wood. The blade of the *ngos-ngos* is fixed to the handle by a spike (tang) that is heated and driven through the wood. Some *ngos-ngos* are made with handles of steel tube welded to the blade. There is a tendency to fit longer handles to the *ngos-ngos* so that it can be used in a more upright position. It is then usually called a *daba* or *larmet*, and it is also used for building bunds.

Axes/Cutting Tools

Traditional axes (*khep*) in varying sizes are used for cutting shrubs and clearing fields before planting. Machetes (*coupe-coupe*) were also found, and these are imported, usually from Brazil.

Harvesting Tools

These include a variety of knives and sickles, most of which are made locally.

Rakes and Five-Tined Forks

These tools, produced by local blacksmiths, have come into use in recent years with the expanded practice of compost-making, although they are also used for raking groundnut haulms during harvesting. The rakes are made from a piece of mild-steel plate from which the gaps between the teeth are cut with a hammer and chisel. The forks are made from round-steel rod duly worked into points. According to some reports, the rakes are especially prone to breakage, although during the group discussions it was said that they could last up to ten years.

Work	Days/year
Weeding	60
Harvesting, including hand-thrashing and winnowing	90-120

Miscellaneous

In one village, an imported European scoop shovel with a D-shaped handle was found, such as that used for coal in Northern Europe. There were also an imported digging hoe and a pick-axe, but neither appeared to have been used much. Similar implements were not seen in any other village.

An animal-draught rake, to be mounted on the frame of a spring-tined cultivator, was seen in one village. It was 75 cm wide, with teeth 45 cm long, and was made by a local blacksmith, from steel reinforcing rod, at the request of the farmer.

Mechanization in Senegal – Past and Present Developments

Animal traction was introduced in the early 1960s and is the basis for agricultural production in the country. A State-owned company, Siscomar, was created in 1963 to manufacture implements under licence from a French concern. Three sizes and weights of frame were produced for use with horses/donkeys on the one hand, and with oxen on the other. They were mounted with up to three or five tines for cultivating and with various sizes of mouldboard ploughs and ridgers. Seeders were also produced.

This range of equipment was made available to farmers under a credit programme launched by the government of President Senghor in 1970. About 800 000 units were produced and sold before the credit scheme was abandoned in 1980, by which time unpaid farmers' debts, reportedly in excess of CFA 20 billion, had accumulated. At that time, Siscomar had a production capacity of up to 150 000

units a year.

Siscomar was sold to a group of private entrepreneurs and its name was changed to Sismar in 1981. The Government assured the company that there would be credit for further purchases of equipment by farmers, but this did not materialize. Thus, from 1980 onwards, virtually no implements built by the company were sold in Senegal, except through externally-funded development programmes. The company survived thanks to exports, mainly to Côte d'Ivoire, and through diversification into other fields such as the production of school furniture.

Meanwhile, blacksmiths began to repair and renovate existing Siscomar implements, so most of them seen in the field were ancient and had been repeatedly patched up. In rarer cases, blacksmiths also build complete implements. Those encountered showed considerable variation, tending to be copies of copies and mixtures of different models, all produced from scrap metal.

However, at the time of the present study, there were prospects for a considerable improvement in the mechanization scene, because in 1997, after some 16 years with practically no credit available, the Government launched its 'Agricultural Programme'. The Programme aims to revitalize this seriously depressed sector, which occupies over 70% of the population and provides about 30% of export earnings.

With support from World Bank and other lending institutions such as the West African Development Bank, credit and other farming support services are to be regenerated. In the specific field of farm equipment, credit for five years at 7.5% interest is being introduced. This should open new horizons for updating and improving the implements park, and for making animal traction more available to women.

"When animal-draught planters arrived and some people started to use them, the others laughed at them and said that they were throwing their precious seed away. But it was not long before everybody wanted one."
Statement by a participant in a discussion group

However, the situation is still complicated by several factors, which in essence are as follows:

- The credit system is based on CNCA providing coupons to farmers who in turn give them to the manufacturer in exchange for new implements. The manufacturer, once he has delivered the implement to the farmer, presents the coupon with the invoice to CNCA which pay him directly. This is a satisfactory system for the very few industrial manufacturers, but it is not yet clear how blacksmiths, who seldom become involved in paperwork and invoices, can be included in the scheme. According to one interviewee among the manufacturers, CNCA may also be reluctant to provide credit for equipment made by blacksmiths, which is usually made of scrap material and for which there is no guarantee of quality.
- Implements are invariably purchased just before the rainy season, and at no other time. This means that manufacturers have to build the implements over a period of several months earlier, say between January and June, and

have them ready for delivery in a very concentrated period around July. In 1997, there was a delay in announcing the funds that would be available, and Sismar and another major manufacturer, URPATA Sahel, could not start building implements in time to meet the demand.

- For 1998, there was a further problem. Sismar believed, from a market survey it had conducted, that it could sell 30 000-40 000 animal-draught units for the cropping season, worth about CFAF 1.5 billion. However, to produce these implements, Sismar needed to order the raw materials in Europe (to a value of about CFA 500 million) in October-November 1997 for delivery in December. CNCA does not begin paying manufacturers on the basis of their coupons for sold implements until about two months into the cropping season, i.e., around September. Thus, even with 90-day terms of payment to the European suppliers of the steel, there would be a credit gap of several months. In September 1997, Sismar was looking for the CFAF 500 million it needed to buy its raw materials, and it seemed that this aspect had not been taken into account in the Government's plans. Unless a solution is found, the potential market for new implements might not be satisfied; credit would be available to farmers, but not the implements.

> "We had never really thought about trying to improve the tools that we and our women use, and we have no dialogue about this with technicians or blacksmiths."
>
> Men's discussion group near Kaolack

Cultural and Socio-Economic Considerations

Working Posture

Senegal does not have the cultural conditioning found in other countries to the effect that work can only be properly done with a short-handled implement and while bent double. The introduction within living memory of the long-handled *hilaire*, and its almost total adoption in the areas of the centre and north – where it is particularly suitable because the soils are relatively light – testifies to this openness. In addition, while travelling in the countryside, the study team noted that the very short-handled and traditional *sokh-sokh* was hardly being used for hoeing, and this was confirmed in the discussion groups – another change that testifies to a level of flexibility and interest in adopting less tiring tools. Animal traction was also adopted very readily and widely in the years after its introduction.

The Senegalese have been consistent travellers for decades, even if only as members of the French Army. Perhaps this helped to develop an openness to the outside world and a readiness for change, even if it happened under duress.

The System of Economic Interest Groups

Senegal has a system of Economic Interest groups, known as GIEs. Under this, two or more people can get together to create a GIE and, once the group is

"We would like our women not to have to work in the fields at all. We would like to be mechanized so that we can do all the field work and come home in the evening to our wives who would only have to look after our homes and children. In that way they would not get old so quickly."

Comment during a men's discussion group

formed, it gives them formal status, access to credit, and the like. The capital required to create a GIE is about CFAF 45 000. Women's groups normally form themselves into GIEs.

Access to Land and Credit

As mentioned earlier, credit for agricultural production was basically unavailable during the period 1980-97. Even now, obtaining it depends on an applicant's being able to provide certain guarantees, the most usual of which is demonstrating his/her access to a reasonable area of cropland. Unless they are heads of households or form a GIE, women's lack of access to land automatically debars them from obtaining credit. For this reason, as in many other African countries, women have benefited from credit to a much lesser extent than men.

Although women's lack of access to land is the main reason for their ineligibility for loans, it was also pointed out by one interviewee that, compared with men, they have less availability of time or other resources and it would thus be difficult for them to embark on the long bureaucratic procedure involved in obtaining credit. For example, a woman living in a rural area would have to journey to the nearest major town and possibly spend one or more nights there. This would involve costs that she may be unable to meet, as well as an absence from her home and children that may be difficult to organize. Thus, it is extremely difficult for an individual woman to obtain credit: only by working through a GIE, sharing costs and relying on group support, can a member undertake the procedures on behalf of the rest of the group and provide the necessary guarantees.

The Caste System

Certain occupations in countries of West Africa are subject to a caste system. For example, castes exist for blacksmiths, carpenters (the Laobé mentioned earlier), leather workers, story-tellers/singers and jewellers. Blacksmiths are on the lowest rung of the social ladder.

That blacksmiths are a caste has importance in the village context, for, in effect, their caste is a group with a certain solidarity and commonality of interests. For example, they often share forges and seem to set common prices for the tools they produce. This gives them a degree of power in their relationships with villagers, who depend on them mainly for the tools they need. It also affects tool-buying habits, in that farmers prefer to buy from the blacksmiths – rather than buying industrially-produced tools – in the interests of harmonious relationships in the village and in order to more easily obtain follow-up repairs and maintenance.

Draught Animals for Women

Horses are the most commonly-used draught animals in the central part of the country where the study was conducted. A horse costs CFAF 80 000-120 000, whereas a donkey can be bought for CFAF 12 000-30 000. Prices are influenced by the time of year, for no one will sell draught animals during the cropping season and when fodder is abundant.

Unlike donkeys that manage to survive by browsing on almost any available vegetation, horses are less hardy and are generally fed with peanut straw. This makes it very difficult for women to own horses, for peanut straw belongs to the men and it is expensive to buy. Thus, if a woman manages to acquire a horse, she has to rely on her husband to provide peanut straw, thereby relinquishing much of her ownership rights to the horse. For this reason, as well as for their lower initial price, donkeys are generally considered to be more suitable for women.

Institutional Aspects

Government Research

The Mechanization Section of ISRA is based at in Bambey. However, at the time of the visit by the study team, the Section had no professional staff. The head of the Section had been posted elsewhere, and there was no indication of when he might be replaced.

For this reason, it was difficult to obtain precise information. However, it seems that the area of manually-operated or animal traction tools for agricultural production has not attracted significant attention. On the other hand, considerable attention seems to have been given to post-harvest technology. This was also confirmed by URPATA Sahel, initially a manufacturer of grain mills before becoming involved in animal-drawn implements, which stated that it worked closely with ISRA's Mechanization Section in developing their products.

There are no institutions in the country with capacity in fields such as ergonomics that could assist the mechanization specialists in developing improved manually-operated tools.

Blacksmith Development and Training

A project called *Projet Artisans Métal et Cuir* (PAMEC) is supported by French bilateral aid and is located in Thies.

Government Programmes for Women

The Ministry for Women, Children and Family is very interested in technology for women, but so far its programmes and projects in the rural sector have concentrated on post-harvest operations and on reducing women's work and drudgery on the domestic front, for example, through devices to lift water from wells and pumps.

Producers of Tools and Implements

Sismar

This company has already been mentioned in connection with the new credit situation. It has the largest production potential in the country and employs about 100 workers. At its peak in the 1970s, it employed about 1 000 persons.