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Impact of the human factor on the cassava cultivation under marginal conditions in the lakeshore area of northern Malawi

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Abstract
In the framework of a technical cooperation project between Malawi and Germany on the control of the cassava mealybug, *Phenacoccus manihoti* Matile Ferrero (Hom.) and a doctoral thesis covering the same topic, we could gain impressions on the various factors determining the development of the cassava cultivation. These observations extended over a period of five years (1988-1993) but do not claim to be representative for other parts of Malawi or even to Africa. However they give an insight into some of the various social factors in the cassava cultivation in Africa. A critical review of the results led in part to unexpected conclusions.

Introduction
Agricultural experiments on research stations tend to overestimate obtainable yields because of the exceptionally good experimental conditions (Reed et al., 1985). To avoid these biases, field experiments were carried out in farmer's fields in Usisya, located in the northern lakeshore of Malawi, for more than three years. Usisya has very poor sandy soils that had developed from the lacustrin sediments of lake Malawi. Through the field trials in this location, there developed diverse social contacts, leaving out the usual framework of agricultural research. The following observations and explanations attempt to counter this lack of overall approaches in common agricultural research.

Materials and methods
Our observations that extended over a period of five years do not claim any general validity. However they allow looking at the various aspects playing a role in the cassava production in Malawi and elsewhere.

Observations

Rationality versus irrationality
Only through the occurrence of the cassava mealybug were the people living in the lakeshore area of Malawi able to attract the attention of their politicians. Since they received food-aid, which they did not want to loose, they occasionally denied the efficacy of biocontrol on the cassava mealybug (Neuenschwander et al., 1991). Besides

this very rational approach we were able to observe the contrary in Usisya.
The fields for our field trials in Usisya belonged to local farmers. We made a contract with them which allowed us to manage these fields without reservations, under the condition that the yield with the exception of small samples would be theirs. We were hopeful that our new cultivation techniques would be accepted as soon as the farmers could recognise the higher yields. Since the yields of our trial fields were relatively high in comparison with the surrounding fields, the owners were very pleased. Unfortunately they did not try to adopt our cultivation techniques. Rather, a rumour circulated in Usisya that our high yields were the result of hidden use of pesticides and fertiliser. What happened? We concluded that it appeared easier for the farmers to stick to relatively old techniques when they can rationalise it with some inputs like pesticides and fertilizer not being available to them. This phenomenon, called “cognitive defence”, was already observed earlier in an agricultural context (Hoffmann, 1991) and is evident worldwide as part of general human behaviour.

Gender, tradition and other social circumstances

In Usisya the main burden of agricultural work in cassava cultivation, consisting of planting, hoeing, weeding and harvesting, was put on the shoulders of the women. This kind of job sharing does not appear specific for the cassava-crop as reported from other countries (Dixon-Mueller, 1985). Men carry out the clearing of a field when it is necessary. This however hardly happened on the sandy soils of Usisya, since hardly any taller plants grew. Therefore most of the work depended entirely on the women. Here it must be mentioned that in other regions of Malawi, men are predominantly involved in fieldwork. Another reason why the burden of fieldwork almost entirely rested on the women was that the men lived in bigger towns or abroad to earn money. This can be traced back to colonial times when Malawi, formerly called Nyasaland, was used as a source of labour force for Rhodesia and South Africa. In the absence of men, the women had an even greater workload through the combination of family and fieldwork. In the past women at least received regularly money from their men. Therefore they were not depending entirely on their field crops.
This kind of job sharing does not work any more, since permanent jobs for men have become scarce. Even when women live together with their men, it cannot be concluded that the man assists in fieldwork. The people from Usisya belong to the Tonga tribe, historically fishermen. In former times it was possible to earn a living from fishing and agriculture was considered to be of minor importance. This combination of social factors left the impression in many people of Usisya that farming can be neglected. Actually there had been a basic change. Hardly any money came from outside and fish harvest was low compared with the past. Many women could not meet the demands of a good cassava cultivation because of their work burden. The consequence was, they hardly paid attention to cassava, since it was growing anyway. It was planted without consideration of the water supply (beginning or end of the rainy season did not matter). The quality of the planting material was often poor. People had to take the consequence that the development would be delayed. Surprisingly, the plants developed nevertheless. But hoeing during the emergence of the plants was neglected despite the sensitivity of the cassava in young development stages to competition.
Field-assistants belonging to the agricultural extension office avoided speaking to the women in this difficult situation. They did not encourage the women to take better care of the cassava. This is due to tradition which prevents the men from addressing women directly. In general a man is regarded as the head of a family and is the first to be approached, although the circumstances in Usisya had changed.

Cattle and goats

Cattle and goats graze traditionally without a shepherd during the dry season in Usisya and in the whole lakeshore area of Malawi. For this reason, the cassava fields in the south of lake Malawi are fenced. With the beginning of the rainy season and the new vegetation period, the herds are
again accompanied by shepherds. In areas with unreliable conditions for field crops livestock serve as a mobile food reserve. In Usisya these animals were owned by few persons and had a high status. They hardly served the majority of the population.

During the dry-season cassava represented the only green fodder. This was particularly true at the end of the dry season, when cassava showed already green leaves and became very attractive to cattle and goats. Even in our trial fields we had great difficulties in keeping these animals at bay. Definitely the prominent persons in the village did not show any concern about this problem. Hence, if the cassava production should be increased on long term so that poor families have adequate food, it will only work with controlled protection against invasion of cattle and goats. The poor people in Usisya do not own cattle. Cassava leaves are their only source of protein-rich vegetable in the dry season. Yet during the dry season the cattle enters into direct competition with them.

Agricultural extension

A fundamental problem in the cassava cultivation is related to the agricultural extension services and has historical roots. During colonial times agriculture in Malawi was of minor importance since the population had to serve as source of labour for South-African mines. The cultivation of corn was strongly promoted by the British colonial system. In addition, the development of hybrid corn seed after the Second World War resulted in euphoria about the potential yields of corn. Nevertheless, a 1958 report of the Colonial Government in Malawi pointed out that almost a monoculture of cassava existed in the lakeshore of the Northern and Central region (The Federal Standing Committee on Agricultural Production, 1958). The importance of cassava was ignored in further details on agricultural production and research priorities. This reveals the biased view of the colonial government towards this field crop (Carter et al., 1992). On one hand cassava was appreciated as a safety crop because of its ability to resist drought and its resistance against certain locusts. On the other hand the prejudice existed that cassava will only promote laziness of the population, malnutrition and deplete the soils.

Despite the importance given to agriculture in Malawi after the independence in 1964, corn was considered the predominant staple crop. The ignorance concerning cassava was a colonial heritage. This continued until the end of the 1970s (R.N. Sauti, personal communication, 1991). From then on cassava was given more attention and a research group was founded in agricultural research. By 1988 cassava was regarded officially as the second staple crop after corn in the country. Subsequently cassava gained more attention in the education of the extension personnel.

Besides the knowledge about cassava of the extension staff we found personal appearance and behaviour as the most important factors in the transfer of scientific and technical knowledge into agricultural practice. In Usisya we did not observe the basic principle "inquire instead of administer" of good agricultural extension (Hummler, 1996). We found a pontificating behaviour that seemed to serve in hiding the lack of knowledge. In most cases the extension personnel had less knowledge and experience than the farmer who should be advised. This deficit should not be considered negative as far as readiness for intense observation and learning on the part of the extension personnel is present. The field personnel should be encouraged to run trials under local conditions and to combine their theoretical knowledge with local experience. The

theoretical knowledge has rather to be applied to the conditions of the cultivator. Overall recommendations are one obstacle in this framework as they too lack the local adaptation.
The extension personnel in Usisya had special problems in the fact that Usisya was so remote that it was accessible by land only on foot. Therefore this location represented not only as hardship but discrimination as well. Due to this fact, the extension personnel came to work without motivation. An additional disadvantage posed by the remoteness of the place was that the field personnel had difficulties joining in the regular meetings of the extension service. On the other hand hardly any of the supervisors visited his staff in this location.

Conclusion

Besides the scientific results collected over several years of field trials it became clear that social factors on a long term baisis play a much greater role in the cultivation of cassava compared to actual scientific and technical knowledge. Continuous and sustainable transfer of this knowledge will only work under consideration of the people, their local living and as well their social conditions. Conditioned through our work in science we expect a speedy transfer of our results into action, thereby neglecting cultural and social considerations. This becomes more evident when the expert comes from another cultural and social background. Especially poor living conditions of local people force the observer to develop the wish that these people accept and adopt new scientific and technical knowledge as fast as possible. Unfortunately for the observer, it is just the opposite which happens. People under difficult living conditions do not take additional risk. They prefer to hold on to so-called "approved" behaviour patterns even if they are doubtful from a scientific point of view. Who will take the consequences?
It is foreseeable that the nutritional situation of the small farmers in Malawi will improve only when they receive more attention. At this point it appears most favourable to understand their behaviour and not to consider them as having a fatalistic, backward-looking and irrational behaviour (Lobdell & Rempel, 1995). Through an adequate level of cooperation with the farmers in the lakeshore of Malawi, higher and sustainable yields of cassava with lower pest damages are possible. Corresponding suggestions are contained in the doctoral thesis by Borowka (1996).

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