

*Farmers' experimentation is allotted great importance in Participatory Technology Development. But what do we actually mean by experimentation? Farmers in Sanando region have their own specific perception and call this shifleli.*

**Arthur Stolzenbach**

**S**anando, a semiarid region of Mali, has merited relatively little attention from 'development institutes'. World Neighbors Mali is a grassroots organisation working in this region with a PTD-related approach (Bunch 1985; Gubbels 1988). Among other things they introduce simple innovations, stimulate and assist farmers to experiment, and organise meetings of farmers from different villages. World Neighbors questioned if the experimenting would go on if they withdrew their initiatives. They asked me to investigate the nature and sorts of experimenting by these farmers, which I did in 1991.

The starting point was that the farmers seemed to have a word that refers to experimenting: *shifleli*. So I started inter-

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viewing using two strategies. In the first place I asked if they had done *shifleli* and, if so, we discussed the 'hows', 'whys', 'whens' etc. On the other hand I tried to reconstruct how they got the knowledge they had and the processes of changing the techniques applied. That brought me indirectly to experimenting activities they had undertaken, without (consciously) having introduced my own concepts of experimenting to them. Soon I ended up with mostly elderly men, because they were the ones who coordinate the farm and cherish the agricultural knowledge, a valuable property, that is not easily shared with any young man.

Trained as an agronomist, my concept of an agricultural experiment was something like: an action, undertaken to explicitly learn from it, and consequently it is undertaken in a particular way to be able to learn most from it. But what does *shifleli* mean to farmers? When I asked this, ever recurring elements mentioned by farmers were: close observation, show or prove something to others, check what others say. The most important criterion for them is that it works in real-life practical situations.

The range of themes was broad, mostly based on an appreciation of changing situations and opportunities. One test, for instance, concerned the proper sowing date of a (to me) unknown variety of cowpea (*Vigna unguiculata*), because cowpea is very susceptible to drought or excess of rain, especially at flowering. Another test was to see if the harvest would be better preserved in the granary after treatment with a certain insecticide. Because crop residues such as straw are scarce nowadays, the granaries are built from loam. This results in greater post-harvest losses caused by insects. But most of all *shifleli* concerns the test of new varieties. Let's take a look at two cases of *shifleli*.

**One key issue: varieties**

*The first time a farmer of Koyan had seen sunan (a short variety of millet) he went to the owner, who told him that this particular variety of millet can be harvested early and yields well. Since the length of the rainy season was decreasing the last few years, he was very interested and he received a handful of seed to try out. Back home he decided to sow at the shortest distance the people of his village used when sowing millet, being four hand-widths. The new variety did produce well,*

*as the other farmer had said, although "the taste is not so good and the colour when it is prepared is a little bit black."*

*Probably the yield could be improved by increasing the plant density and so he reduced the sowing distance the next year. This time he was sowing it on large plots and each year he reduced the distance a little bit, until one year the distance had become too short. At the end, the optimum on his fields proved to be more or less two hand-widths.*

**Another: soil fertility**

*Solo Keta had sown two plots with groundnut. The plots only differed in the application of fertiliser: one plot had not received any manure at all, the other had received mineral fertiliser. In the fertilised plot the vegetative growth of the groundnut was stimulated very much, as he had expected from what he had seen before with cereals.*

*But in this particular case he became anxious that, after flowering, the gynophore (the downward elongating peg that contains the growing seed) could not reach the soil and thus would not produce seeds. He intervened by earthing up the plants of the fertilized plot.*

*After the harvest Solo was very satisfied with the yield increase on the fertilised field. However, the bad taste did not please him. This would not be very problematic if he would sell it, but for him the market for cotton was more interesting than that for groundnut. In the end, he decided not to continue with applying fertiliser, because it was not worth the costs of the fertiliser and the extra labour of earthing up.*

In both cases it is clear that the most important criterion is that a new technique should improve the farmers' situation, considering all consequences. Another common aspect is that, in the course of the *shifleli*, both farmers touch upon new things that could not be foreseen. Solo Keta as well as the farmer from Koyan had to reframe their assumptions and hypotheses. The farmer from Koyan waited for the next season to change the treatment, but Solo changed it in the run of it.

**Explaining effects**

When farmers have tested a technique on a small field for the first time, this mostly gives them enough information to reject the technique or try it out the next year on



**Farmers' experimentation**

a larger field, possibly under slightly different circumstances. They will look for explanations mainly when the new technique does not work out to their satisfaction.

To explain effects, they simply make use of the variation in the results. For instance, if the average yield of a plot is not satisfying, but there are spots where the plants do grow and yield well, it can be concluded that not the rain but the soil fertility has been the most limiting factor. If the production in the whole field is low, probably the rain has been the limiting factor. To farmers, spontaneous variation is a source for interpretation.

A strong point in farmers' experimentation is the frequent observation of their crops during the whole season. Retrospectively they can determine a multitude of factors that could have influenced the yield. For instance, the changes of the colour of the leaves can tell something about the soil fertility. Keen observation, comparison and deduction are the tools for farmers to distinguish the causes and effects. As an example:

*Lassana has one variety of beans that is very sensitive to rain. If, during flowering, there is a cloudburst, the flowers will drop and the crop will not yield. In case of shortage of rain, the sunlight will wither up the flowers and it will not produce either. Lassana uses this characteristic: "Because this is the most delicate variety, I am able to know why another variety has not yielded by referring me to this one."*

### Experimenting as performance

These cases of shifileli could be easily identified as such, because they were somehow isolated from the principal production in place and/or time. Then, for a time, it seemed that I saw more shifileli than did the farmers, for instance, in Adama Diarra's yard.

*In a corner of his yard Adama had sown beans of a new variety. At the other side he had sown last year's beans at double spacing between rows. One month later, in between these rows, he had sown another of his varieties of beans. He told me that this year he did shifileli in the corner of the yard. But although he had never at the same time mixed two varieties of beans and sown them in between each other, he did not consider that shifileli, because "he already knew the varieties of last year". This year "he just tried to*



Photo: Arthur Stoizenbach

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*spread the time of harvest". Accidentally he had had two varieties at his disposition and found it "interesting to mix them". After a discussion he agreed with me that "indeed you can call it shifileli if you want to".*

Farmers do not classify this latter case as shifileli, because it is completely integrated in the production process and more driven by intuition than by an explicit desire to learn. Nevertheless, to me, it comes close to an experiment, although it may be more similar to 'just' experience. In this case the criterion of purposeful action for learning is problematic, especially because Adama has different purposes at the same time with the same actions.

Where does an experiment start and where does it end? Maybe it never ends, and is it arbitrary to set a limit. Especially in regions like Sanando, farming is characterised by variability and unpredictability. In this situation, it is more important to be able to reframe the problem to the changing situation and act according to it than to test a hypothesis thoroughly.

So, to practise agriculture means doing, judging and adjusting, improvising on a repertoire of different themes. Richards (1987) used the term 'adaptive performance' for it. Maybe a better term would be experimenting as a continuous innovative element of the craftsmanship of farming.

### Experimenting as learning process

One nice aspect of an experiment is that it is easy to talk about it when it is laid down in the field. As such, it is an interesting instrument for learning and demonstration. But also without clearly defined experiments, there are so many spontaneous situations of which one can learn by discussion or mere observation that the importance of explicit experimenting for learning may not be overrated. For example, it happens often that two different farmers on adjacent fields are cultivating the same crop, each one in his own manner. Also different people working on the same field can cause different 'treatments'. For instance, children may sow at shorter distance because they have short legs, or "because they have not understood the instructions properly". An open attitude to such situations may lead to new insight without being planned.

One farmer made clear to me how differently experimenting may be appraised: "Once, simply because of lack of manure, I could only manure about half of the field. The manured part produced twice as much as the non-manured part. A few years later, World Neighbors came and proposed to do the same type of test. At that moment I remembered I already had done the test just by accident!"

### References

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# ion: what are we talking about?