

# Crop Collecting in Malawi and Zambia 1980

R.K. Arora <sup>1/</sup>

DURING APRIL-JULY 1980, THE IBPGR, IN COOPERATION WITH THE DEPARTMENTS OF AGRICULTURE OF MALAWI AND ZAMBIA, ORGANIZED A CROP COLLECTING MISSION IN MALAWI AND ZAMBIA. EMPHASIS WAS ON LOCAL VARIABILITY OF MAIZE, RICE, SORGHUM, FINGER MILLET, PEARL MILLET, FRENCH BEAN, LIMA BEAN, BAMBARA GROUNDNUT, COWPEA, PIGEON PEA, OKRA AND CASSAVA.

The team collected 1 799 samples (802 from Malawi and 997 from Zambia), consisting of 370 collections of cereals, 565 of millets and 700 of legumes, as well as other types. This variability was sampled from 234 locations: 122 sampling sites in Malawi and 112 in Zambia. Sampling sources (sites) included farmers' fields, threshing grounds, backyards and village markets. Natural pockets of vegetation were explored to collect wild Vigna, Oryza, Abelmoschus, Solanum, Pennisetum and Sorghum. In general, different agro-ecological belts were explored to gather a wide range of diversity.

Collecting in the central, northern and southern regions of Malawi began 2 May and lasted until the end of the month, while June was devoted to collecting in the eastern and northern provinces of Zambia. The mission spent the final month (July) processing the collections.

The teams comprised:

Malawi: Dr. R.K. Arora, Team Leader, (IBPGR Consultant), Mr. I.R. Denton, Collector, (IBPGR Consultant), Mr. P. Sibale, Local Counterpart.

Zambia: Dr. R.K. Arora, Team Leader, (IBPGR Consultant), Dr. Appa Rao, Collector (ICRISAT), Mr. J.S. Sinkala, Mr. B. Mulyate and Mr. A.M. Ngala, Local Counterparts. JUN 10 4-25, 1980

This mission was funded by the IBPGR and organized in close cooperation with the Departments of Agriculture of Malawi and Zambia. The key local government personnel who helped in planning were Messrs. A.A. Kalinga and D.R.B. Manda, Assistant Chief Agricultural Research Officers in Malawi, and Miss R.K. Chungu and Mr. I.J. Prior, Chief and Principal Agricultural Research Officer, respectively, at Mount Makulu Research Station, Chilanga, Zambia.

This collection mission was a follow-up of the 1979 IBPGR/ICRISAT millet germplasm collection mission to Malawi. It was intended to complete work in Malawi and initiate similar activities in Zambia. The crop diversity collected included:

- (a) Cereals and millets: local cultivars of rice and maize, sorghum, finger millet and pearl millet;

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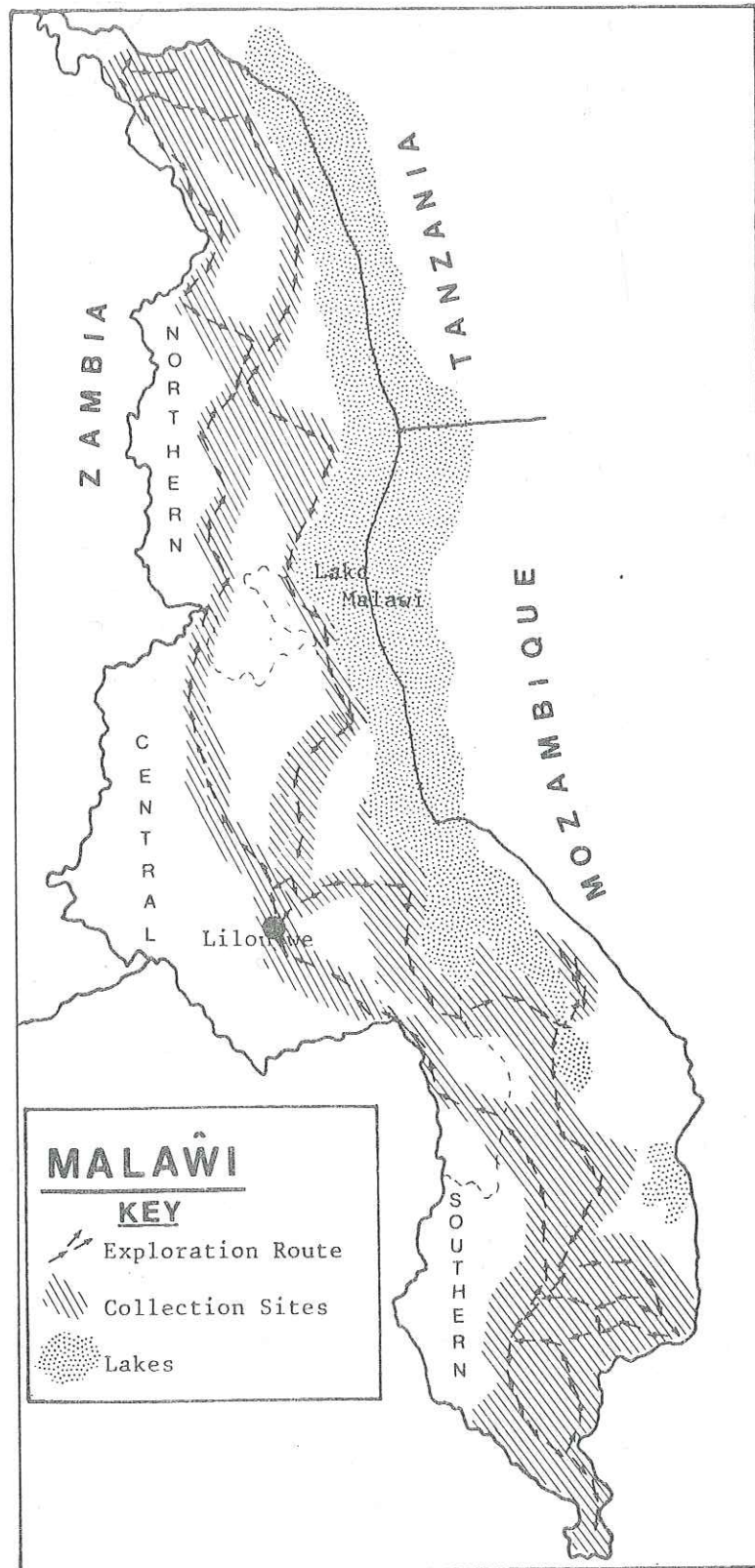


Fig. 1.

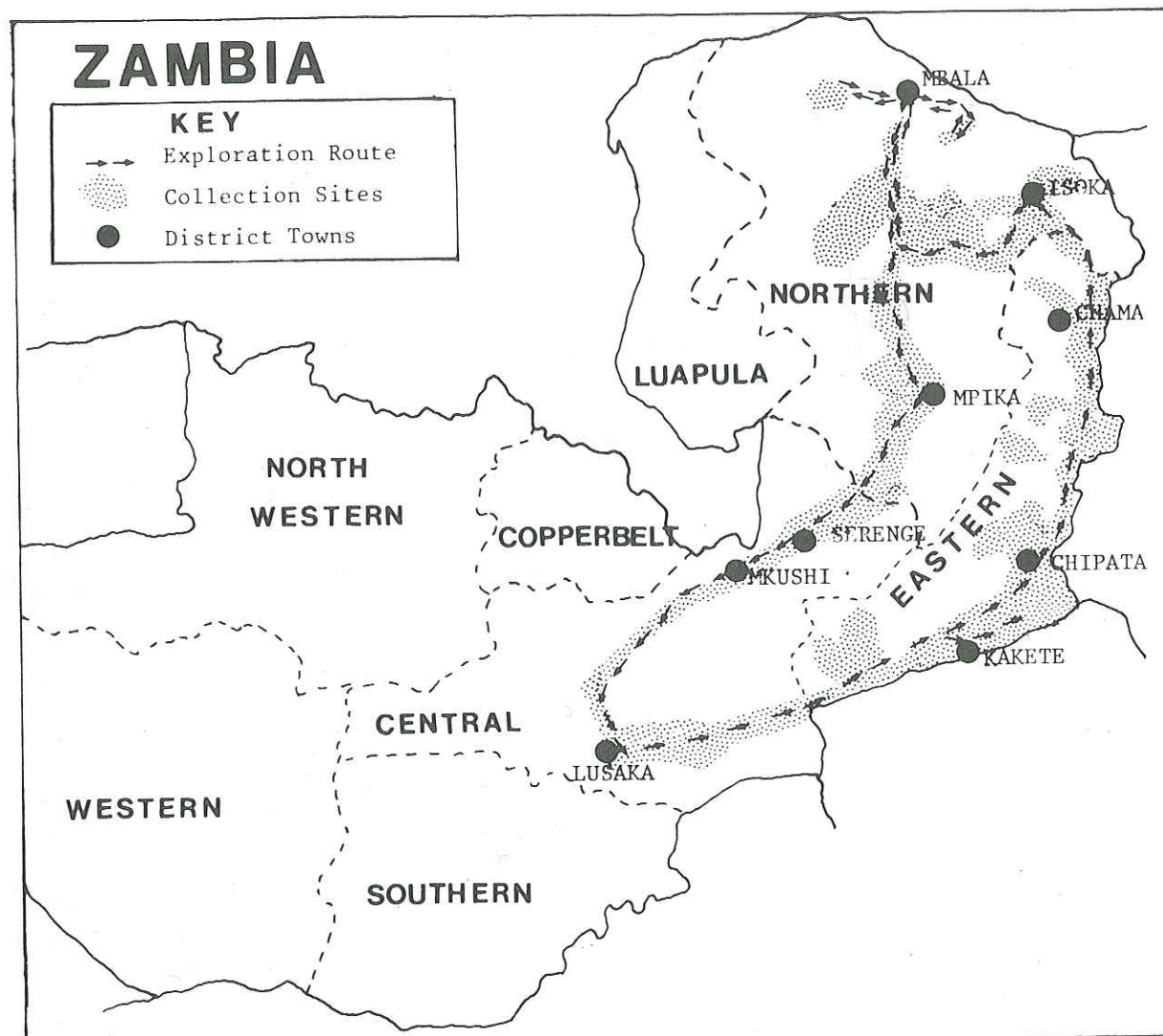


Fig. 2

- (b) Legumes: French bean, Lima bean, cowpea, groundnut, Bambara groundnut, pigeon pea, and less grown crops. e.g. chickpea, broad bean and Lupinus;
- (c) Tuber crops: cassava (seeds) and
- (d) Vegetable types: okra.

The mission had a wide array of

diversity to collect and was entrusted with multi-crop collecting.

A summary of samples collected is shown in Table 1 and the collection routes are shown in Figs. 1 and 2.

Many data on the variability within the different crops were recorded. Full details are available in the author's report to the IBPGR Secretariat (AGP:IBPGR/80/62) and this will be provided on request.



Table 1. Germplasm collected in Malawi and Zambia, 1980

Crops	Malawi	Zambia	Total
<u>Cereals and millets</u>			
maize	83	74	157
rice	141	72	213
sorghum	78	259	337
finger millet	72	110	182
pearl millet	22	24	46
<u>Grain and other legumes</u>			
French bean	126	119	245
cowpea	108	75	183
groundnut	-	82	82
Bambara groundnut	63	67	130
Lima bean	19	14	33
pigeon pea	6	21	27
<u>Tuber crops</u>			
cassava (seeds)	17	24	41
<u>Vegetable types</u>			
okra	30	16	46
<u>Miscellaneous</u>			
Canavalia, velvetbean Dolichos, blackgram, greengram, chickpea, wild solanums (non- tuber), sesame, cucumber, sorghum	37	40	77
	802	997	1 799

### Distribution of Crop Diversity

In the areas surveyed, specific pockets of variability occurred. The pattern of distribution of this diversity varied depending on the agro-climate, farming practices, local preferences, etc. Sporadic prevalence of some types and wider occurrence and more uniform distribution of others was often observed. A few noteworthy points are:

- (a) The lakeshore belt in Malawi and the Luangwa valley zone in Zambia exhibited maximum variability in rice. Other pockets of variability occurred along river levees or 'dombo' sites and were of sporadic distribution.
- (b) The Shire valley in Malawi possessed more variability in sorghum and pearl millet. A narrow pocket of such variability occurred in the central region near Salima and between Chiradzulu-Phalombe. In Zambia more variability was encountered in sorghum in the rift valley zone and in a few isolated pockets in western Kasama, eastern Kasama, western Mbala and western Mpika. This variability pertained to grain/dual purpose types.
- (c) Native variability in finger millet was largely confined to the northern high rainfall zones of Malawi and Zambia, and was often prevalent in bush-fallow-ash culture sites. Usually, forms with closed to partially open, thick fingers with glumes often covering the brown grain occurred and they were mostly dual-purpose types.
- (d) The finger millet zone invariably coincided with cassava and French bean culture. Good variability in cassava occurred in Mzuzu in northern Malawi and between Chinsali and Kasama in northern Zambia. In general, in northern regions of Malawi and Zambia, variability in cassava occurred throughout with distribution of local types varying, depending on local preferences.
- (e) Though French bean was more widely grown, the Misuku hills in Chitipa and the Mzuzu area in northern Malawi, and Chinsali, Kasama and Mbala in northern Zambia possessed more variability. Mixed culture and pure types were grown.
- (f) As compared to French bean, sporadic distribution of Lima bean occurred, with maximum variability encountered in Mangochi in Malawi and Chadiza in Zambia.
- (g) More uniform distribution of Bambara groundnut was observed. However, a few pockets in Mzuzu in northern Malawi and Chadiza and Chama in eastern Zambia possessed more variability, including two-seeded pod types.
- (h) Not much variability occurred in the local groundnut types (mostly bred varieties were being grown); and only in a few sites in Chinsali, Kasama and in the Luangwa valley zone could some variability be collected.

- (i) Locally adapted material in maize also exhibited sporadic/wider distribution, with pockets of variability in Zambia at Chadiza in the eastern province (more widely grown in the rift valley zone) and in the northern hills in Kasama and Mbala; and in central and southern Malawi. Pop maize types were collected from Chadiza.
- (j) More variability in native cultivated and wild okra was encountered in the Shire valley in Malawi and, in cultivated types, in the Luangwa valley in Zambia. The latter zone also exhibited rich diversity in local cucurbits.

being grown under subsistence farming for home consumption.

New crop introduction programmes also pose a serious threat to traditional types with wide areas becoming covered by industrial crops, e.g. clusterbean in southern Malawi and sunflower cultivation in central and other parts of Zambia.

The bush-fallow-ash system ("chitemene" in Zambia, "visoso" in Malawi), widely practised in the northern parts of these countries for cultivation as well as for the clearing of forest cover, provides another reason for the necessity of collecting useful wild relatives and related species of Vigna, Solanum, Cucumis (and several other cucurbits), Abelmoschus, Pennisetum, Sorghum and related types.

#### Genetic Erosion

With the effective implementation of national agricultural extension programmes, more awareness has been created for growing high-yielding cultivars. (Maize hybrid selections from Zimbabwe, Kenya, locally bred materials; rice - Blue Bonnet, Nilo 11, 1639, Angola crystal, several IR selections - work being carried out largely in valley zones by several Japanese and other teams; sorghum - Red Swazi, Sereno and a few more like Barnards red, several hybrids; finger millet M 144, Steadfast and small white; Pearl millet - Serere; French bean - Red Canadian wonder, Mexican 142, Nanchode, more selections in butter beans; groundnut; extensively grown varieties/bred variation like Makulured and Chalim Bana; cowpea; New Era grey and several more types in cassava, sweet potato and other crops). It can, therefore, be seen that the local germplasm is under threat, although not yet at a critical level since traditional varieties are still

#### Processing of Collections

In Malawi the collections were processed in the Chitdeze Agricultural Research Station, Lilongwe. These were sun-dried, arranged crop-wise and later threshed, cleaned and sorted out into two sets (each collection was split into two parts). Team member P. Sibale (as the local counterpart) supervised the latter part of this task. Instructions were given to have one set of collections retained in the Research Station and the other sent to the IBPGR for safe deposition in long-term storage.

In Zambia the collections were dried, threshed, cleaned and sorted out into sets by the team members. The work was carried out in Mt. Makulu Research Station with the help of local labour. One set of collections was deposited with Miss R.K. Chungu, Chief Agricultural Research Officer, Mt. Makulu Research Station, and the other was sent to the IBPGR for safe deposition in long-term storage.



## RESUME

Le CIRP a organisé en avril-juillet 1980, avec la collaboration des Ministères de l'agriculture du Malawi et de la Zambie, la collecte de variétés locales. Le rapport décrit brièvement les travaux exécutés et le matériel génétique récolté.

## RESUMEN

El CIRF, en colaboración con los Departamentos de Agricultura de Malawi y Zambia organizó, en abril-julio de 1980, la recolección de variables locales. En el informe se resume la labor realizada y los germoplasmas recogidos.

# Collection of Peanut Germplasm 1980

Charles E. Simpson <sup>1/</sup>

## Abstract

In 1980, an expedition was carried out as a continuation of the groundnut collecting work started in 1976 (see Newsletter No. 33). The objective of the 1980 expedition was to complete as much of the collection work as possible in the North Beni (Bolivia), eastern Bolivia and southwest Brazil (south and west of the Serra dos Parecis), north Argentina, the North Yungas (Bolivia) and Peru. Limitations of time, logistics and season allowed completion of only part of this objective.

The northwest Argentina area was partially explored, as was eastern Bolivia. The North Yungas was collected and part of southeast Peru was covered. The time of year was unsuitable to explore the North Beni, eastern and part of southeastern Peru. The months of April and May were chosen for the expedition because this was the time most of the areas could be collected (according to prior information). In reality, the time of year for many of the areas is highly dependent upon the weather for that year.

As before, herbarium material of the wild Arachis was collected and deposited in Corrientes, Argentina, from which duplicates will be distributed to the appropriate herbaria. Nodules were collected from all living Arachis collections, and were deposited with North Carolina State University, Raleigh, North Carolina, USA.

Seeds and plants were collected of wild and cultivated Arachis and were deposited with the country of collection when possible. Equal portions were also distributed to the participating countries, if facilities were available to maintain the material. Thirty-seven collections of wild Arachis were made. Nine were collected in northwest Argentina: the remaining 28 were collected in eastern Bolivia. Of the 129 cultivated Arachis collections, 102 were found in Bolivia and 27 were collected in Peru.

Even though the expedition was not able to complete the objective, the venture was highly successful in the importance of the material collected.

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