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✓ **Pearl Millet Production System(s) in the Communal Areas of Northern Namibia: Priority Research Foci Arising from a Diagnostic Study**

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Abstract

Pearl millet is the major crop in northern Namibia where 60% of the population live. Although agricultural research was conducted in these areas during the pre-independence period, the first study to obtain baseline information was conducted in 1993.

The study confirmed the predominance of pearl millet in northern Namibia, with an average sown area per household of 3.5 ha. The farmers identify short duration as the most preferred varietal trait above grain yield, and research needs to be targeted in line with the farmers' preferences. Drought was identified as the major constraint on pearl millet production followed by lack of draft power. Farmers do recognize the importance of a good crop stand, early thinning, and weeding. The use of manure is widespread while the use of chemical fertilizer is very limited.

Research priorities identified in the study include the development of drought-alleviating technologies, development of pearl millet cultivars that meet the farmers' preference, and improvement of soil fertility and crop management strategies.

A large pearl millet grain yield gap was identified with on-farm yields of 0.15 to 0.20 t ha⁻¹ compared with on-station yields of 3.63 to 3.87 t ha⁻¹ during the 1992/93 season. The yield gap analysis shows the comparative grain yield gains of improved management to be between 134 and 725% (for the levels of management identified) compared with varietal change yield gains of 6 to 44% at the specified management levels. Based on these findings the Ministry of Agriculture, Water and Rural Development (MAWRD) is requested to put more effort into resource management research as opposed to genetic improvement, with more emphasis on on-farm research.

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Background

The farmers in the northern communal areas of Namibia, namely, Caprivi, Kavango, and the four regions covering the former Owamboland—Oshikoto, Oshana, Ohangwena, and Omusati—practice a mixed farming system. The system is based on crop and livestock production systems that are interdependent.

Pearl millet is the dominant crop. With no formal pearl millet grain markets, household food security is the target for most farmers.

There are very few baseline data on the farming system and little understanding of its component production systems (UNICEF 1989). During the pre-independence period, research on pearl millet and associated production systems was not given attention. The farmers living in these areas know what is good for them; their survival is adequate testimony to their authority. This baseline survey is the first recorded comprehensive attempt to obtain quantitative data on pearl millet-based production system(s) of northern Namibia. The study seeks to identify research priorities and foci based on the knowledge and perceptions of farmers.

Method of Data Collection

A survey, using a structured questionnaire, was conducted between May and April 1993. Agricultural extension officers did the enumeration in their respective areas. A random sample of at least 20 farmers was interviewed around each Agricultural Development Centre (ADC). The ADC is the location of agriculture extension offices within the region and subregions. There was no preselection of respondents and presence at home during time of visit was an important deciding factor in the 'choice' of respondents. Considering the fact that the population densities in these areas are relatively low, the sample size at each ADC makes the respondents representative of the farming communities in northern Namibia. The actual sample sizes were as follows: Caprivi 18; Kavango 107; Omusati 38; Ondangwa 28; and Oshikoto 18.

In an accompanying exercise the areas of pearl millet and sorghum grown by farmers in the 1992/93 season were measured. This was done by extension officers using measuring wheels, with a target of measuring 20 arable holdings per ADC. Two hundred and six family holdings in the Kavango and Owambo regions were measured.

Results

Average size of holding

No national figures are available. The results of the area measurements conducted during the 1992/93 season are presented in Table 1 excluding the extreme values which had fewer than five observations in each class. On the lower end of the data set only four observations were discounted. The average size of area sown to pearl millet

Table 1. Area of pearl millet grown by individual farmers surveyed in 1993.

Class limit (ha)	Class value (ha)	Observed frequency
0.5-1.4	1	20
1.5-2.4	2	37
2.5-3.4	3	42
3.5-4.4	4	38
4.5-5.4	5	17
5.5-6.4	6	10
6.5-7.4	7	9
7.5-8.4	8	6
Mean	3.5	
SD	±1.76	

per household from this data set is 3.5 ha. If classes with 10 or fewer observations are dropped, the mean is reduced to 2.96 ha.

Constraints on pearl millet production

A primary objective was to identify the major constraints limiting pearl millet production. The rank order of the constraints was established using a score calculated as the sum of the product of:

$$(\text{Number of ranking respondents} \times \text{rank order value})$$

where first is valued 3, second is valued 2, and third is valued 1.

Drought is the most important constraint recognized by farmers. Next is lack of draft power, with lack of improved seed coming third (Table 2). Viewing the produc-

Table 2. Constraints on pearl millet production in northern Namibia identified by a diagnostic survey: May-Jun 1993.

Constraint	Score ¹	Regional rank by score			
		National	Caprivi	Kavango	Owambo
Drought	409	1	3	1	1
Lack of draft power	321	2	4	2	2
Lack of improved seed	269	3	1	3	3
Lack of grain market	176	4	2	6	-
Lack of fertilizer	173	5	5	5	-
Lack of extension	170	6	-	4	5
Low soil fertility	144	7	-	6	-
Lack of manure	76	8	-	4	-

1. Score = (Number of ranking respondents × rank order value).

