The state of research - for - development in the post production system of sorghums and millets in Southern Africa.

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INTRODUCTION

As a programme officer for IDRC my prime task is to support research-for-development in East and Central Africa; more particularly it is the topic of food after harvest, or the post production system which concerns me. As a research promoter, I do little research myself, but I am very pleased to be able to talk to you about the work being done by African researchers.

Shortly after IDRC's creation in 1970, its Division of Agriculture, Food and Nutrition Sciences selected the semi-arid tropics and their neglected crops as one of its areas of concentration. On the food production side, many of you may be familiar with IDRC's support to several national sorghum and millet improvement programmes. Similarly, a very steady support has been given over the years for research in the post harvest section of sorghums and millets, notably but not exclusively, the processing and utilization aspects.

You are all more familiar than I am for the need to integrate your improvement efforts with the prevailing production system being practiced by your clients - the farmers. The importance of adding the post production system in your considerations are two-fold. First, an analysis of the whole food system may in fact indicate that constraints to farmer adoption of improved cultivars lie in the post production area. Crudely put, that means that there has to be demand (or a desire to eat up or otherwise utilize) the increased production which improvement efforts seek to promote. Secondly, it is from the post production sector that you will obtain some of the key criteria by which you will judge whether a new cultivar is really an improved one. Thus, I see an increasing need for improvement programs to obtain feedback from the storer, the processor and the eater.
The Post Production System

The major elements in the post production system can be listed as follows:

- drying
- storage
- transportation
- primary processing
- secondary processing
- marketing and distribution
- utilization and consumption

In considering any particular commodity, the sequence of these steps may be altered, or several of the steps may be repeated. For example, the sequence of steps at the farm level, where the producer is also the consumer, will look different from the sequence whose end point is the urban consumer, who is seldom also the producer.

In the Third World governments have recognized the importance of research on food production. We have well-organized Ministries of Agriculture, we have well established agricultural research systems within or closely associated with those Ministries. By contrast, the post production sector is a virtual orphan. One finds research on elements of the post production system being conducted in disparate places: perhaps a biochemist in a university laboratory, or someone in a Nutrition Centre, or a small group in a Ministry of Industries, even someone in a Ministry of Energy. Those of us involved in post harvest concerns have the task of identifying and linking these researchers, and of convincing them to look at this work in the context of a system. We also face the challenge of convincing the policy maker of the importance of thinking about, not only the production system but the whole food system.

The Botswana dehuller success story

In reflecting on the presentation by our colleagues
from the Rural Industries Innovation Centre, I would like to highlight the following ingredients of that success story.

1. An entrenched preference for sorghum in the rural and urban population of Botswana; this condition does not apply everywhere in SADCC countries.

2. A systematic identification of the key constraints in the food system which impeded the sustained increased production and utilization of sorghum as a common food;

3. A focussed process of research, on an appropriate technology, which was (and this occurs all too rarely) problem-led rather than solution-led.

4. The RIIC understood that technology generation alone is not sufficient to enhance the quality of rural life. The new technology has to finally be widely adopted.

5. There followed a successful process of "introduction of technology" over a number of years, which demonstrated the understanding that "transfer of technology" (a favourite term of the development set) encompasses a set of issues much wider than mere "transfer of hardware".

6. The oft-forgotten key in the process of transfer of technology is the formation of an indigenous cadre of personnel who become totally familiar with the new technology and who develop a national ability to deliver that technology to the end user in a compatible manner and on a sustained basis.

Is there a potential for dehulling machinery in other SADCC Countries?

The short answer to that question is yes. The longer answer will reveal that the yes has to be qualified.
There is a clear future for dehullers under the following conditions.

1. Where the home maker customarily spend time in manually dehulling, or pounding, the grain or grain legume, and considers this a time consuming task.

2. In the absence of a tradition of dehulling, there may be nutritional or taste reasons for introducing mechanical dehulling as a totally new concept.

3. In order to convert centrally stored large volumes into a palatable and edible product.

Is there a priority area? The answer to this question will be shaped by the characteristics unique to each country or region within a country. A general guideline would be to put one's efforts in the direction of the greatest number of potential beneficiaries - we know that about 80% of the populations of the SADCC countries lie in the rural areas and are producer-consumers. I think that we should therefore aim our efforts primarily in that direction. One should, however, also be aware that if the urban 20% can be induced to become consumers of dehulled products; their demand will generate increased incomes for the farmer for whom an excess production of sorghums and millets has in the past seldom been easily convertible to cash.

Let me become very practical now, and offer a brief description of national activities in several SADCC countries with dehullers and processing of sorghums and millets. The analyses I offer will be incomplete, and will at times be deliberately uninhibited in order to generate a discussion among the participants of this workshop.

Towards small scale processing of sorghums and millets in Southern Africa.

SADCC-wide, there now exists one of the Food Security activities,
of special interest to this audience, with two major goals.

1. To bring about a programme of reduced post harvest losses in the region, and

2. To improve existing methods of storage, handling and food processing in the region.

More details of this activity are available, and the leader of the Postharvest and Food Industries Advisory Unit (PFIAU), Mr Victor Kachoka, is participating in this workshop. I hope that the PFIAU team will develop good interplay with each of you, and that you, in turn, will help to direct the members of this unit into directions which are important to your countries.

There is little to report about the dehullers with regard to Angola and Moambique, primarily because as so many of us, I lack competence in Portuguese. Some time ago I did have an inquiry from Moambique about the possibilities of dehulling soy beans. Nor do I have anything to report about Lesotho or Swaziland.

In Malawi there was interest as early as 1978 which has not yet culminated in a specific activity. The agricultural research system has identified home dehulling as a major time constraint, and there is interest in finding an appropriate solution. The major crop there is maize, rather than sorghums or millets. We are in the process of clarifying the most useful research process, which will combine a look at both maize and sorghum.

In Tanzania, the Small Industries Development Organization (SIDO) is conducting very applied and relevant work in the drier areas. Two rural milling installations, one in Dodoma Region and one in Singida Region, are up and running. A further two rural pilot mills are in the process of being installed, one in Shinyanga Region and one in Tabora Region.
The important outcome is that at the end of this process, SIDO should have acquired the knowledge to propose, and later direct, a wide scale dissemination plan for rural milling. Enhanced skills in working with potential recipient communities are to be acquired to ensure that further systems are technically right, socially acceptable and economically viable.

I note with interest that the Rural Industries Innovation Centre are completing the production of ten dehullers for Tanzania's Ministry of Industries. Thus the skills of SIDO will shortly be challenged very severely, to convert a transfer of hardware to a transfer of technology. At Sokoiné University of Agriculture research is also in progress on farm-level storage and on composite flours of sorghum and maize for the traditional porridge, ugali.

In Zambia, sporadic interest has been expressed since 1981 in dehullers, but again has not yet led to any concerted action. The drought in the region helped to spur the focus on sorghum and millet improvement. Success with the generation of new varieties coupled with the publishing of producer prices seems to have brought about a real change in the volumes of sorghums and millets produced. Concentrated and well-directed action in the processing and utilization sectors is urgently needed if the efforts from the production side are to be ultimately transformed into a sustained state of change.

In Zimbabwe some interesting things have begun to happen, and we may soon be able to demonstrate a significant level of applied research on many aspects of the sorghum and millet post production system:

- there have been recent increases in the producer price for red and white sorghums which may soon pose fresh problems for the Grain Marketing Board.

- A non-governmental agency has proposed research on storage structures in the drier areas; with rapid depletion of wood, is proving increasingly difficult for farmers to repair or renew their traditional storage structures; alternative materials are being sought, and in the context
of this on-farm pilot testing several aspects of the post harvest system will be studied, including the prevailing pest complex.

- the same non-governmental agency is now developing an indigenous ability to deliver the dehulling technology to rural areas; it is using a smaller and modified variant of the RIIC design which is probably better suited to the lower density of rural population when compared to Botswana's wide scale dissemination plan for dehullers is the anticipated outcome.

- in the context of a traditional seed project, 30 households have being interviewed in 3 dry areas; the outcome it is hoped, will indicate more clearly why and if farmers prefer traditional cultivars of sorghums and millets; some eater preference feedback has also been obtained.

- there is a possibility that a researcher in Zimbabwe may become involved in identifying grain quality parameters, capable of simple and rapid tests;

- under the aegis of the Ministry of Agriculture an informal small grain working group has been formed, and the potential exists that this group could pull together the findings of the above activities into an integrated study of the post production system of the small grains.

May I round out the picture by looking at all of Sub-Saharan Africa. While the food end uses differ among Southern Africa, East Africa and West Africa, there are some common trends. Most eaters of sorghum and bullrush millet have a tradition of dehulling these grains before eating them. At a meeting in Dakar in March 1985, a review was conducted by some of the researchers in the sorghum and millet processing field. While its objective was to focus on the technical aspects of dehullers, the participants also examined the food
system in the context of which their work was taking place. The work of the Mali national programme set a high standard by focussing on the key characteristic which Malians demanded in the final food - overnight keeping quality. They demonstrated that dry dehulling and milling was an acceptable, and perhaps preferable, alternative to the existing wet process. Traditionally the grain is home dehulled by mortar and pestle and then ground into a moist paste by plate mills. The participants also identified further research needs, and the proceedings of the workshop should make interesting reading when they are published.

Mr Chairman, I hope that this presentation will have accomplished the following:

1. Stimulate lively discussion at the end of the session

2. Provided the participants with an overview of relevant thrusts, if not activities, in the post production system of sorghums and millets;

3. Enticed an increased interest and awareness in the interrelationships between the production system and the complementary post production system

4. Given encouragement to the improvement sector of national programmes to help define national efforts in the after-harvest sector in order to bring about a joint focus on the national food system for sorghums and millets.

In conclusion I would suggest that the ultimate test which should be applied to our collective efforts can be summarized in one simple question: "How many people are eating more and better as a result of our interventions?" Researchers in the Third World face a difficult set of criteria by which their research should be evaluated: it has to be technically sound, socially acceptable and economically viable.