

SEEDS OF HOPE

AN EMERGENCY PROGRAM TO ASSIST RESTORATION OF CROP PRODUCTION AND REHABILITATION OF FOOD SECURITY IN RWANDA AFTER THE CIVIL WAR

VOLUME II - APPENDICES

ON BEHALF OF THE IMPLEMENTING AGENCY CIAT, CALI, COLOMBIA

W.R. SCOWCROFT, CANBERRA

JULY 1996

SB 113 .7 S4 V.2

SB 113 .7 54 12

VOLUME II - APPENDICES



- 1. Interim Technical Report. Seeds of Hope: Socio-Economic Assessments, April 1996.
- 2. SEEDS OF HOPE II: Crop Seed Banks to Assist Restoration of Food Security in the Greater Horn of Africa, December 1995.
- 3. Report 1: Inaugural Meeting, ILRAD, Nairobi, September 21/22 1994.
- 4. Report 2: Report of the Seeds of Hope Business Meeting, ILRI, Nairobi 23-24 January 1995.
- 5. Report 3: Report of the Third Seeds of Hope Business and Coordination Meeting, ILRI, Nairobi, 26-27 May 1995.
- 6. Report 4: Report of the Fourth Seeds of Hope Business and Coordination Meeting, ISAR, Rubona, 17 October 1995.
- 7. Report 5: Report of the Ad Hoc Meeting Among CGIAR Centers on SOH I Activities November 1995-February 1996, ILRI, Nairobi, 13 February 1996.
- 8. Report 6: Consolidated Report of Seeds of Hope Activities for the Period February-June 1996, June 1996.
- 9. Project Completion Report: Support to the Rwandan Tree Seed Centre at Butare, 27 February 1996.

-129667 15 / 1897

APPENDIX 1

Interim Technical Report. Seeds of Hope: Socio-Economic Assessments, April 1996.

INTERIM TECHNICAL REPORT SEEDS OF HOPE: SOCIO-ECONOMIC ASSESSMENTS APRIL 1996

This interim technical report outlines select findings of the ongoing Seeds of Hope (SOH) socioeconomic research in Rwanda, Central Africa. Final reports, including an executive summary, will be issued by June 1996.

The socio-economic work has had two distinct phases. During the first two post-war seasons, SOH worked with a range of non-governmental organizations to help monitor the impact of their aid and, at the same time, gather initial baseline information on farmer seed and varietal needs. During this first phase of emergency relief--a period of substantial fear and insecurity--there were few other avenues for reaching farmers. The SOH and NGO collaboration worked well, building on the research strengths of the CGIAR and the "emergency smarts" of NGO partners. Since September 1995, SOH has been working with the Rwandan Ministry of Agriculture and National Program to help identify longer-term research and development (R&D) needs. It is in this "Phase II" that SOH helped carry out the first intensive nationwide, post-war agricultural surveys.

MONITORING THE IMPACT OF SEED AID AND ESTABLISHING INITIAL POST-WAR BASELINE DATA: PHASE I

STATUS OF REPORTS: PHASE I

From October 1994 through August 1995, SOH most closely worked with Care, Médicins sans Frontières, World Visions and Catholic Relief Services. Seven SOH reports have been drafted and circulated during this first phase. Three are for wider distribution, while four have been written for the specific NGOs to help them evaluate the impact of their seed aid in select locales. These assessments covered the Sept 94 to January 95 (96A) and Feb to July 95 (95B) periods. They monitored seed of all crops given as emergency aid which fall under the SOH mandate:beans, sorghum and maize. Assessments at the beginning were done in collaboration with NGOs as no government structures were functioning and NGO collaborators have specifically thanked SOH for helping to strengthen their research capacity and effecting impact estimates-otherwise not available. Accessibility to former crop information, for example, pre-war national wide surveys and technical reports of CGIAR and national networks, also proved valuable for helping NGOs contextualize their own efforts.

SOH ASSESSMENT DOCUMENTS: PHASE I

Emergency relief in Rwanda:

SOH 1.	ASSESSMENT OF BEAN SEED USE 1995A: SUMMARY REPORT
SOH 3.	ASSESSMENT OF BEAN AND MAIZE SEED USE 1995A IN CARE ZONE OF ACTION
SOH 4:	ASSESSMENT OF BEAN SEED USE 1995A IN WORLD VISION ZONE OF ACTION
SOH 5:	ASSESSMENT OF MAIZE SEED USE 1995A IN WORLD VISION ZONE OF ACTION
SOH 6	ASSESSMENT OF MAIZE SEED USE 1995A: SUMMARY REPORT

SOH 7: ASSESSMENT OF SORGHUM SEED USE 1995B IN CARE ZONE OF ACTION

Varietal erosion assessments:

SOH 2. THE IMPACT OF WAR ON PLANT GENETIC RESOURCES: BEAN VARIETAL ASSESSMENT IN RWANDA 1995A: SUMMARY REPORT

MAJOR FINDINGS ("LESSONS") OF THE ASSESSMENT REPORTS: PHASE I

Some of the major lessons learned in the first phase are outlined below. (Note that these are elaborated in the separate *SOH Assessment Reports* and will be taken up again in the *SOH Executive Summary* volume.)

1. Farmers were able to keep significant portions of their own stocks because seed aid and food aid were distributed quickly.

In 1995A, the first post-war agricultural season, 45% of the bean seed sown came from farmers' "own stocks", with 62% of farmers drawing at least a portion of their seed from home stores. For maize, parallel figures were 25% of the seed sown and 41% of farmers. (The figures on maize are lower in that the sample included farmers who normally don't sow maize but took advantage of the gift from aid.) For a small sample of Gitarama and Kigali farmers, (an area where ICRISAT seed was distributed), 53% of the sorghum seed came from own stocks, representing 57% of farmers during the 95B season. In addition to sowing a portion of the aid seed, farmers mention that eating and selling the relief supplies allowed them to keep the locally-adapted varietal materials.

When looking at farmers' own seed stocks from the perspective of varietal erosion, or 'varietal stress', it is useful to consider the number of farmers holding local varieties, through space, as well as aggregate figures on kgs of seed sown (the figures which normally appear in aid assessment reports.) The greater the percentage of farmers holding even small quantities of local seed, and the greater their dispersal, the greater the possibility of varietal diffusion.

2. Distributing mixtures (and a range of varieties) proved a good strategy for:

- production stability;
- permitting farmers to recover or select out "best varietal bets".

Even if the aid mixture was not appreciated overall, farmer evaluations showed that they were able to select out varieties which later performed well. This subsequent triage implies that the assessment of the performance of aid seed should take place over several seasons; it takes that amount of time for farmers to sort through the 'aid mixtures' and return the 'junk' to the market. Rejected aid seed was sold at same rate as grain for consumption.

3. Targeting varieties brings better results.

As one example, the sorghum varieties brought in from southwest Uganda (purchased by the Ugandan NARO in collaboration with ICRISAT) performed significantly better at higher altitudes than the NGO-purchased varieties which were moved from lower to higher altitudes of Rwanda.

Type of seed	N	Kg/Ha*
Local varieties (Rwanda)		
Shyorongi	12	1126
Mbogo	10	1561
Mugambazi	20	1670
Local varieties (Uganda)		
Nyabikenke	7	3400

Sorghum yields of aid seed in high altitude zones 1995B.

* Yield differences significant at P< .05

[The yields are high because of extrapolation from small surface areas. The final version will also adjust for harvest bag weight. The yield relationships stay the same.]

4. The war had significantly different effects on agricultural production over even very short distances.

The case of sorghum seed in the prefecture of Gitarama illustrates the point. Of 10 farmers sowing in Runda 95B, 7 had lost their entire harvest and 1 had collected "but a handful" during the disruptions of the previous sorghum season 94B. In contrast, all those interviewed in Mbogo harvested the 94B season either "at the normal time" or "slightly late". Thus over short geographic distances, here about 25 km, farmers were very differently affected by the April to July 1994 disturbances. The table below shows 6% of the seed sown in Runda coming from local stocks, with a comparable figure in Mbogo of 84%.

COMMUNE	N	Major sources for seed					
		<u>Own</u>	<u>stock</u>	Eme	ergency aid	1	<u>Market</u>
		Kgs.	70	Kgs.	%	kgs.	70
Gitarama							
Mukingi	10	21.5	59	9.6	26		-
Runda	10	2.0	6	19.0	56	12.8	38
Musambira	10	8.8	35	16.5	65		_
Nyabikenke	5	1.3	28	2.8	61	-	-
Kigali (North)							
Shyorongi	7	25.0	77	7.5	23		
Mbogo	5	29.0	84	5.5	16	-	
Muga mbazi	13	33.5	55	31.0	34	7.0	11

Major sources for sorghum (% and kgs of seed sown), season 1995B CARE zone, (Summary of 7 communes in 2 prefectures).

This finding has implications for deciding how to sample to assess 'varietal erosion' in war torn situations. As will be discussed further, the density of sampling across sites has to parallel the variability in the disruptions caused during stress events. Similarly, the density of sampling in any single site should be in relation to the amount of diversity found previously.

5. Farmers are able to recover many of their "lost' local varieties because local seed channels are functioning.

Many farmers sought refuge away from farm-- with resulting theft from fields and storage stocks. In the case of beans, only 29% said they lost any varieties at all and in the vast majority of these 'loss' cases, farmers know they can re-obtain the variety either on the market or through friends. The Phase I bean survey, January 1995 (N=143 households), only 4% of farmer said they didn't know where to re-obtain select varieties.

6. Improved varieties which have been lost have been more difficult to re-access, unless these varieties had already entered local seed channels (either neighborto-neighbor exchange or local markets).

For varieties distributed in more recently, e.g. since 1990, farmers have been counting on outside channels for restocking: perhaps through development projects, NGOs, or other formal sources. This is particularly the case for improved climbing beans.

NATION-WIDE SURVEYS TO DETERMINE THE EFFECTS OF WAR ON AGRICULTURE AND THE CURRENT STATUS OF PRODUCTION OF FOUR KEY CROPS: PHASE II

In the third season post-war, September 95 to January 96 (96A), SOH guided the first intensive post-war agricultural surveys. The period was the first time that stability was sufficient to allow for a nationwide, spatially-extensive sample. In-depth interviews were conducted in all prefectures and two-thirds of the Rwandan communes (90 of the 144 total). The research on potatoes, beans, sorghum and manioc, key Rwanda crops and key SOH crops, covered some 1200 households. The sample size was large, but also geographically extensive to be able to capture micro-variations in the effect of the war across small spatial distances. The sample size and distribution were relatively comparable to that formerly used by the Ministry of Agriculture's Department of Agricultural Statistics.

This research was in conjunction with the first cadre of post-war Institut des Sciences Agronomiques du Rwanda (ISAR) researchers. As all scientists involved (about 20) were new recruits, the surveys served to introduce most to the methodology of on-farm surveys as well as to expose them to their country's wide regional diversity. Select NGOs also participated in surveys in which they had a keen interest, such as World Vision in reference to potatoes.

Broadly, the survey covered the following themes:

Current crop profiles seed stocks varietal profile select management practices production constraints seed channel / system analysis

The impact of war on agricultural production seed stocks varietal profile select management practices production constraints seed channel / system analysis

STATUS OF REPORTS: PHASE II

Preliminary results have already been synthesized for the national program and for the Ministry of Agriculture. A lengthy seminar, held at ISAR in April 1996, allowed ISAR collaborators, interested government personnel and NGO colleagues to have input into the interpretation of the reports before they were drafted into their final forms. Ministry officials were presented with written drafts so as to allow their formal reply. Three of the four centers holding the key crop mandates were also presented drafts of their crop findings prior to report finalization. The insights of CIAT for beans, CIP for potatoes; and ICRISAT for sorghum have been very helpful.

Draft reports are presently available for the following:

SOH 8:	RWANDA: NATIONWIDE HOUSEHOLD SURVEY: STATUS OF BEAN CROP
SOH 9:	RWANDA: NATIONWIDE HOUSEHOLD SURVEY: STATUS OF POTATO CROP
SOH 10:	RWANDA: NATIONWIDE HOUSEHOLD SURVEY: STATUS OF SORGHUM CROP

These last two pieces are still in outline form:

- SOH 11: RWANDA: NATIONWIDE HOUSEHOLD SURVEY: STATUS OF MANIOC
- SOH 12: EXECUTIVE SUMMARY OF SOH SOCIO-ECONOMIC ANALYSES IN RWANDA: THE IMPACT OF THE WAR ON AGRICULTURAL PRODUC-TION

Final reports will be issued shortly. As suggested above, in addition to crop-specific reports, an Executive Summary will elaborate major findings on the overall impact of the war as well as key crop recommendations.

SELECT FINDINGS: NATIONWIDE SURVEYS: PHASE II

Below are presented a few of the findings in reference to overall patterns. For crop-by-crop insights, it is more useful to consult the detailed technical reports. These latter consider microlevel variations and are being prepared to allow for precise, targeted relief, research, and development operations.

1. THE PATTERN OF THE WAR AS IT AFFECTS AGRICULTURE

1.1. The "time away" from the homestead was highly variable.

The "time away" from the homestead is one important indicator in assessing agricultural stability in any region. "Time away" suggests lapses in crop management but may also be correlated with damage to house infrastructure, seed stock loss, and theft from fields (as was the case in Rwanda).

On average, farmers were away from the homestead about four months. However, in Cyangugu and Gikongoro (the latter being the French's "Turquoise Zone), most farmers didn't move at all. In contrast, Byumba was very hit from about 1992-94 and The Kibungo zone is still relatively depopulated.

In reference to those who were farming in Rwanda before and who are still farming, <u>a</u> significant portion. 30% of farmers, did move from their land—not even for one day. This family stability has important implications for variability stability. The survey noted such "stationary" residents in 59 out of the 90 communes sampled (66% of the communes).

Prefecture	Average time (weeks) "away" during war period
Butare	19.6
Kigali	12.1
Gitarama	11.6
Cyangugu	3.4
Gikongoro	3.8
Kibuye	6.7
Gisenyi	6.7
Ruhengeri	23.6
Byumba	54.6
Kibungo	21.5
Average of total	16.6

Dislocation due to civil war

1.2. Overall, harvest rates of key SOH crops during the 1994B turbulent periods were higher than initial official estimates suggest.

Overall harvest rates

Сгор	% of Farmers who harvested at least a part of what they sowed the 94B sea- son
Beans	55
Sorghum	54
Cassava	91*
Potato	63

- Manioc fields were rarely completely destroyed, but select stealing (from fields of 82% of manioc farmers) was rampant.
- 1.3 However, again, there was significant variability by crop and region (e.g. see case of sorghum in Kibungo).

Rwandan Farmers who successfully harvested sorghum 94B (N=496).

Prefecture	% harvested (of those who sowed)*
BUTARE	31
KIGALI	34
GITARAMA	43
CYANGUGU	81
GIKONGORO	79
KIBUYE	78
GISENYI	53
RUHENGERI	73
BYUMBA	78
KIBUNGO	7
TOTAL	54%

* Only 2 of the 156 farmers who <u>didn't sow</u> cited the war as a reason. For most, either it "was the wrong season" or they "were elsewhere".

1.4. The percentage of female-headed households is presently higher than pre-war levels: currently, 26.2% v. 22-23% pre-war.

II. PRODUCTION CONCERNS (Select summary points of crop by crop surveys)

Potatoes

- II.1 Potato production is drastically down in comparison to the period just before the war, with two-thirds of potato farmers now sowing less.
- II.2 A third of all potato growers are having difficulty resupplying seed lost during the war. Many are still counting on development projects to resupply them. Western Gisenyi is slightly better off than the other major potato zones sampled.
- II.3 Among normal users, fungicide and fertilizer use has also been significantly cut (by 2/3 and 4/5, respectively). Most cite lack of availability and high cost as constraints to continued use of these inputs. Again, Gisenyi is relatively better off in these respects than the other zones sampled.
- II.4 A very small core of potato varieties dominate production, with the reliance in Gikongoro on Cruza reaching an astounding 86% of all seed sown.

<u>Beans</u>

- II.5 The varietal situation in beans looks relatively stable pre and post war. There is strong demand for restocking of improved climbing varieties.
- II.6 A select number of communes complain of a lack of local bean varieties overall (northern Ruhengeri, parts of Byumba, Southern Kigali). Special efforts might be considered to reintroduce local varieties.
- 11.7 Lack of access to seed (i.e. no purchasing power) rather than lack of bean seed per se is a more widespread problem. Development practitioners might consider ways to finance purchase of local seed from local channels as well as the usual strategy of donating seed itself.
- II.8 Root rots seem to be intensifying. Both farmers and researchers noted a sharp rise relative to rates recorded in the pre-war years. (Several communal authorities in Byumba and Kibungo specifically asked ISAR researchers to work on this issue.)

Sorghum

- 11.9 The varietal situation in sorghum looks relatively stable pre-and post war. There may be limited loss of local varieties in small areas of southern Butare and northern Byumba.
- II.10 Lack of access to seed (i.e. no purchasing power) rather than lack of sorghum, seed <u>per se</u> is a more widespread problem. Farmers particularly complain of household shortages in: southern Butare, northern Byumba, parts of Gitarama and much of Kibungo. Development practitioners might consider ways to finance purchase of local seed from local channels as well as the usual strategy of donating seed itself.
- II.11 Only a quarter of farmers have ever tried improved sorghum varieties, and less than 5% are currently growing improved cultivars. There may be room for considerable research impact in this area.
- II.12 Overall, farmers cite few problems relating to their sorghum crop.

<u>Cassava</u>

- II.13 The vast majority of farmers have retained some of their manioc plants: there has been minimal varietal loss.
- II.14 Select regions have low availability of cuttings overall: northern Kigali, southern Gitarama, western Kibuye, select communes in Butare.
- II.15 About a half of manioc farmers report decreased area under cassava production because of:

- lack of cuttings (only 1/3 of responses)

-priority to other crops; (Many don't want to invest currently in long-cycle, low-value crops)

- reduced labor

II.16 Only a fifth of farmers have ever tried improved manioc varieties, with a tenth currently growing improved cultivars.

III. ISSUES OF VARIETAL EROSION

III.1. For beans, there is no evidence of varietal erosion due to the war.

In the vast majority of cases (84% of farmers), key mixture components were stable across pre and post-war seasons. Further, two-thirds of farmers have not lost <u>any</u> desired varieties. Among those who have, re-acquisition is largely feasible through both the local market and from their immediate community of friends and neighbors.

It is important to remember that the "active" war took place at different times in different parts of the country. The very north (Butaro, Kidaho) was most acutely affected in 1990-91. Parts of Byumba was near paralysed 1992-1994. The rest of the country was hardest hit April 1994 onwards. (So we don't have a disruption of agricultural patterns simultaneously across the country.) Second, the effects of the war---even in adjacent zones--was highly variable. The case of sorghum seed has been described elsewhere (*SOH Assessment Document 7*): in areas 25 km apart, one set of farmers reaped 80% of their harvest and the other nearly none. Third, even within the same sector, farmers responded to the effects of the war differently. Some didn't move off their farms, while others in the same zone, may still be out in the Zairian camps. The old, sick rarely moved. Some moved for a few days to a week. There are only a few, very select areas where local varieties are hard to come by: namely northern Ruhengeri, parts of Byumba and southern Kigali.

III.2. For beans, survey results indicate that there has been some erosion of varieties over the longer term due to two related trends: The adoption of climbers due to needs for agricultural intensification and the increase in root rots.

Climbers. There has been an acceleration in the adoption of improved climbers, with 47% of farmers sowing climbing varieties. Across the country, there are zones where improved climbers are pushing out (in some zones completely) both local bush and local climbing types. For example, in the commune of Nyanyumba (Gisenyi), farmers describe their local mixture as composed of "Kajamarike" (Cajamarca), Umubano, and Umwizarenda- all three improved climbing varieties. The effects of the war in this last zone were minimal and farmers specifically say that the local climbing mixes were dropped around 1992, as "they were no longer productive".

Root rots. Farmer evaluations are also showing dropping of local varieties due to heavy disease pressures across the country but particularly in Kibuye, Butare, Gikongoro and now Byumba. In some of these areas, there has been a simultaneous shift to climbers (many of which show greater tolerance). However in places like Cyangugu (e.g. Gisumo and Gafunzo), farmers are still using bush beans, but experimenting with changing the varietal profile. Again, this dropping of varieties occurs in areas where the effects of the war were minimal.

III.3. For sorghum: there is no evidence of varietal erosion due to the war.

From early on after the war (e.g. 95B, the first major post-war sorghum season), farmers have drawn a large part of their sorghum seed from their own stocks. Two-thirds say they have lost no varieties at all. Among those who have, most have already restocked through the markets or friends.

III.4. Sorghum varietal diversity is less extensive than SOH scientists had suspected.

The survey generally showed about 7 varieties grown within each commune sampled. Further, over two-thirds of the seed sown was of "pure varieties"---not mixtures.

III.5. The Rwanda data is encouraging a major rethink of the concept of "varietal erosion" The concerns in Rwanda are not varietal "absence and presence". Varieties can be found. The problem is ACCESS.

Farmers often suggested that "lost" varieties exist locally but that have no re-obtained them. Why? 1) In many regions, farmers describe seed price as inordinately high; 2) For both beans and sorghum, they complain of having to buy entire mixtures in order to get the one or two varieties they really want and 3) their priorities are simply elsewhere. Rather than buy the specific varieties lost, they first want to get a door on the house, fix the windows, maybe pay for labor not needed before. What the surveys show overwhelmingly is that most farmers are poorer than they were before. They've had to buy seed, their livestock (key for manure) have been stolen and/or eaten, and farm infrastructure needs repairing. Farmer seed systems, however, particularly the many many local markets, are functioning.

III.6 The Rwandan analyses suggest that future initiatives such as SOH give at least equal attention to the SEED CHANNELS which can re-supply germplasm as to the germplasm itself.

When thinking about varietal erosion, one should consider not only the germplasm itself, but the seed channels through which the germplasm is accessed. The issue goes beyond whether the farmer has a particular variety at one point in time. The key point is whether the farmer can get the variety again, if he/she so desires. Varietal erosion is a dynamic process, but so it "varietal re-accessing".

As noted above, the Rwandan varietal situation looks relatively promising. This "limited varietal damage" is partly due to the pattern of the war itself (see point 1). However, in terms of safe-guarding diversity, one of the great bonuses of Rwanda also centers on its seed channel structure. For self-pollinated crops such as beans and sorghum, seed restocking can be done very locally through the many decentralized local markets which serve rural needs. Restocking through neighbors and friends (social relationships that may have been ruptured by the war) has never as important as the local markets. Even the first season post-war, we find such markets supplying the bulk of farmer seed---not

relief aid agencies.

The hardest hit crop, by far, was potatoes. Farmers near exclusively rely on improved potato varieties. The formal, centralized seed structures, which routinely deliver potato seed, completely stopped functioning for almost two years—along with the commercial channels which supply inputs as fertilizer and fungicide.

The full set of *SOH Assessments* (12 separate reports) are now being finalized. Reports are, and have been prepared for different audiences: the Rwanda MoA and National Program, specific NGOs, the International Research Community interested in germplasm concerns, and the Donors. It is IDRC's strong commitment to client-orientation and practical results which has allowed the Principal Investigator such flexibility.

APPENDIX 2

SEEDS OF HOPE II: Crop Seed Banks to Assist Restoration of Food Security in the Greater Horn of Africa, December 1995.

SEEDS OF HOPE II

CROP SEED BANKS TO ASSIST RESTORATION OF FOOD SECURITY IN THE GREATER HORN OF AFRICA

A USAID FUNDED PROJECT

"Helping to prevent conflict and repair its ravages has become a primary interest for the donor community."

> Development Assistance Committee of the OECD, December 1993

"...the cost of not acting, of having to deal with imploding societies and failed states, will be far greater than the cost of effective action."

USAID Strategy Paper, May 1993

Implementing Agency: The International Center for Tropical Agriculture, Cali, Colombia

Project Consultant: William R. Scowcroft PhD, Australian National University, Canberra, Australia



SEEDS OF HOPE II

CROP SEED BANKS TO ASSIST RESTORATION OF FOOD SECURITY IN THE GREATER HORN OF AFRICA

A USAID PROJECT FUNDED THROUGH THE GREATER HORN OF AFRICA TASK FORCE

I. PURPOSE

To conduct a feasibility analysis and develop an action plan which will:

Provide a continuing technological response to disaster by reestablishing food security through rapid replenishment of adapted varieties of major food crops in the Greater Horn region of Africa.¹

II. PRIMARY OBJECTIVE

The primary output will be a comprehensive report that evaluates the feasibility of the SEEDS OF HOPE II (SOH II) proposal and a proposed action plan and implementation strategy including multilateral funding options.

III. RATIONALE

Disaster resulting from civil strife or natural events frequently devastates agriculture and domestic food production. The consequence is seriously impaired food security. To avoid starvation, illness and death, massive and prolonged food aid is usually required.

Worldwide, increasing numbers of people are being affected by disaster, rising from 50 million per year in the early 1970s to 125 million in the 1980s and more than 320 million in 1991. Refugee numbers escalated dramatically to more than 17.5 million in 1992/93 and there are also an estimated 20-25 million internally displaced people in 31 countries (Global Humanitarian Emergencies, US Mission to the UN, 1995).

In response, official development assistance (ODA) for emergency relief has grown from 2% of total ODA in 1988/89 to more than 7% in 1991. Each year a greater proportion of the USA overseas aid budget supports emergency relief. Similarly, in 1988 Germany spent \$36 million on emergency relief but by 1992 the amount had spiralled to \$680 million.

Disaster and its relief in the Greater Horn of Africa is no exception. Since 1980 significant disaster, either man-made, natural or both, has affected every country in the region (Table 1).

¹ Maize, wheat, sorghum, beans, cassava, potato/sweet potato, plantain and sugar along with milk account for at least 70% of calories and 60% of protein (Tables 3 & 4).

Among the poorest regions in the world, food security in the Greater Horn is highly vulnerable, further exacerbating the problem. More than 70 million people (46% of the population) in the region are chronically food insecure. In 1994 external food aid was required for 22 million people, half of which were refugees or displaced people as a result of civil strife. The other half were victims of severe drought.

There is an urgent call for action to mitigate against food insecurity through the development and application of pre-emptive technology to restore food production in disaster stricken areas.

Notably, USAID, supported by President Clinton's initiative on the Greater Horn of Africa², is promoting a strategic approach to counter the impact of disaster on food security.

The Seeds of Hope for Rwanda program has successfully shown that the restoration of genetic diversity for critically important food crops undeniably assists the rehabilitation of domestic food production. Starting before the end of the civil war in Rwanda, immediate and effective support was mobilized from eight CGIAR Centers, five donor countries and World Vision Australia, NARS of the neighboring region and many emergency relief organizations. This approach will also work on a broader scale for the Greater Horn region.

IV. SCOPE OF THE FEASIBILITY ANALYSIS

In the Greater Horn region pre-emptive action must focus on the nine most significant food crops (Table 2). For any one country in the region five crops at most are critical to food security.

Throughout the northern part of the Greater Horn wheat, maize, sorghum, barley and sugar along with milk contribute at least 75% of calories (Table 3) and 65% of protein to diets (Table 4).

In countries of the southern Horn region maize, sorghum, cassava, potato/sweet potato, beans and plantain contribute more than 70% of calories (Table 3) and 60% of protein (Table 4).

Development research on these crops is being carried out by one or more of the CGIAR Centers, mostly with staff permanently located in eastern, central and northern Africa (Table 5). Most of this research is integrated with country national programs usually through networks.

Only the CGIAR Centers have the ability to focus and adapt relevant crop technology to restore food security in an emergency situation. Technology is already developed and available from the CGIAR Centers, some developing country NARS and other research institutes. Adaptive research will be needed to apply existing technology to situations requiring low technology solutions.

²Breaking the Cycle of Despair: President Clinton's Initiative on the Horn of Africa. Building a Foundation for Food Security and Crisis Prevention in the Greater Horn of Africa, November 1994.

A fully implemented program will require effective and rapid replenishment of adapted varieties of major crops. This will require concerted effort to strengthen four interdependent components:

1. Variety Seed Banks

It is proposed that strategically located seed banks will be established to provide adequate storage for crop varieties, land races and advanced breeding materials adapted to specific regions and neighboring areas. Full documentation and regular reporting on holdings will be a feature of these banks.

It is imperative that the seed banks complement one another and those of the NARS and IARCs of the region in terms of crop species and variety and land race distribution. Sufficient seed must be stored in order to have a significant impact on restoring relevant crop diversity to disaster stricken areas within a short time. Seed must be made available immediately and unconditionally during and following disaster.

The seed banks should be based on technology which is independent of external services such as electricity, which can be unreliable in the event of disaster and even during normal times.

The seed banks can also supply non-emergency requests for "certified" seed of adapted material for use by public and private seed producers during normal times.

2. Seed Multiplication Capacity

It will be necessary to secure production of high quality planting material for continuing replenishment of variety seed banks. Seed multiplication and monitoring will depend on NARS and farmer community participation and management.

Protocols will have to be implemented to ensure high quality seed production under appropriate cultural, phytosanitary and harvesting conditions.

A possible commercial spin-off may be the widespread development of a certified seed industry in the region.

3. Crop Environment Domain (CED) Maps

Maps which integrate crop variety and land race characteristics with agroclimatic descriptors of the Greater Horn region will facilitate sourcing of appropriately adapted material from one region for use in agroclimatically similar regions which have experienced disaster.

To create CEDs crop varieties and land races are classified primarily on the basis of adaptation to temperature, precipitation and water availability and soil type, and to a lesser extent on radiation and photoperiod.

These CEDs will be of particular value to NARS, emergency relief NGOs and intergovernmental agencies involved in restoring food security in disaster stricken areas.

To ensure widespread availability and utility the CEDs and associated manuals of variety descriptions should be produced in hard copy and CD-ROM format.

A preliminary CED map and a variety descriptor manual for beans has been produced for Rwanda and the surrounding region as part of the Seeds of Hope for Rwanda initiative.

4. Partner Integration

A mechanism must be established to ensure rapid and efficient planning and implementation of emergency restoration of food security through effective delivery of adapted varieties and associated agricultural inputs.

Partners and stakeholders will include:

- * National Agricultural Research Organizations (NARS)
- * Regional organizations, eg ASARECA
- * CGIAR Centers and other IARCs
- * Emergency relief NGOs and PVOs
- * Intergovernmental organizations, eg FAO, UN agencies, World Bank
- * Relevant donor agencies and foundations

The USAID project DESFIL (Development Strategies for Fragile Lands) has taken a lead role in liaising with NGOs to determine NGO requirements from a comprehensive approach to restoring food security following disaster. DESFIL will provide the major input to this phase.

V. STRATEGY

The in-depth feasibility analysis will develop an action plan and implementation strategy that includes options for multilateral donor support.

ASARECA, which is an affiliation of NARS Directors in the region, is expected to provide policy guidance and direction to the SOH II initiative.

The feasibility study will be carried out in an established institute which has a tradition of internationality and impartiality.

The objectives and outputs will be assessed and further refined in terms of:

- * Essential technology to restore food security after disaster.
- * Relative contribution of specific food crops to effective restoration of domestic food security by region and country.
- * Capacity to access and implement relevant technology.
- * Commitment to the initiative by:

NARS in their own right and through regional bodies such as ASARECA. CGIAR Centers individually and collectively through the CGIAR. NGOs and other relief agencies. Donors, foundations and possible private sector interests.

The action plan and implementation strategy will address a number of criteria including:

- * Regional applicability through demonstrable impact on more than one country.
- * Human resource development, particularly the use and enhancement of skills in farming communities, local scientists and technicians and emergency relief workers. Specific attention will be given to gender related aspects of restoring food security.
- * Contribution of potential outputs to the emergency relief development assistance continuum with emphasis on sustainable food security, transition from disaster relief to sustained development and economic growth directly and through spin-off benefits.
- * Delivery of outputs and effective implementation within the near term.
- * A strategy to develop and consolidate linkages among concerned organizations.
- * A strategy to secure multilateral funding, preferably for at least seven years in the first instance.

VI. WORK PLAN AND BUDGET

The feasibility analysis and action plan will be completed by September 30 1996 according to the milestone schedule in Appendix I.

The funding to support the US\$100,000 budget for this project (Appendix II) was provided by the United States Agency for International Develoment through its Greater Horn of Africa Task Force.

Reporting obligations for the project are:

January 29, 1996	- first progress report
April 26, 1996	- second progress report
July 29, 1996	- third progress report
September 30, 1996	- final report

The project will be managed and coordinated by Dr W.R. Scowcroft on behalf of CIAT, Cali, Colombia.

.

VII. CONTACT PERSONS

a .	For the Project:	
	Dr William R. Scowcroft,	Phone +61 6 249 0660
	Centre for Resource and Environmental Studies,	Fax: +61 6 249 0757
	The Australian National University,	E-mail: billscow@cres.anu.edu.au
_	ACT 0200, Australia	Private phone/fax: +61 6 282 4354
Ъ	For CIAT:	
	Dr Rupert Best,	Phone: +57 2 445 0000
	Deputy Director General - Research (Acting),	Fax: +57 2 445 0273
	CIAT,	E-mail: R.Best@ CGNET.COM
	AA 6713, Cali, Colombia	-

c. For USAID: Ms Carole Levin, G/EG/AFS IARC, USAID, Room 402 SA-2, Washington, DC 20523-0214, USA C.Levin@CGNET.COM

APPENDIX I

PROPOSED PROJECT MILESTONES

	DATE	MILESTONE
	1995	
	Nov 13	Formal start of project
	Nov 27	Work plan submitted for approval
	Dec 15	Work plan approved
	1996	
	Jan 29	First progress report
	Feb 9	Operations begin in the Greater Horn region Africa resource specialist appointed Initial round of partner consultations started
	Mar 6	Consultative workshop in Entebbe convened by ASARECA involving NARS, IARCs and other partners
	April 26	Second progress report
~	May 31	NARS project components completed
	June 28	Specialist consultant report completed
	July 29	Draft feasibility/third progress report
	August 31	Second consultative workshop to discuss project result
	Sept 30	Final report of feasibility analysis

APPENDIX II

PROPOSED BUDGET EXPENDITURE

	\$US
Project Consultant	33,750
Project Travel	15,200
Local Resource/GIS Specialist	11,000
NARS/Partners Consultative Works	hop 24,360
NARS (ASARECA) Project Develop	oment 10,000
Project Office Support	5,690
TOTAL	\$100,000

SOH II/WRSCIAT/DEC 95 PAGE 9

~

ACRONYMS

.

.

ASARECA	Association for Strengthening Agricultural Research in East and
·	Central Africa
CUAR	Consultative Group on International Agricultural Research
CIAT	Centro Internacional de Agricultura Tropical
CIMMYT	Centro Internacional de Mejoramiento de Maiz y Trigo
CIP	Centro Internacional de la Papa
EABRN	East African Bean Research Network
EARRNET	Eastern African Root Crops Research Network
EARSM	East African Research on Sorghum and Millet
FAO	Food and Agriculture Organization
IARCs	International Agricultural Research Centers
ICRC	International Committee for the Red Cross
ICRISAT	International Crops Research Institute for the Semid-Arid Tropics
IGO	Intergovernmental Organizations
IITA	International Institute of Tropical Agriculture
IPGRI	International Plant Genetic Resources Institute
NARS	National Agricultural Research Services
NGOs	Non-Government Organizations
NVRP	Nile Valley Regional Program
OECD	Organization for Economic Cooperation and Development
PRAPACE	Programme Regionale d'Amelioration de la Pomme de Terre et de
	la Patate Douce en Afrique Centrale et de l'Est
PVO	Private Voluntary Organizations
RESAPAC	Reseau pour l'Amelioration du haricot (Phaseolae) dans la region de
	l'Afrique Centrale
SADC	Southern Africa Development Committee
SARRNET	Southern African Root Crops Research Network
SOH	Seeds of Hope
UN	United Nations
USAID	United States Agency for International Development

Drought and Civil Strife in the Greater Horn



Source: U.S. State Department, 1994; World Bank, 1994,

From: Breaking the Cycle of Dispair: President Clinton's Initiative on the Horn of Africa, Nov. 1994.

SOH II/WRSCIAT/SEPT 95

Country	Pop n '	Wheat	Rice	Maize	Sorg	Other cereal ²	Cass	Potato etc	Plantn	Sugar	Beans	Ferm bevs	Milk	Other ³
Djibouti	0.56	79.6	62.7							40			60.2	25%
Ethiopia ⁴	57	32.2		27.4	15.3	45.6								17%
Somalia ³	7.9	N/A	N/A	N/A	N/A.								N/A	11%
Sudan	30	53.1			87.3	4				18			127.8	18%
Burundi	5.7			27.8			97.4	119.3			52.8	62.5		24%
Kenya	27	14.3		103.2			30.0	28.5		22			80.3	6%
Rwanda	7.3			15.7	20.8		51.6	139.5	147.9		24.5			14%
Tanzania	25.8		13.4	70.6	9.1		242.6				6.1	71.6		27%
Uganda	17.2			19.7		21.6	123.9	96.5	167.2		17.4			27%

TABLE 2 : Consumption of major food commodities in countries of the greater horn region of Africa (kg/cap/year)

Source : Compiled from FAO Agrostat Data, 1992.

¹ In millions; figures for 1992.

- ² Includes barley, millet, oats and rye.
- ³ Percentage of calories from remainder of food intake.
- ⁴ The figures for Eritrea are not available separately from Ethiopia.
- ⁵ Data on totals not available for Somalia.

SOH II/WRSCIAT/SEPT 95

Country	Total	Wheat	Rice	Maize	Sorg	Other cereals	Cass	Potato etc	Piantn	Sugar	Beans	Ferm bevs	Miľk	Other
Djibouti	2166	638 29%	528 24%							405 17%			106 5%	489 25%
Ethiopia	1414	279 20%		262 19%	142 10%	489 35%								285 17%
Somalia	1423	154 11%	125 9%	462 33%	158 11%					82 6%			279 20%	163 11%
Sudan	2061	450 22%			738 36%					176 9%			255 12%	442 21%
Barundi	1767			242 14%			184 11%	311 18%			486 28%	119 7%		425 24%
Kenya	1747	107 6%		898 51%			86 5%	71 4%		210 12%			139 8%	236 14%
Rwanda	1814			137 8%	186 10%		147 8%	345 19%	361 20%		225 12%	162 9%		251 14%
Tanzania	1926		111 6%	632 33%	82 4%		456 24%				57 3%	63 3%		525 27%
Uganda	2013			162 8%		159 8%	334 17%	247 12%	408 20%		161 8%			537 27%

TABLE 3 : Calorie contribution by major food sources in the countries of the greater horn region of Africa (cal/cap/day)

Source : Compiled from FAO Agrostat Data, 1992.

WHO levels are : International minimum standard for survival - 2100 cal/day Standard for adequate diet - 2400 cal/day

Includes other roots and tubers, dry peas, soya beans, groundnuts, vegetable oils, fruits and vegetables, beer, meat, fats, eggs and fish, all in small quantities.

SOH II/WRSCIAT/SEPT 95

1

Country	Total	Wheat	Rice	Maize	Sorg	Other cereals	Cass	Potato etc	Plantn	Sugar	Beans	Ferm bevs	Milk	Other
Djibouti	49	19.0 39%	9.8 20%		ł					-			5.7 12%	14.5 30%
Ethiopia	46.5	8.3 18%		6.7 14%	3.1 7%	12.0 26%								16.4 35%
Somalia	42.6	4.4 10%	2.4 6%	12.2 29%	4.5 11%					•			12.0 28%	7.1 16%
Sudan	62.3	13.7 21%			21.1 32%					-			13.2 20%	14.3 23%
Burundi	58.9			6.4 11%			0.9 2%	4.3 7%			31.4 53%	1.2 2%		14.7 25%
Кепуа	48.5	3.2 7%		23.7 49%		*	0.7 1.5%	1.2 2.5%		•			6.9 14%	12.7 26%
Rwanda	43.2			3.6 8%	5.1 12%		0.7 2%	5.1 12%	3.2 7%		14.6 34%			10.9 25%
T <i>anza</i> nia	45.3		2.1 5%	14.9 33%	2.5 6%		4.8 11%				3.7 ¹ 8%	0.9 2%		16.4 35%
Uganda ²	46.8			3.9 8%		2.7 6%	2.9 6%	3.5 7%	3.7 8%		10.6 23%			19.5 42%

TABLE 4 : Protein contributed by major food sources in countries of the greater horn region of Africa (g/cap/day)

Source : Compiled from FAO Agrostat Data, 1992.

.

¹ In Tanzania beans account for only 3% of calories, but 8% of protein.

² Fish contributes 4.1 g/cap/day (9% of total protein), although the contribution to total calories is not significant. SOH II/WRSCIAT/SEPT 95 TABLE 5

CGIAR CROP AND RELATED EXPERTISE FOR ... E GREATER HORN REGION

, ·

CGIAR CENTRE	CROPS FOR GHA	AFRICAN REGION EXPERIENCE	STAFF LOCATIONS IN GHA	REGIONAL NETWORKS	RESEARCH ON GHA (+)
CIAT, CALI COLOMBIA	BEANS CASSAVA	EASTERN; GREAT LAKES; SOUTHERN	UGANDA, TANZANIA RWANDA*	RESAPAC EABRN SADCC	BR, GR, CP, PP, BT, IA, PR.
ICRISAT, HYDERABAD, INDIA	SORGHUM MILLET PULSES	EASTERN; SOUTHERN; HORN	KENYA	EARSAM	BR, GR, CP, PD, IA
ICARDA, ALEPPO SYRIA	BARLEY PULSES	HORN		NVRP	BR, GR, CP, BT, PD, IM, PR
CIP, LIMA PERU	POTATO, SW. POTATO	EASTERN; CENTRAL; HORN	KENYA, TANZANIA RWANDA*	PRAPACE SARRNET	BR, GR, PD, BT CP, IA, PR
CIMMYT, MEXICO	MAIŻE, WHEAT	EASTERN; SOUTHERN	KENYA, ETHIOPIA		BR, CP, PD, GR.
IITA, IBADAN NIGERIA	CASSAVA PLANTAIN	EASTERN; GREAT LAKES; SOUTHERN	UGANDA, TANZANIA RWANDA *	EARRNET SARRNET	BR, GR, PM, PD, CP, BT, IA.
IPGRI, ROME ITALY	GENETIC RESOURCES	EASTERN; GREAT LAKES; HORN	KENYA	SADCC	GR, IA, BT, PR

1. e e

ang pang ng pan

* INTERNATIONAL STAFF EVACUATED, 1994

+ BR - BREEDING

GR - GENETIC RESOURCES CP - CROP PRODUCTION BT - BIOTECHNOLOGY PD - PEST DISEASES PM - PROPAGATION METHODOLOGY IA - IMPACT ASSESSMENT PR - PARTICIPATORY RESEARCH

.

APPENDIX 3

Report 1

Inaugural Meeting, ILRAD, Nairobi, September 21/22 1994.

SOH RWANDA/PCR/JULY 96/WRS

•

SEEDS OF HOPE

INAUGURAL MEETING AT ILRAD, NAIROBI SEPTEMBER 21/22 1994

1. The following organizations were able to participate in the meeting which was called at relatively short notice:-

CGLAR Centers - CIAT, ICRISAT, CIP, CIMMYT, IITA, IPGRI (apologies from ILCA)

NARS - ASARECA (represented by NARO, Uganda)

INTERNATIONAL ORGANIZATIONS - World Bank, FAO

DONORS - IDRC, Nairobi office; AIDAB, Nairobi office

NGOs - World Vision

Names and telecom contacts are in Appendix 1.

2. The meeting opened at 8:30am. Representatives and their organizations introduced, the agenda agreed to (Appendix 2), and W.R. Scowcroft, DDG, CIAT approved as Chairman.

- 3. Proposal Update and Funding Status W.R. Scowcroft, CIAT
- (i) Introduction and Background

SEEDS OF HOPE (SOH) is a CGIAR based initiative to assist Rwanda in the rehabilitation of agriculture and reestablishment of domestic food security through the emergency reintroduction of crop varieties and genetic diversity adapted to Rwandan conditions.

The civil war in Rwanda has devastated agricultural production, in a country where more than 90% of the population is engaged in agriculture. The major sources of food in Rwanda are beans, sweet potato, potato, sorghum, maize, cassava and plantain. These crops represent 73% of food consumption and 79% of both calorie and protein intake.

Sustained crop and food production under the characteristic low input conditions of Rwandan agriculture, absolutely depends on genetically diverse, well adapted and disease resistant crops suited to the diverse growing conditions of Rwanda.

Several CGIAR centers have worked on crop development projects in Rwanda and countries of the region for many years. These include CIAT (beans), CIP (sweet potato, potato), ICRISAT (sorghum), CIMMYT (maize), IITA (cassava, plantain). In addition IPGRI is concerned with conservation of crop genetic resources and ICRAF with forest tree genetic resources.

Within the first month of the outbreak of war, several centers (CIAT, CIP, ICRISAT) independently responded to the expected devastating impact of the war on food production. These centers, encouraged by USAID and IDRC, Canada, consolidated their efforts and joined by CIMMYT, IITA and IPGRI, convened in Nairobi, June 23, 1994 to formulate the SOH initiative. CIAT took on the convening role for SOH.

Meanwhile many of the Centers had consulted with and provided technical support to NGO and international relief agencies and participated in UNREO convened coordination meetings in Nairobi. CIAT and ICRISAT published technical pamphlets for the benefit of relief agencies who were acquiring planting seed for use in Rwanda.

IDRC, Nairobi also convened a meeting in late June of bilateral and multilateral organizations concerned with past development projects in Rwanda.

In early July, 1994, the CGIAR inter-center SEEDS OF HOPE initiative was presented to potential donors and made available to international agencies, NGO relief agencies and NARS in countries of the region.

(ii) Current Funding Status

By mid-August, commitments to cover the full cost of the SOH initiative had been received as follows:-

In \$US

USAID/OFDA	\$US 400,000	400,000
ODA (UK)	£Stg 150,000	78,000 (estimate)
SDC (Swiss)	\$US 200,000	200,000
AIDAB (Aust)	\$AUD 260,440	$185,000^{-1}$
World Vision Aust	\$AUD 140,845	100,000
IDRC (Canada)	\$CAN 150,000	110,000 (estimate)

	TOTAL	1,073,000

¹ AIDAB have contributed an additional \$US50,000 to assist in the rehabilitation of the Tree Seed Centre in Butare to be undertaken by CSIRO in collaboration with ICRAF.
The participating CG Centers will be contributing an additional \$U\$800,000 as in-kind contributions to the SOH initiative.

All of the Centers actively increasing seed have been using core funds to support this initiative to date. Direct costs involved in SOH seed increase activities since July 1 will be considered as part of budget allocation. Purchase of seed of sorghum landraces by ICRISAT (\$3,000) has also been supported by Mennonite Central Committee.

Agreements have been signed with ODA and SDC. Similar agreements from IDRC, USAID and AIDAB are imminent. Cash flow has begun with ODA funds being received in early September.

4. The Situation in Rwanda - R. Buruchara/W.Youngquist - CIAT

(i) Observations on Seed Supplies in Rwanda

The following was distilled from a meeting with Pierre Lepoint (previously with Service de Semences Seleccioné - SSS); Jim Hooper et al; WV; and personal observations (13-17/9/94).

Our general observation of the crops from Kigali to Butare are as follows. The rains had not yet started in southern Rwanda and consequently the hillsides were not showing much farming activity. The marrais were being planted. We estimated that about 40-50% of the marrais shows current farming activity. Of this area:

50-60% has been planted to sweet potato 20-25% to beans 10-15% to soya 10-15% is not yet planted or else crop could not be identified

Beans

For the seed scheme, the bean varieties that they would like are Peveya 8, Urugezi, Vuninkingi, 59????, Kilyumukwe (if seed is available).

In Ruhengeri region (north), WV observed about 1% of the cropped land with climbing beans still on the vine.

Most people that we talked to indicated that beans were in short supply. Farmers were planting other crops (sweet potatoes, soya) because they didn't have beans.

<u>Maize</u>

SSS have 250 kg of Pool 8A (areas above 2000 masl), of which 200 kg will be given to World Vision for increase. Pool 9A seed was all lost. This was for the 1800-2000 masl. The varieties Mugamba and Isega from Burundi were liked by the farmers (SSS). For the low altitude areas, Bambou seed was all lost except for about 25 kg. They had lost their seed for Katumani, but this is not the same as Kenyan Katumani since it had been reselected over many years and may not be recoverable. Nyaka Flint is also desired. He noted that F2 seed of Kenyan Hybrids 625 or 626 would be pretty good. He noted that the Kenyan Hybrids were better than the Zimbabwean.

At the Tamira station, Mutura (Gisenyi), the farmers have some Pool 8A seed.

Generally in the north, there is still a fair amount of maize growing (anywhere from knee high to mid grain fill) from April-June plantings.

<u>Sorghum</u>

Sorghum seed was largely not looted in Kigali, though it has had poor storage with insect and rat problems. Ikinaruka is an early maturing variety that had been high in demand (current stock - 100 kg). The second is Tura of which they have 1.0 mt. For Kigufi, they have 1.0 mt, Kebo 1.2 mt, Amasugi 0.6 mt, and 100 kg of 5DX160 which is the variety in demand for brewing.

At Kinigi, some sorghum was observed in the fields.

Wheat

The breeding populations are lost, but the seed stocks remaining appear to be good. This amounted to 1.6-2.0 mt of Rwere, 1.2 mt Calima, and 0.9 mt of Mbundi.

At Kinigi, there is some activity threshing about 30 varieties. This should yield about 11b per variety.

Potato

For the variety Sangema, there are 50,000 minitubers that are pregerminated and ready to be planted. There are three tons of seed of the variety Cruza (for the Gigongoro area). The Belgians have 5000 minitubers of Kirundo and 5000 of Mabundo that could be imported. There is an approximate need for 500,000 minitubers. World Vision will be cooperating to plant and increase these seed stocks.

At Tamira, Mutura (Gisenyi), 2400 masl, there are about 4 ha of potatoes planted that should be ready in the next two weeks:

Cruza	1.5 ha
Mabondo	0.75
Mizero	0.75
Kirundo	0.75

Note that Selistin and an observator are still at the station.

At Kinigi, there are about 25 varieties of potatoes in storage (small quantities) and about 2 mt of Cruza and 3 mt of Sangema (germination expected in about 1 week). They need to prepare about 3 ha for seeding.

Generally in the north, potatoes can be found in the markets at a price similar to the prewar price.

(ii) Trip Report of Visit to Rwanda, 12 -19 Sept, 1994.

Wayne Youngquist and Robin Buruchara visited Rwanda and eastern Zaire (Mulungu) immediately before the SOH Nairobi meeting to:-

- a. make contact with the new authorities in Rwanda regarding SOH and CIAT activities;
- b. attempt to visit CIAT offices in Butare and Rubona.
- c. attend a meeting on seed relief aid for Rwanda in Kigali,
- Sept 17, 1994
- d. visit PNL scientists in Mulungu Research Station, Zaire

This comprehensive report is in Appendix 3

(iii) Prospects for the 1995 A Season (Oct, 94 - Jan, 95)

Rains have begun in the North of Rwanda and there is evidence of land preparation in progress. It is still dry in the south but there is some evidence of farm activity in the valley bottoms. However, the valley bottoms represent the best land and only 5% of farmed area in Rwanda.

According to a report of an FAO/WFP Crop and Food Supply Assessment Mission which visited Rwanda 9 - 17 August, the harvest from the 1994 B season (Jan - July, 94) was severely affected by the civil war. Planting for this season was normal and weather conditions were favorable to excellent. Yield and quality could have been above normal. But large scale displacement of people, the extensive killings and civil disruption impeded or completely halted crop maintenance leading to weed proliferation and increases in pest populations thus reducing yields. In addition, scavenging by people and damage by animals further reduced yield.

The net effect is a 60% reduction in the production of cereals and pulses and a 30% reduction in output from plantains and roots and tuber crops. Massive grain imports will be needed to avert famine until the next harvest is in (Jan/Feb, 1995).

The outlook for the 1995 A season will depend on three factors:-

- * reasonable political stability and security
- * extent and speed of return of displaced persons and refugees.
- * the availability of seeds, tools and fertilizers.

Widespread shortages of beans and maize seeds are being experienced. Emergency planting seed for the 1995 A season are estimated by FAO at 8,500 tons of beans, 1,700 tons of maize, 640 tons soybeans and 850,000 packages (10 g.) of vegetable seed. Clean, healthy cuttings of sweet potato and cassava are in short supply and an estimated 800,000 hoes are required along with nearly 1,000 tons of fertilizer.

The NGO and international relief agencies have been very active in acquiring supplies of planting seed. A weekly "Seed Meeting" is held in Kigali to coordinate efforts. The relief agencies are targeting prefectures and communes in a systematic way to minimize duplication and to ensure adequate coverage is made in all areas and for as many relevant crop species as possible. Details are in Appendix 4.

Time is of the essence. Land preparation should be well advanced and seed, fertilizer and implements already distributed to farmers. Advanced acquisition and distribution of large volumes of seed, implements and fertilizer, though not a direct part of the Seeds of Hope, was strongly advocated early by many including SOH members. It is to be hoped that the recent effort in August/September by the World Bank/FAO for "Emergency Supply of Basic Agricultural Inputs to Affected Farmers" is in sufficient time to have a significant impact on this 1995 A season planting. If not food aid will be required for a further 4 - 6 months.

- 5. World Bank/FAO Initiative on "Emergency Supply of Basic Agricultural Inputs to Affected Farmers" - Jit Srivastava, World Bank and Wil Collett, FAO.
- (a) The Proposal

The World Bank has provided \$20 million for emergency relief to Rwanda. \$4 million is targeted for emergency assistance to farmers for which FAO is the executing agency. This initiative has two major actions:-

* The immediate priority is the distribution of seed and implements to cultivate the main food crops. Seed varieties selected include those adapted to the country's agricultural conditions and available locally on the sub-regional markets. Once the

"acceptable" varieties have been defined, the process of negotiating, purchasing and transporting the seeds will begin. (Main crops will be beans, maize, sorghum and vegetables. Tuber and root crops will not be considered at this stage as they are less affected than legumes and cereals by the impact of the crisis.)

* A follow up measure is the reconstruction of the genetic diversity of the main food crops by multiplying basic seed under rural conditions (rural multiplication network).

The program has been approved by the Board of the World Bank and the agreement signed between the Bank and FAO and by the Government of Rwanda.

The program will be managed by a facilitating agency, likely to be an international NGO with experience in managing emergency assistance and handling inputs distribution. It is anticipated that the facilitating agent will appointed by mid-October.

A consortium will be established consisting of representatives of the Bank, FAO, donor governments and NGOs. The purpose of the consortium is to share information and to maximize collaboration.

Seeds of Hope will be a member of this consortium.

Mr. Wil Collett, FAO had just been appointed as the FAO representative for this Rwanda initiative. He will visit Rwanda arriving there Sept 23 following which details of the operational aspects will be more clearly defined.

(b) Relationship of WB/FAO initiative to Seeds of Hope

There is clear and obvious complementarity between the two initiatives. SOH was not designed to provide and distribute large volumes of seed and implements to farmers on an emergency basis. Rather its purpose is to restore relevant genetic diversity to Rwanda which is essential for the early rehabilitation of sustainable food production.

Multiplication of the adapted material assembled by SOH is essential to replace initial seed introduced by the WB/FAO initiative which cannot be expected to be well adapted to Rwanda. It is anticipated that the WB/FAO initiative will provide some incremental support to the larger scale, farmer and contract based seed multiplication phase of SOH.

NGO relief agencies will be the primary agents for seed, implement and fertilizer distribution under the WB/FAO initiative. Since the civil war began SOH has provided technical advice and support to the NGOs particularly about sources of supply and target areas for adapted crop varieties. This support will continue.

NGOs will also be the primary distributors for samples of adapted crop seeds as and when they become available from SOH, beginning season A 1995. SOH will maintain technical advice and support to NGOs and recipient farmer groups during the distribution phase and thereafter.

Several NGOs will provide follow up support in Rwanda following initial large scale seed/implement distribution under the WB/FAO initiative. Likewise, SOH will consolidate on the reintroduction of genetic diversity to further enhance the spread of adapted material and to determine the impact. Jointly, the NGOs and SOH have the objective of assisting Rwanda to rehabilitate its agriculture in the shortest possible time.

IARC members of SOH, NGOs and intergovernmental agencies (IGOs) active in Rwanda have already benefitted from the highly complementary and mutually beneficial collaboration that has occurred since the civil war began. As emergency relief gives way to development initiatives, the IARCs, the NGOs and the IGO,s will continue to work together.

Moreover, the contacts already made, the mutual benefit already derived and the joint experiences learnt provide an excellent base for an early and effective response to inevitable future disasters.

6. NARs Collaboration and Role - Dr D.R.Akimanzi, NARO, Uganda

Dr Akimanzi was nominated to attend by Dr Mukibi, who is Director of NARO, Uganda. Dr Mukibi was invited to attend primarily in his role as Director of the newly formed ASARÈCA (Association for Strengthening Agricultural Research in East and Central Africa).

SOH has budgeted for a significant contribution to NARS activities which assist in meeting the objectives of SOH. Allocation of these funds should not be unnecessarily delayed.

Research scientists and their organizations in countries which neighbor Rwanda have shown a splendid response to requests for seed and germplasm samples, assistance with seed multiplication and encouragement for SOH. To date countries involved include Uganda, Burundi, Tanzania, Kenya, Zaire and Malawi.

At a recent meeting in Addis Ababa, the Seeds of Hope initiative was endorsed by ASARECA. It was noted that as SOH is now established, it is important to strengthen the initial links with the NARS of the region.

Discussion from the floor addressed the issue of NARS assisting in the development of seed multiplication schemes within their own country. This received strong support and it was noted that this concept was a logical part of and an extension to SOH and consistent with the seed multiplication component of the WB/FAO initiative.

Further discussion from the floor emphasized the need for capacity building, particularly in Rwanda, but also in neighboring NARS. More attention should be given to establishment of more comprehensive germplasm banks throughout the region so as to provide security against loss of adapted material as a result of civil or natural catastrophe.

Copies of the report of this meeting are to be sent to the Director of ASARECA and to Directors of the NARS in Rwanda, Burundi, Uganda, Kenya, Tanzania, Zaire and Malawi.

7. NGO Interface and Role - Dick Venegoni, World Vision Intl and others

The interface and strong collaboration already developed between the SOH members, NGOs working in Rwanda and NARs has been referred to earlier and it was again emphasized how important that has been up until now and obviously into the future, particularly in Rwanda, but also elsewhere.

8. Donor Support and Commentary - Luis Navarro, IDRC & Andy Olver, AIDAB

The two donors present at the meeting, along with the other donors, were formally thanked for their support and the speed at which they had responded to this emergency in Rwanda.

One donor commented that with the new WB/FAO initiative, it was important that SOH and the WB/FAO initiative be highly complementary and avoid duplication. Earlier meeting discussion and further clarification led to a consensus declaration that the two initiatives were highly complementary and related but sequential parts of the spectrum of emergency activities required to help ensure effective and rapid restoration of crop production and food security in Rwanda.

IDRC, following the meeting it convened in July, took the initiative to publish a monthly bulletin entitled "Rwanda News" (Appendix 5). This is most timely as a means to keep all organizations informed. A summary version of this SOH meeting will be included in the next issue.

There was some discussion as to whether SOH might require additional funding beyond the end of 1995. It was pointed out that most crop related activities in Rwanda had been part of ongoing development projects and networks before the civil war.

Given reasonable political stability in Rwanda, it is expected and hoped that ISAR staff and facilities will be restored to a sufficient operational level to resume development research programs and network activities during 1996.

- 9. SOH Seed Multiplication Activities and Workplans
- (i) CIAT Bean Seed Multiplication Activities

Rwanda

- 1. Seed from on-farm trials, 8 varieties, about 2 kgs each are being set up in Butare for increase.
- 2. Seed is to be given to WV Rwanda for multiplication which is being coordinated with the Ministry of Agriculture:

a.	Nginurare	3 kg
b.	Flora	5
C,	Vunkingi	5
d.	Umubano	50
e.	Urunyumba	50
f.	Cal 96	100
g.	MCM 5001	550

Uganda

- CARE from on-farm trials of Rwandan climbers, 2-3 kilos of each of 11 climbers have been located for multiplication, as well as 250 kg Umubano, and 150 kg Urunyumba.
- 2. The national bean program is planting over one hectare to 65 different Rwandan bred varieties at Namalongwe. These are RWR and RWK lines, about 0.5-4 kgs of each variety.
- 3. CIAT is producing the same lines, but have an additional extra ten that are in short supply.
- 4. Two Rwandan seed mixtures that were collected by UNICEF are to be multiplied.

Kenya

24 lines at Kakamega with root rot tolerance are being multiplied. Some of these lines are from Zaire.

Malawi

250 lines originating from Urs's collection are under multiplication (c. 0.5 ha?)

Tanzania

- 1. About 65 introduced lines that had been tested in Burundi are being multiplied.
- 2. 5 released Burundian varieties are being increased. (c. 4 ha)
- 3. 10 mixtures from Burundi are being increased in conjunction with Sasakawa/Global 2000 and Tanzania Ministry of Agriculture. (c. 5 ha)
- 4. About 25 lines from 3 Rwandan mixtures that had been stored by Wellesborne in England are being multiplied.

Zaire

160 lines from Urs's collection have been increased in the screen house and will be ready for the next planting in about 3 weeks.

Cali

35 varieties were increased. 15 are now ready for shipping (150 kg). An additional 300 entries from Betsy Lamb collection are to be increased.

(ii) **ICRISAT Sorghum Multiplication Activities**

Sorghum is an important traditional food crop in Rwanda. It is consumed both as a porridge and a beverage, and as such supplies Rwandans with about 20% of their caloric and 17% of their protein intake. It is cultivated on 150,000 ha in all parts of the country. There are three major zones of production based on elevation, the lowlands (1200-1500 masl), mid-altitudes (1500-1800 masl), and highlands (above 1800 masl). For seed set, virtually all sorghum grown in Rwanda requires tolerance to low temperatures, a characteristic found only in sorghum of the eastern and central African highlands and a very few other areas of sorghum production.

ICRISAT's activities on sorghum for the Rwanda Seeds of Hope initiative are summarized below:

1. A brochure, "Sorghum for Rwanda", was produced in late June and about 300 copies have been distributed. This brochure is meant to serve as a guide to agencies involved in the multiplication of sorghum seed for Rwandan farmers. It provides information on varieties suitable for the various production areas of Rwanda (including a map), possible sources of seed, and a word of caution about the necessity of cold tolerance in sorghum varieties suited to Rwanda conditions.

- 2. In order to have seed available for the next sowing season (Dec-Feb) in the Rwandan highlands, an effort is underway to procure grain of landraces from the July harvest in the adjacent highlands of southwestern Uganda. Funds (\$6000) for purchase of 20 t grain have been provided equally by ICRISAT and the Mennonite Central Committee, the logistics for procurement has been arranged by NARO (Uganda) staff located at a nearby research station, and CARE International is providing transport to Kigali and storage facilities. About half the grain had been procured by mid-September.
- 3. A Rwandan variety suitable for cultivation in the lowlands (1200-1500 masl) is currently under increase by a commercial firm in Kenya. We expect this increase to provide 10 t seed in time for the season beginning in Dec 1994. Seed stocks for this sowing came largely from the ISABU sorghum program in Burundi. Hence, we hope to have a total of 30 t seed available for the season beginning in Dec 1994.
- 4. The University of Nairobi is providing ICRISAT land to increase seed of highland sorghum. We expect to have increased by Nov 1994 0.2 kg seed of each of over 1000 germplasm lines (about 300 from Rwanda) and 5 kg seed of each of 30 advanced breeding lines of the ISAR sorghum improvement program. This seed will be maintained by ICRISAT until ISAR's program is in a position to use it. Additionally, about 0.1 ha has been sown of each of two Rwandan varieties (mid and high altitude) to provide seed for further increases in 1995 by the private sector in Kenya (10 t each) and much larger increases by NGOs in Rwanda.
- 5. Between now and the Dec 95/Feb 96 sowing we expect to have an additional 45 t of sorghum produced in Kenya and sufficient seed available to NGOs in Rwanda for much larger increases in 1995. We are concentrating our efforts toward increasing seven of the best Rwandan sorghum varieties, two for the lowlands, two for mid elevations, and three for the highlands. KARI is providing land for initial increases of some of these varieties.
- 6. We hope to be able to send two ISAR technicians for 6 months In-Service Training at the ICRISAT Asia Center in 1995 and to provide financial support to the ISAR Sorghum Coordinator (now in Goma) to become engaged in useful activities (eg. seed production) in Rwanda during 1995.
- (iii) CIMMYT Maize Multiplication Activities

The maize component of the Seeds of Hope project will largely consist of a major increase of seed in 1995 for use in the September 1995 and January 1996 plantings in Rwanda.

Activities:

- 1. July 1994. Seed of three varieties selected for multiplication was sent from Mexico and from CIMMYT-Harare to Cargill International in Tanzania. Two of these varieties, Pool 9A (11 kg) and Pool 8A (2 kg) are adapted to the higher elevation of Rwanda. They had previously been released by ISAR. The other, ZM 607 (10 kg), is an open pollinated variety developed at CIMMYT-Zimbabwe, with adaptation to the lower elevations within Rwanda. It has streak resistance, a virus disease that is common in this environment and has been widely tested in East Africa.
- 2. August 1994. Cargill International, under irrigation in northern Tanzania near Arusha, planted the 3 varieties CIMMYT provided.
- 3. December 1994. These materials will be ruoged by CIMMYT breeders from Harare to ensure purity. This initial increase will be harvested in January and will be planted in February, 1995. Seed from the February 1995 planting, which should amount to about 200 t, will be ready for shipment to Rwanda by September 1995.
- 4. On-going. J. Ransom is collaborating with WV to see if an increase of maize can be initiated within Rwanda. Apparently, 200 kg of Pool 8A have been supplied to WV by the former seed scheme in Rwanda, and could be increased in northern Rwanda.

(iv) CIP/PRAPACE Multiplication of Potato and Sweet Potato

Before the war, Rwanda had well-developed seed systems for both crops. The successful multiplication and distribution of planting material for vegetatively propagated crops requires an interlocking system of seed technologies and institutions. The rehabilitation of the physical facilities and human resources of the Rwandan NARS should receive high priority for immediate further funding.

For potato, the first goal of CIP and the PRAPACE network within the SOH is to support the production of adequate quantities of basic seed in neighboring countries to provide foundation stocks. This material will be transported into Rwanda for further multiplication into certified seed. Several alternative techniques will be employed in order to produce adequate foundation stocks. The multiplication and distribution of the material within Rwanda should begin as soon as possible, and will be financed out of other sources, possibly including the World Bank/FAO project and NGOs.

1. In Kenya, five potato varieties are in the process of rapid multiplication from tissue culture at CIP/KARI facilities at Muguga. Sangema and Cruza have been widely adopted by Rwandese farmers over the past 20 years. Mabondo was released more recently, and has been well accepted in certain target regions. Victoria and Kabale

have recently been released in Uganda, and have performed extremely well under conditions similar to those in Rwanda.

It is expected that up to 200,000 tuberlets will be produced by January 1995. These nuclear seed stocks will then be multiplied in Rwanda if possible. It is estimated that after one additional multiplication, this material will generate 100 tons of basic seed.

- Starting next month at the NARO Kalengeyere station in Kabale, Uganda, 3 tons of prebasic seed and 45,000 mini tuberlets of the varieties Sangema and Cruza will be multiplied in the field. This should generate about 50 tons of basic seed in early 1995. Concurrently, rapid multiplication techniques using stem cuttings will produce an additional 15 tons of nuclear seed stocks by January or February 1995. After further multiplication within Rwanda, this material can generate up to 140 tons of basic seed by May 1995.
- 3. In Burundi, about 76,000 minitubers of Cruza will be field multiplied, generating up to 40 tons of basic seed.

The use of TPS as a low-cost source of clean seed tubers will be organized within Rwanda starting in 1995. The strategy will involve the distribution of packets of high-quality seed of adapted TPS progenies to groups of farmers. They will be trained to produce tuberlets in nurseries, and then use these tuberlets as a low-cost source of seed. This technology for the utilization of the TPS will be promoted through on-site demonstrations and training in cooperation with community groups and NGOs. It is too early to establish quantitative targets.

In the case of sweet potato, the goal will be to rehabilitate and reorganize multiplication systems within Rwanda. Reports indicate that extensive areas of sweet potato are in the field, and that the risk of genetic loss of the diverse landraces is low. Starting in 1995, scientists from CIP and PRAPACE will work with local institutions and NGOs to organize training and other activities in response to demands as they evolve.

- (v) Impact Assessment
- (a) The Socio-economic Impact of War on Plant Genetic Resources : Beans and Sorghum

Key Questions:

- What genetic material do farmers have?
- How is it distributed?

- How do farmers and researchers value its variability?
- How best can genetic perspectives be integrated in seed relief efforts?

Objectives of Genetic Resource Assessments:

- Investigate genetic variety available to farmers before and after relief efforts.
- Analyze farmer assessments of their utility.
- Document farmer insights on post-relief vs. pre-war varietal blends.
- Shape genetic perspective in NARS reconstruction.

Research Activities:

- 1. Country-wide genetic profiles on existing diversity (bean and sorghum) to include:
- a. Collection of seed samples from 500 households in major agro-ecological regions pre- and post- seed relief effort.
- b. Comparison of collections against baseline sources (characterization of three collections: baseline, post-war and six seasons after on-set of seed relief activities).
- 2. Investigation of farmer assessments on need for and access to valued genetic material which will involve surveys at regional (market) and household levels to:
 - a. Determine available genetic materials.
 - b. Determine how farmers value it.
 - c. Document farmers' comparison of pre- and post-war bean mixtures.
- 3. Impact assessment of seed relief activities

Monitor through surveys conducted 2, 4 and 6 seasons after seed distribution, the impact of re-introducing 250 bean varieties and a number of sorghum varieties.

Key questions: Which varieties were distributed? Where? In what quantities? To which farmers? Was seed sown? Was it adapted? Do farmers value the material?

(b) Genetic Analysis of Bean Diversity in Rwanda: Pre- and Post Civil War

Output 1: Catalog of germplasm from the Great Lakes Region

- Activity 1.1: Passport documentation of collections from Rwanda, Burundi and Zaire
- Activity 1.2: Color photograph of germplasm from Rwanda
- Activity 1.3: Assembly of database
- Activity 1.4: Linking germplasm with available passport data to GIS

Output 2: Genetic Structure of the Great Lakes Region with Special Emphasis on Rwandan Germplasm

- Activity 2.1: Sub sampling of available collections based on morphological data
- Activity 2.2: Constitution of a core collection for the Great Lakes regions
- Activity 2.3: Phaseolin and AFLP analysis
- Activity 2.4: Linking with data collected on constitution of farmers of mixture, preference and evaluation
- Activity 2.5: Based on results of activity 2.4, monitoring of population dynamic of selected mixture over time

Output 3: Selection of Germplasm from the Primary Centers

- Activity 3.1: Identification of primary centers germplasm from the bean core collection with similar agroecological adaptation
- Activity 3.2: Molecular analysis of identified source of phosphorus efficiency in comparison with the Great Lakes regions
- Output 4: · Estimate of Genetic Loss
- Activity 4.1: Seed sampling of selected region in Rwanda before the introduction of new seeds
- Activity 4.2: Comparison with previous ex-situ collections from the same regions
- Output 5: Availability of Ex-Situ Collections to Rwanda
- Activity 5.1: Identification of Rwanda collections and selected germplasm from the Great Lakes regions and primary centers for introduction

Output 6: African Staff Introduced to Concept of Integration of Agronomic, Molecular and GIS Evaluation

Activity 6.1: Workshop on genetic diversity in Rwanda and the Great Lakes

(vi) ILCA Seed Multiplication

ILCA has offered to multiply seeds of bean, sorghum or maize germplasm under irrigation during the dry season in Ethiopia as planting material for larger scale production elsewhere.

Centers requesting this support should contact Jean Hanson at ILCA directly. Indicative costs to increase seed based on 40 accessions occupying 0.1-0.2 ha are:

Labor	\$US	7,000
Supplies		1,000
Fuel		1,000
TOTAL	\$US	9,000

Shipping costs to Kigali would be approximately \$580/ton.

(vii) Other Center Activities and Workplans

IPGRI (genetic resources), IITA (cassava) and ICRAF/CSIRO Division of Forestry (tree seed bank) are in the process of developing workplans for the SOH initiative.

10. SOH Coordination and Reporting Requirements

CIAT would continue to provide the convening role for SOH. Wayne Youngquist would provide the main coordinating effort in east and central Africa, with Robin Buruchara providing strong representation in the region on behalf of SOH.

A monthly report is to be prepared and distributed by Wayne Youngquist beginning with a report for October. This report will serve as the report for September. Information for inclusion in the monthly report should be in Wayne's hands by the <u>25th of each month</u>. Information in each months report may be extracted by Luis Navarro for inclusion in the IDRC Rwanda News Bulletin.

Reports will be sent to the following:-

<u>CG CENTERS</u> -	SOH involved personnel, DGs,
	CIAT, CIP, CIMMYT, ICRISAT, IITA, IPGRI, ILCA, ICRAF
	CG Secretariat, TAC Secretariat

<u>SOH DONORS</u> - USAID, USAID/OFDA, IDRC, ODA, SDC, AIDAB, World Vision Australia. (HQ + Nairobi + Rwanda offices) IGOs -UNREO, UNHCR, UNICEF, FAO, FAO/OSRO, WORLD BANK
('IQ + Nairobi + Rwanda offices)NGOs -World Vision Int, CARE, ICRC, Swiss Disaster Relief (Others may
be added as required)NARS -Directors, SOH involved personnel
ISAR, Rwanda; ISABU, Burundi; Uganda; Kenya; Zaire; Tanzania;
Malawi; Ethiopia; Sudan.OTHERS -ACIAR, Aust; Sasakawa Foundation; Crawford Fund for International
Research; CSIRO Division of Forestry, Winrock International; Cargill,
Tanzania; Ford Foundation; Rockefeller Foundation.

A network file will be set up to handle the E-mail.

If you wish additional institutions or names added to this list, please advise.

Periodic reports to SOH donors and sponsors will be required according to the agreements that will be signed. CIAT as the contracting agency will be responsible for generating and submitting these reports.

11. Consolidation of Budgets and Cash Flows

Budgets are being consolidated in line with detailed work plans for each of the participating CG Centers. All centers are expected to have submitted detailed work plans by the end of October along with budget requirements including modifications to the original proposal budget. A consolidated budget can then be prepared which will reflect activity through Dec 1995.

CIAT has established a special account into which funds will be received and from which payments will be disbursed. It was agreed that payments to Centers would be made quarterly in response to invoices which reflected expenditures during the previous three months and where necessary committed expenditures for the ensuing three months.

The first invoicing period was to September 30, 1994. Thereafter, the invoicing dates will be the last business day for the months of December, March, June and September.

Please submit 30 September 1994 invoices by end of October.

12. Next Meeting

It was decided that the next meeting would be held in Nairobi, tentatively scheduled for February 1 and 2, 1995.

Subsequently, W.R.Scowcroft will have to be in Cali, Colombia for the final phase of a quinquennial EPMR scheduled to start Jan 29, 1995. Hopefully the SOH meeting can be bought forward one or two weeks.

WOULD ALL CG CENTER MEMBERS OF SOH AND OTHER PARTICIPANTS CONFIRM THEIR WILLINGNESS TO MEET IN NAIROBI ON EITHER OF THE FOLLOWING TWO DATES:-

FIRST PRIORITY - MON/TUES 23/24 JAN, 1995 SECOND PRIORITY - THURS/FRI 19/20 JAN, 1995

POST SCRIPT

The next meeting will be held from 23-24 January 1995. We are exploring the possibility of holding the meeting in Kigali.

W.R. Scowcroft Deputy Director General-Research CIAT 13 October 1994

NAME	AFFILIATION	FAX	PHONE	<u>E-MAIL</u>
Stan King	ICRISAT, Nbo	254-2-747554	254-2-747557	ICR-EARCAL@cgnet.co
Dan Kiambi	IPGRI, SSA, Nbo	254-2-631699	254-2-632054	IPGRI-KENYA@cgnet.c
Luis A. Navarro	IDRC, Nbo	254-2-711063	254-2-713160	LNAVARRO@cgnet.com
Jitendra Srivastava	The World Bank	1-202-334-0473	1-202-473-8975	JSRIVASTAVA@cgnet.c
Joel K. Ransom	CIMMYT, Nbo	254-2-631499	254-2-632054	CIMMYT-KENYA@cgn
Roger Kirkby	CIAT	255-51-75600	255-51-72714	RKIRKBY@cgnet.com
Peter T. Ewell	CIP, Nbo	254-2-630005	254-2-632054	CIP-NBO@cgnet.com
H.M. Kidanemariam	CIP, Nbo	254-2-630005	254-2-632054	CIP-NBO@cgnet.com
Dick Venegoni	World Vision Int.		254-2-339736, Ext 255	
Robin Buruchara	CIAT	256-41-567635	256-41-567670	CIAT-UGANDA@cgnet.
Wayne Youngquist	CIAT	255-57-8264	255-57-2268/8734	wyoungquist@cgnet.com
Andy Olver	AIDAB, Aust. High Commission, Nbo	254-2-445034/9	·	, ,, ,, ,,
Wil Collett	FAOR, Kigali	254-2-727584	254-2-725069	
Soniia David	CIAT	256-41-567635	256-41-567470	CIAT-UGANDA@cgnet.
Dev R. Akimanzi	NARO		20556	140
Harold Norton	FAO	254-2-727584	254-2-725069	
J.B.A. Whyte	IITA/ESARC			c/o CIAT-KAWANDA
J. Hanson	ILCA	254-2-631481	254-2-632066	ILCA-NAIROBI@cgnet.

4

•

,

•

.

·

SUGGESTED AGENDA

A workshop roundtable format is the preferred structure. Named people (or nominees) are to introduce and lead discussion.

Wednesday, 21 September

•

08:30	Introductions/Agenda Approval	
09:00	Proposal Update and Funding Status	W.R. Scowcroft
0° 30	The Situation in Rwanda	W. Youngquist/R. Buruchara
10.00	World Bank/FAO Program	J. Srivastava/Wil Collett
10:20	Update on Center/Crop Activities*	
	CIAT/Beans	W. Youngquist
	CIP/Potato/SWP	P. Ewell
	ICRISAT/Sorghum	S. Kîng
10:30	Coffee	
10:50	CIMMYT/Maize	J. Ransom
	IITA/Cassava	J. Teri
	ICRAF/Forest Seed	D. Boland
	IPGRI	F. Attere
	ILCA	J. Hanson
	Socio/Economic Impact	S. David
	Genetic Analysis	W. Scowcroft
	(* Names are suggested; nominees OK)	
12:00	Open Discussion	
12:30	Lunch	
14:00	NARS Collaboration and Role - NARS Rep	Dev Akimanzi
14:30	NGO Interface and Role - NGO Rep	D. Venegoni
15:20	Coffee	
15:40	Other Issues and Clarification	
17:00	Adjourn	

Thursday, 22 September

08:30	Activities Definition and Budgets
	(10 min presentations for each crop/activity)
	Beans
	Potato/Sweet Potato
	Sorghum
	Maize
	Cassava
	Forest Seed
	Socio/Economic Impact
	Genetic Analysis
	Coordination
	Other
10:00	General Discussion
10:30	Coffee
10:40	Consolidation of Budgets and Cash Flow
11:40	SOH Coordination
12:00	Reporting Requirements and Schedule
12:30	Lunch
14:00	Completion of Earlier Agenda and/or Other Business

TRIP REPORT

To:Drs. Roger Kirkby, J. Kornegay, W. Scowcroft, F. Kramer, W. Havaner (DG). From:W. Youngquist and R. Buruchara. Date:24 September 1994. Subject:Report on trip to Rwanda and Zaire; 12-19 September 1994

1. PURPOSE:

A.To make contacts with new authorities regarding CIAT's activities and the Seeds of Hope efforts. B.Reattempt to visit CIAT offices in Butare and Rubona. C.To attend a meeting on seed relief aid for Rwanda in Kigali. D.To visit PNL scientists at Mulungu.

2. PERSONS CONTACTED:

 Dr Augustine IYAMULEMYE, Minister of Agriculture and Livestock, Rwandan Government.
 Mr Anastase MUREKEZI, Directeur du Cabinet (Permanent Secretary).
 Mr Laurent GASHUGI, Chef de Division Alimentation et Intrants, Agricoles, Acting Head of Crop Production.
 Jim Hooper, World Vision International, Rwanda.
 Pierre Lepoint, Belgium Cooperation
 Sewilien NDUWUMWAMI, Service de Semences, Min. of Agriculture.
 Jean-Francois Gascon, FAO, Rwanda.
 Urs Galliker, Swiss Disaster Relief, Kigali.
 Mbikayi Nkonko, PNL-Mulungu, Zaire.
 Pierre NYABYENDA, ISAR, currently in Bukavu.

3.SUMMARY:

A.Institutional Observations.

I.Meeting with Minister of Agriculture:

We met the Minister of Agriculture at his office shortly after our arrival in Kigali. We highlighted CIAT's activities both before and after April (1994) in the GLR, particularly, in Rwanda. We sought his guidance as regards to the validity of the agreement between the previous government of Rwanda and CIAT and our continued cooperation with Ministry of Agriculture (MOA). We also sought permission to visit Rubona and Butare offices. The following are the responses:

1. The minister assured us that the agreement and cooperation between the previous government and CIAT should still be considered valid and will continue. He will undertake to write a letter confirming this.

2.He pointed out that no bean germplasm were recovered from any

of the research stations or the seed scheme stores after the war and most of it was lost. He will count on CIAT's support and advice in the reestablishment of the bean genetic diversity in the country which he considers a priority and which should be considered as an emergency. He had received the Seeds of Hope proposal and his ministry will do everything to support it. Some seed multiplication should be considered to be done in the country and the government can set aside some land for this.

3.He suggested that we should encourage ISAR researchers to return. Humanitarian support for them to maintain their morale is acceptable.

4.A survey to determine the effect of war on germplasm is acceptable. A proposed visit by Louise Sperling in October should be OK.

He asked us to make visits to the seed scheme, Rubona, Butare and give him our impression and observations of the (bean) situation He handed us to his Directeur du Cabinet and also gave us another appointment at the end of the visit. The Directeur du Cabinet is the immediate past Chef du Department Statistiques Agricoles (DSA) which collaborated with CIAT in the adoption study of improved climbers in Rwanda. He is familiar with CIAT's activities and former CIAT staff. He asked Mr GASHUGI, the actin-Head of Crop Production to accompany us and facilitate our visit to Butare.

II.Visit to Butare/Rubona:

We visited Butare twice. First with Mr Gashugi and secondly on our own.

1.Butare - We met with the Sub-prefect and reviewed CIAT's work in the region and obtained permission to visit our offices in Butare and at ISAR, Rubona. The computer, printer, fax, photocopier and other electronic equipment had been removed. Most of the files, mail, blank checks and other office materials were slightly scattered, but still there. As much of the accounting paperwork for January-March 1994 as could be found were removed to Uganda.

We attempted to shift the files and documents to Robins' former house. But to our surprise, one government official showed up and informed us that we could keep the office since they expect continued collaborate with CIAT. Only a few documents were removed and the rest arranged and stored on the shelves. A specific rental agreement was not signed and this will have to b done at a later date. It is expected that the building will be given preference while restoring telephones and electricity sinc it is also occupied by the Prefect of Butare.

2. Rubona - The first time we visited the station there were a few military personnel guarding Rubona who took us around the offices. There was a systematic effort to remove, loot and destroy everything. All electronic devices were removed along with most of the diskettes. Anything that had no apparent use was literally destroyed. Some of the bookshelves had been overturned, files and papers were everywhere. Some desks were outside and certain offices, including Wayne's, had beds with files on them. Some offices were apparently used for lodging by the military. Food left-overs were scattered around. Window or door glass were smashed and chemicals poured out. Doors were broken. Several seed bags were meticulously (it must have taken time and patience) torn and seed either taken or poured on the floor. However, some seed samples, mainly ALS differentials which RB had asked a technician to pack, were still in seed packets. The main seed store was looted with the seed taken. Our last order of some 30 bales of paper bags were still in one looted store. The germplasm conservation unit was looted of equipment such as freezers etc. Much of the seed was taken or poured but there were some bean samples of accessions from CIAT. The basement section of the unit could not be entered as it looked "suspect". Next to the window were two shallow graves 1.

Two days after the first visit, we stopped at Rubona (ISAR) on our return to Kigali and found the place vacant of any military presence. We spent about ten minutes gathering a few important documents from our offices and departed. It is a concern that looters may return if the military has abandoned Rubona.

Negotiations were completed on Robin's former house for renting it for the next six months, with a three months rent payment being made. A few furnishings (chairs, desk, book case, file cabinet) were moved into it from Wayne's house. Repair work on the doors and windows had been completed, but some remained to be finished.

A meeting with Aubert and Beatrice resulted in plans for the seed increase of the varieties that Aubert had recovered from a few on-farm trials. Both indicated willingness to continue working with CIAT. Damascene, CIAT driver, was also at the meeting, but his having other employment and our lacking the need for a driver (no car) resulted in not continuing his employment. This could change in the future.

B.Technical Observation:

1.Observation of the crops from Kigali to Butare. The rains have not yet started in southern Rwanda and consequently the hillsides are not yet showing much farming activity. The marrais (valley bottoms) are being planted. We estimated that about 40-50% of the marrais shows current farming activity. Of this area: 50-60% has been planted to sweet potato 20-25% to beans 10-15% to soya 10-15% is not yet planted or else crop could not be identified.

2.We met with Pierre Lepointe (previously with Service de Semences Seleccion). He saw no point in our visiting the SSS station. All bean seed was looted. They plan to initiate seed multiplication of released varieties and would appreciate to receive initial seed from CIAT. This should include Peveya 8, Urugezi, Vuninkingi, 59/1-2, Kilyumukwe etc. Seed could be sent to WV, to be divided to Seed Scheme and WV.

3.Meeting with Jim Hooper of World Vision (formerly with IRRI in Madagascar).

We discussed their current plans. They are quite interested in starting in- country seed increase and they have started some negotiations with the Service de Semences Seleccion to start wit maize and potatoes. They also want to multiply some beans, particularly climbers in Ruhengeri research station. Earlier, they had received MCM 5001 and CAL 96 from us to try in Ruhengeri, Karama and Gikongoro. We are sending WV climbers seed (115 kg) of five Rwandan varieties that have now been harvested in Kabale area of Uganda. They have expressed an interest to assist ISAR on starting up again and would be interested in som of the material from the IBN.

4. Meeting with Urs Galliker of the Swiss Disaster Relief.

Urs formerly worked in Kibuye and is arranging to acquire seed and distribute in the prefecture of Kibuye. The population is still very much unsettled with many people continuing to move through the area. He indicated that the current price of beans is about FRW 180-250/kilo (US\$0.60 - \$0.85) and maize is at FRW 150/kilo (US\$0.50) in the market. We briefly discussed seed sources and future seed multiplication.

4.Seed Meeting in Kigali.

WY left for Zaire by air while RB stayed to attend the seed meeting. The minister of Agriculture participated and chaired th meeting. He pointed out that his presence was to show concern of the government on the seed issue. The government with the help of FAO and UNDP had started coordinating of seed relief activities so as to avoid duplication or omissions. He was keen to know plans, capacity and commitments of aid agencies and progress mad in seed distribution. He suggested that plans for distribution should be finalized by now and did not wish to burden agencies with indefinite seed meetings. He stressed that multiplication of seeds of adapted or Rwandan germplasm should be considered as ar emergency activity. He announced the efforts of the CGIAR center under the Seeds of Hope project. He was grateful that this was being done. He asked NGOs to collaborate with the Seeds of Hope project in multiplication and distribution. He proposed that multiplication be also considered inside Rwanda and promised the governments' support and contribution of land for seed multiplication. Of the estimated requirement of about 12,000 m tons of bean seed for this season, only about half had been pledged. Aid agencies were requested to give estimates of the their pledges and contribution before the next meeting.

Zaire

The research station at Mulungu is dominated by the presence of a refugee camp of some 40,000 persons. This camp begins at the border of the station 1 km from the office buildings. The planting season for beans started in the area in early September. The station had not yet planted trials (lack of funds), but land was being prepared. Expectations for a harvest (due to the refugees) is low.

Seed multiplication for the Seeds of Hope proposal was progressing in the screen house as had been planned. This seed should be ready for harvest in about three weeks and is expected to be planted back directly for further increase. Guards will be stationed to protect it.

Pierre NYABYENDA (RESAPAC Coordinator from 1 October) is currently living in Bukavu and we had a meeting discussing his future plans as coordinator of RESAPAC. Attempts are being made to obtain authorization for his taking up a temporary post in Arusha.

Plans were made for Mbikayi and Elukesu to travel to Cali and Kampala respectively for meetings.

Winifred is reported to have left Butare with the beige Landcruiser and taken up a residence in Rwanda about 30 km from Cyangugu. We attempted to locate her and recover the car, but were only able to find her daughter. She indicated that her mother had gone to Cyangugu, but not returned. There is a great difference between Rwanda and Zaire in this area which is the numbers of people. On the Rwandan side of the border, there are very few people, though some agricultural work appears to be progressing.

C.Implication for CIAT.

It was very good to find out that CIAT's agreement with the Government of Rwanda will continue in force, though we need to follow up on the letter confirming this if it does not arrive (addressed to DG). We should continue to support our staff in Rwanda with hopes that ISAR will be re-established. This will depend on conditions in Rwanda and the GoR demonstrating an ability to have the researchers return to their positions from Zaire.



La réunion a été ouverte par Monsieur Ahmed RHAZAOUI, Représentan Résident Adjoint du PNUD. Il a insisté sur l'importance de lance les activités agricoles qui permettront de reprendre les programme de développement. Enfin, il a passé la parole pour présider l réunion à Monsieur Anastase MUREKEZI, Directeur de cabinet qu représentait le Ministre de l'Agriculture et de l'Elevage empêch à cause de la visite officielle du Président de la République Butare.

Une partie importante de la réunion fut consacrée à des échange d'informations sur les stocks disponibles d'intrants agricoles, e l'usage que pourrait en faire différentes agences dans le cour terme. Il a été en particulier décidé que ADPR (Eglis Pentecotiste de Suède) pourrait distribuer les stocks de semence que possède le HCR, dans la région de Kibuye et Cyangugu. Le HC a offert d'examiner d'autres cas de régions n'ayant pas reç d'assistance pour de futures allocations.

Caritas Rwanda a annoncé le début de ses activités au nivea national, avec une première distribution de houes et de semence dans les préfectures de Butare et Gikongoro. La distribution serait étendue aux préfectures de Cyangugu et de Kibuye aprè l'avoir discuté avec les donnateurs intéressés. Le réseau o distribution extrêmement important dont dispose cette organisation doit pourtant encore être remis sur pied.

Il a été demandé au PNUD/UNREO de préparer deux tableaux destine à faciliter la gestion des ressources, et qui pourraient servir d base aux discussions durant les réunions hebdomadaires. Le premie de ces tableaux comprendrait un inventaire des intrants rendu disponibles au Rwanda, face à un inventaire des ressource disponibles pour la distribution. Le deuxième tableau reprendra toutes les informations sur quel organisme fait quoi et où.

Une ébauche de ces tableaux a été circulée pendant la réunion et premier jet préparé ultérieurement par le PNUD est attaché à cet note. Il est important de noter que d'après ce tableau, problème principal rencontré par les agences est celui du manque capacité pour la distribution des intrants dans les régio rurales. Le PNUD/UNREO veillera à ce que ces tableaux soie continuellement remis à jour.

La quantité de semences distribuées pour chaque famille se maintenue à 15 kg de semences de haricots par famille par mois, 5 Kg de semences de maïs. Le Président de la réunion a pourta noté que ces quantités pourraient varier en fonction de la régio de la disponibilité des semences et de la taille des familles. moyenne des surfaces disponibles pour les familles est inférieu à 1 ha. Le MINAGRI a proposé un document d'action pour la réhabilitation agricole, et une copie de ce document sera distribuée dans les boîtes aux lettres des agences qui le désirent au bureau de UNREO.

Le MINAGRI a aussi annoncé la création d'un secrétariat pour les intrants agricoles au sein de son Département, situé dans les bureaux du Ministère, derrière l'Hôtel des Mille Collines. Il sera dirigé par M. Servilien NDUWUMWAMI, qui participera aux réunions hebdomadaires, et travaillera en collaboration étroite avec le PNUD.

Le MINAGRI a aussi recommandé que les organisations qui n'auraient pas réussi à écouler pour la présente saison leurs semences, les conservent pour la saison prochaine (en mars 1995).

La discussion s'est alors déplacée sur le sujet des possibles inconvénients de la distribution des semences. Celles-ci peuvent être consommées ou revendues, ce qui nuirait à la capacité du pays à atteindre l'auto-suffisance. Plusieurs recommandations ont été faites; en particulier assurer une distribution de houes quelques jours avant la distribution des semences (le problème étant la difficulté de s'assurer un stock d'outils au moment propice); que les semences soient échangées contre de l'argent ou de la nourriture, voir dans un programme "food for work" (le problème étant le denuement de la population); ou finalement que les distributions de semences soient encadrées par des distributions de nourriture. Il a été noté que par le passé les campagnes d'avertissement au sujet de la toxicité des semences n'ont pas été très efficaces pour empêcher leur consommation par la population. La Coopération Belge a fait remarquer que les semences qu'elle écoule sont soigneusement triées pour éviter des maladies, mais ne sont de préférence pas craitées.

Le Président de la réunion a alors demandé aux agences de veiller par dessus tout à ce que la distribution se fasse, et cela le plus tôt possible. La réunion fut alors clôturée, et il fut décidé de la reprendre Samedi le 10/9/94 à la même heure et au même endroit.

Kigali, le 3/09/1994.

Emery BRUSSET PNUD/UNREO

	~	
٥		· · · · · · · · · · · · · · · · · · ·
•.	· · ·	
	Noms	Adresse
	Nome 1. Lazare NDAZARO 2. Ewald ZIMMER 3. Phil SUTJER 4. Jeff SEED 5. Simon MIZRAHI 6. Vincent BRIAC 7. Jean MUTAMBA 8. Leo GLENSVIG 9. Ibrahima KABA 10. Anastase NZIRASANAHO 11. Mathias BIGAYA 12. Aart VAN WESSEL 13. Jean BAGIRAMENSHI 14. Bobby WANDEL 15. Manfred HORR 16. Stephane DEVAUX 17. Petta WINDISCH 18. Darrell SEXSTONE 19. Ernest RUZINDANA 20. Patrice NZEYIMANA 21. Jean Pierre DE MARGERIE 22. P. BREABUY 23. Gérard BONNIERE 24. Brian MCKEOWN 25. Bertin KANA 26. Ssenteza Kajubi Masembe 77. Anastase MUREKEZI 28. Emery BRUSSET 29. Marc DEMYS 30. Athanase NGENDAHIMANA 31. Philippe CHARDONNET 32. Bernard MARKEY 33. Serge RWAMASIRABO 34. Klaus PITSCHE 35. Thaddée HABIYAMBERE 36. Galliker URS 37. Mark VANDERHKES 38. Alfred TOBLER 39. Philippe DE VESTELLE 40. Paul CRAWFARD 41. Spéciose KANTENGWA 42. Servilien NDUWUMWAMI 43. Anne MALONE 44. Simon NZARAMBA 45. Ray STUDER 46. Dabed PHAZAOUU	Adresse Ministère de la Réhabilitation et de l'Intégration Sociale CARITAS SWITZERLAND/CRS CARE INTERNATIONAL CARE INTERNATIONAL CARE INTERNATIONAL Médecins du Monde/Urgence Rwanda CARITAS RWANDA AUSTRIAN RELIEF PROGRAM UNHCR FAO MINAGRI MINAGRI MUNAGRI LUTHERAN WORLD FEDERATION German Agro Action CEE Bruxelle GTZ (German Technical Cooperation ECHO-RWANDA WORLD VISION WORLD VISION WORLD VISION WORLD VISION MORALD VISION AA RWANDA/TRANSINTRA: ADRA Directeur de Cabinet MINAGRI PNUD/UNREO KIGALI Coopération Technique Belge PNUD/KIGALI ACTION NORD SUD CONCERN WORLDWIDE UNICEF Agro Action Allemande MINAGRI Swiss Disaster Relief Unit CRWC ADEPR/PMV, B.P. 404 KIGALI MSF - KIGALI ADRA WORLD VISION MINAGRI REFUGEE TRUST REFUGEE TRUST REFUGEE TRUST REFUGEE TRUST REFUGEL
	 2. Construction 2. Construct	<pre>mail for a construction for the construction f</pre>
		•

DISTRIBUTION DES SEMENCES ET OUTILLAGES AGRICOLES

alana ya ana ana ana ana ana ana ana ana a				alist - Justian	
Organistina Prefecture		Constant			a contraction of the contraction
			Senerres		
	Kinali	Sharonni	Mais, Haricota	Itouca	
CAPE	N I E RII	Butamwa		*	
		Mogo	* *		
		Mugambazi		1.	
		Gitumero			
		Gikora		.	
	Byumhe	Giti		1.	
	y sprint a	Shtarzs Shtarza		•	
	Libunan	Kiwali Ville	En allenie	En attente	
€# rith +-Rsemitt#	Kirali	Rukaro	Į		
		En ciude (ofr ICRC)	Haricola	Houce	
MSF	Région Butere	f	1	1	
		*	Haricon		
	1 sham - 1	LOBICS SC# CONTRAINCE	Main/Haricola	House	Engrais chimiques
ADEPR/PNIV	Kinuye/				
	C 3 m 15 m 19			I	
Robusco True	Kigali	Kunzenze & Ngenda	Haricola	Houce	
Revolution			Main, Jegumen	(8000)	Meanmon
				Hours	1.000
			•		•
*** 55 \$1.	i andi	Gaubors, Kanzesze, Necoda		1 *	
Yourkal Y Is NON	r. 15 411		· ·		
•	Ruhengeri	Ndusu, Gmonde, Cycni			
*	-			•	
•	Cinenyi	Kanama, Mutura			
	<u>.</u>	Mine Makan Departing		•	•
	(ii) sopato	Arou, sigora, its assoc.			
		Muschesa	*		
				l .	
Tramice	Giuinne	Runua, Taba	1	ļ	
		1	Allerscols + Allein		Ante aforementative
				Houes	
	2°	Musmhies	Haricota + Maia	Hours	
Capacity	Colorwith a	Ritulawe			
		Tambwc		Howe	Nourrisure & Rutare
			Harkow + Maia	Sickles + Axes	
Action Nord-Sud	Kigalı	Rutongo	1 Zrumes	I IV, BUU Piowes	
(achat at distribution)		Rysiants	l Herstell		
		Burtanta	T OC WING	l	
Carstan SurverC'RS	By umba	A Calmer	Manine	4, SHO Houce	
		Mannte	SIXI NT Haricou	30.000 Hours	
turning Datist Program	Rubengeri	(String du Nord)	SOO XEE Minia	1	Appui au MINAGRI
VERNWO KUNU LIORUNU	Bysamba	Muvumlin	2.5 MT Selv	1	Programme de
			Haricots, Misis,		Telorencean
UNICR	1		Egumes, liunas de		
			potete doik'r,		
FAO			BOMINICH RC 17471102		
	3	1	ſ		

• •

t

۰.

TABLEAU DES BESOINS ET DE L'OFFRE

ONG/AGENCE	DISTRIBUTEURS (avez-vous betoin de dist.ibutions)	OFFRE DE SEMENCES ET OUTILS (avez-vous besoin d'offres)	
1. Médecins du Monde	Pas de capacité de distribution	MdM recherche des stocks de distribution de semences et ourils	
2. Core tern direct	Pro to bargins or failiques	Pre tabanoirs en sifiering	3
3. Caritas-Rwanda	Actuellement peu de capacité en étude de rétablir les anciens réseaux de distribution	En étude	
4. Austrian R.P.	Distrbution: Ruhengeri et Byuniba	Houes: 15.000 (promier programme) Seeds: en préparacion	
5. UNHCR	A besoin de distributions		
6. FAO	Avons des besoins pour la distribution aux paysans	Avons des besoins d'achat d'intrants (semences de haricots, de légumes, de maïe)	
7. ADPR	Distribution semences de haricots à Kibuye et Cyangugu		

٩.

.

٩

4

T.I. SITUATION AU 10/09/94 DES ENGAGEMENTS DES DONATEURS POUR FOURNIR DES SEMENCES VIVRIERES ET L'OUTILLAGE AGRICOLE AUX PAYSANS POUR LA SAISON CULTURALE 1995 A (Septembre 1994-Février 1995)

SEPIENCES			SENENCES	CES 007111		AGRICOLE	DATE DE DISPONIBILITE
DOKATEURS/ONG	Narīcots(1)	Maïs(†)	Légumes(Kgs)	Autres sommes	Houes(Pce)	Autres outils(Pce)	
CRS	100	100	105		30.000	20.000	12/09/94
German Agro-Action				······································			
UNKCR	500	500	502		4.500		20/09/94
CARE International	400	400			40.000	· · · · · · · · · · · · · · · · · · ·	
Refugee Trust	100				8.000		· ·
LWF					20.000		
ICRC	1.550	300			60.000		
Austrian Relief Programme					15.000		
Action Word-Sud	88	10			6.000		12/09/94
ADRA	750 -						· · ·
TROCATRE			·······				
Concern Vorldwide					15.000		
Vorld Vision	470	235	94		94.000		
FAO	700						20/09/94
WFP							
UNICEF	700			1			κ
UNDP							
Total	5.358	1.545	701		292.500	20,000	
Besoins totmax	11.873	3_407			2.400.000		
A couvrit	6.515	1,862			2.107.500		

ş

T.Z. SITUATION AU 10/09/94 DES DISTRIBUTIONS PAR ONGS/AGENCES POUR FOURNIR DES SEMENCES VIVRIERES ET L'OUTILLAGE AGRICOLE AUX PAYSANS POUR LA SAISON CULTURALE 1995 A (Septembre 1994-Février 1995)

ONGS DISTRIBUTEURS	HARICOTS (T)	MAIS (T)	LÉGUMES(KGS)	ALITRES SEMENCES(T)	NOUES(PCE)	AUTRES OUTILS(PCE)	AUTRES ACTIVITÉS	DATE DE DISTRIBUTION
Caritas Suisse/CRS	100	100	105		30.000	× 20.000	Nourriture	12/09/94
German Agro-Action								-
UNHCR				2.500	(30.000	-	Nourriture: 30.000 T	20/09/94
CARE International	400	400			40.000			
Caritas-Rwanda -			×	······				,
ADEPR/PHV	*****		•				· •••	
Refugee Trust	100			·····	8.000		Engrais chimiques	
ICRC	1.550	300			69.000		Nourriture	
Austrian Relief Programme				99999900000000000000000000000000000000	15.000			
Action Nord-Sud	88	10		•	6,000		Nourriture	12/09/94
IROCAIRE								
Concern Worldwide					15,000			
World Vision	470	235	94		94.000		Nourriture	
L WF					20.000			
Total	2.708	1.045	199	2.500	307.000	20.000		
Besoins totaux	11.873	3.407		•	2.400.000			
A couvrir	9,165	2.362			2.093.000			

.

Rwanda News

September 1994

the second of the second se

Guest Editorial

S ince April 1994, the world has watched with horror the unfolding events in Rwanila. We have funed in to daily media accounts of unimaginable atroctices and ever-increasing estimates of numbers of dead and displaced. Rwanda, a small country that was little known outside Africa has become a courte stace of global attention. Due stination has underscored for inen and women in Africa and the rest of the solid the ophemeral nutrice of hanon life and the tragility of pence and competation.

Canada's International Development Retearch Centre (IDRC) has supported research in Rwan. - having the post 20 sears. Our efforts 6, - and at strengthening the agricultural sector and at holding cupients in science and technology pole cand indivelopment research. We continue to have strong faith on Rwanda and despite the dispersion of semiang Rwandan research the dispersion of semiang Rwandan research the dispersion of containg Rwandan research the dispersion of semiang Rwandan research the dispersion of semiang Rwandan research the dates. IDRC has a consistent to help the periode of Rwanda to remail theoriespite holtassing twends a poets.

In hour IDRC's regumal office for Eastern and Southern Africa in Nation. Kensu concencel a meeting of some of the bilateral and multilateral organisations that in the past hove been insolved with Kwuudu's develops

tofferery Emphasis in this meeting was on what could be done to assist with the reconstruction of Rwanda after the cessation of active conflict. All the domors present shared a devicto assist. It was agreed that in order to acoul dapla about of officers and to promote a greater level of coherence in the international community's efforts in Kwanda, there say need for accornic and unitedate information on initiatives and programmes being "developed both in Kwandir and neighbouring countries. IDRC offered to undertake the task of becoming a charmybony fo about mitiatives in Rosandor. This sigst hulletin is a direct materime of that decision

The Juffern soil be issued on a monthly basic during the next sear. It will be widely tready and others with an interest nu the reconstruction of Kwandu. We invite all interested above or others to send us intermittion about 20 years of phanicil initiative yin Kwandu.

Lya M. <mark>Rathge</mark>her Regional Director IDRC

Half-a-million Rwandese Children to benefit from UNICEF's Education Project



Despile the civil strife in their country, Rwanda's children can still smile as they look. aher to better days.

he United Nations Children's Fund (UNICEF) is set to relaunch the National Schools' Education system for more than 500,000: primay school age children in Rwanda.

The project's curriculum which includes reading, elementary arithmetic and sentence composition is part of a larger programme entitled "Basic Education for Survival and Peace", a UNICEF's Rwanda Emergency Programme.

To be implemented by UNICEF, UNESCO, local authorities and different community structures, the project is based on the premise that school is an important means of helping children cope with loss of community and family support. In addition to emphasizing numeracy and literacy skills' therefore, the project will also provide the children with schooling to relieve post-traumatic stress and a sense of stability on an emergency basis.

Starting ind-July 1994, the implementing agencies embarked on the production, introduction and testing of the UNESCOdeveloped basic primary school kits on 30,000 Rscandescretugeechildren in Ngara.

Tanzania, following the massive influx Rwandese refugees there in April.

issue

Meanwhile, in preparation for the tal off of the project inside Rwanda, UNIC is focussing on the training of teacher traers for the project in Kigali.

A similar project carried out in Somalic 1993 in which displaced school teach were highly motivated and mobilized establish 'tree shade' schools for studer with a blackboard on the grass in the can for the displaced, showed that school w the most effective way to re-establish reference point for normalcy and stabilfor the children

In addition, under the 'Basic Education and survival and Peace' programme, bo-UNESCO and UNICEF will encourage peace awareness among parents, teacher and communities through school-related activities. Parent-teacher meetings with local leaders will provide a venue for introducing peace themes.

For more phormation contact

Deborah Dishman,UNICEE Esato P.O. Box 44145, NAIROBI, KENYA Tel: 622176 + Fax 622078

6)D

he International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has initiated a seed multiplication project of several Rwandon sorghum varieties, some of which may be available for sowing in Rwanda during the coming season (December 1994 to February 1995). The rest of the seeds, however, will be further multiplied and targetted for sowing in subsequent seasons

ICRISAT's main assistance objective in Rwanda is focused on the replenishment of sorghum seed. In July, ICRISAT's Dr. Stanley King was in Rwanda to initiate steps to procure sorghum grains from farmers in Kabale area suitable as seed for sowing at 1800m to 2300m elevations in Rwanda.

ICRISAT's goal is to secure 20 tonnes of the grain from the current meagre harvest and package it into two kilogramme bags for distribution to farmers immediately before the main sorghum sow



ICRISAT to provide farmers with sorghum seeds

Collaborative work on Sorghum between l'institute des Sciences agronomiques du Rwanda (ISAR) and ICRISAT has been conducted since 1982, Above Agricultural Reseachers compare notes on sorghum varieties in Rwanda.

the main sorghum sowing season begins in late December.

Sorghum is an important crop in Rwanda, consumed both as a porridge and a beverage. The crop supplies Rwandans with about 20% of their caloric and 17% of their protein intake. Sorghum is grown in all regions of the country, with the area under the crop covering about 150,000 hectares.

Inside Rwanda, ICRISAT's seed multiplication efforts are backed by Uganda's National Agricultural Research Organisation, CARE International, and the Mennonite Central Committee. ICRISAT is also working in collaboration with the Kenya Agricultural Research Institute (KARI), the University of Nairobi and a private seed producer in Kenya

Meanwhile, the All-Africa Conference of Churches (AACC) and the Church World Action-Rwanda are negotiating with Canadian and Belgian suppliers to try and bring enough seeds and hand tools to Rwanda so that farmers returning home can begin to plant when the rainy season starts in September.

For further information please contact: Dr. Stanley King, ICRISAT P. O. Box 39063 Nairobi, Kenya •Tel: 741264/747557 • Fax: 747554

IDRC Supports "Seeds o Hope" project

ATINC

In an effort to alleviate the critical agricultuand food security situation in Rwanda, the limnational Development Research Centre (IDF is backing and contributing to a unique propoknown as "Seeds of Hope". Geared towards introducing seeds and planting material of most important crop varieties and landraces of tivated in Rwanda as a way to restart agricultuand initiate the social reconstruction of that cotry. IDRC is supporting its network of reseapartners and their utilization of knowledge gerated from previous research efforts in the gion.

The proposal which relates directly to Food Systems under Stress and Biodiver themes is a joint initiative of six Internati-Agricultural Research Centres in collabora with national and community reseorganisations in countries neighbouring Rwa The six CGIAR centres involved are CIAT co-ordinator (beans), ICRISAT (sorghum), (sweet potato and potato), CIMMYT (ma IITA (cassava) and IPGRI (genetic resource

IDRC's contribution is directed at suppor socio-economic studies and surveys to asses current situation and to monitor and evaluat restoration of biodiversity after the introduof planting materials. Rwanda's main food c are beans, sweet potato, potato, sorghum, m plantain and cassava. Together they accour 73% of the country's total food consumption contribute 79% of calories and 79% of proto Rwandan diets.

"Seeds of Hope" also aims to rebuild Rwar human technical capacity: provide technical vice and support for relief agencies and N concerned with food aid distribution and restion of agricultural production; analyze the pact of the initiative for follow-up action arother things. The budget for 1994 through cember 1995 is US\$ 1.011,000, for which is sors are being sought. The CGIAR has consto provide in-kind resources worth US\$800

For further information contact: Dr. Luis Navarro, Senior Programme Officer, 10RC, Nairobi, Kenya, Tel: (254) 02-713160/1 Fax: (254) 02-711063

Wayne Youngquist, Co-ordinator, RESAPAC P O. Box 2704, Arusha, Tanzania, Tel. (255) 57-2268/7012 Fax¹ (255) 57-8557/8264 E-mail, CIAT-RWANDA @ cgnet.com

Robin Buruchara, CIAT, Kawanda Research Station, Kampala, Uganda, Tel: (256) 41-567670/567470 Fax: (256) 41-567635/530412 E-mail: CIAT-UGANDA @ cgnet.com

RWANDA News - Septembe

2

Projects

ICRC Completes Clinics Rehab in Kigali

he International Committee of the Red Cross (ICRC) recently completed the rehabilitation of three clinics cum dispensaries around Kigali, Rwanda, to cope with the large number of patients wounded in the civil war. The three, Biligiogo, Muhina and St. Paul, are currently handling between 100-150 consultations a day, as well as serving as cholera clinics.

This latest medical project comes in the wake of ICRC's earlier establishment of a 200-bed field hospital with a five-man surical team in Kigali soon after the collapse with ecity's medical infrastructure, and more recently, another surgical facility in Gitarama, 45 km south of Kigali.

In the past four months the surgical team in Kigali has operated on over 1,000 patients while thousands more have received treatment as out-patients. ICRC's medical projects are part of the institution's Rwanda Action programme — currently the largest of the ICRC's operations worldwide with some 140 expatriates working on the field and a budget of \$78,000,000.

Hand in hand with the ICRC's medical programme in Kigali has been the institution's initiative to ensure that 75% of Kigali's population has access to clean water. ICRC's water and sanitation engineers are providing technical expertise and chemi- \int_{-1}^{-1} 's to increase the capacity of the semisagara water treatment station in Kigali. The aim is to ensure the long-term productivity and continued maintenance of the station whose current output is 600 cubic metres per hour.

RELIEF OPERATIONS

S ince April, the ICRC has delivered 14,516 tonnes to internally displaced Rwandans. The ICRC is currently distributing food and non-food items to 800,000 displaced in what is presently the institution's largest relief operation in the world. A food pipeline has been established through the Mombasa port Kenya, bringing in approximately 15,000 tonnes per month to be transported overland by a fleet of 40 trucks to various distribution points in Rwanda.

The Lutheran World Relief (LWR) through the Lutheran World Federation has been airlifting food, blankets and medicines from Nairobi to Goma, Zaire, and by trucks

A Rare Show of Co-operation

In a rare show of what joint partnerships in the reconstruction of warravaged Rwanda can achieve, local and international institutions working in Rwanda together recently responded quickly and successfully to the unprecedented influx of some 200,000 refugees who streamed into Ngara District, Tanzania within a period of 24 hours.

On April 28, 1994, several United Nations agencies, international organisations, national governments and Non-governmental organisations pooled their resources together and were able to start giving immediate assistance to the refugees.

Within 24 hours of the start of the influx, Spanish and Belgian Medecins-Sans Frontieres organisations (MSF) for instance, had already started constructing an emergency water supply system. An emergency health post onsite was set up by the Tanzanian Red Cross and within three to four days, other medical agencies had joined them and medical facilities were being made available.

. Meanwhile, Kobero, the Italian construction company working in the area dug drainage channels and pit latrines, with additional inputs from the International Rescue Committee (IRC) and other agencies.

By the end of the first 96 hours of the refugees' arrival, the IRC had made the first food distribution and as the operation expanded, new relief agencies swiftly joined the team to give a hand.

With the four months civil war having left the country's 75 percent infrastructure destroyed, while almost half of its manpower - some three million people have been lost to murdes or displacement, such is the interinstutional cooperation that will be required to put Rwanda back on its feet.

Currently in Rwands's capital city, Kigali, there is neither electricity nor running water; no functioning telephones aor schools or universities; and although a barely-operating civil service does exist, national and city taxes are neither being levied nor paid. As it were, famine looms across this central African country if nothing is done to help fugitive farmers return in time to save the now ready crop for harvesting.

While gradual reconstruction has started across Rwanda concentrating on the restoration of essential services first, greater cooperation and joint responsibility, between the different development and humanitarian organisations may be the key to the speedy resuscitation of this nation in need.

from Uganda and Zaire. For the past three months, the LWR has also provided water and daily food rations to refugees in camps in Tanzania. Meanwhile, two containerships carrying quilts, clothing and tools destined for the refugees are en-route to the camps in Zaire via Tanzania. The total value of the LWR effort to-date is just over US\$1 million.

The Mennonite Central Committee (MCC) has embarked on a US\$2 million relief programme for Rwanda over the next three years. Most of this financial assistance, personnel and clothing will be used in a camp for 40,000 to be built near the eastern Zairean town of Bukavu. MCC is the lead ency in a 6,000 tonne Canadian Foodgrains Bank food shipment to Zaire half of which (worth more than USS4 million) will go to the one million-plus retugees in Goma, with the remainder going to Bukavu.

The Canadian International Development Agency (CIDA) in conjunction with the Canadian Physicians for AID and Refiel (CPAR) have donated CAD 320,000 towards AMREF's Health Programme for Rwandese refugees in Tanzania and for the displaced people in northern Rwanda To boost the same programme, the Austrain government has given \$78,000, Swedish Broadcasting 100,000 swedish kroners, AMREF Italy \$20,000 and AMREF UK \$5,000 j

Organisations Involved in Development and Research Operations in Rwanda

NB. This is not an exhaustive list. The list was establishe based on a consultative meeting held in Nairobi on June 5, 1994 at t regional office of the International Development Research Centre: It is open to all organisations and agencies involved in ai development operations in Rwanda.

United Nations Development Programme P.O. Bax 50218 *Nairobi, Kenya Tel: 622134 *Fax: 331897

Canadian High Commission P.O. Bax 30481 • Nairobi. Kenya Tel: 214804 •Fax: 226987

United Nations High Commission for Refugees P.O. Box 43801 • Nairobi, Kenya Tel: 443028-34 • Fax: 443037

Nairobi Peace Initiatives P.O. Bax 14894 • Nairobi, Kenya Tel: 441444

International Board for Plant Genetic Resources (IBPGRI/IPGRI) P.O. Box 30709 *Nairobi, Kenya Tel: 632054 * Fax: 631499

International Development Research Centre P.O. Box 62084 • Nairobi, Kenya Tel: 713160-1 8 • Fax: 443037

International Potato Centre (CIP) P.O. Box 25171 • Nairobi, Kenya Tel: 632151/632206

International Centre for Tropical Agriculture (CIAT) P.O. Box 2704 * Arusha, Tanzania

Germplasm Resource Centre P.O. Box 30726 + Addis Ababa, Ethlopia

Lutheran World Relief P.O. Box 14205 • Navobi, Kenya Tel: 447611

... Food For Thought

The Baptist Relief Service conducted a survey of unaccompanied children in Kagenyi I and Kagenyi II camps, Karagwe, Tanzania, and found that out of a population of 13,000, 904 children were unaccompanied. 29% witnessed the murder of their parents in Rwanda and 63% saw other killings. These results confirm the need for substantial support to a programme for the traumatised. Embassý of Switzerland P.O. Box 30752 + Nairobi, Kenya Tel: 228735-6 + Fax: 218416

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) P.O. Box 39063 • Natrobi, Kenya Tel: 741264/747557 • Fax: 747554 E. Mail Dialcom '157: CG-1113

Kenya Agricultural Research Institute P.O. Box 39063 • Nairobi, Kenya Tel: 444144

African Medical Research Foundation P.O. Box 30125 • Nairobi, Kenya Tel 501300-3 • Fax: 506112

Japan International Cooperation Agency P.O. Box 50572 • Nairobi, Kenya Tel: 724121-4

All Africa Conference of Churches P.O. Box 14205 • Nairobi Kenya Tel: 441483 E. Mail AACC, PARTI & ECUNET, ORG

United Nations Environent Programme (UNEP) P.O. Box 30552 • Nairobi, Kenya Tel: 622305

International Centre for Maize and Wheat Improven P.O. Box 25171 * Nairobi, Kenya Tel: 630165

International Committee of the Red Cross P.O. Box 73226 • Nairobi, Kenya Tel: 333451-4 • Fax: 218924 •

International Institute of Tropical Agriculture P.O. Box 7878 • Kampala, Uganda

Royal Netherlands Embassy P.O. Box 41537 * Nairobi, Kenya Tel: 227111 * Fax: 339155

United Nations Children's Fund (UNICEF ESARO) P.O. Box 44145 • Nairobi, Kenija Tel. 522059/622176 • Fax: 522078

Mennonite Central Committee P.O. Box 14894 • Nairobi, Kenya Tel: 443149

This newsletter is published monthly by the donor community active in Rwanda, Editorial & Design Consultants: Apex Communications Ltd P. O. Box 12313, Nairobi, Kenya, Tel. 718235, Contributions, inquiries and other correspondence regarding Rwanda News should be address The Editor, Rwanda News, IDRC, P.O. Box 62084 Nairobi, Kenya, Tel. 713160-1 or 713273-4 Fax. 714063, E. Mail R. Ongesci & IDRC. Co

*

Report 2

Report of the Seeds of Hope Business Meeting, ILRI, Nairobi 23-24 January 1995.

۲
REPORT OF THE SEEDS OF HOPE BUSINESS MEETING

HELD AT THE INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

NAIROBI, 23 - 24 JANUARY 1995

TABLE OF CONTENTS

.

•

1.	Introduction Image: Image and the second
2.	Venue Change and Kigali Technical Meeting
3.	Rwanda Situation and Update
4.	Centers and Crop Activities Update34.1Overview4.2CIAT - Beans4.3ICRISAT - Sorghum4.4CIMMYT - Maize4.5CIP and PRAPACE - Potato, Sweet Potato4.6IITA - Cassava4.7ICRAF - Tree Seed Centre4.8ILRI - Seed multiplication and forages4.9IPGRI - Genetic resources strategic support4.10Socio-Economic Survey (CIAT)
5.	Issues, Problems and Concerns85.1Human resources in Rwanda5.2Rwandan expatriates working in CGIAR centers5.3Rwandan priorities
6.	Seeds of Hope Coordinator for Rwanda
7.	Budget Report
8.	Greater Horn of Africa Initiative
9.	Kigali, Rwanda Technical Meeting, February 1-3, 1995 11
10.	Date of Next Meeting

REPORT OF THE SEEDS OF HOPE BUSINESS MEETING

HELD AT THE INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

NAIROBI, 23 - 24 JANUARY 1995

1. INTRODUCTION

1.1 Welcome

The meeting opened at 9 a.m. with Dr W.R.Scowcroft occupying the Chair. The members of the SOH consortium and invited participants and observers were welcomed. Each participant introduced themselves along with their affiliated organization.

1.2 Participants

The participants who attended the meeting are listed in Annex I. Additional participants on day 2 included the Director General of ILRI, Dr Hank Fitzhugh, Dr Ralph van Kaufman, ILRI and the DDG of ICRAF, Dr Bruce Scott.

1.3 Agenda

A previously circulated tentative agenda was reviewed and a revised agenda agreed to (Annex II) which took into account the belated change of venue.

2. VENUE CHANGE AND KIGALI TECHNICAL MEETING

Originally the SOH meeting was scheduled to be held in Kigali, Rwanda on January 23/24 under the auspices of the Rwanda Minister of Agriculture. Because of other pressing issues and schedules, regrettably the Minister was unable to convene the meeting on January 23/24 and requested a postponement until the following week. This request came Thursday January 19 after some participants were on route to the meeting.

It was decided to go ahead with a business meeting on January 23/24 in Nairobi and to schedule the technical component in Kigali one week later on February 1 to 3 1995. W.R.Scowcroft was unable to stay over for this Kigali meeting because of previously scheduled unavoidable commitments that same week in CIAT.

A small delegation (W.Scowcroft and W.Youngquist, CIAT; E.McGaw, ICRISAT; R. Contant, ISNAR) went to Kigali January 25 and 26 to meet with the Minister of Agriculture and the newly appointed Director of ISAR, Professor Munyanganizi.

Most participants were able to contribute to issues, problems and concerns about SOH activities in Rwanda. In addition to a technical report on SOH progress, additional suggested

agenda items and issues for discussion at the Kigali meeting included:-

- * Procedure for phytosanitary screening of seed entering Rwanda.
- * Who was to receive seed in Rwanda and who would be responsible for further multiplication in Rwanda i.e. ISAR, NGOs, farmers.
- * Extent of seed multiplication outside Rwanda
- * Which ISAR stations would be able to conduct multiplication. ISAR is planning to open three stations in February, one each at low (Karama), medium (Rubona) and high (Ruhengeri) altitudes.
- * Who would fund seed multiplication in Rwanda. ISAR is expected to have funding for seed multiplication from new donors.
- * What varieties for which crops should be prioritised.
- * Ways and means to build technical capacity in Rwanda.
- * Need for an SOH coordinator in Rwanda.

Other information relevant to the Kigali meeting about seed supply, distribution, multiplication in Rwanda included:-

- * FAO are canvassing organizations to multiply seed including World Vision, GTZ (Germany), Caritas, Salvation Army.
- * Twenty five NGOs were distributing seed for the 1995B (Jan-July, 1995) season.
- * Scheduled planting times for material during 1995 is:-

Beans - for B season end of January to mid-March.
Sorghum - December-February for short cycle varieties. CARE is planning to increase the seed.
Potato/Sw. potato - September/October, 1995.
Maize - currently all SOH maize seed multiplication is being done outside Rwanda.

SOH representatives tentatively agreed that the following CGIAR centers would be represented at the Kigali meeting: CIMMYT, CIAT, CIP, IPGRI, ICRAF AND FAO. It was also hoped that a field trip could be arranged in the northern part of Rwanda.

3. RWANDA SITUATION AND UPDATE

Dr Louise Sperling presented an overview of the current situation in Rwanda based on a recent visit January 4-16. The following summarizes her observations along with additional comments from CIAT personnel who accompanied her:-

- * The general situation in Rwanda is quickly improving. Services such as electricity, telephones, postal services are working at least in Kigali and primary and secondary schools have resumed teaching. The University at Butare was scheduled to reopen on January 29. The currency has been changed to invalidate the old currency much of which had left the country during and immediately after the civil war.
- Busloads of refugees are returning each day and the estimate agricultural population
 "at home" is estimated to be 4.8 million which is 2 million less than before the civil

war. Currently, 87% of Rwandans are involved in agriculture which is down from that prior to the war.

- * In Kigali markets, food is in good supply and prices are not out of line e.g. beans were selling at 80-100 Rw.fr./kg compared to 60 Rw.Fr previously.
- During the past season many NGOs (with whom SOH worked) have distributed considerable volumes of planting seed including approximately 7,000 tonnes of beans, 1,700 tonnes of maize and 7,200 kg of vegetable seed along with hoes and fertilizer. FAO has provided major support to this effort.

Much of the bean seed was sourced and targeted for distribution in the correct regions largely as a result of SOH advice. It is uncertain whether the maize seed distribution was as accurately targeted. The outstanding effort of NGOs, FAO and other donors during the 1995A season indicates that bean seed supplies will not be seriously short for the imminent 1995B season. It is estimated that 83% of seed supplies will be met from locally produced seed but it is not certain as to whether this is well adapted material nor is there any information about seed quality. The Butare prefecture only has 50% of its bean seed requirements.

4. CENTERS AND CROP ACTIVITIES UPDATE

4.1 Overview

It was emphasized that the SOH program was initiated to restore genetic diversity in crops adapted to Rwanda and to provide technical assistance to assist in the restoration of agriculture and food security in Rwanda. The primary objectives are:

- * Reintroduction of genetic diversity
- * Provide technical support to NGO relief agencies
- * Rehabilitate seed health and multiplication
- * Reestablish development programs
- * Assess impact of restoration of genetic diversity

Comprehensive reports for the activity of each center are reported in the respective annexes. Only highlights will be presented in the following sections.

4.2 CIAT - Beans (Annex III)

- * Bush and climbing beans are under multiplication including varieties previously released in Rwanda (33 varieties), local landraces (450 varieties), advanced ISAR lines (50 lines), Burundi varieties adapted to Rwanda (5 varieties) and local mixtures from Burundi.
- * By January 31, 1995 6,300 kgs of numerous varieties and landraces will be ready for further multiplication in Rwanda. By March 31 a further 9,000 kgs of diverse material will be ready.

- Multiplication during 1995A was carried out in collaboration with national agricultural research organizations and NGOs in Uganda (NARO and CARE), Malawi (MARO), Tanzania (TARO and SASAKAWA), Kenya (KARI), Zaire (PNL), Ethiopia (Inst. Agric. Res), Rwanda (World Vision) and Colombia.
- * From May 1994 CIAT has worked closely with many NGOs to help locate seed sources, provide technical input, review current and future seed acquisition and distribution on a regular (weekly basis) and assist in targeting distribution of seed.

4.3 ICRISAT - Sorghum (Annex IV)

- * Six tonnes of variety 5DX160 for lower elevations was ready for shipment to Kigali by February 15 for distribution by World Vision. Four tonnes of another low altitude variety SEDO will also be available.
- * ICRISAT assisted NARO and Mennonite Central Committee in the acquisition in Uganda of 20 tonnes of a landrace variety for distribution by CARE in Gikongoro Prefecture.
- * Sorghum seed increase is being carried out in collaboration with KARI (Kenya) of released varieties adapted to high and mid elevations 13 Rwandan varieties and several 100 germplasm lines. Many 100s of germplasm lines have been screened to provide 500 lines to Rwanda to resume sorghum improvement in February.
- * ICRISAT will continue increasing seed of sorghum for Rwanda. It is able to provide in service training for two sorghum breeding technicians. The lack of someone knowledgeable about sorghum in Rwanda makes it difficult to predict future seed requirements.

4.4 CIMMYT - Maize (Annex V)

- * Two varieties, Pool 9a and Pool 8a, previously released by ISAR in Rwanda were of CIMMYT origin and seed was available from Mexico. These are suitable for higher elevations. A third variety, ZM607 which is adapted to lower elevations in Rwanda and has good maize streak virus resistance was obtained from CIMMYT in Zimbabwe.
- * Seed increase of these varieties was organized by Cargill-Tanzania with farmers in northern Tanzania. Planting took place in August 1994 and harvest will be completed by January. A second round of seed increase will occur in 1995 to provide the following amounts of seed by September 1995:- ZM607 - 25 tons; Pool 9a - 108 tons; Pool 8a - 15 tons.
- * World Vision will also increase another variety, Pool 5a, in Rwanda.
- * Seed will be distributed in Rwanda as small (2 5 kg)packets with appropriate labels.

* Special mention was made of a Rwandan scientist Tassiana Mukarusagra, who made special effort to save genetic resources of Rwandan adapted maize material.

4.5 CIP and PRAPACE - Potato, Sweet Potato (Annex VI)

- * Potato seed multiplication of pre-basic and basic seed is being carried out in collaboration with NARO in Uganda and KARI in Kenya.
- * In Uganda field multiplication of varieties Cruza and Gahinga will yield 10 tons each of planting material. Pre-basic seed (tuberlets) of Cruza and Sangema is also being produced to yield 2 tons and true potato seed (TPS) of two newly adapted Indian lines (IP88006 and IP88001) will yield 6 tons. This material will be further multiplied in Rwanda on ISAR stations, at other locations or with supervised farmer-multipliers.
- * In Kenya at the Plant Quarantine Station, Muguga, "super-elite" pre-basic seed of three varieties adapted to Rwanda is being produced. This will be used to support the redevelopment of multiplication programs in Rwanda. By mid-July 99,000 tuberlets of Sangema, Cruza and Mabondo will be available for Rwanda. It is planned to work with farmer groups and/or NGOs to set up TPS nursery sites for tuberlet production in Rwanda.
- * For sweet potato, vines of varieties in demand will collected, selected for quality and multiplied in strategically located production nurseries.

4.6 IITA - Cassava (Annex VII)

- * IITA's participation in SOH is through its two networks in the region EARRNET and SARRNET and will focus on multiplication, distribution, training and human resource rehabilitation.
- * A survey carried out along the south-western border of Rwanda and Uganda identified two Rwandan varieties, Rutamisi and Machunda, as important for Rwanda. Fortunately african cassava mosaic virus was not evident. Three other varieties adapted to Rwanda were identified in Uganda. These five varieties are undergoing multiplication at two sites, Nyaruntuntu and Kayonza in the Ntungamo district.
- * In Tanzania four bitter varieties and seven sweet varieties of Rwandan origin were identified. Multiplication of two varieties is being undertaken at Rusomo Prison Farm close to the Rwanda border and five varieties are being multiplied in collaboration with CARITAS at Rulenge near the Burundi border.
- * Three varieties of Rwandan origin have been identified in Burundi and these will be multiplied during 1995.
- * Cassava has low multiplication rates and is very bulky. When conditions allow

material will be transferred to Rwanda for multiplication by ISAR.

* A training course in collaboration with CIP is planned for Rwanda as soon as possible.

4.7 ICRAF - Tree Seed Centre (TSC) (Annex VIII)

- * This is part of SOH but sponsored directly by the Australian Government (AIDAB) through CSIRO, Division of Forestry, Australia and ICRAF. ICRAF is negotiating with the Swiss Development Corporation for additional financial support.
- * A survey of the TSC at Ruhande indicated considerable superficial damage and loss of all major moveable items and vehicles. Many of the seed acquisitions were destroyed or mixed up. The library and arboretum are intact.
- * Rehabilitation will involve repairs to buildings and resupply of necessary refrigeration equipment and a generator.
- * Restoration of genetic resources will involve collection of selected species within Rwanda and from East African highlands.

4.8 ILRI - Seed multiplication and forages (Annex IX)

- * ILRI offers facilities for seed increase. As most seed increase will now occur in Rwanda this generous offer will probably not be required.
- * ILRI has collections of forage species obtained in Rwanda and this material is available for repatriation.
- * With the reestablishment of ISAR, ILRI is ready to assist ISAR in both forage and livestock research and animal health.

4.9 IPGRI - Genetic resources strategic support (Annex X)

- * IPGRI has prepared a comprehensive proposal for a three year project to develop a National Program for genetic resources in Rwanda. The program will direct national efforts in safeguarding the genetic resources of the country through establishment and rehabilitation of conservation facilities, training and capacity building and identifying priorities and activities in collaboration with ISAR.
- * Activities are likely to include germplasm acquisition, conservation, documentation, multiplication, rehabilitation of conservation facilities, characterization and evaluation. This will involve close collaboration with ISAR and CGIAR centers.
- * The project will require additional funding above that already allocated for other SOH activities.

4.10 Socio-Economic Survey (CIAT) (Annex XI)

- * Extensive baseline surveys of beans and maize began mid January to evaluate the following :-
 - (i) The proportion of total seed which came from local farmer stocks, from NGO/aid distributed material or purchased from local markets.
 - (ii) Farmer evaluation of the types of seed distributed and how they compared to local supplies.
 - (iii) The yield from various sources of seed and how they compared with the usual sources of seed sown. In particular the survey is concerned with the impact of emergency relief distributed seed.

Large volumes of seed was distributed in the 1995a season by NGOs and relief agencies partly on advice from SOH as to source and target. The impact of this is crucial to determine to what extent local adapted germplasm was disrupted or not. The information is important to assess the impact of SOH and to provide future planning information for NGO partners and the Ministry of Agriculture in Rwanda.

The survey assessments includes eight of the 10 Rwandan prefectures to cover 32 communes among which 165 households are to be surveyed. This survey will therefore cover the major agro-ecologies of the country. Seventeen partners have been trained representing MINAGRI and four collaborating NGOs - World Vision, CARE, Medicins san Frontiers

and Catholic Relief Service. The trained individuals will train additional people to assist in the survey.

Initial field work for beans was expected to be completed by February and maize assessments will be completed by the end of March. Baseline surveys of other crops including potato, sweet potato, sorghum and manioc will be conducted during 1995.

Genetic diversity assessment is being confined to beans. Preliminary surveys which were initiated in November 1994, were intensified in January. Genetic composition of mixtures is being assessed as well as specific varieties lost or gained. Ex situ collections based on 400 samples comprising about 4,000 varietal components will be fingerprinted using molecular marker technology. This will provide an accurate assessment of genetic diversity changes that have occurred as a result of disruption to agriculture during the civil war.

5. ISSUES, PROBLEMS AND CONCERNS

5.1 Human Resources in Rwanda

The number and availability of scientists and trained technicians in Rwanda is appallingly low. Many are in refugee camps, have left the country or still in hiding. The Ministry of Agriculture and the Government of Rwanda is urging Rwandan scientists to return to the country to assist in rehabilitation. A recruitment rationalization process is to be implemented (Annex XII, extracted from Rwanda News, IDRC).

In retrospect the SOH program underestimated the impact of the civil war on the devastation of human resource capacity. According to ISAR a major initiative is required for training and human resource development, preferably on-site in Rwanda. Out of country training should be targetted to the needs of Rwanda and limited to less than 6 months. CGIAR centers are expected to play a major role in training.

It also appears that considerable data and institutional records and statistics dealing with agriculture have been lost. Some of this information may be held by USAID. It was considered that an attempt should be made to recover this on behalf of Rwanda.

5.2 Rwandan expatriates working in CGIAR Centers

Discussion ensued on concern about several Rwandan scientists currently located at CGIAR centers as to what approach should be adopted to encourage their return to Rwanda. The general consensus was that scientists should be encouraged to return, but that SOH had no jurisdiction over individual centers' policy nor should SOH judge individual cases. The chairman was asked to communicate the concern of the meeting to centers through the Center Directors Committee Chairman for Sub-Saharan Africa.

[NOTE of February 3, 1995 - On January 26 Mr Martin Bicumumpaka, coordinator for PRAPACE, was unexpectedly arrested by Rwandan authorities while attending the SOH technical meeting in Kigali. Further action on the issue of Rwandan scientists located in centers and working under humanitarian support was suspended pending further clarification of Mr Bicumumpaka's arrest.]

5.3 Rwandan Priorities

With the effective reestablishment of MINAGRI and ISAR much needed dialogue can now occur to ensure that SOH is fully appraised of Rwandan requirements within the objectives of SOH. Priority needs of Rwanda include:-

- * Reestablishment of research capacity.
- * Reestablishment of a national germplasm gene bank, including restitution of material previously collected by CGIAR centers.
- * Multiplication of seed in Rwanda at ISAR stations.
- * Acquisition of basic farm, laboratory equipment and vehicles.
- * Restoration of a seed quality and phytosanitary service through Service de Semences Selectionees which is being restored with Belgian government assistance.

* Reestablishment of development projects and networks involvement.

6. SEEDS OF HOPE COORDINATOR FOR RWANDA

- * Now that ISAR has been reestablished and Rwanda recovering from the impact of the civil war, there is an essential need to have an SOH coordinator located in Kigali. Primary activities are to coordinate SOH activities in Rwanda, to collaborate on a day to day basis with staff of ISAR and emergency relief agencies and intergovernmental organisations in Rwanda and to interact with collaborating NARs of neighbouring which have participated in SOH.
- * A plan of action was approved to recruit a person for this role immediately. CIAT representatives would initiate the recruitment and consult with other SOH partners prior to appointment. An individual would be appointed for the remainder of 1995.

7. BUDGET REPORT

- * A statement of funds pledged, received and committed to expenditure to December 31, 1994 is in Table 1. Funds committed for expenditure by the various SOH center partners are covered by memorandums of understanding between the relevant centers and CIAT. These centers are ICRISAT, IITA, CIMMYT and CIP. A generic copy of the memorandum signed by each center and a schedule of specific committed payments to each center is in Annex XIII. Payments are made against invoices received by CIAT. There are no committed expenditures at present by IPGRI or ILRI.
- * Funds (\$49,000) to assist ICRAF and CSIRO in restoration of the Tree Seed Center were targeted as part of the Australian AIDAB/World Vision Australia contribution and have been disbursed directly to CSIRO by World Vision Australia.
- * An interim statement of receipts and commitments up to March 2, 1995 is in Table
 2. By this date approximately half the pledged funds have been received as full or initial tranches under contracts signed by CIAT and the respective donor agency.
- * Some adjustments will have to be made to committed expenditures to take account of a predicted shortfall of \$US40,050 relative to funding pledges. This is not envisaged as being a significant problem because the initial success of reintroduction of genetic diversity, reduced need to multiply material outside Rwanda and additional support from donors to Rwanda will likely result in reduced expenditure by SOH in the second half of 1995.

8. GREATER HORN OF AFRICA INITIATIVE (Annex XIII)

- * Since July 1994 there has been increasing concern to develop a strategy for technical input which could provide a preemptive and preventative approach to the restoration of food security in countries and regions of the greater horn of Africa which are vulnerable to civil and natural disaster.
- * In November 1994, President Clinton put forward an initiative called "Breaking the Cycle of Dispair Building a Foundation for Food Security and Crisis Prevention in the Greater Horn of Africa". USAID took the lead in implementing this initiative.
- * Based on the Seeds of Hope experience and CIAT's proactive response to this initiative CIAT was asked by USAID to lead and formulate a CGIAR position to provide technical input into the GHA initiative. In early January 1995 CIAT responded affirmatively to this request which was endorsed by relevant CGIAR center directors.
- * Because of its potential importance to CGIAR future activities in Africa and because of SOH experience, the GHA was listed as an agenda item for discussion.
- * It was decided that logistically CIAT's Latin American location was not well suited to lead the CGIAR's input to GHAI. Rather it would be preferable to do this from a CG center located within the Greater Horn of Africa region. An ad-hoc task force was formed to provide CGIAR input to a joint ASARECA-CGIAR proposal.

ICRAF agreed to take on the role of CGIAR Co-coordinator with ASARECA. A joint ASARECA-CGIAR Task Force will be formed to develop a proposal.

* The result of this discussion are recorded in a set of separate minutes (Annex XIV).

9. KIGALI, RWANDA TECHNICAL MEETING FEBRUARY 1 - 3, 1995

This meeting was carried out under the auspices of the Minister of Agriculture. Minutes of this meeting will be distributed separately when they become available.

10. DATE OF NEXT MEETING

The third meeting of SOH is scheduled for late May or early June.

11. THE MEETING CLOSED AT 12:30 PM

TABLE 1

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL - CIAT PROJECT: Seeds of Hope Statement at 31 December 1994

Pledged f	Received	Funds		
Donor	Local Currency	Amount US \$	Amount US\$	Date
USAID	US\$400.000	US\$400.000 400,000	-	
ODA, UK	£50.000	78,000	76,000	08-08-94
SDC, SWISS	US\$200.000	200,000	200,000	11-10-94
AIDAB-WORLD VISION - AUSTRALIA	AUD314.084	223,000	55,736	16-12-94
IDRC	CAN150.000	110,000		
TOTAL		1,009,000	331,736	

Funds

INSTITUTION	Committed Total	Commited To 12/94
ICRISAT - Sorghum	137,550	41,265
IITA - Cassava	79,000	24,000
CIMMYT - Maize	127.000	38.000
CIP - Potato/Swset potato	103,500	31,000
CIAT - Beans	214,000	52,070 (
CIAT — impact	238,000	-
Program Coordination	1 50,000	44,115 0
TOTAL	1,049,050	230,450

841 CAME -- 1 8 843 88 -- 6841 -- 83

(1) includes preliminary expenditures for impact assessment

(2) Promite experienture

TABLE 2

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL - CIAT PROJECT: Seeds of Hope Statement at 2 March 1995

	Amou	nt	Received Funds		
Donor	Local Currency	US S	Amount US\$	Date	
USAID	US\$400.000	400,000	125,000	10-01-95	
ODA, UK	£50.000	76,000	76,000	08-08-94	
SDC, SWISS	US\$200.000	200,000	200,000	11-10-94	
AIDAB-WORLD VISION - AUSTRALIA	AUD314.084	223.000	55,736	16-12-94	
IDRC	CAN150.000	1 10,000	52,667	03-02-95	
TOTAL		1,009,000	509,403		

Piedged Funds

Funds

INSTITUTION	Committed Total	Sent/Spent To 12/94	Commited To 03/95	Total
ICRISAT - Sorghum	137,550	41,265	20,635	61,900
IITA Cassava	79,000	24,000	12,000	36,000
CIMMYT - Maize	127.000	38,000	19,000	57,000
CIP - Potato/Sweet potato	103,500	31,000	16,000	47,000
CIAT - Beans	214,000	52,070 (1)	18,452	70,522
CIAT - Impact	238,000	-		
Program Coordination	1 50,000	44,115	26.400	70,515
TOTAL	1,049,050	230,450	112,487	342,937

(1) Includes preliminary expenditures for Impact Assessment

ANNEX I

PARTICIPANTS TO SEEDS OF HOPE MEETING ILRI, NAIROBI 23-24 January 1995

	NAME	INSTITUTION	ADDRESS
1.	Wayne Youngquist	CIAT/RESAPAC	P.O. Box 2704 Arusha, Tanzania Tel:255-57-2268
2.	Rudolf Contant	ISNAR	P.O. Box 93375 The Hague 2509 AJ The Netherlands Tel:31-70-3496151
3.	Dan Kiambi	IPGRI	c/o Box 30677 ICRAF, Nairobi
4.	Franck Attere	IPGRI	c/o Box 30677 ICRAF, Nairobi
5.	Amadou Niang	ICRAF	P.O. Box 30677 Nairobi Tel:254-2-521450 Fax:254-2-521001
6.	Kwesi Atta Krah	ICRAF	P.O. Box 30677 Nairobi Tel:254-2-521450
7.	H.M. Kidanemariam	CIP	P.O. Box 25171 Nairobi
8.	Maurice Kalunda	NARO	P.O. Box 295 Entebbe Tel:20512

9.	J. Edward Milner	Acacia Prods.	80 Weston Park London N8 9TB UK Fax:44-81-341-9392 Fax:44-81-341-4879
10.	Louise Sperling	SOH Socio-Economic Consultant	E 11/2 Vasant Viha 110 057 New Delhi, India Tel:91-11-6110827 Fax:91-11-4622707
11.	Lewis K. Mughogho	ICRISAT	P.O. Box 776, Bulawayo Zimbabwe Tel:263-83-8311
12.	Stan King	ICRISAT	P.O. Box 39063 Nairobi Tel:254-2-747557/741264 Fax:254-2-747554
13.	Peter Ewell	CIP	P.O. Box 25171 Nairobi Tel:254-2-632054 Fax:254-2-630005
14.	Martin Bicamumpaka	PRAPACE	P.O. Box 102 Entebbe, Uganda
15.	Eric McGaw	ICRISAT	Patancheru P.O. Andhra Pradesh 502 324 India Tel:91-40-596161 Fax:91-40-241239 E-mail:E.McGaw@cgnet.com
16.	David Jewell	CIMMYT-Zimbabwe	P.O. Box MP163 Mount Pleasant Harare, Zimbabwe Tel:263-4-301807 Tel-Fax:263-4-885090

.

17.	Joel Ransom	CIMMYT-Nairobi	P.O. Box 25171 Nairobi, Kenya Tel:254-2-632054 Fax:254-2-631499
18.	John Ndikumana	ILRI-Nairobi	P.O. Box 46847 Nairobi Tel:254-2-630743 Fax:254-2-632013
19.	Wilmer Collett	FAO-Kigali	Tel:250-73593/73513 Fax:873-1545-326 (Satellite)
20.	Bill Scowcroft	CIAT, Cali, Colombia	A.A. 67-13 Cali, Colombia, S.A. Tel:1-305-592-4249 (via USA)
21.	Luis Navarro	IDRC-Nairobi	Tel:254-2-713160 Fax:254-2-711063
22.	Hank Fitzhugh	ILRI-Nairobi	P.O. Box 46847 Nairobi Tel:254-2-630743 Fax:254-2-632013
23.	Ralph van Kaufmann	ILRI-Nairobi	P.O. Box 46847 Nairobi Tel:254-2-630743 Fax:254-2-632013
24.	Bruce Scott	ICRAF	P.O. Box 30677 Nairobi Tel:254-2-521450 Fax:254-2-521001

*

•

ANNEX II

2ND SOH COORDINATION MEETING January 23 & 24, 1995

ILRI, Nairobi, Kenya

AGENDA

<u>Monday, 23 Jan</u>		
08:30	Introduction and Welcome	W.R. Scowcroft
09:00	Agenda Approval, Arrangements and Rapporteurs	W.R. Scowcroft
09:30	Change of Venue and Kigali Technical Meeting Discussion	
10:30	COFFEE	
10:50	Rwanda Situation Update & Discussion	
	SOH CROP & CENTER ACTIVITIES UP	DATE
11:20	CIAT/Beans	W. Youngquist
11:40	ICRISAT/Sorghum	S. King
12:00	CIMMYT/Maize	J. Ransom
12:20	LUNCH	
14:00	CIP/Sw. Potato, Potato	P. Ewell
14:20	IITA/Cassava (no verbal presentation)	
14:40	ICRAF/Forest Tree Center	A. Niang
15:00	IPGRI/Genetic Resources	F. Attere

Monday, 23 Jan (cont.)

15:20	Socio-Economic & Impact Diversity Analysis	L. Sperling
16:20	COFFEE	
16:30	General Discussion of Activities Including FAO/World Bank, Relief Agency, PVO Reports	
18:00	Adjourn	

٠

Tuesday, 24 Jan

Þ

08:30	Greater Horn of Africa Initiative
10:30	COFFEE
10:50	Budget Report
11:30	SOH Coordinator Kigali
11:50	Issues and Concerns
12:30	Close of Meeting

ANNEX III

Bean Seed Multiplication - Seeds of Hope

CIAT/RESAPAC/EABRN and National Programs of Malawi, Uganda, Kenya, Tanzania, Zaire, Burundi, Ethiopia, and Rwanda

A summary of current activities presented to the Business Meeting of SOH - Nairobi, 24 Jan. 1995

Bean Seed Multiplication - Seeds of Hope

A. OBJECTIVES:

- 1. To improve and stabilize bean yields and production.
- 2. To ensure maintenance and/or attempt to re-establish the wide genetic diversity that existed in Rwanda.

B. CATEGORIES OF BEAN SEED UNDER MULTIPLICATION:

- I. BUSH.
- II. CLIMBING TYPES.

These include:

- 1. Released varieties (improved and selections from local germplasm) and varieties in diffusion.
- 2. Local landraces (in local mixtures).
- 3. Varieties that were in advanced stages of development by the national research institute (ISAR).
- 4. Varieties that had been evaluated in Rwanda but had been released in Burundi.
- 5. Local mixtures from Burundi.
- Note: (i) Seed of the categories 1, 2, and 3 was procured from the national agricultural research programmes of countries within the bean networks of The Great Lakes(RESAPAC), Eastern Africa (EABRN), Southern Africa (SADC) and at CIAT headquarters in Cali, Colombia. The initial seed of these materials was available in small quantities (e.g. 50gms) in germplasm banks or as research materials.

(ii) Seed of category 4 was obtained from Institut des Sciences Agronomiques du Burundi (ISABU), Burundi.

(iii) Seed of category 5 was available in relatively greater quantities and was included for multiplication since it was considered to be adapted to select regions in Rwanda.

C. SITES OF SEED MULTIPLICATION

- I. Multiplication started in June 1994 of seed categories 1, 2, 3. This was done in:
 - 1. Uganda (in collaboration with National Agric. Res. Organization (NARO) of Uganda).
 - 2. Malawi (in collaboration with Agric. Res. Dept.).
 - 3. Arusha
 - 4. Colombia, at CIAT headquarters.
- II. Multiplication is in progress for all seed categories (starting in October 1994) at the following sites
 - 1. Rwanda (in Butare and Kinigi, the latter in collaboration with World Vision)
 - 2. Uganda (in collaboration with NARO and CARE-Uganda)
 - 3. Malawi. (in collaboration with Agric. Res. Organization)
 - 4. Tanzania (Arusha) by SASAKAWA and in collaboration with Tanzania Agric. Res. Organization (TARO).
 - 5. Kenya (Kenya Agric. Res. Institute (KARI), Kakamega).
 - 6. Zaire (Programme National Légumineuse (PNL), Mulungu).
 - 7. Ethiopia (Institute of Agric. Res.).
 - 8. Colombia. (CIAT).

D. SEEDS OF HOPE: TIME LINE (for Beans)

Seed for Rwandan farmers was supplied by NGO's. The 6700 mt of seed imported and distributed was primarily obtained in Uganda and represented both pure lines and seed mixtures. The effort to obtain this quantity of seed and have it distributed was a tremendous undertaking. Following is an outline of the principal activities of SOH interaction with NGO's:

I. Farmers seed for immediate planting (Sept.-Nov. 1994)

1994

May	Seed	sources	located,	some	NGO's	contacted	by	SOH
-----	------	---------	----------	------	-------	-----------	----	-----

- June Information flyer on seed sourcing produced and distributed
- July Information distribution, seed meetings in Kabale were started
- Aug. Review seed work with some NGO's, attend seed meetings Kigali
- Sept. Review seed work with some NGO's, attend seed meetings Kigali
- Oct. Seed Distributions

Nov. 94 - Feb. 95

Review seed distributions, evaluate and determine needs for future

Feb. 95 - July 95

Asssist in-country seed multiplication schemes

II. Activities related to the multiplication of Rwandan seed stocks (Genetic Diversity) (10-20 mt of seed):

1994

April Project concept and review of seed sources, seeds planted in Cali

- May Project Proposals formulated, seeds planted in Uganda
- June Projects submitted, seed acquired in Burundi, seed planted in Malawi
- July Projects submitted, seed planted in Zaire (INERA), Tanzania
- Aug. Funding accumulation, seed planted in Tanzania
- Sept. Funding started, seed replanted in Uganda (NARS)
- Oct. Seed harvested in Malawi sent to Tanzania (NARS), seed from Cali to Uganda
- Nov. Seed planting in Tanzania, Zaire (INERA)
- Dec. Harvest started

1995

Jan. Seed survey and genetic diversity study started in Rwanda and Cali, seed harvests continue

.*

Feb. Seed taken to Rwanda for additional increase (some distribution to farmers)

June In country follow up on seed survey and genetic diversity study Sept/Oct.

Seed distributions to farmers in Rwanda

E. TYPES OF SEED AND QUANTITIES EXPECTED FROM CURRENT MULTIPLICATION.

Much of the seed that will be harvested from the current multiplication will be for further multiplication in Rwanda.

I. BUSH TYPES IN	IAINS)			
Category of Seed	Identification	Target Zone	Expected Quantity	Expected Time of Hervest
Rwandan Local landraces	A. 170 types collected from local mixtures from different parts of the country.	Low/Medium/High	A. 0.3 tons B. 4.0 tons	A. End Jan. B. March
	B. 280 types collected from different parts of the country.		0.1 tons	End of January
Released varieties (improved and selections from local germplasm) and improved varieties in diffusion	25	Low/medium	2,5 tons	End of January
Advanced breeding lines	50			
Rwandan Mixtures	From Rwamagana and Nyamata	Low		
Released improved varieties in Borundi	5 varieties	Low/medium/high	4.0 tons	End of January
Burundían mixtures	Several components of mixtures		1.3 tons	End of January
II. CLIMBING BEA	NS			•
Released varieties (improved and selections from local germplasm) and improved varieties in diffusion.	8 varieties	Medium/high	2.5 tons	Mid to end of February
TOTAL			9.7 tons	

F. Bean Seed Production, priliminary, estimates of Yield (20/1/95).

This table represents estimated seed quantities and lines ready for distribution to Rwanda. The '+' indicates harvested material, but not yet weighed, other values are estimated yields.

• •

Bean Material	Seed Lines	Kawanda, UG	Namalonge UG	Kenya	Tanzania	Rwanda
Released	A 321	+	4		1300	
or in	CALIMA	+		*		
Diffusion	IKINIMBA	300	•			
	Kilyumukwe				{60kg}	
	Mutiki					
	MLB 40-89A	* +	,	15	{+}	
	MLB 48-89A	+		15	{90}	
	MLB 49-89A	+		15	{70}	
	MORE 90019	+		5		
	Nain de Kyondo					
	NSIZEBASHONJE	+				
	NTEKERABASILIMU	+				
	PEVEYA	+		5		
	Rwandarugali (RWR 221)				{130}	100
	SCAM 80 CM/5	+				
	SCAM-80-CM/2	+	3			
	URUBONOBONO		36			
	URUGEZI	uğ.	3	5		100
	RWR 866	+		10		
	RWR 1091	+		15	{40}	
	RWR 1092	nifer		15	{30}	
	RWR 1059	nife		15		
	RWR 432	+		15		
	RWR 719	ndje.	43	15		
	<u>NUMBER</u> of Additional Bred Lines	(56)		(13)	{(31)}	
	NUMBER of Landraces (includes climbers)				(84) now (86) Mar.	

Table F. Cont.						
Material	Seed Lines	Kawanda, UG	Namalonge UG	Kenya	Tanzania	Rwanda
Burundi	HM 21-7				1000	
	PVA 779				1200	
	H 75			-	1000	
Climbore			•			
Climbers	Viminkingi			5		1500?
	Flora			5		400?
	Flor de Mayo				800	
	Decelaya					400?
	Ngwinururare			5		300?
	Umubano	CARE		10		200?
	Gisenyi 2 bis	CARE		5		
	Puebla		•	5		
	Urunyumba	CARE				
Total kg e in Rwand:	expected ready 31/1/95 for a Multiplication	400	100	200	5600	
Total kg Bush and Climbers ready by 31/3/95		1000	1000	300	4000	3000 Feb.

·· •

ANNEX IV

ICRISAT's SOH Activities, 1 Oct- 31 Dec 1994 -

1. Seed increase of sorghum variety 5D×160 in Kenya. A private seed company was contracted to produce 10 t seed of 5D×160, a Rwandan sorghum variety suitable for lower elevations in Rwanda (1200-1500 m asl). It was planned that the seed be available for shipment to Kigali in Dec 1994. However, the crop was planted late and a portion of the multiplication will not yield as much seed as expected. Hence, we anticipate that about 6 t seed should be ready for shipment to Kigali by 15 Feb (hopefully by UNHCR air). World Vision has expressed interest in distributing this seed to appropriate areas in the southern part of Kigali Prefecture.

Four tons of another sorghum variety, Seredo, which is suitable for low elevations could be provided by 15 Feb, if needed, to make up the 4 t deficit.

- 2. For higher elevations (>1600 m asl), 20 t of grain of landrace sorghum varieties was purchased in the highlands of southwest Uganda and transported by road to Kigali. The Mennonite Central Committee assisted with the purchase of part of this grain, NARO assisted with the logistics of procurement from village markets between Kabale and Kalengyere, and CARE trucked the grain to Kigali. CARE is taking responsibility for seed distribution in Rwanda, with much of it targeted for the Gikongoro Prefecture.
- 3. We are increasing seeds of two Rwandan sorghum varieties, Cyatanobe for high elevations (>1800 m asl) and Ikinyaruka for mid elevations (1500-1800 m asl) at Nairobi University Farm, Kabete. We anticipate this increase will yield about 300 kg of each variety for shipment to Kigali during the first week of February. Some of this seed could be used for further increases in Rwanda (GTZ has requested 50 kg + for this purpose) or Kenya, and some of it could be distributed to Rwandan farmers.

1

- 4. In an effort to provide ISAR with suitable sorghum gerinplasm for a sorghum improvement program, we have screened about 1400 highland sorghum gerinplasm lines at Nairobi University Farm, Kabete (1800 m asl), and at KARI's Genebank Farm, Muguga (2000 m asl). About 500 lines have been identified, and about 200 g seed of most of these should be available by 1 Feb 1995. Identification and seed multiplication of additional lines will be done in 1995. In addition, seeds of 21 selected populations/lines are being increased to 3-5 kg amounts. Most of these materials and breeding lines in suitable storage in Nairobi until ISAR is rehabilitated.
- 5. We are in the process of increasing seeds of 13 Rwandan sorghum varieties (7-20 kg each) and several hundred germplasm lines at Kabete. We hope to have this seed increase completed by about 15 April 1995.
- We provided information and advice about sorghum to a number of NGOs and the GoR.
- 7. S.B. King travelled to Rwanda 6-10 Oct to make contacts in Kigali and to better ascertain the situation regarding sorghum production and seed availability in the country.

Future Plans

- As much as 100 kg seed of each of 3 varieties, 5D×160, Ikinyaruka, and Cyatanobe should be available by 15 Feb to parties interested in using it for further seed increase in Rwanda. Seed of other varieties will also be available for seed multiplication later in 1995.
- With funding from SOH, ICRISAT could probably arrange for further multiplications (10-20 t total) in Kenya of sorghum varieties for lower elevations (5D×160 and Tura)

during 1995, and in time for sowing during the 1996 B season.

- 3. Another 10-20 t seed could also be produced in Kenya in 1995 of varieties suitable for mid to high elevations (Ikinyaruka, Cyatanobe, MB- 30, and possibly others).
- 4. ICRISAT plans to have a sorghum breeder participate in a bean and sorghum survey in Rwanda in June 1995.
- 5. ICRISAT Asia Center (India) is prepared to provide in-service training in sorghum production and improvement to two technician level employees of the GoR during 1995. The candidates must be identified very soon, by 15 Feb if English training is required and by 1 April if training in English is not required. The course is for 6 months (May-Nov).
 - 6. We shall continue to provide information and advise on sorghum to agencies working in Rwanda and supply seed for multiplication as it becomes available.
 - 7. We plan to make one or two trips to Rwanda during the first quarter of 1995 to implement sorghum production activities of SOH.

CONCERNS

;; :

- 1. Of major concern to ICRISAT is the lack of a more precise understanding of the present and future needs for seed of sorghum varieties in Rwanda. It is difficult to know how best to plan seed multiplication activities without having a clearer picture of the current situation.
- 2. It is difficult to conduct SOH activities in Rwanda without having someone based there who is attached to the project. We believe SOH should seriously consider using project funds to place a SOH representatives in Kigali.

ð lov

Summary of ICRISAT Expenditures on SOH

Activity	Amount US\$	
Communication (telephone/fax/courier)	1242	
Multiplication of seeds	2370	
Procurement of seeds in Uganda ¹	3000	
Travel to Uganda (July)	1187	
Travel to Rwanda (October)	1194	
Total	8993	

SOH expenditures by ICRISAT as of 31 Dec 1994.

Anticipated SOH expenditures by ICRISAT. 1 Jan - 31 Mar 1995.

Activity		Amount USS
1.	Payment of multiplication contract of 10 t seed for lowlands (including shipment Nairobi to Rwanda)	10.250
2.	Reimbursement of additional expenses for seed procurement in Uganda (NARO, NGOs)	1,000
3.	Possible initiation of additional seed multiplication in Kenya for Rwandan farmers	1,500
4.	Purchase of one air conditioner for storage of seeds in Nairobi	900
5.	Shipment of 500 kg seed Nairohi to Kigali	100
6.	Production of seed of 13 varieties (7-20 kg each) and several hundred germplasm lines (200 g each)	2,000
7.	2 trips to Rwanda	2,500
8.	Communications	600
9.	Consultancies	1,500
10.	Contingencies	500
	Total	20.850

ANNEX V

Seeds of Hope Progress Report, CIMMYT-Nairobi Reporting Period Ending 31 December, 1994

Submitted by J. K. Ransom

INTRODUCTION

CIMMYT became a partner in the Seeds of Hope Project, with the intent of providing technical and logistical support to the production of seed of adapted, high yielding maize varieties that can be used by displaced farmers returning to their farms in Rwanda. This activity was deemed critical, largely due to the fact that much of the maize grown in Rwanda is grown in the highlands, and there is virtually no adapted material commercially available in the region for this highland environment. The CIMMYT component of the Seeds of Hope will consist of a multiplication of three genotypes for use in the September, 1995 and January, 1996 plantings.

Fortunately, two genotypes that had recently been released by the National Research Program in Rwanda, were of CIMMYT origin, so basic seed was available from CIMMYT, Mexico to start the multiplication process. A third genotype, ZM607, adapted to the lower elevations in Rwanda, and widely tested in the region, was selected for multiplication to meet the needs of this environment. This variety has a good level of resistance to Maize Streak Virus, a disease that is common in the valley bottoms of Rwanda. Seed of ZM607, was provided by the CIMMYT breeding program in Harare, Zimbabwe.

ACTIVITIES TO DATE

Seed of Pool 9a (11 kg) and Pool 8a (2 kg) were obtained from CIMMYT's Highland Breeding Program in Mexico in July, 1994. These pools have a relatively broad genetic background and were released by the ISAR in the late 1980's. Pool 9a and Pool 8a are known as Tamira and Mamesa, respectively within Rwanda. Seed of ZM607 (10 kg) was also obtained from CIMMYT's Mid-altitude Breeding Station in Harare, Zimbabwe in July, 1994. This open pollinated variety had been widely tested in eastern Africa and has a relatively good level of resistance to Maize Streak Virus.

Seed of these varieties were given to Cargill-Tanzania to organize the initial increase with farmers in northern Tanzania. All materials were planted under irrigation in August, 1994.

David Jewell and Batson Zambezi, Maize Breeders from the CIMMYT Harare and Joel Ransom, CIMMYT Nairobi visited the production sites in late October to view progress and to rouge off-types in the field. This visit corresponded to the grain filling period of Pool 8a and the flowering period for Pool 9a and ZM607.

A second visit was made to the production site by D. Jewell, K. Pixley (CIMMYT Maize Breeder, Harare) and J. Ransom in December, 1994. At the time of this visit, most of Pool 8a had been harvested. The group performed mild selection among the cobs of this variety. Pool 8a produced enough seed to enable an increase which will yield appropriately 20 tons in the final increase in 1995. Pool 9a and ZM607 were in the grain filling stage during the December visit. Some rouging of off-types of these varieties was carried-out. Pool 9a was in good shape and approximately 2 tons of seeds is expected from this site, more than enough to enable the required final multiplication of 108 tons. ZM607 looked very good and will yield more than enough seed to meet requirements.

At the end of the year, negotiations between CIMMYT and Cargill on the final multiplication was being carried-out. Based on the price of production and the cost of shipping to Rwanda, the following amounts of seed will be increased and made available in Rwanda by September 30, 1995: ZM607- 25 tons, Tamira (Pool

9a)- 108 tons, and Mamesa (Pool 8a)- 15 tons. By mid-January, 1995 all of the varieties has been planted.
In addition to the seed increases in Tanzania, at the request of Jim Hooper, World Vision-Rwanda, 5 kg of Pool 5a was sent from Mexico to Rwanda. This material will be increase by World Vision in Rwanda.

.

ANNEX VI

"Seeds of Hope" Progress Report CIP/PRAPACE January, 1995

For vegetatively propagated crops, the basic goal of the project is to support the reestablishment of effective systems for the multiplication and distribution of planting material within Rwanda. For potato, progress has been made in the multiplication in Uganda and Kenya of pre-basic and basic seed of the most important-varieties grown by Rwandese farmers. This material will be ready for transport to multiplication sites in Rwanda by August or September.

Uganda

In collaboration with NARO, material is being multiplied at the Kalengyere station near Kabale.

	Tons
Basic seed	
• Field multiplication of Cruza, one hectare will produce approximately	10.00
• Field multiplication of Gahinga (called Rutuku in Uganda), one hectare	10.00
Pre-basic seed (tuberlets)	*
• Approximatelely 30,000 stem cuttings of Cruza = 150,000 tuberlets	1.5
• Approximately 10,000 stem cuttings of Sangema = 50_000 tuberlets	.5
• 200 g of TPS of the Indian line IP88006 = 600,000 tuberlets	3.0
• 200 g of TPS of the Indian line IP88001 = 600,000 tuberlets	3.0
Total	28,00

Arrangements will be made in Uganda for the harvest, storage, packing, and transport of this material to Rwanda. Arrangements must be made for land, supervisory personnel, and labor for field multiplication of this material, as well as of seed currently being multiplied at Kinigi and other sites in Rwanda. This can be done on the ISAR experiment stations, on seed farms set up at other locations, or with trained and supervised farmer-multipliers. The 20 tons of basic seed from field multiplication should be planted at a rate of approximately 2 tons per hectare. The pre-basic tuberlets from stem cuttings and TPS should be planted at a rate of 1 ton per hectare. The material from Uganda will require a total of approximately 18 hectares of land, distributed strategically to meet demand in the major zones of potato production.

Kenya

CIP, PRAPACE, and KARI operate a regional seed support unit at the Plant Quarantine Station at Muguga. "Super-elite" pre-basic seed of three varieties for Rwanda is being produced. Clean tuberlets are being produced from stem cuttings in screenhouses and *invitro* to support the redevelopment of multiplication programs in Rwanda, or the expansion of multiplication in Uganda. The tuberlets can be used either to grow mother plants for rapid multiplication using stem cuttings, or for field multiplication. The targets for production by mid July are as follows:

	Tuberlets
In-vitro tissue culture	
• Cruza	10,000
• Sangema	2,000
Mabondo	- 1,000
Stem cuttings in screenhouses	
• Sangema	75,000
• Cruza	10,000
Mabondo	1,000
Total ·	99,000

In addition to the potato seed production and field multiplication sites, we plan to work with farmers groups and/or NGO's to set up TPS nursery sites for the production of tuberlets for distribution within small local areas. For sweetpotato, we expect vines of varieties in demand to be collected, selected for quality, and multiplied in intensive nursery beds at strategic locations. We are waiting for the results of the needs assessment within Rwanda to plan and budget these activities.

We would also like to organize a two-week training session on the technology of seed multiplication and seed farm management for technicians, NGO's and selected farmers who will be involved in the program. We suggest that this event be held in August to prepare for the September/October planting season.

Budget

For various reasons, the budget has been spent more slowly than we anticipated in September. To date, out of a budget of \$95,000, \$8,500 have been expended for seed production costs in Uganda and Kenya and a planning visit to Rwanda. The rate of expenditure will accelerate rapidly in the coming months as we begin to execute activities within Rwanda. Mechanisms for transfering funds and for accountability need to be developed.

ANNEX VII

REPORT ON SEEDS OF HOPE FOR RWANDA. IITA'S PARTICIPATION

1. Introduction

The seeds of hope for Rwanda is an initiative of the CGIAR centers operating within the East African Region in collaboration with NARS with objective to provide planting material of the major crops to Rwanda after the sad war which occurred and destroyed the achievement of the tentative agricultural development production.

The IITA's participation in the SOH initiative, through its two networks in the region, EARRNET and SARRNET is focusing on three major areas: multiplication/distribution, training and human resource rehabilitation.

The training component will be undertaken to improve the process of multiplication/distribution and enhance the exploitation and adoption of varieties. Two main groups are targeted:

1. Extension personnel of the Ministry of Agriculture and NGO's and

2. Farmers

The extension agents will be trained to participate and provide supervision to farmers who will be involved in the multiplication scheme. Once the multiplication scheme moves into its second phase, farmers group will be constituted in Rwanda and trained on the rapid multiplication techniques so further the activity in country.

The goal of the two stages multiplication scheme is to produce adequate quantities of basic seed material in neighbouring countries as foundation stock. These would then be transplanted into Rwanda for further multiplication and distribution. The first stage of the multiplication activity is now being carried out in collaboration with national cassava research programmes in Uganda, Tanzania and soon with Burundi while the second phase will be implemented in Rwanda. The present report gives the activities progress.

2. SOH activities in Uganda and Tanzania

First an initial survey has been conducted to investigate the possibilities of implementing

the programme in each country and to identify varieties availabilities which could have been cultivated by Rwanda farmers. The survey has been carried out along side the borders of these participating countries with Rwanda. In Uganda and Tanzania, the seeds of hope activities have been initiated since July, 1994.

2.1. UGANDA

From the survey conducted in Western-southern of the country towards its border with Rwanda particularly in Ntungamo district by cassava national scientists the following information was gathered:

Two varieties Rutamisi (bitter) and Machunda (sweet) were identified as originated from Rwanda and were in important quantity in fields farmers to enable to do the rapid multiplication program. An important observation made was that there was no african cassava mosaic virus incidence in farmers cassava fields.

Multiplication sites (land) were also identified near Rwanda boarder at Nyarutuntu and Kayonza in Ntungamo district at a distance of 35 km of the border.

Also personnel from Agriculture offices of Ntungamo district was very receptive and understable to that matter. An other survey has been done to investigate more varieties with root crops specialists from EARRNET office and following more information was obtained:

Varieties identified from Rwanda in Uganda

Uganda local name		Rwanda vernacular name	
1.	Rutamisi	Rutamisi (=Eala 07)*	
2.	Machunda	Mulundi*	
3.	Mpologoma	Kiryumukwe*	
4.	Bukalasa	Bukalasa	
5.	Musoropiyo	Musoropiyo	
The varieties with asterik were identified as the varieties which have been released by Rwanda cassava national program. Other varieties are local and very widely used by farmers in Uganda and are also grown in Rwanda.

Musoropiyo and Bukalasa are cultivated largely by farmers in Kibungo towards Mutara and in Bugesera region in Rwanda.

Presently two sites, Nyarutuntu and Kayonza in Ntungamo district are concerned by the multiplication. With the 5 varieties, 9 ha have been planted at Nyarutuntu and 2 ha. are being multiplied, soon to be finished around 15th January at Kayonza.

The land was provided by the Agricultural and local council offices as their constitution to the initiative of SOH. Land preparation was done mechanically at Nyarutuntu and manually at Kayonza.

There is good collaboration between EARRNET office and DAO's office in implementing the program. A joint meeting for activities planning and budget is done for every three months.

2.2. TANZANIA

The initial survey conducted in Tanzania by root crops scientists from this country has identified following varieties:

Local bitter varieties

Nusurupia

	Rubona	of Rwanda origin
	Rushiguimkuba	ŧ
	Kumalampumu	11
	Kitamisi/Ngunda	58
Local	sweet varieties	
	Bukalasa	of Rwanda origin

**

Kalinji	11
Imidebe	11
Mlekimani	a
Misumbaluzi	11
Rusuna	11

Two sites for multiplication were identified at Rusumo and at Rubale.

- (i) Rusomo Prison Farm: is located very close to the Rwanda border with main road leading to the official customs border between the two countries. The officer-In charge of the prison is helping in the supervision of cassava multiplication by giving labour with collaboration of two crops Technical officers from Ukiriguru Research Station under supervision of the head of root crops program. Dr. R. Kapinda in collaboration with SARRNET agronomist based in Tanzania, DR. Mahungu. Rusumo is situated in Ngara district. Two varieties are multiplied, the most popular Ngunda (bitter) and the other is Rushigwi-Nkuba (sweet). A total of 5.5 ha have been planted and 2.5 ha. other are being multiplied.
- (ii) Rulenge Catholic Mission (CARITAS) Rulenge is located more closer to Burundi border than to Rwanda. The multiplication is done in collaboration with CARITAS of the Rulenge Catholic mission. From the initial planned 4 ha of land only 1,5 ha have been prepared and planted due to heavy destumping required coupled to labour shortage and cost because of the presence of many NGO helping refugees in November, 1994. By now the other part is supposed to be finished. Varieties being multiplied at Rulenge are Rusuna, Kachachare and Misimbaluzo/Kasibaluzi as sweet and Kitamisi as bitter.

Generally in Rwanda, the bitter variety widely grown by farmers which is Eala 07 has many vernacular names as Kitamisi, Ngunda, Rutamisi etc.

So far the collaboration with officials of Rusumo Prison and Caritas Rulenge Mission is very satisfactory. African cassava mosaic virus disease (ACMD) pressure in farmers fields around Ngara and Rulenge is very low.

Cassava green mite was observed in farmers fields but may not constitute a threat to the SOH multiplication as the planting material was very selected and early planted in good season. The main potential risk is cassava mealybug which is not yet reported in Ngara district. Attention was given however to most officers to be more strict in the movement of people and material mainly from Mwanza/Ukiriguru where cassava mealybug is of relevant in some few fields.

3. Burundi

A preliminary survey has been carried out also and has identified Gitamisi, Crealinha and Maguruyinkware as varieties with Rwanda origin. All have been released by Rwanda cassava program. However, it is important to note that Maguruyinkware variety became susceptible to cassava mosaic virus and so has been removed from the list of varieties to be released to farmers since 1991. The programme of multiplication will start in the second season of 1995 in Burundi.

It is proposed to start with an in-country training course for technicians to enhance the program and for its efficient management.

4. General comments

- Spacing of 1mx0.5m is being used in both countries to secure a minimum of 20,000 stem/ha.(~ 120,000 cuttings). This however may be more depending on varietal growing habit and will be more precisely estimated later during the growth.
 - Labour has become scarce and expensive, even tractor hire. Then it is evident that tentative budget made before was merely underestimated.

- Considering that stocks from the initial multiplication sites will have to be moved across border, it is assumed quarantine regulations would be adjusted to permit movement of vegetative planting material into Rwanda.
 - As cassava has a low multiplication ratio and bulkiness, large area are therefore required to produce any meaningful quantity of stock material. The budget is to achieve 20-25 ha in each country collaborating to this program. But in return this will make it expensive to transport. The experience we have now however indicates that planting material will be a limit to get 20-25 ha as planned.

Meanwhile, it is hoped that World bank emergency grant for seed and tools will provide further assistance in distribution through the participating NGO's working in Rwanda. (Care International, World Vision etc).

. .

.

Proposal for Emergency Support and Rehabilitation of the Tree Seed Centre at Ruhande, Rwanda

.

٠

•

€

Submitted in relation to the

Seed of Hope Support Programme

.

.

By the

International Centre for Research in Agroforestry (ICRAF) Nairobi, Kenya

December, 1994

Introduction

The Tree Seed Centre (TSC) was established in 1978, place under the responsibility of Institute of Agronomic Science of Rwanda (ISAR), with technical and financial assistance of the Swiss Cooperation.

The purpose of the Centre was to provide a facility within Rwanda that places priority focus on tree seeds required for re-afforestation in the country. The Centre was charged with the responsibility of making collections of seeds of various indigenous forest tree species for both reforestation and conservation purposes. The responsibility of Centre expanded to include both indigenous and exotic tree species. The focus of the Centre also expanded from reafforestation to include agroforestry interests. To this end the Centre included multipurpose trees and shrubs (MPTs) within its mandate.

The role of the Centre as a national tree seed centre also expanded very quickly outside the borders of Rwanda. TSC was, indeed, offering seed services to several research and development projects from various countries within the East and Central Africa highlands region. It was therefore a regional tree seed centre for highland regions in the making.

Current status of the Centre

The TSC was one of the numerous establishments that suffered from the civil war that broke out in Rwanda. The extent of damage and pilfering at the Centre is described below:

- There was general but superficial damage of the buildings. All doors and windows were broken.
- All major moveable items of equipment such as computers, photocopiers, fridge, typewriters, cars, etc, were all missing
- Even containers holding seed stocks were removed, and therefore seeds were mixed-up and scattered around
- Most of the documents and books in the library and the different offices appeared to be intact
- The arboretum was also intact
- About seven staff members of the Seed Centre were available in either Kigali or Butare

T,

Justification for emergency rehabilitation

The environmental consequences of the Rwandan civil war and refugee crisis for Rwanda itself and also for the region as a whole (especially in areas supporting refugee populations - e.g. Goma and Bukavu in Zaire) is daunting. The East African highlands region is of crucial importance, both from an agricultural and environmental point of view. The region is a major water catchment area and is the source of major rivers in the region.

There is an urgent need to reduce the current rates of deforestation going on in these areas and also to encourage re-establishment of trees, not just in afforestation programmes, but even more so in farming situations. The latter could be done through agroforestry and community forestry actions.

An immediate and regular source of tree seeds is required for such an initiative. Emphasis should be on indigenous tree species, and already known and proven exotics. This should not be the time for bringing in completely new, and untested material.

The requirement, therefore, is for a major local collection effort within Rwanda and, probably also, the East African highlands region. Collected seed materials have to be well documented and stored for subsequent distribution for tree planting purposes. This is the task that the TSC's rehabilitation would be geared to tackle. It will provide tree seeds to both development and research groups for planting in Rwanda.

Links with AFRENA project

The TSC has always had direct links and collaboration with the Agroforestry Research Network for Africa (AFRENA) project in Rwanda by establishing seed orchards of the new germplasm selected by AFRENA projects. For the purpose of this rehabilitation and emergency operation project. TSC and AFRENA would be made to operate together. Thus, for example, surviving staff of the two projects will be put together in the establishment of the task force for the TSC rehabilitation project. Seeds required for agroforestry research activities will constitute a component of TSC activities.

Objectives

The overall objective of this proposal therefore is to rehabilitate the Rwanda Tree Seed Centre in such a way as to enable it to embark on emergency seed collections and conservation activities.

The specific objectives are:

- To provide emergency rehabilitation to the TSC (building, facilities and equipment)
- To make collections of seeds of selected tree species from within Rwanda, and also from the East African highlands region, for conservation, and for distribution purposes.
- To supply viable tree seeds for reforestation, agroforesty and community forestry projects within Rwanda

 Subsequently, to be able to supply seeds to other projects within the East African highlands region (at cost)

Proposed activities

1. Staff build-up and support

This will involve putting together a team of scientists and technicians for the emergency and rehabilitation operations of the Centre. The team will be constituted from surviving members of staff of the TSC and AFRENA agroforestry projects.

The team will consist of one scientist (as coordinator), two technicians (as field team leaders) and six climbers/seed collectors. Other staff will be: one seed storekeeper, one secretary and one accountant. Casual workers will be employed as and when needed.

Their salaries and allowances will be carried on the project for a 6 months period: January - June, after which they will be re-absorbed into the national budget.

2. Stock-taking and conservation activities

This will involve sorting out, assessment and re-organization of seeds, books, documents and other materials and equipment which are still in place in the TSC. In the case of seeds, it will also involve carrying out of viability test. Appropriate repairs will also be done on malfunctioning equipment.

3. *Repairs on the building*

Essential repairs will be carried out on the TSC building. This will involve mainly replacement of doors and windows, and some painting.

4. Purchases of essential equipment for collections and office operation

- (i) Cold room
 - the refrigeration unit appears to be in order (this needs to be confirmed)
 - major purchase will be for one generator
 - containers for seeds

1

- (ii) Seed collection (local)
 - equipment for seed harvesting are in place.
 - major requirement will be 2 pick-up vehicles

- (ii) Office equipment and materials
 - one computer and printer
 - one typewriter
 - one photocopying machine
 - one dozen office chairs
 - office stationery/materials (Miscellaneous)
- (iv) Operation expenses
 - petrol, vehicle maintenance
 - purchase of seed from neighbouring or other countries
 - seed viability testing materials
 - miscellaneous

The estimated cost for this emergency rehabilitation for the Tree Seed Centre will be approximately US\$ 100,000. The Australian government has committed US \$ 49,000 towards rehabilitation of the Tree Seed Centre, as part of its contribution to the Seeds of Hope Programme. This input is being managed by the CSIRO Division of Forestry (Australia) which reports to World vision (Australia). ICRAF and CSIRO are currently negotiating an agreement which will enable most of these funds to contribute to the programme proposed here.

An extra \$50 - 60,000 will therefore be required in cash as kind to implement the entire proposal.

Financial Management Plan

For a transitional period, it will be necessary to have an external reputable organization take some responsibility for financial management and fund disbursement, as will as for overall programme implementation.

ICRAF agrees to play this role within the framework of the Memorandum of Understanding existing between ICRAF and the Government of Rwanda. ICRAF will, however, liaise with the Swiss Development Cooperation and the FAO as co-implementing institutions in this initiative.

The Ministry of Agriculture and the Ministry of Environment in Rwanda, will be the national counterparts and hosts for this project. It is proposed that the Ministry of Agriculture, through ISAR, will take over the implementation and financial management of the project after this emergency period of six months. ICRAF and the other organizations will continue to collaborate and provide technical support and advice.

Proposed Budget

1. Staff costs

Scientist(1) $\$$ 350 x 3 months Technicians(2) $\$$ 210 x 2 x 3 months Field workers (climbers) (3) $\$$ 50 x 3 x 3 months Casual labourers (miscellaneous activities) Secretary (1) $\$$ 100 x 3 months Accountant (1) $\$$ 170 x 3 months Drivers (3) $\$$ 100 x 2 x 3 months Watchmen/Guards (15) $\$$ 50 x 15 x 6 months	1,050 (1) 1,260 (1) 450 (1) 2,000 (2) 3,000 (1) 300 (1) 510 (1) 600 (1) 4,500 (2)
	13,670
 2. Per diems/Overtime Local per diem Technician/scientist \$ 20x 5 days x 6months x 3 persons 	1,800 (1)
 Field workers \$ 10 x 10 days x 6 months x 3 persons Drívers \$ 10 x 15 days x 6 months x 2 persons 	1,800 (1) 1,800 (1)
¢	5,400
3. Repairs on TSC building (estimate)	
 Replacement doors, windows Painting 	2,500 (2)
4. Seed purchases (from international sources)	3,000 (1)

.

.

5. Operation, Servicing and Maintenance Costs

-	Electric #ty/water		400 (1)
-	Fax/telephone/mail		800 (1)
-	Vehicle maintenance + operation (petrol)		2,500 (1)
-	Office stationery		1,000 (1)
			4,700
		3	

6. Capital items (purchase)

- Generator 13.5 KVA	12,000 (2)
- Single cabin pick-up vehicle (1)	15,000 (2)
- Double cabin pick-up (1)	18,000 (1)
- Photocopier (1)	1,500 (1)
- Gateway Computer	2,600 (1)
- Printer	800^(1)
- UPS	. 600 (1)
- Typewriter	600 (1)
	51,200
7. ICRAF backstopping	
equation wight from HO	

.

- scientist visit from HU	
ticket: \$ 480 x 3	1,440 (1)
per diems: \$ 120 x 7 days x 3 visits	2,520 (1)
- Technical visit and support from AFRENA/ICRAF	
Uganda	1,000 (1)

,	4,960
Overhead costs (\$ 12,000)	6,000 (1)
	65000 (2)
Grand Total \$ 9	7,330

Items/cost marked (1), (2) have the following implications:

- (1)
- Costs charged to Australia/CSIRO budget Extra cost requested from the Swiss Development Cooperation (2)

.

Budget Request Summary

Australia/CSIRO total SDC total	-	55,330 42,000
Grand Total		\$ 97,330

ς`

International Livestock Research Institute

SEEDS OF HOPE

POTENTIAL FOR ILRI CONTRIBUTION

1. Seed Multiplication

The Seeds of Hope project adopted production of seeds from some food crop species (maize, sorghum, beans, wheat, cassava, sweet potato, vegetables, etc..) as the priority for their activities.

Being specifically a Livestock Research Institute, ILRI is not directly involved in food crops production but, is very keen to contribute in the international effort to assist Rwanda. Initially, ILRI has offered to do initial multiplication of basic quantities of seeds of maize, sorghum and beans at its Debre Zeit site where it had set aside five hectares of land with irrigation facilities. The produced seeds would thereafter, be multiplied further in Rwanda.

Now that the SOH project has decided to work mainly in Rwanda, the ILRI facilities will probably not be needed. However, ILRI is still ready to assist in seed multiplication if need arises.

2. Forages

- ILRI genebank has some accession of indigenous forage species collected in Rwanda. The assumption is that forage germplasm in natural pastures will not have been greatly affected by the war. However, this material is available for repatriation if required.

- The ILRI African Feed Resources Network has been involved in assisting ISAR Forage Research Programme in Germplasm Evaluation. Now that ISAR has planned to resume its activities in February 1995, ILRI is ready to discuss with the new ISAR management and depending on ISAR priorities in the rehabilitation of livestock research, ILRI could continue its technical backstopping in future activities of ISAR activities in Forage Research. If need be, ILRI is ready to assist in re-establishment of forage germplasm collections through forage seed supply from the genebank.

3. Rehabilitation of Livestock Research

If ISAR wishes so, ILRI is available for technical assistance in the rehabilitation of livestock research in Rwanda.

4. Training

ILRI is available to assist in training Rwanda scientists and technicians on the various fields related to livestock research.

Discussion

Participants agreed that livestock is a major component of the Agricultural Sector. It has suffered severe setbacks during the war and there is a need for a major initiative similar to the SOH initiative for rehabilitation of the sector in Rwanda. ILRI could be the major actor to launch this initiative.

ANNEX X

DEVELOPMENT OF A NATIONAL PLANT GENETIC RESOURCES PROGRAMME IN RWANDA

An IPGRI/ISAR Proposal

1.0 INTRODUCTION

Rwanda is small landlocked country with a total land area of 24,950Km and pre-war population estimated at 8 million. It is a primarily agricultural country with over 10% of the population relying on farming.

In the period before the war, population density was the highest on the continent and was estimated at 445 person/km². Its per capita income is among the lowest in Africa at US\$285. The country does not have any important mineral deposits and the economic mainstay is predominantly agriculture with fields intensively intercropped with bananas, beans, sorghum, sweet potatoes, cassava and maize which are among the major food crops. These crops represent 73% of food consumption and 79% of both calorie and protein intake.

Sustainable crop and food production under the typical low input agricultural conditions in Rwanda depends on genetically diverse, well adapted and disease resistant crops suited to the diverse agro-ecological zones in the country.

In the past several IARCs have worked on crop development projects in Rwanda in collaboration with the National Agricultural Research System (ISAR). They include CIAT. (beans), CIP (sweet potato, potato), ICRISAT (sorghum), CIMMYT (maize), IITA (cassava and plantain), ICRAF ((Agroforestry), IBPGR/IPGRI (germplasm collecting/conservation and development of conservation facilities).

The genetic heritage of Rwanda has always been of concern to the world community. Before the war farmers grew the greatest range of bean varieties found in active use anywhere else. Several of these varieties were already identified as unique and valuable germplasm. This type of genetic diversity is essential for rebuilding and sustaining a productive agricultural system for Rwanda's predominantly farming population. The country shows marked agroecological heterogeneity with clusters of varieties adapted to different altitudes, soil types and the presence of diseases.

2.0 JUSTIFICATION

The escalation of civil war in Rwanda since April 1994 has resulted in the serious disruption of agricultural activities in the country. The most serious consequence is perhaps the neglecting of agricultural crops in the field leading to severe losses of germplasm stocks for planting in the subsequent seasons particularly for cereals and grain legumes. The country had conservation facilities at Rubona, Ruhande and Kigali during the pre-war period but visits to these stations have revealed that the germplasm stocks have been destroyed or mixed up, most of the equipment stolen or vandalised and the facilities need to be rehabilitated.

According to a report of an FAO/WFP crop and food supply assessment mission which visited Rwanda on 9 - 17 August 1994, the harvest from the 1994 `B' season, which stretches from January to July, was severely affected by civil war. Planting for this season was normal and weather conditions were favourable to excellent. Yields and guality could have been normal but large scale displacement of people, the extensive killings and civil disruption impended or completely halted crop maintenance leading to weed proliferation and increases in pest populations thus reducing yields. Scavenging by the people and damage by animals further reduced yields. The net effect was a 60% reduction in the production of cereals and pulses and a 30% reduction in output from plantains and roots and tuber crops. This unrest has had a negative impact on availability of well adapted germplasm for planting in the next season, since whatever seed was available was used as food (as the most important and immediate need). This will greatly narrow the genetic diversity of agricultural crops in the country. Widespread shortages of beans and maize seeds have been experienced. The FAO estimates that the requirement for emergency planting seed for the 1995 'A' season (August-December) will be as follows: 8500 tones of beans; 1700 tonnes of maize; 640 tonnes of soya beans; 850,000 10g packages of vegetable seed. Clean healthy cuttings of sweet potato and cassava are in short supply. An estimated 800,000 hoes and 1000 tonnes of fertilizer are also required.

At the moment, there are close to 140 NGOs and relief agencies operating in Rwanda, many of them are involved in seed procurement and distribution to farmers. However, the growing conditions in Rwanda are sufficiently unique that varieties brought in from other areas are likely to be poorly adapted, disease susceptible and therefore poor yielding. This loss of adapted varieties is most critical for beans, sweet potatoes, yams, sorghum and maize. Plantains, bananas and cassava are at lower risk because of their perenniality. The genetic diversity of these crops needs to be restored if the country's agricultural productivity is to be sustained on long term basis.

Many of the relief agencies and NGOs concerned with seed supply, restoration of food production and security in Rwanda, lack the technical and scientific expertise to ensure the genetic integrity of material supplied to farmers is maintained. After the current emergency situation is contained, the important issue of restoration and conservation of the genetic diversity of agricultural crops has to be addressed through an indepth search of past germplasm collections from Rwanda, their repatriation, multiplication and redistribution to farmers and also the recollection of valuable germplasm.

An important step is the development of a nationally coordinated effort i.e. a National Program on Plant Genetic Resources involving the relevant ministries, institutions and relevant NGOs. The essence of the program will be to develop national action plans, strategies and activities for plant genetic resources conservation in the country including restoration of the conservation facilities in Rubona, Ruhande and Kigali which have all experienced varying degrees of damage. Training of manpower to undertake plant genetic resources activities, germplasm collection, multiplication redistribution and duplication of the material outside the country are also important issues which the National Programme will need to address.

The relevant government ministries and various institutions operating in Rwanda in agricultural rehabilitation including FAO and the other IARCs will also contribute in the strengthening of the National Plant Genetic Resources Programme.

3.0 THE PROJECT

This will be a three year project which aims at developing a National Program for plant genetic resources in Rwanda. The Program will direct national efforts in safeguarding the genetic base of the country through establishment and rehabilitation of conservation facilities, training of manpower and developing plant genetic resources priorities and activities. These activities will include germplasm acquisition (collection and repatriation), conservation, documentation, multiplication, development of conservation facilities, characterization and evaluation.

4.0 OBJECTIVES

4.1 Goal

To restore and safeguard the genetic diversity of agricultural crops in Rwanda through an integrated and nationally coordinated effort.

4.2 Specific objectives

- 4.2.1 To carry out an indepth assessment on status of plant genetic resources in Rwanda.
- 4.2.2 To organize a national workshop on plant genetic resources.
- 4.2.3 To form a national plant genetic resources coordinating committee.
- 4.2.4 To rehabilitate conservation facilities in the ISAR centres and develop a National Plant Genetic Resources Unit.
- 4.2.5 To train manpower in plant genetic resources at MSc, short courses and technician levels.
- 4.2.6 To develop plant genetic resources documentation capability through a computerized data management system and an information resource centre.
- 4.2.7 To carry out germplasm exploration and collection in Rwanda and neighbouring countries particularly West and North West Zaire.
- 4.2.8 To repatriate, multiply and redistribute germplasm originally collected in Rwanda by IARCs and other international genebanks.
- 4.2.9 Characterize and evaluate germplasm of Rwanda origin and incorporate it in crop improvement programmes.
- 4.2.10 To initiate crop working groups and networks in Rwanda and CEPGL countries.

- 4.2.11 To carry out genetic diversity studies on the germplasm introduced under the SOH initiative and the emergency seed distribution programme.
- 4.2.12 To provide technical backstopping to NGOs involved in seed multiplication and distribution in Rwanda.

5.0 ACTIVITIES

5.1 Status assessment

A detailed study will be carried out in Rwanda to find out the actual status of plant genetic resources. An analysis of the past activities in plant genetic resources conservation and utilisation will be carried out with an indepth review on past germplasm collection missions (what was collected, regions covered and where the material was kept and by who). The past crop improvement programmes and trends in germplasm utilisation will be assessed. Updates on current on going activities by the ministries, research institutions, development agencies and NGOs will be made.

A profile of contact persons involved in plant genetic resources activities and policy development at the ministerial level will be developed. A more general profile will be developed for other contacts persons and institutions, both governmental and nongovernmental. An indepth assessment of damages caused to the conservation facilities in the country particularly cold rooms, freezers, equipment, other facilities and infrastructures connected to PGR activities will be carried out. The study will also review the plant genetic resources needs and priorities, particularly training, conservation facilities and germplasm, collection, repatriation and multiplication.

5.2 Organisation of a National Workshop

A national workshop which will bring together the key players in the agricultural and environment sectors and genetic resources will be organised. The participants will be the relevant government ministries, research and academic institutions, local and international NGO's, UN agencies and IARCs operating in Rwanda. The success of a National genetic resources programme depends on a wide range of inputs, so the involvement of as many interested parties as possible will be encouraged. The objectives of the workshop will therefore be to review the status and on-going activities in plant genetic resources conservation, identify constraints and develop strategies and action plans for further PGR work depending on expressed needs.

5.3 Formation of a National PGR Coordination Committee

A national integrated coordination committee with the overall responsibility of coordinating national germplasm activities will be formed. The committee will be an interface between national resource planning at the ministry level and the technical, operational aspects of germplasm management at the level of research institutions. Its constitution will comprise of representatives of governmental ministries, national NGO's, national institutions of higher learning and research establishments carrying out plant genetic resources activities in the country. The responsibility of the committee will be to make policy guidelines and strategic plans leading to the formulation of a National Action Plan for genetic resources management in the country. It will also coordinate all national activities on germplasm management which entails regular reviews of national plans of action and establishment of a timetable for the rational development of genetic resources activities, including regular monitoring of progress. The committee will also be responsible for the promotion of a rational institutional framework for genetic resources management with a secure operational budget for conservation activities and facilities, sufficient manpower and an effective training programme. The Committee will carry out liaison work with other countries, regional programmes and international organisations to coordinate the efficient collection, conservation, documentation, evaluation and utilisation of germplasm at both regional and international levels.

5.4 Rehabilitation of conservation infrastructure and development of a national Plant Genetic Resources Centre

The germplasm conservation facilities at Ruhande, Rubona and Kigali need to be rehabilitated. This will include the repairing of cold rooms, fixtures and structures. The facilities at Rubona will be upgraded to a National Plant Genetic Resources Centre. The infrastructure will need to be expanded by additional office space and additional storage facilities particularly chest deepfreezers, seed handling equipment such as heat sealing machines, seed driers, ovens, incubators, weighing balances, seed containers seed counters and germinators. Other ancillary facilities which are required include growth chambers and greenhouses. The NPGRC will be responsible for keeping active and base collections of germplasm and will be the implementing arm of the National Programme in collaboration with other institutions as may be necessary.

Field genebanks for vegetatively propagated crops will be established in the major ecological zones. Collaboration will be sought from IITA and the other IARCs to duplicate this material in *in vitro* genebanks.

5.5. Training

The National Programme staff will receive training in conservation of plant genetic resources. MSc training will be provided to national programme staff who will take the responsibilities for conservation activities, exploration and collection of germplasm and documentation. Short courses will be provided to research assistants and technicians who will provide technical support to the relevant scientists. Training will be carried out in the region and overseas as may be necessary. Development of the Plant Genetic Resources Centre's training capability will be pursued through provision of training packages and equipment. This will enable the centre to organise short training courses in conservation of plant genetic resources for the national scientists and technicians.

5.6 Documentation of plant genetic resources and related activities

An appropriate data management system for the documentation of germplasm and all plant genetic resources activities will be developed. The necessary computer hardware and software packages will be procured and installed at the National Plant Genetic Centre which will also manage a resource centre for PGR information gathering and exchange. It will also operate a library for plant genetic resources reference material and offer bibliographic services at the national level.

5.7 Germplasm exploration and collection

Exploration and germplasm collecting missions will be organised in the different agroecological zones to rescue particularly landraces and locally adapted material for long term conservation at the NPGRC. Germplasm could also be collected in the neighbouring countries which share similar climatic conditions with Rwanda particularly West and North Western Zaire which are said to be rich in genetic diversity of some of the most important food crops. The National Programme will determine germplasm collection priorities depending on identified gaps, needs of breeders for crop improvement and perceived threats of genetic erosion. The collecting missions will be preceded by short courses on germplasm exploration and collection and the collection team members will comprise of the national staff assisted by the relevant IARCs depending on the targeted crops and or type of collecting mission. Duplicate samples of the collected germplasm will be sent to collaborating IARCs.

5.8 Germplasm repatriation and multiplication

A search will be carried out to locate the germplasm previously collected by IARCs and other international genebanks. This material will be repatriated, multiplied in Rwanda and redistributed back to farmers. Collaboration in this activity will be sought from the relevant IARCs and some of the NGOs such as CARE and World Vision who are already multiplying and distributing seeds in Rwanda.

5.9 Characterization and evaluation of germplasm

Germplasm acquired in collection missions, repatriated or donated by various institutions will be enhanced through a programme of characterization and evaluation. This will be done inclose collaboration with the natural breeders involved in the various crop improvement programmes and with the assistance of the IARCs depending on the mandate crop.

5.10 Crop working groups and networks

The concept of crop working groups will be introduced with the aim of bringing together breeders, conservation scientists and other agricultural and environmental scientists interested in particular genepools to discuss genetic status, problems, constraint, priorities and strategies for conservation and utilization of the germplasm in that genepool. The working groups will keep the national germplasm needs for a wide range of nationally important crops under constant review. Their functions will include assessment of national germplasm needs for their mandate crops, monitoring of genetic erosion in situ viz. in the farmers fields and in the natural habitats. The working groups will ensure the adequacy of conservation facilities and conditions for their mandate crops. They will also carry out inventories of existing national collections, coordinate the evaluation, breeding and national trials and identify gaps in the collections or in the evaluation with a view to advocating for more collecting or evaluation.

5.11 Genetic diversity studies

As part of the emergency relief operation, a lot of germplasm of unknown genetic origin and integrity is being introduced to the Rwanda agricultural system. The diversity of this germplasm in terms of species, varieties and genetic variability will be assessed in order to know the material and determine its usefulness and suitability for the Rwandan agricultural needs particularly adaptability to the varied environment, disease resistance and yield potential. This activity will be implemented jointly with CIAT who already have planned a socio-economic impact assessment study with an appreciable component of genetic diversity study.

5.12 Technical assistance to NGOs

Two to three day seminars will be organized to educate NGOs' staff involved in seed production and distribution on standards for maintenance of genetic integrity in conservation and multiplication of plant genetic resources. They will be provided with the relevant literature and educational material.

6.0 OUTPUTS

The main output will be a functional and well coordinated National Programme on plant genetic resources with a national coordinating committee and a national PGR Centre fully equipped with appropriate conservation facilities and adequate manpower. At the research level, the main output will be germplasm stocks which the breeders of the National Agricultural Research System can draw from, for the improvement programmes. Well adapted improved varieties will be the output from crop-improvement and research activities.

The report of the status assessment and the National workshop outputs will enable the conservation scientists and policy makers to understand the status of plant genetic resources in the country and therefore facilitate and speed up the National Plan of Action for plant genetic resources conservation and utilization.

7.0 BENEFICIARIES

The main beneficiaries will be the Rwanda NARS and the farming community. The NARS will benefit from availability of germplasm for crop improvement programmes and its long term conservation in the National Plant Genetic Resources Centre. The farmers will benefit from well adapted germplasm which will lead to increased production and self sufficiency in food supply. The available genetic diversity will provide the farmers with the necessary options, flexibility and insurance against food scarcity and crop failure.

8.0 IMPLEMENTATION

The project will be implemented mainly by the IPGRI-SSA group. However, scientists from the relevant Thematic groups will be associated as may be necessary.

The main collaborator will be ISAR of the Ministry of Agriculture which will provide the staff, in-country logistical support and other services in kind as may be required.

Other collaborators will be the members of the SOH initiative particularly ICRAF, CIAT,

CIP, CIMMYT and ICRISAT who will be involved in activities such as germplasm repatriation and genetic studies, etc.

Collaboration will be sought from IITA for the *in vitro* conservation of root and tuber crops especially bananas and cassava. Other collaborators will include FAO, World Vision, CARE international and EEC Rehabilitation Department.

The project will be financed by the SOH initiative to a limited extent (urgent action) and by other donors.

Allocation of funds to various activities will be done in collaboration with the national plant genetic resources committee

9.0 BUDGET

	Description	US Dollars
9.1	Status assessment	10,000
9.2	National workshop and publication of proceedings	10,000
9.3	Rehabilitation of conservation facilities at Rubona and Kigali	30,000
9.4	Development of National Plant Genetic Resources Centre	_
9.4. 1	Equipment 6 chest deepfreezers and storage files 2 heat sealing machines 1 incubator 1 oven 2 computers, printer and software packages 1 germinator	25,000 2,000 8,000 7,000 10,000 8,000
9.4. 2	<u>Ancillary facilities</u> Germination/growth chamber Glasshouses Information resources (literature and reference material)	5,000 10,000 5,000
9.4. 3	<u>Field genebanks</u> Establishment of a sweet potato field genebank Establishment of a cassava field genebank Rehabilitation of the banana field genebank	10,000 10,000 10,000

	Description	US Dollars
9.4. 4	<u>In vitro conservation</u> Rehabilitation of minimal in vitro conservation facilities (a tissue culture laboratory already exists at Rubona) In vitro establishment and transfer of tissue cultures for medium-term conservation in IARCs.	10,000 10,000
9.5	<u>Training</u> 6 MScs in Plant Genetic Resources Conservation @ US\$30,000 6 Short courses in Plant Genetic Resources @ US\$10,000	180,000 60,000
9.6	Germplasm exploration and collection (4 collection missions @ US\$10000) Inductive training courses on germplasm exploration and collection (4 courses @ US\$5000)	40,000 20,000
9.7	Germplasm repatriation, multiplication and redistribution Data search and germplasm repatriation (communications, packaging and postage) Multiplication and distribution (labour, material, agricultural inputs processing, packaging and transport)	5,000 60,000
9.8	Initiation of crop working groups (three consultations @ US\$5,000) (meeting an cost of consultant)	21,000
9	Genetic diversity assessment studies	10,000
9.10	Seminars for NGOs (two seminars on genetic resources conservation), travel and services	20,000
9.11	<u>Technical assistance to Rwanda</u> IPGRI staff travel to Rwanda - 12 ten-day visits (four per year) @ US\$2,500	30,000

ANNEX XI

Jan.1995

SOH Socio-economic monitoring:baseline data

The approach outlined for collecting baseline data is based on three principal observations.

- SOH baseline information is not directly that of a post-war context. Having given advice to Non-Governmental Organizations (NGOs) for 95A, we will be directly intervening on farmers' fields at the earliest in 1995B. NGO distributions have been significant; from September through October 1995, NGOs distributed some 6970 MT of bean, 1707 MT of maize seed, and 7230 kg of vegetable seed
- Our efforts can and should be integrated with those the Minister of Agriculture (MINAGRI) and NGOs. In this way SOH findings can influence action in several arenas.
 Baseline data should be of immediate practical use and can help shape future National Program and International Center Strategies.
- 3) Baseline surveys can provide an important opportunity for capacity building. Done rigorously, methods can be shared which allow the collection of precise socio-economic and agronomic information— with farmers as partners. Certainly all NGOs contacted expressed the need for sharpening their agronomic expertise. Further, many of the Rwandan technicians now on site have little knowledge of local agriculture, and even less experience with on-farm methodology.

Baselines 95A (September 1994-January 1995)

Extensive baseline surveys started mid January 1995, towards the end of the first season of NGO intervention. (Harvests this year have been staggered from beginning January through mid-February). Surveys on maize and beans, the two major SOH crops distributed aimed to evaluate the following:

- 1) The proportion of the total seed which came from local stocks, versus aid or markets.
- 2) Farmers' appreciation/evaluation of the various kinds of seed distributed and how the rated in comparison to local varieties.
- 4) The yield of various types of seed and how, in particular, 'aid' types (procured partially with SOH advice) compared with the usual seed sown.

This information is key to SOH in that it indicates the extent to which farmer local germplasm was disrupted as well as the relative success of introduced seed options. Such information is also of high interest to NGOs partners as well as the MINAGRI. To-date, no other performance assessments have been made; while hundreds of tons of seed has been distributed, there is scant information on whether the emergency aid gave adequate yields.

To effect the surveys, SOH trained partners representing the MINAGRI (in the Prefecture of Kibuye) and four NGOs : World Vision, CARE, Médicins sans Frontières¹, Catholic Relief Services. Such collaboration has allowed crop assessments to be made in most major agroecological of the country, the sample encompassing 8 of the 10 Prefectures, including 32 communes and 165 households (see attachments for numbers trained and specific regions covered). While partners will carry out the fieldwork, SOH will affect the analysis and report write up. (Each NGO and MINAGRI field unit will receive its own regional report as well as the global analysis).

Field work for the bean assessments will be completed 15 February 1995. Maize assessments will be completed by 30th March.

Baselines 95B (February 1995- June 1995)

Baseline assessments are being planned for the May-June period to encompass other major crop seed distributions: these include Irish potatoes, sweet potatoes, sorghum and manioc, and perhaps wheat. Potential survey partners include the NGOs, an enhanced role for the MINAGRI as well as intensive collaboration with ISAR scientists (should the national institute get off its feet—as planned for February 1995). The survey would again try to meet dual objectives of research data collection and capacity building.

Genetic diversity monitoring

1

Farmer assessments of their bean genetic diversity will be an ongoing exercise. The goals are practical: to help better target where additional varietal material is or is not needed. Assessments of varieties, however, is an issue which cross-cuts crops and will be explored: for all SOH crops, are there key varieties which farmers have lost? Have the aid efforts caused a major shift in varietal use and how is this shift perceived.

Preliminary surveys to assess the genetic diversity of beans started in November 1994. Assessments in Butare (N=80) showed that 35% of the farmers had planted at least some of their local mixture during the September -January season (season A). Further 29% of the total seed planted was from the farmers own local stock and another 48% from regional markets (some of the seed purchased being of local origin). This relatively high figure of local beans is remarkable considering that the Prefecture of Butare was the one which showed the highest bean deficits, an area which FAO estimated could meet only 50% of its minimal bean needs. Of note is that only 19% of farmers were growing improved climbing beans versus 49% during the same season in 1992. Perhaps 'improved' germplasm has been harder to restock than the local varieties.

More intensive bean genetic monitoring surveys were initiated in January, in conjunction with

While the MSF agronomic program closed up in January, SOH has agreed to continue evaluating MSF work in their Butare zone of action. Results will be forwarded to MSF/Belgium, as well as to the local authorities.

the crop performance assessments described above. Farmers countrywide are being asked to compare mixtures now with those sown immediately before the dramatic April events. General composition of mixtures is being assessed as well as specific varieties lost or gained. Small amounts of both mixtures and pure lines are also being collected from all 165 farmers, giving an estimated total of 400 samples, or about 4000 varietal entries.² Such material will be grown out in March and eventually compared against baseline bean collections made in Rwanda in both 1985 and 1992. Twenty-four of the 32 communes being covered in the NGO collaboration (75%) correspond to communes sampled during the previous genetic sampling research.

At this point, molecular characterization is being reserved for the bean material. Sates the CIAT geneticist, who came to Rwanda to collaborate in the January survey:

Ex situ collections will be fingerprinted using the AFLP technique which is already being applied in CIAT for the evaluation of genetic diversity. Variance will be estimated from marker bands to compare variability in ex-situ collections made formerly, with variability collected from farmers' fields in the present effort. AFLP fingerprinting will permit recognizing unique genotypes in ex situ collections which are absent or in low frequency in farmers' fields and which require reestablishment.

Sorghum diversity reconnaissance surveys are being planned for June in conjunction with ICRISAT breeders. While we have little reason to believe there have been marked losses, close field analysis will determine whether further efforts to restore sorghum germplasm need be considered.

²

Our interviewers insist that the amounts being collected are so small that farmers will freely give the samples under the idiom of 'friendship or mutual aid'. We have, however, made provision to reimburse the farmers with high quality local seed at a rate of 1 to 2: 1 handful collected, 2 handfuls returned.

FOLLOW-UP 95A: BEANS-MAIZE

NGO/MINAGRI	PREFECTURE	COMMUNES	# TRAINED	# HOUSEHOLDS
MINAGRI	Kibuy s	Mwendo 8wakira Mabanza Rutsiro Gitesi	3.	25
World Vision	Kigali	Ngenda Gashora Kanzenze	4*	15
	Gikongoro	Karama Nyamagabe Mubuga Rwamiko		20
	Ruhengeri	Cyeru Nyarutovu Nyamugare Nkuli		20
	Gišenyi	Kanama Mutura		10
CARE	Kibungo	Muhazi	6	5
	Kigali	Rubungo (?) Shyorongi Butarriwa		20
	Byumba	Giti		5
MSF/SOH	Butare	Gishamvu Mbazi Shyanda Mugusa Ruhashą	2	25
CRS/SOH	Byumba *	Kinyami Muhura Murambi Rutar o	2**	20
TOTAL			17	165

* Those trained will train others

.

4.

.

** CRS staff did not stay for the entire training. Byumba agronomist will be trained on site.

.



Special Brain-drain - A Menace to Rwanda's Research Future

W ith a semblance of peace and stability taking root in Rwanda, one of the challenges that the current government has to grapple with is the massive exodus of researchers and scientists that was sparked off by the escalated civil war a few months back.

While lauding the International Centre for Research in Agroforestry (ICRAF) for its action in helping displaced Rwandan scientists by rescuing them from refugee camps and temporarily placing them within ICRAF research projects during round-table talks between Rwanda Government Officials and an ICRAF mission to Kigali, Rwanda's ministers for Agriculture, Environment and Forestry strongly urged ICRAF to inform the Rwandese scientists wherever they are that "they are badly needed at home for the task of reconstruction and getting research back on course", and to let them know that "the time for returning to Rwanda's 'as soon as possible'".

According to Dr Kwesi Atta-Krah, ICRAF's Regional Coordinator for the East and Central Africa AFRENA (Agroforestry Research Networks for Africa), who together with Amadou Niang and Don Peden visited Rwanda in October 1994 to assess the general situation with regard to its affect on research operations, as well as to assess the view of the government and non-government officials on their perspectives of the rehabilitation and stabilization process, their vision of the future and their plans, the government's greatest concern currently is the fact that its human resource pool was badly shattered by the war.

At the national agricultural research institute (ISAR) for example, it is estimated that only about 10 per cent of the research scientists and technicians are presently within the country. Moreover, to facilitate the process of re-establishing the instituition, the ICRAF mission was informed that the government would have to appoint a Director of ISAR pitting the fate of the previous Director who is currently outside of Rwanda.

It was variously estimated that only 10-20 per cent of the civil servants and other government officials were still in place. At the Department of forestry in the Ministry of Agriculture, only 10 per cent of the staff have reported back to work. "Out of the ten regional heads of forestry, only one was known to be at his desk. While three were known to have bace been killed, the remaining were suspected to be in refugee camps in Goma or Bukavu, still at the Directorate of Forestry, only the Director of forestry. Mr Thade's Habiyambere was back to work, assisted by a couple of secretaries.

While the government of Rwanda professes an 'open-door' policy position on diplaced scientists and researchers, it was made abundantly clear to the ICRAF mission that the government was not considering amnesty for people who are known to have either engineered, facilitated or participated in the carnage which led to the deaths of several thousand Rwandans.

People who have cases to answer would be made to go through the justice process that is being established to handle such cases.

Says Dr Atta-Krah. The real difficulty for everybody (including ICRAF) however is knowing who could be considered safe or unsafe to return. While the Minister for Agriculture assured us that everything would be done to ensure that returning scientists and researchers innocent of any wrongdoing received full protection of the law, the situation is however, really confused, and there are no clear guarantees for anybody."

On the other hand, the government of Rwanda is considering a process of recruitment and rationalization of senior and intermediate positions in the civil service and other Government instituitions (including research instituitions). This will enable the Rwandans now returning to the country after decades of exile in neighbouring countries to compete either for positions declared vacant or with incumbents for the positions on the basis of merit.

What this implies is that there is no guarantee that returning scientists would automatically retain their positions. Within the Ministry of Agriculture, and particularly within the research division, it is said that this policy, even if implemented would not make much difference to the staff structure which existed prior to the outbreak of the war.

All professional staff in government employment currently out of the country therefore risk losing their positions, especially if they have not returned to Rwanda at the time of the recruitment rationalization process. No dates have yet been fixed for this exercise.

ANNEX XIII

MEMORANDUM OF UNDERSTANDING (MOU) BETWEEN THE CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL (CIAT) AND

PROVIDE NEAR TERM REPLENISHMENT OF PLANTING SEED OF PROPAGULES OF ADAPTIVE VARIETIES OF MAJOR CROPS TO RWANDA.

TO

The undersigned duly authorized representatives of the parties hereby agree to the following terms and conditions and all attachments as indicated in section 5:

WHEREAS, a group of donors -United Kingdom ODA, USAID/OFDA, Swiss Development Cooperation, World Vision Australia, and Australia Minister of Development Cooperation, and Canadian IDRC among others- have accepted to provide their cooperation for the implementation of the project entitled "Seeds of Hope" (hereinafter referred to as the "Project");

WHEREAS, six CGIAR centers have agreed, in a cosortium, to pool technical expertise to respond to the critical need to restore crop production and biodiversity in Rwanda - CIAT in beans, CIMMYT in maize, CIP in potato and sweet potato, ICRISAT in sorghum, IITA in cassava, and IPGRI in genetic resources;

WHEREAS, the Centro Internacional de Agricultura Tropical (hereinafter referred as CIAT) and the donors have entered into a contract for the implemntation of the "Project" together with the "Cosortium" as set for in the project document;

WHEREAS, CIAT as the coordinator of th "Project" desires to set up the mechanism to obtain the collaboration of the

(hereinafter referred as) in order to carry out the activities required for the implementation of the Project as set forth in the Project Document;

NOW THEREFORE, CIAT and ______(hereinafter referred collectively as the "Parties") hereby agree as follows:

1. SCOPE OF WORK

1.1 The Parties agree to be bound by the provisions herein set forth as well as in the Project Document (Annex 1).

1.2 Description of Project: The project purpose is to provide near term replenishment of planting seed or propagules of adapted varieties of major crops in Rwanda; to provide technical and scientific advise to concerned relief agencies, NGOs, and relevant NARS; and to assist in the rehabilitation of rwandan agricultural crop production.

The inmediate objective is to increase seeds supplies of beans, sorghum, and maize, primarily in neighboring countries (Uganda, Burundi, Kenya, Tanzania, Zaire). This seed increase will be done through contracts with farmers in

neighboring countries. The seed will be packaged in small lots and distributed to the Rwandan farmers through food relief agencies and NGOs. The vegetatively propagated

crops (sweet potato, potato, and cassava) require large volumes of planting material. Relevant diversity has been assembled in neighboring countries. Facilities to enable rapid propagation of planting material will have to be reestablished quickly in Rwanda as soon as conditions allow.

The success of reestablishing biodiversity of the relevant crops will be monitored both at the socio-economic and experimental level.

2. RESPONSABILITIES OF

2.1 ______ shall perform and complete all the activities described in the Project Document that correspond to______ (Annex 1).

2.2 For such purpose______ shall provide the services of suitable qualified and experienced expert personnel to perform the activities.

2.3 In order to comply with donors requests_____shall submit to CIAT reports in two parts as follows:

a Part One shall consist of a quarterly progress report describing the activities carried out and the results reached for the respective period. The initial report is due 31 December, 1994.

b. Part Two shall consist of a quartely financial report providing information for the covered period on all expenditures made under this Agreement and an Invoice for the next period.

c. ______shall submit at the end of the Project's period and not later than 60 days after the closing date, a complete technical report and a final financial statement. ______shall be made accesible to any one of the donors or their representatives for audit purposes at anytime.

3. PAYMENTS

3.1 As full compensation for the activities carried out for a period of 17 months (1.8.94 through31.12.95), CIAT will pay_____up to a maximum of US\$------ broken down as follows:

ITEM

<u>US\$</u>

SEED RELIEF NARS/REHABILITATION/CAPAC. BUILDING STRATEGIC RESEARCH SUPPORT OPERATION AND ADMIN. SUPPORT

TOTAL

3.2 CIAT, subject to availability of funds from the pool of donors, will disburse the funds according to the following schedule of payments:

Upon signing the MOU and presenting an Invoice US\$ Every quarter, beginning January 1995 At arrival of Final Statement

4. PROJECT TERMINATION

4.1 The duration of the Project is limited to the 31st December 1995 unless extended by mutual agreement.

4.2 At the end of the Project CIAT and the donors in consultation with _______ shall decide jointly on the future use of vehicles and equipment purchased with Project funds.

4.3 The present Agreement covers the Project period from 1st August 1994 until 31st December 1995. It shall enter into force on the date of its signing with retroactive financial reports are presented to CIAT.

4.4 This Agreement can be terminated at any time by the Parties involved by written notice given at least three months in advance.

5. ANNEXES

The following Annexes form an integral part of this Agreement:

-Project Document -Budget

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL ____(CENTER)_____

Robert Havener

(Legal Representative)

Date:

Date:

3. PAYMENTS - CIMMYT

3.1 As full compensation for the activities carried out for a period of 17 months (1.7.94 through 31.12.95), CIAT will pay CIMMYT up to a maximum of US\$127,000 broken down as follows:

ITEM	USS
SEED RELIEF	109,000
NARS/REHABILITATION/CAPAC. BUILDING	5,000
STRATEGIC RESEARCH SUPPORT	*-
OPERATION AND ADMIN. SUPPORT	13,000
TOTAL	127,000

3.2 CIAT, subject to availability of funds from the pool of donors, will disburse the funds according to the following schedule of payments:

Upon signing the MOU and presenting an Invoice	US\$	38,000
Every quarter, beginning January 1995		19,000
At arrival of Final Statement		13,000

3. PAYMENTS - CIP

3.1 As full compensation for the activities carried out for a period of 17 months (1.7.94 through 31.12.95), CIAT will pay CIP up to a maximum of US\$103,500 broken down as follows:

ITEM	<u>US\$</u>
SEED RELIEF	31,500
NARS/REHABILITATION/CAPAC. BUILDING	60,000
STRATEGIC RESEARCH SUPPORT	
OPERATION AND ADMIN. SUPPORT	12,000
TOTAL	103,500

3.2 CIAT, subject to availability of funds from the pool of donors, will disburse the funds according to the following schedule of payments:

Upon signing the MOU and presenting an Invoice	US\$ 31,000
Every quarter, beginning January 1995	16,000
At arrival of Final Statement	8,500

3. PAYMENTS - ICRISAT

3.1 As full compensation for the activities carried out for a period of 17 months (1.7.94 through 31.12.95), CIAT will pay ICRISAT up to a maximum of US\$137,550 broken down as follows:

ITEM		<u>US\$</u>
SEED RELIEF	77,550	
NARS/REHABIL	ITATION/CAPAC. BUILDING	21,000
STRATEGIC RE	SEARCH SUPPORT	15,000
OPERATION AN	D ADMIN. SUPPORT	_24.000
TOTAL		137,550

3.2 CIAT, subject to availability of funds from the pool of donors, will disburse the funds according to the following schedule of payments:

Upon signing the MOU and presenting an Invoice	US\$	41,265
Every quarter, beginning January 1995		20,635
At arrival of Final Statement		13,745

3. PAYMENTS - IITA

3.1 As full compensation for the activities carried out for a period of 17 months (1.7.94 through 31.12.95), CIAT will pay IITA up to a maximum of US\$79,000 broken down as follows:

ITEM	<u>US\$</u>
SEED RELIEF	5,000
NARS/REHABILITATION/CAPAC. BUILDING	25,000
STRATEGIC RESEARCH SUPPORT	33,000
OPERATION AND ADMIN. SUPPORT	16.000
TOTAL	79,000

3.2 CIAT, subject to availability of funds from the pool of donors, will disburse the funds according to the following schedule of payments:

Upon signing the MOU and presenting an Invoice	US\$	24,000
Every quarter, beginning January 1995		12,000
At arrival of Final Statement		7,000

ANNEX XIV

DATE : 02-0 (CGIAR) TO: CG-DGS TIME: 10:3 FAX+12026632797 CC: Coordination of GHAI SUBJECT : **PRIORITY: ATTACHMENTS** : _________ FAX-039-95 FAX - (202) 663-2797 Dr. Ted D. Morse, Director, Greater Horn of Africa TO: Initiative, USAID All Center Directors All CIAT Directors From: R.D. Havener, IDG CIAT Subject: Coordination of the GHAI 9 February 1995 Date:

Dr. Morse, there have been several developments following our recent phone conversation. On February 3rd we received the written report of the Ad hoc meeting held in Nairobi between concerned centers and ASARECA on this subject. The report made a strong case as to why the GHAI could more effectively be coordinated with African NARS and other national and regional organizations from an Eastern African base. Bruce Scott, DDG of ICRAF, who was designated by the Centers to co-chair a Task Force Group further reported on a subsequent meeting with John Flynn of the REDSO office and a plan for the CGIAR-GHAI Group to meet with Ms. Gail Smith on March 9, 1995. Based on these developments on February 4 I sent the following EMail to all CGIAR Center Directors:

QUOTE

To: Dr. Eugene Terry, DG WARDA Chairman, African Sub-Committee, CDC cc: Dr. Christian Bonte-Friedheim, DG ISNAR, Chairman CDC Directors General all other IARCs From: R.D. Havener, IDG CIAT Subject: Coordination of the GHAI Date: 4 February 1995

Eugene, as you know because USAID had suggested the GHAI might be patterned after the Seeds of Hope initiative, Dr. William Scowcroft, CIAT's DDG for Research agreed to try to provide coordination and staff support for the preparation of an intercenter proposal. Following your canvas of all concerned centers it appeared there was a consensus endorsement of this. approach and you asked CIAT to proceed accordingly.

On January 24. 1995 a meeting was held in Nairobi to discuss the

Seeds of Hope initiative. The participants, including Bill Scowcroft, decided to hold an Ad hoc meeting to discuss the GHAI. Virtually all concerned Centers were represented at this meeting as was a representative of ASARECA.

Even though not clearly authorized to do so by their respective centers nor the CDC, in deference to the bureaucratic importance and urgency of the situation, the group decided to proceed to outline a new intercenter approach involving a GHAI Task Force, and proposed a Regional Planning Meeting to be held on February 7 at In order to provide leadership on the ground in ICRAF in Nairobi. Eastern Africa, Bruce Scott was identified to serve as Co-Chair of the GHAI Task Force along with a designated Co-Chair from ASARECA. Since at least among those participating in the Ad hoc meeting in Nairobi, there appears to be a strong preference for this approach, let me record that CIAT endorses this approach and is prepared to join as full participant in this effort. In doing so, however, I must also record that we cannot be held responsible to produce a coordinated document nor to assure that one is submitted to USAID within the agreed upon time frame. It is unfortunate that the new plan did not come forward earlier. However, if other Center Directors agree to this new approach, it is unrealistic for CIAT to try to assume a central coordinating role. Clearly that must of necessity be left to our colleagues on the ground in East Africa.

Given the general understanding I had with Ted Morse of USAID and Alex von der Osten of CGIAR, I shall of course also need to inform them of this change of plans, which I will attempt to do in a very positive manner.

Bill Scowcroft will immediately make available to the GHAI Task Force group and Bruce Scott all of the information he has received from concerned CGIAR Centers (which is in fact very little) and all of the information he and his colleagues have accumulated and will continue to provide leadership for CIAT's involvement with the initiative.

Time is short, the issue is vitally important both to the countries and people of East Africa and to a number of important donors. I urge all centers to provide full support to Bruce Scott and the proposed Task Force group.

It is not clear to me what protocol, among the CDC members, is appropriate to recognize this change in responsibilities but please take the steps, presumably with the blessing of our Chairman, necessary to do so.

With all best wishes. Bob Havener

cc: Dr. Alex von der Osten, Executive Director, CGIAR Secretariat Dr. Joseph Mukiibi, ASARECA All CIAT Directors UNQUOTE

I have since received confirmation from Dr. Eugene Terry, Chairman of the African Sub-Committee, CDC, that he endorses this arrangement.
We at CIAT appreciate your counsel and advice as to how to move forward on this important initiative. Even though the coordinating role now has shifted to Eastern Africa, I hope we can continue to consult with you as needed on specific matters related to CIAT's participation in the GHAI partnership.



Please find attached draft minutes of the meeting held on 24 January, 1995 at ILRI to discuss the Greater Horn of Africa Initiative (GHA1).

The principal outcome of the meeting was an agreement that a joint ASARECA CGIAR Task Force should be established to prepare a proposal for an agricultural research component in GHAI.

This called for two immediate actions. (i) to consult with ASARECA to seek approval of a joint approach and the designation of a co-chair and (ii) to discuss the proposed approach with John Flynn of USAID/REDSO in Nairobi.

On Wednesday 25 January Bruce Scott and Ralph von Kaufmann met with John Flynn. This was very timely because John Flynn had decided independently to call such a meeting.

John Flynn explained that GHAI was an inter-agency initiative of the United States Government. It is hoped that other governments will support the initiative as well so that it becomes a multi-donor initiative. Mr. Ted Morse has been appointed to head the initiative on a full time basis. He was visiting Europe to interest other potential donors.

Ms. Gall Smith was at the same time having discussions on GHAI with senior officials in the ten countries of the Greater Horn of Africa. She will be returning to Nairobi in early February

Pending agreement by the members of the Task Force, a tentative appointment has been set on Wednesday 8 February, 1995 for the Task Force to meet with Ms. Gail Smith in Nairobi for a roundtable discussion. If this date is confirmed, it is suggested that the Task Force meet on Tuesday 7 at 1400 hrs at ICRAF to prepare for the meeting.

Each member of the Task Force is requested to prepare a short, one page summary of activities that their Centre might propose for consideration in the ASARECA/COTAR

ICRAF 2

proposal. ASARECA representatives will be requested to do the same as soon as it is known who they are. The original background document on GHAI is attached for your information and guidance in identifying appropriate responses.

You are requested to consider the following questions: how the initiative might be useful, are the identified problems the right once, and what might a plan of action look like? It will be useful to the Task Force if you could review your Centre's portfolio of activities in the region so that a harmonious regional proposal can be developed. Although the activities may be carried out in collaboration with NARS in the countries on a bilateral basis, the planning should be regional in scope.

While it is true that the momentum behind GHAI is accelerating and there is a certain orgency, it is also true that there is very little new money on the table. The challenge is to develop an approach that, while responding to existing and impending crisis in the region, can also achieve sustained development. It will require a particularly convincing proposal to draw funds from other activities. The adoption of a joint ASARECA-CGIAR approach would be a first step in devising a new way of doing business.

A list of members of the Task Force is attached. Please indicate any errors or omissions as soon as possible so that all members can be kept fully informed. The Small ruminant Cooperative Support Programme (SR-CRSP) is proposed as a member of the task force because the programme has had joint discussions with ILRI and USAID on potential livestock activities and the three agencies are working together on this.

Regards

Yours sincerely,

Bren 9=

R. Bruce Scott Deputy Director

4 . . .

ICRAF 3

Minutes of the meeting held to discuss the Greater Horn of Africa Initiative (GHAI)

ILRI, Nairobi, 24 January, 1995

The opportunity was taken, of the meeting held at ILRI on the Seeds of Hope Initiative, 23-24 January, to discuss the CGIAR response to the USAID Greater Horn of Africa Initiative-(GHAI) proposal for 'Breaking the Cycle of Despair: Building a New Foundation for Food Security and Crisis Prevention in the Greater Horn of Africa'.

Participants at the meeting are listed in Annex 1. The meeting was chaired by Dr. Bill Scowcroft, the Deputy Director General of CIAT.

The following points were agreed:

- 1. GHAI will involve the ten countries of Eastern and Central Africa: Eritrea, Djibouti, Ethiopia, Somalia, Sudan, Uganda, Kenya, Tanzania, Rwanda and Burundi
- 2. The goal is to place a strategic focus on sustainable development while responding to the existing and impending crises in the region.
- 3. The experience gained in implementing the Seeds of Hope (SOH) programme will be exploited in developing a proposal for CGIAR involvement in GHAI.
- 4. By participating in GHAI, the CGIAR Centres signal their concurrence with the goals, and a willingness to be proactive in assuring the donor community, and USAID in particular, that they are producing useful and important products that can contribute to improving food security and development in the region. The activities proposed for GHAI must have utility in both mitigating and preventing disasters. GHAI has long-term goals, but continuing funding will require rapid success.
- 5. CIAT suggested four potential activities:
 - i. Farmer/community-based seed multiplication;
 - ii. Networked national/regional crop variety banks holding reasonable samples (1-10 kgs) of seed of locally and regionally adapted material;
 - iii. Integrated GIS-variety-adapatation maps to facilitate rapid sourcing of seeds supplies from a region targeting to areas where disaster has struck (CIAT is doing a "map" for beans in Rwanda); and
 - iv. Continuing association with NGOs and PVOs particularly those with a follow-up role to disaster relief.
 - 1. Tracy Atwood and John Lewis of USAID had requested ILRI to consider developing a livestock component. Initial discussion had been held with Harvey Blackburn of USAID and Montague (Tag) Demment of the Small Ruminant Cooperative Support Programme (SR-CRSP). ILRI and SR-CRSP

ICRAF 4

had technologies that could be considered for extession by NGOs and strong links with NARS networks. SR-CRSP also represents a strong consortium of US land-grant universities which could contribute to the programme both scientifically and by helping gain political and local level support in the US. Other networks such as INSORMIL may be interested in participating.

- 2. Other CGIAR centres had also been developing potential components for the CGIAR response to the invitation to contribute to the GHAI.
- 3. It had been indicated that there might be US\$ 9 m available over three years, but present indications are that there would only be about US\$ 200,000 available initially. This could be used for programme development.
- 4. The concepts originated and were being orchestrated in Washington, but the REDSO Nairobi office, under Mr. John Flynn, was expected to take a lead in directing planning and implementation and has sought funds to do this.
- 5. The CGIAR offered a potential mechanism for design and implementation and it is conceivable that USAID support for CGIAR related activities, such as the research networks in East Africa, could be directed to support GHAI.
- After a slow initiation, GHAI is developing fast and a concept paper (approx. 10 pages) is expected by mid February. A set of five criteria for GHAI proposals has been prepared by USAID:
 - i. Regional applicability an activity or study must be able to demonstrate that findings are useful in more than one country. (30)*
 - ii. Enhancing human resource development capacity, including gender considerations - extra consideration for proposals that seek to use or expand locally existing skills. (10)
 - iii. Short duration of the given activity need completion (results) in 6 18 months. (15)
 - iv. Degree to which the proposal leverages additional resources and promotes linkages. (10)
 - v. Degree to which the proposal can define specific results as they relate to the relief-development continuum (the four elements as; a. operating principle, b) economic growth/ 4% solution, c) portfolio reviews, and d) conflict resolution/early warning. (35)
 - 1. These are revised criteria to use in screening proposals for GHAI funding. This list does not place any value on priority of listing but weights are attached to individual criteria. (Based on 100 points weights shown in parentheses*)
 - 3. Despite the orident organized it is assential that the proposal has developed with the NARS
 - 3. The Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) will be informed of the objectives

ICRAF 5

and intended approach. The meeting agreed that it was essential to have ASARECA as a full partner with the CGIAR in the conceptualisation and implementation of GHA1. This would increase the chances of success and assure a focus on research.

- 4. Decisions can only be binding on ASARECA with the consent of six Directors. The process for seeking their commitment to the proposed process for developing a proposal should be initiated immediately.
- 5. A concept paper could then be tabled for discussion at the meeting of ASARECA scheduled for early March 1995.
- 6. A Task Force will be established, under the co-chairs of ASARECA and the CGIAR, to develop the ASARECA-CGIAR proposal.
- Dr. Bruce Scott will be the CGIAR co-chairperson. ASARECA will be invited to nominate the other co-chairperson.
- The CGIAR members of the Task Force would be drawn from the CGIAR centres active in the region and NARS members will be nominated by ASARECA.
- 9. Members of the Task force would identify a few key NGOs to join the Task Force.
- 10. The REDSO office will be contacted as soon as possible to seek approval for the joint ASARECA-CGIAR approach.
- 11. Financial support will be sought from USA1D for the preparation of the proposal.

ICRAF

APPENDIX 5

Report 3

Report of the Third Seeds of Hope Business and Coordination Meeting, ILRI, Nairobi, 26-27 May 1995.

APPENDIX 5

Report 3

Report of the Third Seeds of Hope Business and Coordination Meeting, ILRI, Nairobi, 26-27 May 1995.

TABLE OF CONTENTS

1.	Introduction			
	1.1 1.2 1.3	Welcome Dr. Martin Bicumumpaka Agenda		
2.	Genei	ral Overview and Update of SOH Activities		
3.	Center and Crop Activity Updates			
	3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8	CIAT - Beans ICRISAT - Sorghum CIMMYT - Maize CIP/PRAPACE - Potato IITA - Cassava IPGRI - Genetic Resources ICRAF - Tree Seed Center Impact Survey and Needs Assessment		
4.	Rwan	dan Assessment and Overview		
5.	FAO Report and Discussion			
	5.1 5.2	Overview FAO/SOH/ISAR/MINAGRI Collaboration		
6.	Discussion of SOH Related Needs in Rwanda			
7.	Budget			
8.	Management of SOH			
9.	Other	Business		
	9.1 9.2	Seeds of Hope II Agricultural Rehabilitation in Angola		
10.	Next I	Meeting		
	Annexes			

×

Report of the Third Seeds of Hope Business and Coordination Meeting

Held at ILRI, Nairobi 26-27 May 1995

1. INTRODUCTION

1.1 Welcome

The meeting opened at 8:30 a.m.; Dr. W.R. Scowcroft as chair.

Participants (Annex I) were welcomed and all participants introduced themselves.

1.2 Dr. Martin Bicumumpaka

The meeting recorded its profound regret and sadness at the death on 17 May of Dr. Martin Bicumumpaka, coordinator of PRAPACE in King Faisal Hospital, Kigali. Dr. Bicumumpaka had been arrested in Kigali while attending a SOH meeting on 2 February 1995.

The meeting recorded its sorrow at the unfortunate loss of a friend, colleague and scientist. As a mark of respect for Martin and an expression of condolence for his family, a period of silence was observed.

1.3 Agenda (Annex II)

A previously circulated agenda was revised and agreed to.

2. GENERAL OVERVIEW AND UPDATE OF SOH ACTIVITIES

Drs. Wayne Youngquist and Robin Buruchara presented an overview of the situation in Rwanda and the activities of SOH. Several of the participants provided additional comments. Major points were as follows:

- Against a background of recent disasters in Ethiopia and Burundi it was clear that the technical response to restore crop production was less than adequate.
- The civil war in Rwanda which began in April 1994 had an immediate impact causing up to 1 million deaths, huge numbers of refugees and an estimated 2 million displaced people.

- Consequently the 1994B (January-July) crop growing season was devastated and the prospects for the 1995A (September-January) season appeared ominous with potentially dire consequences for food production.
- Seeds of Hope came into being to address this problem with the following objectives:
 - * Reintroduction of genetic diversity
 - * Provide technical support to NGO relief agencies
 - * Rehabilitate seed health and multiplication
 - * Reestablish development programs
 - * Assess impact of restoration of genetic diversity
- SOH is a partnership of NARS (including the crop regional networks), NGOs, IARCs and donors.
- Relief agencies and intergovernmental organizations had also mobilized to provide massive food aid and large scale supply and distribution of planting seed, implements and fertilizer.
- In August 1994 the war stopped, the new government in Rwanda began functioning, a seed scheme was put into operation and some NGOs began to reduce their agricultural program. The result was a reduced need to supply large quantities of seed from outside Rwanda but an increased effort for seed multiplication inside Rwanda was required.
- FAO commented that SOH appeared not to assist ISAR rescue its operations after the war ceased. It was pointed out that ISAR was not reestablished by the government until December with the appointment of Dr. Bikoro Munyanganizi as Director. Moreover some research stations were occupied by the military until early 1995. Once ISAR was reestablished, SOH has provided assistance. World Vision has also played a significant role in helping to reestablish ISAR.
- Several incidents were recounted about the extraordinary efforts of Rwanda technicians to save valuable genetic material during and immediately after the war. This included harvesting seed from the bean breeding trials in Ruhengeri, maize trials and potato variety evaluation trials.

3. CENTER AND CROP ACTIVITY UPDATES

Following the reestablishment of ISAR and because most seed multiplication will occur in Rwanda in collaboration with ISAR and the MINAGRI Seed Scheme (SSS), SOH

has recruited Dr. Kande Matungulu to coordinate SOH activities in Rwanda. The terms of reference for the coordinator are in Annex III.

Dr. Kande took up duties in April 1995.

3.1 CIAT - Beans (Annex IV)

• The types of seed multiplied or under multiplication include:

Released varieties Local Rwandan landraces and mixtures Lines in different stages of variety development Improved varieties released in Burundi Local mixtures from Burundi

- The extent and distribution of bean diversity multiplication is in Annex IV.
- Current areas and locations of SOH seed multiplication are Rwanda (3 ha -Rubona and Rwerere ISAR Stations); Zaire; Uganda (0.9 ha); Tanzania (3 ha).
- CIAT is assisting ISAR which has appointed a leader of the bean program and established technical staff at ISAR stations.
- At Rewerere the 1994B bean variety trial was harvested during the war by a resourceful technician and the harvest saved in numerous ways. Seed multiplication of this trial began in 1995B. This action by the Rwandan technician is estimated to have advanced the restart of the bean development program by several years.
- Some seed multiplied in Burundi was still being held by SSS. It may not be released and if not will be held by CIAT for potential use in Burundi.
- There was some concern that MINAGRI through Service de Semences Selectionees (SSS) were not able to multiply seed because of small quantities. It may have been perceived by MINAGRI that SOH was like other NGOs producing large quantities of seed. This is clearly not SOH's purpose. Rather it is to supply high quality (genetic and phytosanitary) seed in small amounts of the maximum number of adapted varieties for onward multiplication by NGOs, MINAGRI and farmers.
- Future seed multiplication to restore genetic diversity will depend on the impact survey analysis.

3.2 ICRISAT - Sorghum (Annex V)

- Seed increase is advanced in Kenya in collaboration with NARO including varieties for mid, high and low altitudes.
- Twenty tons of sorghum procured in Uganda by ICRISAT and NARO was shipped and distributed by CARE in Gikongoro.
- Several hundred germplasm lines are under increase in Kenya (KARI and University of Nairobi) to assist ISAR resume the Sorghum Improvement Program. Restoration of this program in ISAR is essential.
- It is still unclear what Rwandan farmers' needs are for sorghum. The planned survey should clarify this.

3.3 CIMMYT - Maize (Annex VI)

- Three main varieties are under multiplication in Tanzania for delivery to Rwanda. Quantities contracted are Pool 8a - 15 MT; Pool 9a - 108 MT; 2M607 - 25 MT.
- It is important that contact be maintained with FAO to assist in the purchase of this seed. If the contract has to be met from SOH existing funds as per its obligations other activities such as assisting ISAR will be reduced. The contract obligation is \$109,000 due September 1995.
- FAO distributed through NGOs 1707 tons of maize in 1995A and 626 tons in 1995B.

3.4 CIP/PRAPACE - Potato (Annex VII)

- Multiplication of potatoes outside Rwanda will be brought to a close sooner rather than later. ISAR will begin multiplication on ISAR stations.
- World Vision and SSS are multiplying potato in Rwanda. WV is assisting SSS in certifying potato seed for Rwanda.
- A training course on potato propagation is being set for August 1995. A course will also be conducted jointly with IITA later in 1995.
- It is essential to find some funds to help reequip ISAR micropropagation facilities in Rwanda.
- There appears to be no need for multiplication and reintroduction of sweet potato in Rwanda.

3.5 IITA - Cassava (Annex VIII)

- Initially 20 ha were targeted for multiplication in Uganda and Tanzania. With the opportunity to multiply in Rwanda, the area used for multiplication outside Rwanda is reduced to 10 ha. This is expected to yield 4 million mini-cuttings.
- In Rwanda multiplication will be done around Karama. It will be very important to control mealy bug.
- Import of cassava into Rwanda is not a problem provided the varieties are listed in the catalogue of recognized material and that importation is done through MINAGRI.
- There is possible concern that immigrants from Uganda into Rwanda after the war brought cassava material infected with African Cassava Mosaic Virus. This will have to be monitored to prevent endemic spread of ACMV.
- World Vision reported that they are multiplying 1 ha each of 17 different cassava cultivars. This is being done in collaboration with FAO/World Bank operations. This will also assist restoring operations at the Karama ISAR station.

3.6 IPGRI - Genetic Resources

- IPGRI has done a survey of Rwandese landraces which are held in the germplasm collections of the IARCs. Some 761 accessions have been identified. It was suggested that national and regional collections also be surveyed specially for vegetatively propagated crops. Germplasm from neighboring countries is certain to be useful in Rwanda.
- It was stated that it should be possible to work quickly to restore ISAR's capacity to store germplasm at Rubona and other sites. MINAGRI is assembling a country report on status of genetic resources in Rwanda.
- Rubona is the best storage area. Major equipment is intact but small laboratory and office equipment has been stolen. Rubona can be rehabilitated quickly provided essential equipment is obtained and training programs begun soon.
- IPGRI will continue survey work and develop a plan to assist rehabilitation of the gene bank.
- Though the seed bank is fundamental to provide high quality initial seed for multiplication, the FAO funds are not designed for technology assistance.
- IPGRI will assist ISAR to upgrade the Musa field collection.

- 630

 IPGRI was encouraged to revise their extensive proposal of December 1994 for more limited funding designed to target immediate problems in Rwanda to restore the gene banks.

3.7 ICRAF - Forest Tree Center (Annex IX)

- This is jointly between ICRAF and CSIRO, Australia, funded by AIDAB and SDC, as an independent but SOH related activity.
- The re-establishment of operations at the tree seed center was used as an example of how relatively limited funds can provide enough leverage to get ISAR's operations going. Lack of funds to pay the salaries of the support staff and lack of transport are the major constraints at this point.
- As an example of the relatively low cost required to re-establish ISAR operations, World Vision summarized their experience at Rwerere. As an interim measure, WVI agreed to pay the salaries of over 100 support staff. The senior staff are behind on their salaries, but they are able to work. With this incentive, almost full operations of the station have been restored, and much equipment and many files have been recovered from hiding places.

3.8 Impact Survey and Needs Assessment (Annex X)

- a) <u>Survey</u>
- The bean survey reported in the Annex was highly successful considering the extremely difficult circumstances throughout the country.
- One hundred forty three household covering eight of the ten prefectures in Rwanda were successfully surveyed.
- The tentative conclusions of the survey work are that farmers who have been in place for some months have been able to conserve much of the genetic diversity of the traditional farming systems, and continue to obtain a significant proportion of their seed from local sources. This is a tribute to the resourcefulness of Rwandese farmers. Nevertheless, it is not clear how completely this conclusion will apply in the months ahead, as new people are resettled, or how long farmers could have maintained their sources of seed if the crisis had lasted for a longer time.
- The FAO estimated that an average of 70% of the original rural population was back on the land by January, when the surveys were carried out. Future activities should be targeted towards vulnerable groups.

- There is also evidence that some of the "seed" distributed by NGOs was consumed, and that the local varieties were saved for seed.
- The phase of massive distribution of seed and tools by the FAO is now drawing to a close. The SOH project is in a good position to help Rwanda deal with chronic problems in the future, by building up the capacity of ISAR and the seed system to meet local needs.
- W. Scowcroft explained the GIS maps of bean variety suitability and a photo atlas of bean landraces. As this set of data and the algorithms are improved, this system promises to match varieties ever more closely to agroclimatic conditions on a fine scale. J. Kornegay added that an analysis with agroclimatic zones in Latin America would permit a better targeting of germplasm introductions to areas where they are likely to have significant advantages over the local germplasm.
- While the initial survey was conducted on beans, surveys are also planned for sorghum and maize.
- b) Genetic assessment
- 250 separately collected mixtures have been grown out to yield a large number of lines for genetic analysis.
- These lines will be analyzed using molecular genetic analysis to assess relative level of diversity in farmers' seed stocks.
- c) Concluding remarks

Beans were purportedly one of the hardest crops hit during the April-June 1994 disruptions. Many farmers fled before the prime harvest period. Beans are also a good food for those on the run: pods are easy to snatch and provide immediate nourishment; dry grains are very portable. In such a context, it is remarkable that farmers were able to draw substantially on their own seed stocks for the 1995A season.

The NGO seed scheduled for emergency relief performed relatively well in such a stress situation. Even though a good proportion was sowed late (through mid-November), cases of complete failure were few. A future challenge should be towards better targeting of seed. The distribution of pure seed (one variety) versus mixtures of varieties also needs to be explored further.

Some of the interpretation of the above survey depends on our better understanding the population interviewed. Was this population a needy one-- was it listed on official registers to receive aid? Alternatively, was this population a privileged one--precisely because it has made the aid "gift" lists. The answer is probably a bit of both and overall, we have no reason to believe that our NGO-linked sample was any worse or better off than the average Rwandan who was settled in-country and sowing 1995A.

The agricultural situation in Rwanda remains highly fluid. Within the last few weeks, refugees camps outside the country have been emptied and tens of thousands of farmers have re-entered, hopefully to take up their hoes for the first time in more than a year. Unlike the resident population interviewed in this survey, few of these new returnees will probably have retained local bean seed stocks; in September, with luck, most will sow for the first time in three seasons.

The SOH initiative on seed and genetic assessments was first conceived within a frame of reference of "before and after". The April 1994 events caused significant agricultural disruptions. The SOH, NARS, and NGO community asked what it could do to help in the aftermath. It is now apparent that the disruptions in the agricultural cycle are continuing, albeit on a greatly-reduced scale. SOH and its partners might start to think of its work in terms of multiple seed/genetic baselines and, if necessary, multiple interventions.

4. RWANDAN ASSESSMENT AND OVERVIEW

The Director of ISAR, Dr Bikoro Munyanganizi, was able to provide detailed commentary about the general situation in Rwanda and about the rehabilitation process for ISAR in particular. He thanked all organizations and people who had come to the help of Rwanda during an extremely difficult time in its history. Major comments are:

- * The security situation in Rwanda is now considered good. It is relatively safe and easy to move through the country.
- * NGO's had done an excellent job in emergency seed distribution. However there have been some inefficiencies which SOH should now help to correct. For the future the emphasis should be on quality of seed and not quantity. In particular seed of well adapted varieties that is as free as possible from disease and impurities is the main requirement.
- * The program should be expanded to include livestock and forest tree species. The civil war devastated livestock populations and restoring herds is a major priority. It was pointed out that ICRAF and CSIRO, Australia have begun rehabilitation of The Tree Seed Center at Rubona and that

ILRI has submitted a proposal to USAID to restore the genetic base of livestock in Rwanda.

There are now 27 young researchers assigned to ISAR, with at least one at each of the stations. Approximately 10 trained technicians have also been re-hired. Thus staff in ISAR is approximately 60% of the pre-war level. Funds are needed to restore the offices and houses, and short-term training to give the researchers enough information to get started. The short-term priorities are:

Re-collect and assess germplasm Multiply seed Train personnel

The names of the officers working on each crop are available.

* Rwanda and ISAR requires short term (1-2 months) training programs preferably in Rwanda to restore basic technological capability to the country. In particular the Director asked that SOH target training to assist rehabilitation of structures that give rise to high quality seed.

ICRISAT has a trainee on short-term attachment in Nairobi, and would be pleased to include Rwandese scientists in six-month courses in India and in Niger. All of the other centers are ready to help with training.

The chairman of the meeting summarized ISAR's expectations:

- provide quality seed in terms of its genetic suitability, phytosanitary quality, and viability.
- 2) training
- 3) help in rebuilding the infrastructure of the institute.

These expectations are in line with SOH priorities.

5. FAO REPORT AND DISCUSSION (Annex XI)

5.1 Overview

FAO has three primary activities in Rwanda:

- 1. Evaluation of agriculture and food in Rwanda and to assess needs. Four surveys and assessments have been done June, July and August 1994, February 1995 to evaluate harvest from 1995A season. A further survey will be done during June.
- Assist MINAGRI to coordinate emergency relief efforts. Immediately after the war more than 150 relief agencies and NGOs were in Rwanda. Coordination was extremely difficult. Mr Gascon was appointed by FAO in September to carry out this activity. Coordination includes information exchange, convening regular meetings, providing maps for the 145 communes in Rwanda and regular publication of distribution tables (Annex XI).

An indication of the scope of the emergency aid to help restore crop production is given by the following figures (Annex XI) for all material distributed in Rwanda during September/October, 1994 for the 1995A season:

7,000 tons beans 1,700 tons maize 7,000 kilograms vegetable seed 1,540,000 hoes

High distribution levels were also done for 1995B during January/February.

- 3. Administer the distribution of \$4 million provided by the World Bank. FAO has purchased and arranged for distribution between September 1994 and May 1995 of the following:
 - 2,150 tons beans 700 tons soy bean 500 tons peas 300 tons wheat 1,300 tons fertilizer 650,000 hoes

5.2 FAO/SOH/ISAR/MINAGRI Collaboration

FAO are pleased and willing to cooperate with and assist the SOH coordinator, Dr Kande, who will be located in Kigali.

The three main collaborations between SOH and FAO are:

- Assisting Louise Sperling in carrying out the impact survey particularly to identify vulnerable groups of people. ISAR strongly supports this and will contribute wherever possible. The World Food Program (WFP) is also part of this.
- 2. Work closely with the SOH coordinator and integrate NGO efforts with the objectives of MINAGRI and ISAR. It is clear that all seed introductions and seed health issues come under the control and coordination by MINAGRI. All seed based activities of NGO must be coordinated through MINAGRI.
- 3. Collaborate in a consortium of donors and implementing agencies to coordinate relief efforts in Rwanda. The next roundtable to be held at the end of June.

6. DISCUSSION OF SOH RELATED NEEDS IN RWANDA

- * It appears that large scale seed distribution will not be required in September 1995 due to the exceptional efforts by all concerned to restore seed to Rwanda. However, effort is still needed to restore seed supplies and particularly crop diversity to:
 - a. Continuingly vulnerable farmers and those who "missed out" on seed distribution in 1995A and B;
 - b. Particular adapted crop varieties which are still in short supply, e.g climbing beans.
- * Restoration of germplasm improvement and genetic resources at all relevant ISAR stations in Rwanda is very high priority. ISAR wants to have a leader for each major crop activity.
- * The Director of ISAR made a strong appeal for relevant CGIAR centers to restore and if possible add human resources to Rwanda to restore crop production. This includes CIP, ICRAF, IITA, ICRISAT and CIAT. Some concern was expressed about guarantees of security for people and for facilities.
- * Additional funds are required to rebuild the human and physical resources of ISAR. SOH has been requested to do this. While wishing to help, SOH is a transitional initiative to provide emergency assistance and is scheduled to be phased out at the end of 1995 except for the impact survey research. It is expected that the traditional crop development programs that existed before the war will take over from SOH as soon as possible.

-0920

However, donors appear to want a period of stability before reinvesting in long term development in Rwanda.

7. BUDGET (Annex XII)

- * A financial statement was presented by Dr Scowcroft. There are no unusual items to report. Expenditure is on track and the donors are meeting their funding obligations.
- Because of the success of the SOH program and the emergency relief effort, there is expected to be less expenditure on seed increase during the 1996A season. A final answer will not be available until the 1995B harvest is assessed and the impact survey analysis further advanced.
- Centers were asked to consider other activities that might be done within the context of the objectives of SOH. There was considerable discussion about possible activities including:
 - a. Resume longer term development research.
 - b. Additional training.
 - c. Repair of facilities.
 - d. Purchase of equipment.
 - e. Restore relevant crop production data bases.
 - f. More effort on germplasm restoration eg IPGRI.

It was emphasized that the SOH partners, particularly the CGIAR Centers should not get involved in areas outside its expertise such as restoring research facilities. There are bilateral funds set aside by donors for this purpose.

The Director of ISAR again requested assistance from SOH to help restore human resources in research within ISAR stations. Assistance to fix up broken doors, windows and furniture is also desperately needed. The position was strongly endorsed by World Vision, FAO and the SOH Centers.

8. MANAGEMENT OF SOH

The SOH convener, Dr W.R.Scowcroft, announced that he would be leaving CIAT as Deputy Director General of Research at the end of June. However he will be on study leave at The Australian National University with continuing interests in SOH.

Scowcroft indicated that he would like to continue convening the SOH initiative. The meeting agreed that this was desirable because the main phase of SOH is scheduled for completion at the end of 1995.

9. OTHER BUSINESS

9.1 Seeds of Hope II

A proposal has been prepared for USAID to support a feasibility analysis, develop an action plan and implementation strategy and evaluate multilateral funding options which will:

Provide permanent disaster response capacity to reestablish food security through rapid replenishment of adapted varieties of major food crops in the Greater Horn of Africa.

The four objectives considered to be essential components of the initiative and which must be fully integrated are:

- a. Seed Multiplication Capacity establish production of high quality planting seed and propagules primarily for variety seed bank replenishment. Seed multiplication and monitoring will depend on NARS and farmer participation and management.
- b. Variety Seed Banks establish strategically located crop seed banks throughout the Greater Horn which provide adequate storage for varieties, land races and advanced breeding material adapted to specific regions and neighboring areas.
- c. Variety Adaptation Maps GIS based maps which integrate variety and land race characteristics with agroclimatic descriptors of the Greater Horn region to facilitate sourcing of similarly adapted material in the region and reciprocally to target materials to disaster affected regions or countries.
- d. Partner Integration establish a mechanism to integrate the partners to ensure rapid and efficient planning and implementation of emergency restoration of food security through targeted delivery of adapted varieties and associated agricultural inputs.

9.2 Agricultural Rehabilitation In Angola

An initiative has been developed by ICRISAT to restore adapted crop genetic material to Angola. This will involve sorghum, groundnut, maize, cassava, beans,

cowpeas, sweet potato and millet. A consortium would include the Angola national research program, NGO/PVOs and IARCs. Likely CGIAR centers are ICRISAT (convening center), CIMMYT, IITA, CIAT and CIP.

CGIAR centers met in Nairobi during the Mid-Term Meeting and endorsed the initiative. The proposal will go forward to USAID for funding support.

9.3 The convener, Dr Scowcroft, thanked the participants for their continuing enthusiastic approach towards assisting Rwanda rehabilitate her crop agriculture and food security.

He specially thanked Dr Munyanganizi for being able to attend.

Special thanks were given to the translators, Ms. Pavlidis and Mr. Muhindi, who did a sterling job particularly during the second day when microphone facilities were not available.

Special thanks were also recorded for Drs. Youngquist, Buruchara and Ewell for handling the meeting arrangements.

10. NEXT MEETING

The Director of ISAR offered to host the next meeting of SOH in Kigali. The time was set as the last week in September or first week of October.

The meeting closed at 12:30 p.m.

ANNEXES

ANNEX I

PARTICIPANTS IN SEEDS OF HOPE MEETING NAIROBI 26-27 MAY 1995

Name

Affiliation

Phone/Fax/E-mail

Caroline Scowcroft Joel K. Ransom Stan King Julia Kornegay Kwesi Atta-Krah H.M. Kidanemariam David Kiala Kilusi Eric McGaw Bill W. Khizzah Jim B.A. Whyte J.W. Kamau Edward Carey Peter T. Ewell Pierre Nyabyenda Louise Sperling

Luis Navarro Daniele Donati Jean Francois Gascon Kande Matungulu

S.Z. Mukuru Jean Ndikumana Dan Kiambi Bikoro Munyanganizi Bill Scowcroft

Emmanuel A-Atayi Wayne Youngquist Robin Buruchara

Joachim Voss

Translators

M.L. Pavlidis Nairobi Joe K. Muhindi Nairobi

CIAT CIMMYT ICRISAT CIAT, Cali, Colombia ICRAF CIP WV Rwanda ICRISAT IITA/EARRNET IITA/EARRNET KARI CIP CIP, POB 25171, Nb RESAPAC SOH

IDRC-Nairobi OSRO-Rwa-407-WBR FAO SOH/CIA c/o ICRAF P.O. Box 30677 Nairobi ICRISAT ILRI IPGRI ISAR CIAT IITA/EPHTA CIAT CIAT 632054/631499/CIMMYT-Kenya 747557/741264/ICRISAT@canet.com 4450474/j.kornegay@cgnet.com 521450/521001/K.Atta-K@cgnet.com 632054/630005/CIP-NBO@cgnet.com 25076229/25076791 (91-40) 596161/e.mcgaw@cgnet.com 241241/241242 241241/241242 0145-30684/30186 2542632054/630005/T.Carey@cgnet.com 2542632054/630005/P.Ewell@cgnet.com Fax: 255-57-8557 91116110827/91114622707/ Postmast@IDRC.Ernet.In Fax 711063/LNavarro@IDRC.CA BP 1502 Kigali, Rwa; 00250-73122 BP 1502 Kigali, Rwa; 250-73513 2542448600/2542521001

747557, 741264/747554 630743/632013/J.Ndikumana@cgnet.com 521514/521209

5 7 2 4 4 5 0 2 3 8 / 5 7 2 4 4 5 0 2 7 3 / w.scowcroft@cgnet.com Ibadan, Nigeria 255572268/SOH@cgnet.com 2 5 6 4 1 5 6 7 6 7 0 / 5 6 7 6 3 5 / R.Buruchara@cgnet.com

ANNEX II

SEEDS OF HOPE BUSINESS AND COORDINATION MEETING Nairobi, 26-27 May 1995

Proposed Agenda

Friday, 26 May

08:30	Welcome Introductions Agenda Approval and Arrangements	W.R. Scowcroft W. Youngquist
09:00	General Overview and Update of SOH Activities (Including Rwanda Coordinator Activities)	W. Youngquist/ R. Buruchara to lead discussion
10:00	COFFEE	
	SOH CROP AND CENTER ACTIVITIES UPDATE	
10:30	Beans	CIAT W. Youngquist/ R. Buruchara
10:50	Sorghum	ICRISAT - S. King
11:10	Maize	CIMMYT - J. Ransom
11:30	Potato/Sweet Potato	CIP - P. Ewell
11:50	Cassava	IITA - J. White
12:10	Genetic Resources	IPGRI - D. Kiambi
12:30	LUNCH	
14:00	Forest Tree Center	ICRAF - K. Atta Krah
14:20	Impact Assessment	CIAT - L. Sperling
15:00	COFFEE	

15:30	Rwanda Needs Assessment from SOH	ISAR - B. Munyanganizi
19:30	Dinner - Hosted by SOH & CIAT (Jacaranda Hotel, Nairobi)	
Saturday, 2	7 May	
08:00	FAO Presentation	J.F.Gascon/D.Donati
08:30	Discussion of Rwanda Needs Assessment	
09:15	Budget Report and Future Needs	
10:30	COFFEE	
11:00	Management of SOH	
11:30	Other Business	
12:30	Adjourn	

. X

.

.

-

ANNER X ITT COORDINATOR

TERMS OF REFERENCE

COORDINATOR IN RWANDA FOR "SEEDS OF HOPE" PROJECT

The "Seeds of Hope" (SOH) project in Rwanda is concerned with the development and supply of appropriate seed stocks for farmers. The civil disturbances in 1994 have resulted in problems The SOH project represents a for farmers in obtaining seeds of appropriate varieties. consolidated effort to assist with the redevelopment of Rwanda's agricultural production. This project is organized as a consortium of International Agricultural Research Centers (IARC's) and the Regional Research Networks, of which Rwanda is a member. Activities in Rwanda are coordinated under the direction of the Ministry of Agriculture. During the past ten months, a number of seed multiplication activities have occurred outside of Rwanda. At this time, many of these activities are being shifted into Rwanda and are integrally involved with the reestablishment of ISAR. There is a need for coordination of these activities in Rwanda.

The "Seeds of Hope" project proposes to hire an international staff person to work in Rwanda for nine months, in close cooperation with a Rwandese counterpart in ISAR. He will be responsible to the SOH project. CIAT will manage the day to day details of the position under the terms of its Memorandum of Understanding with the Government of Rwanda. The principal activities assigned to this position are as follows:

1. Coordinate seed activities associated with SOH in Rwanda. Specifically he will:

.-'Act as the representative in Rwanda of the IARC's involved in the "Seeds of Hope" project.

- Serve as a liaison between the institutions involved in the seed project: the IARC's, the FAO/World Bank project, MINAGRI, ISAR, SSS, World Vision, and other NGO's. His work should be closely coordinated with Mr. Donati, Facilitator of the FAO/World Bank Project.

- Follow up on issues related to the importation of seed, particularly quarantine and quality control.

- Coordinate with the national institutions involved on the management of seed multiplication sites.

2. Work closely with ISAR with the re-establishment of its research centers, particularly as regards mechanisms to reestablish germplasm collections and multiply stocks of 'Breeders Seed'.

3. Help identify and setup training activities for ISAR employees, in conjunction with the IARC's and the regional research networks.

4. Assist the individual IARC's with their programs in Rwanda as they relate to improving seed stocks and production. This will be based on the needs of each IARC and specific activities will be set up on a case-by-case basis.

-GD

BEANS

Table 1. Bean seed multiplication activities involving National Bean Programs, NGO's and private seed companies.

]

]

]

]

]

]

<u>]</u>

Country	Organization	Activities
Rwanda.	CIAT	Remnant seed of 8 varieties (2kg each) from on-farm trials has been collected in Rwanda. This seed has been planted for increase in Butare.
	World Vision	Seed that had been previously multiplied in Uganda has been given to World Vision Rwanda for further multiplication. This is being coordinated with the Ministry of Agriculture. These are Nginurare (3 kg), Flora (5 kg), Vunkingi (5 kg), Umubano (50 kg), Urunyumba (50 kg), Cal 96 (100 kg), and MCM 5001 (550 kg).
Uganda	CARE	Seed collected from on-farm trials of 11 Rwandan climbers, 2-3 kilos of each, and grown in SW Uganda have been located for multiplication, as well as 250 kg Umubano, and 150 kg Urunyumba.
	NARO	The national bean program has planted over one hectare to 65 different Rwandan bred varieties at Namalongwe. These are RWR and RWK lines, about 0.5 - 4 kgs of each variety.
	CIAT	Producing the same lines as NARO, but including an additional ten extra lines for which seeds are limiting.
	CIAT	Two Rwandan seed mixtures that were collected by UNICEF are being multiplied.
Kenya	KARI	Twenty-four lines are being increased at Kakamega Rsch. Stn. that have root rot tolerance. There are additional lines that have been distributed to 500 farms, but in small quantities. Some of these lines originate from Zaire.
Malawi	CIAT/Min. Agric.	Lines originating from Urs's collection and from the Rwandan breeding program (about 250 total) are under multiplication. This is scheduled for harvest (Oct 94) and about 600 kg of seed will be shipped to Tanzania for increase.
Tanzania	Rotian Seeds	About 65 introduced lines that had been tested in Burundi are being multiplied by a private seed company. Five released Burundian varieties are being increased by the same company on 4 ha of land.
	SASAKAWA /GLOBAL 2000	Ten mixtures from Burundi are being increased in conjunction with the Tanzania Ministry of Agriculture on 3-4 ha. This involves 25 farmers near Moshi.
	CIAT	25 lines from 3 Rwandan mixtures that had been stored by Wellesborne in England are being multiplied.
	Min. Agric.	The seed from Malawi will arrive for increase. This is expected to plant up to 15 ha.
Zaire	INERA	A number of lines (c. 160) from Urs's collection have been increased in the screen house and will be replanted in October.
Cali	CIAT	Thirty-five varieties were planted in April in Cali for increase. Fifteen of these have been shipped (150kg) to Uganda. An additional 300 entries from Betsy Lamb collection are to be increased.

.

May 1995

ICRISAT's SOH Activities, 1 Jan-22 May 1995

- Twenty tons of sorghum procured by ICRISAT and the National Agricultural Research Organization (NARO) from the highlands of southwest Uganda (>1600 m asl) were transported and distributed by CARE International to needy farmers in the Gikongoro Prefecture during January.
- 2. Seeds of three Rwandan sorghum varieties have been multiplied in Kenya for distribution to farmers in Rwanda. Ikinyaruka (580 kg) for mid-elevations (1500-1800 m asl) and Cyatanobe (560 kg) for high elevations (>1800 m asl) were multiplied in collaboration with the University of Nairobi (Kabete farm) and harvested in February. Seed of a third Rwandan variety 5D x 160 (6.3 t) for lower elevations (<1500 m asl) were produced and packaged (2 kg packets) by a private seed company in Kenya under contract. These are being sent to Rwanda by road in early June for distribution to farmers for sowing during the 1995 C season, and possibly for further multiplication in Rwanda. Multiplication of this seed in Kenya was initiated in August 1994.</p>
- 3. Seeds of a number of sorghum varieties and several hundred germplasm lines have been or are being increased in Kenya in collaboration with the University of Nairobi and the Kenya Agricultural Research Institute (KARI), for future use by ISAR's Sorghum Improvement Program. This exercise should be completed by mid-year.
- Mr. Innocent Uwimana who was appointed Coordinator for ISAR's Sorghum Improvement Program early in 1995, is now undergoing about 7 weeks (14 May - 3 July) of training in sorghum improvement with ICRISAT in Kenya.
- 5. S.B. King and E. McGaw participated in the SOH business meeting in Nairobi in late January, and S.Z. Mukuru participated in the SOH technical meeting in Kigali in early February.

6. With permission from the GoR to shoot a video titled "Seeds of Hope" in rural areas of Rwanda, Eric McGaw (ICRISAT) and Edward Milner (Acacia Productions) initiated shooting the video in January/February. Some footage was also obtained in Nairobi and Arusha.

Future Plans

- 1. Continued seed multiplication in Kenya of sorghum germplasm for ISAR.
- 2. Travel to Rwanda by S.B. King and/or S.Z. Mukuru in June/July to assess the sorghum situation.
- 3. Involvement in a survey that includes sorghum during the 1995C season.
- Provision to ISAR by mid-year of field supplies for initiating sorghum research in
 Rwanda.
- 5. Additional footage for the Seeds of Hope video is to be obtained in Rwanda in July. The video should be completed shortly thereafter.

Items of concerns

- 1. We still do not have a very clear picture of the sorghum seed needs of Rwandan farmers. Hopefully this will become more apparent soon; the survey being planned should be helpful.
- 2. We believe some of the remaining SOH funds for sorghum should be used to rehabilitate ISAR's sorghum research facilities, especially at Karama. Perhaps this will be discussed during the business meeting of SOH in May.
- There is a shortage of ISAR personnel for sorghum research. As staff became available, ICRISAT would like to use SOH funds to help meet training needs of these staff.

FINANCIAL REPORT, SOH (ICRISAT) 1 JAN - 31 JUL 1995

Activity	Amount US\$	
 Communications (telephone/fax/courier)	695	
Multiplication of seeds (Rwanda farmers and ISAR)	4,524	
Travel to Rwanda (January-SZM)	485	
Operations and admin. support (10%)	<u>570</u>	
Total	6,274	

a. Expenditure during the first quarter (1 Jan-31 Mar 1995)

b. Expenditure, 1 Apri-22 May 1995

	Activity	Amount US\$	
	Communications	152	
	Multiplication of seed	339	
4	Purchase of A/c unit (seed storage)	750	
	Operations and admin. support (10%)	<u>124</u>	
	Total	<u>1,365</u>	

c. Anticipated costs, 23 May-31 Jul 1995

Activity	Amount US\$
Training for ISAR sorghum scientist (in Kenya)	2,600
Payment to seed producer for 6.3 t 5D x 160 seed for Rwanda farmers	3,900
Transport 7.5 t seed Kenya to Kigali	1,700
Seed multiplications for ISAR (Kenya)	300
Supplies to initiate ISAR sorghum research	1,500
Travel to Rwanda (2 trips)	3,000
Communications	350
Operations and admin. support (10%)	1,335
	14,685

MARZE-CIMMY

Seeds of Hope Progress Report - Maize

Submitted by J.K. Ransom on 25 May, 1995

The objective of CIMMYT's involvement in the Seed of Hope Project is to facilitate the multiplication of adapted varieties of maize for distribution in Rwanda. Three main varieties are currently being multiplied - ZM607, Pool 8a (Mamesa) and Pool 9a (Tamira). Basic seed of these varieties was planted in August 1994. A final multiplication was planted in early February. This increase is being organized under contract with Cargill Tanzania. Quantities contracted are:

Pool 8a	- 15 MT
Pool 9a	- 108 MT
⁻ ZM607	- 25 MT

æ

Seed will be packaged in 5 kg packets and be delivered to Kigali from mid-September, 1995. Seed production is on schedule, and due to the favorable weather, more than sufficient seeds will be produced to meet the contract.

Budget

A total of \$109,000 will be required to meet contractual obligations with Cargill in September 1995.

Issues for discussion:

- 1. What are the requirements for obtaining an import permit for the seed?
- 2. Should seed be dressed with insecticide?
- 3. Logistics of distribution.
- 4. Other interested parties in purchase the over-production?

ANMED VIL Normo - CIP

CIP/PRAPACE Progress Report

CIP and PRAPACE continued on the plan presented at the last meeting. In collaboration with NARO-Uganda and KARI-Kenya, pre-basic potato seed of the three most common varieties grown in Rwanda is being multiplied to feed into the Rwandese system of multiplication and distribution. This will complement other sources of seed which are already being multiplied: seed recovered from ISAR stations at Kinigi and Tamira, and in-vitro microtuberlets provided by the Belgian company Vitrobio. The plan approved in collaboration with MINAGRI, SSS, World Vision, and the FAO is summarized in the table.

The first truckload of seed from Uganda will be delivered before the end of May. All of the rest of the seed multiplied outside of the country will have been transported by the end of August. For the rest of the year, activities will concentrate on training and support for multiplication inside of the country. Special emphasis will be placed on the application of the technology for true potato seed (TPS). This will focus on the use of this technology as a local source of seed in selected areas of the country where conventional seed methods are impractical or expensive. A course for technicians in potato seed technology is planned for August. A joint course with IITA on cassava and sweetpotato multiplication is planned for later in the year.

Type and Source of Seed	Varieties	Multiplier in Rwanda and Quantity		
		SSS	World Vision	Total
1. Field multiplied basic seed, Uganda	Cruza, Sangema		10 T	10 T
2. Tuberlets from stem cuttings, Uganda	Cruza	100,000	50,000	150,000
	Sangema	25,000	25,000	50,000
3. Tuberlets from TPS, Uganda	IP 88001		600,000	600,000
۰.	IP 88006		600,000	600,000
4. Tuberlets from stem cuttings, Kenya	Sangema	12,000		12,000
	Mabondo	3,000		3,000
	Cruza	3,000		3,000
5. True Potato Seed (TPS)	IP 88001	50g	50g	100g
	IP 88004	50g	50g	100g
	IP 88006	50g	50g	100g

CIP/PRAPACE Potato Seed Multiplication Plans

•

Expenditures to Date (US \$)

Kenya 6,500
Uganda 16,500
Travel and services 6,000
Total 29,000
Balance 67,000

Planned Activities

- Production and Maintenance in Uganda and Kenya and transport to Rwanda
- Potato seed training (including TPS)
- Sweetpotato multiplication training (with cassava, in coordination with IITA/EARRNET)
- Share of costs of multiplication in Rwanda
- Participation in surveys
ITA - CASSANA

SEEDS OF HOPE

Anney Br

IITA/EARRNET TECHNICAL PROGRESS REPORT.

Background

With the outbreak of civil disturbances in Rwanda, the CGIAR Centers operating within the East African Region in collaboration with NARS developed the "Seed of Hope (SOH)" initiative to provide planting material of the major crops in anticipation of the usual devastating impact of wars on food production. This initiative is designed to implement a regional network of seed suppliers with technical back up to mitigate the impact of the disaster. The key objectives include restoration of farm productivity and domestic food production, decrease food aid costs, restore/maintain germplasm diversity, protect investment in prior research and food sector development and shorten the time from relief to restoration of development.

Improvement of cassava which started with the technical assistance and financial support from IITA and IDRC, respectively, made significant progress in developing production technologies for the various agro-eco-climatic conditions. Before the termination of research and development activities due to the civil disturbances, a number of clones (Eala 07, Creolinha, Karama 1, Kiryumukwe, Gazika, Maguruyinkwale) which are high yielding, disease and pest resistant/tolerant with good agronomic and quality characteristics, adapted to the different ecological zone and acceptable to consumers had been selected or developed from the local cultivars and introduced seed populations. Large quantities of these varieties were multiplied and distributed to farmers in the major cassava growing areas through an FAO project. A biological control program had been instituted to locally rear E. lopezi for mealybug control.

International Institute of Tropical Agriculture (IITA)

IITA participation in the SOH initiative focuses on two major areas: multiplication/distribution and human resource rehabilitation through training. The programmed activities are implemented by the East Africa Root Crops Research Network (EARRNET) and the Southern Africa Root Crops Research Networks (SARRNET). At the begining of IITA's involvement, meetings were held in Uganda (28 June 94; 2 July 94) to gather information on existing varieties, selection of multiplication sites, assessing available facilities and human resources, and preparation of detailed implementation plan.

Multiplication

A two-stage multiplication scheme was proposed to produce adequate quantities of basic seed material in neighbouring countries as foundation stock. These would to be transported into Rwanda for further multiplication and distribution. The first stage was carried out in collaboration with national cassava programs in Uganda, Tanzania and presently initiated in Burundi. The second phase will be implemented inside Rwanda (conditions permitting). A search was carried out to identify sources of initial stocks of adapted varieties for multiplication. From this initial survey, a number of varieties which had either been released by the national cassava program or were local cultivars of Rwanda origin were identified. Varieties found in Uganda were Rutamizi (Gakiza or Eala 07), Machunda (Mulundi), Mpologoma (Kiryumukwe), Bukalasa (Bukalasa) and Musoropiyo (Musoropiyo). Musoropiyo and Bukalasa are cultivated largely by farmers in Kibungo towards Mutara and in Bugesera region in Rwanda. The two varieties released by the Uganda national cassava program had to be dropped from the earlier list. The Tanzania cassava program identified a much larger number of clones; Rubona, Rushigiwinkuba, Kumalampunu (bitter) and Mlekimani, Imidebe, Bukalasa, Kahinji and Nusurupia which are sweet. Gitamisi (Eala 07), Creolina, Maguruyinkware, Mpambayabashengezi I and II were sourced in Burundi. Multiplication in Uganda and Tanzania started in 1994 whilst that in Burundi started in March 1995.

Total areas presently under multiplication vary within each country. Uganda (Nyarutuntu, Kayonza) and Tanzania (Rusomo, Rubale) have planted 10ha each instead of the 20ha initially targeted for each country. This came about as a result of requests made the Director General of ISAAR to immediately initiate activities in Rwanda as a prelude to rehabilitation of research activities at the different stations. Planting densities used were however doubled to compensate for this since the goal of the activity is production of propagules. The land under utilization was provided by the Agricultural/Local Council offices of the Ntungamo district (Uganda), Rusomo prisons/Catholic mission (Tanzania) as their contribution to the initiative. This is very much appreciated. Plots are being maintained presently.

From each in-country multiplication plots, crops will be ratooned in September. About 4 million mini-cuttings are expected to be generated after this initial phase. These will be transported to Rwanda to establish other multiplication and demonstration plots and the rest distributed to Rwandese farmers who have returned. The percentage of these materials distributed or used for further multiplication would depend on the physical infrastructure and human resources available in the country. The Karama research station has been considered as the major primary multiplication site. This will be extended to the other major cassava growing regions depending on the success of the training course programed for the second rainy season. It is our hope that by then rehabilitation would have commenced to permit an efficient in-country implementation and control of the multiplication and distribution activity in Rwanda. The ratooned plots would be maintained for further supply during the first rains of 1996.

There are certain characteristics of cassava which need to be noted in developing strategies for subsequent activities in Rwanda. Cassava has very low multiplication ratio, bulky and therefore require large areas to produce any meaningful quantity of stock material which in turn makes it expensive to transport. Long distance transportation tend to expose the cuttings to physical damage and extreme care is needed. Establishment of secondaryand tertiary multiplication sites in Rwanda, using the rapid multiplication technique, is therefore necessary. We continue to hope that the World Bank emergency grant for seeds and tools will provide assistance in distribution through the participation of NGOs (Care international, World Vision). Considering that stocks from the initial multiplication sites will have to be moved across borders, it is assumed that quarantine regulations would be adjusted to permit movements of vegetative planting material into Rwanda. It is important to note that Burundi and Rwanda had developed an arrangement whereby planting materials were permitted to move freely between the two countries.

Some of the varieties being multiplied in the neighbouring countries are not resistant to the major biotic stresses constraining production. The initial multiplications plots are sited in areas with virtually none of these biotic stresses. It is thus imperative that the incountry multiplication be accompanied by application of the developed technologies for the control of some of these constraints to prevent the widespread distribution of diseases and pests once the distribution phase commences.

Permit me to take this opportunity to recognize the support provided by Prof. Mukiibi, Director General of NARO, Dr. Sengooba, Director NAARI, Dr. Otim-Nape, Uganda national cassava program leader, Mrs Kalikwisiyo, DAO, Ntungamo district towards our achievements to date.

Training

The training component will be undertaken to improve the process of multiplication/distribution and enhance the exploitation and adoption of varieties for improved crop production. Two main groups are targeted: (1) extension personnel of the Ministry of Agriculture and NGOs and (2) farmers. The extension personnel would be trained to participate and provide supervision to farmers who will be involved in the multiplication scheme. Once the multiplication scheme moves into its second phase, farmer groups would be constituted in Rwanda and trained on the rapid multiplication techniques to further the activity in-country. The training course for extension personnel of the Ministry of Agriculture and NGOs is scheduled for September 1995. An integral part of this course will be the follow-up arrangements for training farmers.

Finance

•

•

IITA/EARRNET provided seed money in June 1994 to begin the multiplication scheme in Uganda and Tanzania, thus the relatively low cost outlay in the expenditure to date.

.

SOH expenses in Tanzania		
-	Tsh	US\$
Travel	4,169,758.25	8,018.77
Fuel/Vehicle maintenance	499,400.00	960.38
Laboratory supplies	40,000.00	76.92
Wages	67,000.00	138.85
Annual meeting contribution	223,021.00	428.89
	4,999,179.25	9,613.81
SOH expenses in Uganda		
Travel	2,314,768.00	3,477.00
Wages/labour	2,335,000.00	2,541.00
Fuel/Vehicle maintenance	496,000.00	540.00
Laboratory supplies	863,480.00	940.00
Salary		3,000.00
	6,009,248.00	10,498.00

ANNEY STX

PROGRESS REPORT, May 1995

ICRAF/CSIRO/SDC Collaborative Support to the Tree Seed Centre, Rwanda

A Seeds of Hope Activity

Kwesi Atta-Krah

The objectives of this project are:

- 1. to assist in the rehabilitation of the Rwandan Tree Seed Centre (TSC), and initiate tree seed collection, storage and distribution activities of the Centre.
- 2. to assess status of the tree planting and agroforestry projects initiated in collaborative projects between ISAR and ICRAF, CSIRO or SDC, and assist with the rehabilitation of research activities.
- ICRAF is the implementing agency for the project.

Status of Activities

- A memorandum of understanding was signed between ICRAF and SDC in April 1995, for the financial management of the project. Funds received from CSIRO will be lodged in ICRAF, and transferred through an imprest mechanism to SDC, Rwanda for meeting operational costs.
- The first \$20,000 has been received from CSIRO. Out of this \$5,000 has been transferred to SDC. No request for further transfer of funds has as yet been received from TSC.
- An ICRAF Scientist, Dr. Amadou Niang, visited the TSC in April. His account of latest developments is provided below:-
- 1. Infrastructure, equipment and personnel at TSC
- The Tree Seed Centre has a stock of 12 tonnes of tree seeds comprising of 34 different species in pure batches and 1.5 tonnes of seeds of a mixture of 12 species and provenances.
- From February to March 1995, 80kgs of tree seeds of 8 commonly sought species were collected and a quantity of 20kgs was sold to different NGOs and projects at a

total cost of 184219 FWR. The TSC now has about of 700kgs of seeds of different species. Some of the seeds ordered are available. The others comprising of 10kg of *Mimosa scabrella*, 5kgs of *Pinus Kesiya*, 10kgs of *Alnus acuminata* and 10kgs of *Pinus occarpa* can be ordered through CSIRO. A fax was sent to Chris Harwood to order these seeds.

Germination tests were conducted on almost all the species in storage.

Because of storage problems, the germination rate is generally low (less than 60% for the majority of the species). Now that the cold room is functioning, an active campaign of seed collection and ordering has to be conducted urgently in order to replace the old seeds, increase and also diversify the stock.

• The TSC is now fully operational. The cold room is functioning and a minimum of equipment (computers, printers etc.) for administrative and scientific work is available.

However, the problem of transportation needs to be solved in order to improve the efficiency of the TSC:

The land cruiser which is made available to the TSC by SDC is very small for seeds and personnel (scientists, technicians and climbers) transportation. There is a need to have a second-hand pick-up Hilux.

- There is also a need to have a sartorius balance for specific activities. This balance can be bought by ICRAF who will forward it to the TSC.
- ISAR has recruited and posted three scientists to Ruhande arboretum, one for each of the three programmes, viz. Agroforestry, Afforestation and Natural forest. These three scientists are all foresters and they have different professional backgrounds. The one working in Agroforestry was working with INERA (Research Institute in Zaire) as an agroforester, the scientist in Natural forest was district forester in Tanzania and the one in Afforestation programme was a teacher in Forestry Secondary School. All of them need close supervision. These scientists will be used to help undertake some of the Tree Seed Centre activities. Their salaries are normally paid by ISAR.

2. Activities undertaken during my visit

2.1 Tree Seed Centre

A lot of potential users of the TSC, including Rwandans themselves are new in Rwanda. Nothing has as yet been done to inform them about the centre and its activities. During my visit, I helped to write three documents to inform widely the NGOs, extension projects and other users. These documents include:

• A catalogue listing the species, the quantity of plants/kg of seeds and the different prices. Jean Damascene was asked to photocopy and distribute this catalogue and

circulate to all the potential users of the TSC within and outside Rwanda. The same, catalogue was given to Damary (ICRAF) to edit it in seed lists brochure form.

- A letter to the potential clients to inform them about the recommencement of the TSC activities.
- A document also was written containing the information on germination rate, pretreatments techniques of the different species.

A Memorandum of Understanding prepared by Dr. Kwesi Atta-Krah defining the different responsibilities between ICRAF, SDC, T.S.C. and ISAR concerning the utilization of CSIRO funds was given to Antoine Gollay for signature. This document was brought back to be signed by ICRAF DDG. After signing, a copy has to be sent to Antoine Gollay, DG of ISAR, Jean Damascene and CSIRO.

- . .

2.2. AFRENA-Rwanda Project

2.2.1 Equipment recovered

Some of the equipment of the project was recovered from NTENDEZI (Cyangugu). NTENDEZI was the last station, where ISAR was based before the scientists withdrew from Rwanda on their way to Zaire.

2.2.2. Status of Experiments

<u>Ruhande</u>, is one of the sites used for the multilocational trial of 14 provenances of M. scabrella. The trial there looks very heterogeneous and some trees were cut. <u>It was then decided not to rehabilitate this trial</u>.

In Gakuta, the trials are in bushy fallow but not destroyed. All the administrative and technical staff left for Zaire. Only the guards remained. In our project site, we found a day guard posted there by the bourgmestre since February, 1995.

ISAR has also nominated a scientist to be responsible for the station but he had not yet joined the station.

<u>In Rwerere</u>, the trials are well maintained. Two field assistants and three watchmen have been working continuously since March, 1994. ISAR has posted a scientist in charge of the station and at the same time head of wheat programme.

After this tour to different experimental trials, the following activities were proposed:

• Athanase and the technicians will verify for each trials the latest observations made and the data missing. Where the data exist, he will calculate the means and try to analyse them. If not able to do the analysis, he can send the same to me for analysis. The objective of this exercise is to write an 1994 progress report on the trials where data exist and are complete. Since some of the equipment exist, it will be very important for Athanase to attend the training course on Experimental design and Analysis for agroforestry Research. 19th-30th June 1995.

- Athanase will also read all the documents written by the projects and in Agroforesty. Now the post office is operational, all the documents (agroforestry Today, Agroforesterie Aujourd'hui can be sent to him and Ruhande librarian at the same address as before.
- The only trials worth rehabilitating are:

٠.

- i. The multilocational trial of 10 Australian provenances established on 8th November 1992 at Rwerere and Gakuta (but also in Burundi and Uganda).
- ii. The multilocational trials of 14 provenances of M. Scabrella at Rwerere and Gakuta. The Ruhande site will not be maintained.

All the project staff/scientists and field assistants will help the TSC in different seed collection activities and also observations in Grevillea and Casuarina provenance trials established by the TSC.

Already our staff in Rwerere have harvested and sent to the TSC more than 20kgs of chamaecytisus palmesis from the seed orchard established by the project.



EMERGENCY RELIEF IN RWANDA

ASSESSMENT OF BEAN SEED USE 1995A

SUMMARY REPORT

DRAFT DOCUMENT NOT FOR CITATION

Seeds of Hope(SOH) in collaboration with: CARE World Vision Médecins sans Frontières Catholic Relief Services Swiss Disaster Relief/MINAGRI-Kibuye

> Dr. Louise Sperling SOH Assessment Document 1

ACKNOWLEDGMENTS

It is not easy to conduct field assessments under stress conditions such as post-war Rwanda. The recognition of the importance of impact assessments by the MINAGRI and, in particular, by the Directeur du Cabinet and the Directeur de la Production Agricole has been a welcome boost. SOH notes the special efforts of the interviewers, who confronted difficult situations with quick thinking and grace. In addition to personnel, CARE and World Vision and Swiss Disaster Relief/MINAGRI-Kibuye offered substantial technical and logistical support. Médecins sans Frontières shared data from previous surveys and Catholic Relief Services supported follow-up work in zones from which they had already relocated. This socio-economic assessment has been funded by the International Development Research Centre. In guiding the analysis, W. Youngquist, R. Buruchara, and M. Loevinsohn provided key assistance.

NOTE

This impact on seed relief in Rwanda 1995A was originally to present results on the two major types of seed distributed: maize and beans. As at the time of writing this report (May 1995), the maize harvest remains unfinished in northern Rwanda, maize findings will appear as SOH Assessment Document 5.

INTRODUCTION

۱

The escalation of the Rwandan civil war in April 1994 resulted in the death of up to one million persons and the displacement another two million. Agriculture, the main occupation of upwards of 90% of the population, was acutely affected as civil disruptions peaked in the midst of the normal February-June growing season (the '1994B' season). Harvest losses overall during this period have been estimated as high as 60 percent (Dr. Iyameremye, nd).

The aid community, particularly non-governmental organizations (NGOs) and various United Nations agencies, responded swiftly and on a wide scale to the agricultural crisis. During the subsequent growing season, September 1994-January 1995 (the '1995A' season), large amounts of seed of key crops were distributed: 6970 MT of bean, 1707 MT of maize, and 7230 kg of vegetable seed. Seed distribution was complemented by distribution of hoes, fertilizer and pitchforks (MINAGRI/UNREO/PNUD/FAO 1994).

Members of the aid community, the Ministry of Agriculture (MINAGRI), and a group of the international and national agricultural research centers (NARS and IARCS) joined under a "Seeds of Hope" (SOH)¹ initiative have been keen to evaluate the role aid seed played for Rwandan farmers during the 1995A season and to take a frank look at its production performance. Such assessments of the impact of seed aid will help gauge farmers' additional seed needs, as well as guide relief strategies for future seed distribution.

While this report focuses on the results of "seed" relief <u>per se</u>, a complementary report (*SOH Assessment Document 2*) examines the impact of the war on varietal diversity, specifically that of beans. In heterogenous agro-ecological environments such as Rwanda, where inputs are few and climatic fluctuations marked, longer-term production stability is very much tied to use of diverse, well-adapted cultivars. This second report, addressing potentially longer-term research and development needs, also emerges from collaborative investigations by emergency relief agencies, government institutions, NARS and IARCS.

The Seeds of Hope Initiative was formalized in September 1995. Many Africa NARS have contributed germplasm, field space, and advice to the initiative (those of Ethiopia, Kenya, Malawi, Tanzania, Uganda, Zaire and Zimbabwe. In addition, some seven IARCs are strongly involved in the Rwandan Agricultural reconstruction (see list below)

International Agricultural Research Centers united in "Seeds of Hope" :

International Center for Tropical Agriculture (CIAT)

International Maize and Wheat Improvement Center (CIMMYT)

International Potato Center (CIP and its network PRAPACE)

International Center for Research in Agroforestry (ICRAF)

International Institute of Tropical Agriculture (IITA)

International Livestock Research Institute (ILRI)

International Plant Genetic Resources Institute (IPGRI)

SURVEY OVERVIEW AND METHODS

This survey assessing the impact of seed aid was conducted during the harvest of the first post-war planting season. In January 1995, SOH trained partners representing the MINAGRI/Swiss Disaster Relief (in the Prefecture of Kibuye) and four other NGOs : World Vision, CARE, Médecins sans Frontières², Catholic Relief Services. Survey work started immediately after the training sessions and extended to the end of the maize harvest, early April 1995.

NGO/MINAGRI collaboration has allowed bean and maize crop assessments to be made in most major agro-ecological of the country. We hope the survey has also helped to strengthen the research skills of NGO staff as well as to provide valuable and immediate feedback on aid delivered. The sample encompasses 8 of the 10 Prefectures, 29 communes, 94 secteurs, and 143 households. (See Annex I and II for specific regions covered). Coverage fell sightly short of the original target of 165 households due to arrest of interviewers in Kibuye, transport problems, and, in several sites, unusable data. As samples were selected along zones of specific NGO intervention, sample sizes are uneven across prefectures: Kigali, Butare, Byumba and Gikongoro are better represented than Kibuye, Gisenyi, Ruhengeri and Kibungo. No interviews took place in Cyangugu and Gitarama. While the overall coverage is sufficient to permit countrywide extrapolation, findings in zones of small sample size should be interpreted with caution.

In order to follow-up on NGO activities, fieldworkers were asked to interview farming households who had received maize and bean seed aid. No other biases are apparent. Five households per commune were to be sampled. The survey instrument has been appended (Annex III).

Yield assessments were obtained through taking crop cuts on fields sown by farmers for normal production purposes. Both green harvest (pods/fresh seeds) and dry harvest were measured from plots 9m² if green consumption had already occurred, such green culling had to be recalled. Intercropping densities were noted and appropriate area adjustments made.

FINDINGS

Quantity of seed planted from various sources

Farmers were asked to indicate the quantity of seed they sowed from all sources during the 1995A period. "Own stock" indicates seed saved from the previous season, and most often represents, well-adapted, location-specific bush bean mixtures. Emergency aid, that distributed by the NGOs, was of the several types: bush bean mixtures obtained from mid and southern Uganda, a popular Uganda variety "K-20" which had been tested in Rwanda but had never emerged among the better entries, and a small quantity of bush bean mixtures bought from northern Burundi. "Market" seed is a heterogeneous grouping. Even pre-civil unrest, the farmer might find local mixtures in her/his neighborhood market as well as mixtures from afar: the borders of Zaire, Burundi, Tanzania, or Uganda, depending on where one resided. There

2

While the MSF agronomic program closed up in January, SOH agreed to continue evaluating MSF work in their Butare zone of action. Results will be forwarded to MSF/Belgium, as well as to the local authorities.

are anecdotal reports from most zones of NGO action that "aid" seed often made its way to the market as farmers sought to swap such "foreign" seed for that they felt was more locally adapted. Seed from both categories "friends/neighbors" and "kin" usually suggests local mixture seed with which the farmer has previous experience.

Table 1 summarizes the total quantity of bean seed sown from all sources as well as average quantities sown per farmer. Of particular note is the large quantity of seed coming from farmers' own stocks, that is, almost half the total quantity sown. Given that many farmers were dislocated just at 1994B harvest time, this a surprising and welcome finding. The large-scale use of "own stock' is a promising sign in terms of encouraging production stability and the preservation of local varietal diversity.

This survey also shows that aid seed provided almost a third of the total seed sown. The heightened importance of the aid contribution would be expected as the sample was targeted towards recipients of NGO relief. Again, it is remarkable that a supposedly needy population was able to rely so much on their own seed stock reserves.

Seed gifts or borrowing seed from neighbors and kin was negligible. This proved to be true even in pre-war sowing periods, i.e. 1991-92 (Sperling et al. 1994).

Source	Total Kgs sown	% Total seed	Avg kg. per farmer
Own stock	1168.90	45.1	8.17
Emergency aid	726.40	28.0	5.08
Market	685.45	26.4	4.79
Friends/neighbors	10.75	0.4	.08
Kin	3.00	0.1	.02
TOTAL	2594.50	100.0	18.14

Table 1.	Sources for bean seed sown (% seed sown) in Rwanda, season	1995A
	(Summary of 8 prefectures) ($n = 143$ farmers).	

Table 2 shows that there was great regional variation in the importance of the three major seed sources. In zones of larger sample sizes, (N = 15 and above) "own stocks' represent about a quarter to almost two-thirds of the seed sown. The variability in use of market seed is even more marked, with the region of Kibuye being particularly dependent on this source.

PREFECTURE	N		Major sources for seed				
		<u>Own stock</u> kgs. %		<u>Em</u> kgs.	ergency aid %	kgs.	Market %
Kigali	35	320.5	51	256.6	41	47.0	7
Byumba	20	250.6	63	66.5	17	81.2	20
Kibungo	5	32.0	32	33.0	33	35.0	35
Kibuye	15	87.0	23	32.3	9	256.0	68
Gikongoro	20	153.8	50	137.3	44	17.0	6
Ruhengeri	18	55.3	37	49.1	33	45.3	30
Gisenyi	5	22.0	16	25.8	18	90.0	64
Butare	25	248.0	50	126.0	26	114.0	23

Table 2. Major sources for bean seed sown (% and kgs of seed sown) in Rwanda, season 1995A, by Prefecture (n = 143 farmers).

Finally, Table 3 looks at the issue of bean seed acquisition from the perspective of the number of users. Upwards of 40% of farmers drew on their own seed stocks to some degree, with an overall average of 62%. Again, the high figure for those using 'aid' seed stems from the deliberate bias of the sample. The percent of households using emergency aid seed does not equal 100 as some recipients chose not to sow the relief seed given.

Table 3.Farm households (%) accessing the three major bean seed sources, Rwanda,
season 1995A, by Prefecture.

PREFECTURE	N	Farmers using seed from:		
		<u>Own stock</u> % farmers	Emergency aid % farmers	<u>Market</u> % farmers
Kigali	35	54	100	26
Byumba	20	65	60	30
Kibungo	5	60	100	40
Kibuye	15	67	73	80
Gikongoro	20	95	100	15
Ruhengeri	18	44	100	44
Gisenyi	5	40	100	40
Butare	25	56	72	48
TOTAL	143	62	87	38

Type of bean seed sown

l

Types of bean seed sown can be described along several axes: Was the seed sown a pure variety or mixture of varieties?; Was it a bush bean or climbing bean? (one that may twine up stakes of up to two meters); and Was the seed local or foreign (that is are the varieties considered adapted to the local region). Each parameter has consequences for production gains and production stability.

The pure versus mixture issue is described in Table 4, with overall one quarter of the seed sown pure and the rest in mix. In pre-war conditions, a variety was sown pure in four situations. The farmer might be testing the variety in pure and particularly assessing how if performs in isolation. She might want to multiply it in greater quantity. Third, the improved climbing beans are usually grown in pure stand (although local climbers are traditionally sown in mix). Finally, In areas of eastern Rwanda, where commercial production was most pronounced, bush beans were sometimes sown in single variety plots. Twenty-five per cent of the land area in pure varieties is slightly higher than the norm, which probably hovers between 15 and 20%. The percentage of farmers sowing some of their stock pure is largely the result of aid seed distributions. Ruhengeri and Gisenyi are also areas of high climbing bean use (both the local and improved cultivars)--hence the high percentage of farmers there sowing some of their bean plots as pure varieties. Figures would have been much more out of balance had emergency aid not also distributed a chunk of its seed aid in mixture.

PREFECTURE	N	<u>Pure v</u> % seed sown	ariety % farmers	Mixed % seed sown	varieties % farmers
Kigali	35	40	89	60	83
Byumba	20	7	20	93	100
Kibungo	5	31	80	69	100
Kibuye	15	11	40	89	100
Gikongoro	20	6	40	94	100
Ruhengeri	18	33	94	67	89
Gisenyi	5	77	100	23	100
Butare	25	27	60	73	92
TOTAL	143	25	63	75	93

Table 4. Description of bean seed sown, pure variety versus mixed varieties, Rwanda 1995a, by Prefecture.

Table 5 describes the immediate post-war use of bush and climbing beans. Local climbing beans are indigenous only to the northwest, with adoption of improved climbing beans being a remarkable research and development success of the last 10 years. Nationwide surveys conducted shortly before the acute civil arrest (in 1992 and 1993) showed 40% of farmers

countrywide growing improved climbing beans (Sperling et al. 1995), albeit usually in small plots of 3 or 4 ares.³ The current sample would suggest that climbing bean use has dipped with the war, and farmer statements would confirm this in two ways. One of the major complaints about emergency aid seed came from the northern regions where they resented receiving any bush bean seed. "Climbers should be grown here", farmers responded when answering questions about their appreciation of aid seed. Second, farmers' assessments of varietal loss (*SOH Assessment Document 2*) identified improved climbing beans as one of the major areas in which they had had problems restocking seed.

PREFECTURE	N	<u>Bush bean</u> % seed % farmers sown		<u>Climbing</u> % seed sown	<u>a bean</u> % farmers
Kigali	35	97	100	3	9
Byumba	20	98	100	2	15
Kibungo	5	100	100	0	0
Kibuye	15	89	100	11	47
Gikongoro	20	92	100	9	50
Ruhengeri	18	56	100	44	44
Gisenyi	5	18	100	82	100
Butare	25	87	100	13	16
TOTAL	143	87	100	13	28

Table 5.Description of bean seed sown, bush versus climbing bean,
Rwanda 1995A, by Prefecture.

Table 6 describes bean seed sown 1995 along the third parameter of local versus foreign varieties. With few exceptions, farmers classified their own stocks and those they bought from the market as "local" and emergency aid seed as "foreign". As noted above, the distinction is not as clear cut. For instance, some of the market seed may not have been as local as farmers may have hoped, although farmers probably selected out the best local bets. Yet, no matter what the proportion of market seed which was locally well-adapted, the analysis serves to show that the vast majority of farmers sowed some local seed and the major part of bean seed sown was of local origin.

3

This 40% figure would probably rise 5-10% if combined with farmers who growing climbers, but only varieties of local origin.

PREFECTURE	N	<u>Loca</u> % seed sown	l % farmers	<u>"Fore</u> % seed sown	eign" % farmers
Kigali	35	59	83	41	100
Byumba	20	83	90	17	60
Kibungo	5	67	80	33	100
Kibuye	15	91	100	9	73
Gikongoro	20	56	100	44	100
Ruhengeri	18	69	89	31	94
Gisenyi	5	82	100	18	100
Butare	25	74	88	26	72
TOTAL	143	72	90	28	86

Table 6.Description of bean seed sown, local versus "foreign" (non-local), Rwanda1995A, by Prefecture (n = 143 farmers).

Farmer appreciation of bean seed from different sources

In order to understand better farmers reaction to "aid" seed versus that they usually get through other sources, recipients were ask to qualitatively compare seed used from different sources and comment on its positive or negative characteristics. A simple scale of comparison ranged from 1 to 3: "1" less appreciated than that normally used; "2" the same seed or of equal appreciation, and "3", more appreciated. Table 7 suggests scores by prefecture. Overall, aid seed was less appreciated than own stock, with scores dramatically dipping in three prefectures. Both in terms of positive and negative characteristics, farmers mainly focused on yield, disease resistance and length to maturity (although some 20 criteria were identified, giving 40 positive or negative parameters). Certain types of seed aid panned altogether: Gikongoro farmers disliked the "highland mix", the Butare contingent thought K-20 a failure, and those in the Gisenvi did not appreciate receiving bush beans--no matter what their qualities. Specific commentary on select varieties in specific zones of action has been forwarded to the NGOs. Inter-prefectural comparisons should be made with caution: the interviewer in Butare seems to have used "3" as the standard of comparison as evidenced by all local mixtures receiving that score.

СКУ Г

PREFECTURE	Total N	Own stock	Emergency aid	Market
Kigali	66	2.19	2.25	1,44
Byumba	29	2.07	1.91	1.80
Kibungo	10	2.00**	1.80	2.00**
Kibuye	31	2.18	2.00	2.30
Gikongoro	43	2.13	1.1	2.67**
Ruhengeri	34	1.75	1.82	1.75
Gisenyi	10	2.00**	1.00	2.00**
Butare	46	3.00	1.14	1.83
TOTAL	269*	2.23	1.71	1.90

	Table 7.	Farmers'	appreciation	scores of	bean seed	obtained	from	various	sources.
--	----------	----------	--------------	-----------	-----------	----------	------	---------	----------

* The cases exceed the number of farmers as some farmers used several sources of seed.

** Small sample size: less than five cases.

Yield of bean seed from major seed sources

Yield data collected resulted in 183 "usable" measurements. This figure compares very favorably to the former scope of nationwide on-farm trials and is also relatively large considering the markedly staggered harvests. ("Unusable data" came mainly from trials which were harvested before the interviewers arrived or which had not yet been harvested by the time questionnaires were to be collected.)

Table 8 summarizes the climbing bean and bush bean yield data for six prefectures. (Sample sizes in Kibuye and Gisenyi were too small). Table 9 considers the yields of bush beans alone.

Table 8.	Bean yields (bush and climbing beans) of seed from the three	major sources,
	Rwanda, 1995A.	

Seed source	N	Kg/Ha
Own stock	54	1320 a
Emergency aid	105	886 b
Market ,	24	934 b
TOTAL	183	1020

note: F = 8.65, P<.001. Yields followed by the same letter do not differ at P=.05.

Seed source	N	Kg/Ha
Own stock	43	1195 a
Emergency aid	104	890 b
Market	22	958 ab
TOTAL	169	976

Table 9. Bean yields (bush only) of seed from the three major sources, Rwanda, 1995A.

note: F = 4.10, P<.02. Yields followed by the same letter do not differ at P=.05.

As expected, in both cases, seed from "own stock", that is, locally tested and adapted seed, performed significantly better than "emergency aid seed". Overall, yields fall within the range of normal, with averages possibly 10-15% higher than a standard year. In many regions, farmers had an relative abundance of land on which to sow and there may have been more targeting of beans toward better plots.

While the performance of aid seed was lower overall, it was remarkably good considering its origin. The bulk of emergency aid seed came from a restricted area of mid to southern Uganda. Rwandan sowing conditions, in contrast, are quite diverse, in normal times beans being sown from 1000 to 2200 masl. In the entire aid sample, there were only 2 cases of complete failure of 'aid' seed. Within-prefecture analyses showed no statistical difference among yields of seed from the three major sources.

In terms of strategies for delivering relief seed, the question might be posed of whether the SOH advice of disseminating mixtures, instead of single varieties, paid off. One should reflect on how novel the distribution of mixtures is. For instance, in August/September 1993, CARE distributed bean seed to Rwandan farmers in many regions of the country. At that time, they moved two varieties, one for high and one for low altitude (M. Campbell, CARE, personal communication). The seed aid was critically needed and the effort laudable. However, this time, taking heed of genetic diversity issues, CARE distributed substantial amounts of Ugandan mixtures as well as K-20.

At first glance, the distribution of mixtures country-wide seems not to have brought unusual results: pure aid and mixture aid performed at equal levels (Table 10). Similarly, analysis of yield differences between pure aid seed and mixed aid seed showed no significant differences by prefecture or by NGO zone of action.

Type of seed	N	Kg/Ha
Pure variety	63	913
Mixed varieties	42	845
TOTAL	105	886

Table 10. Bean yields of "aid" seed only, 1995a, Rwanda.

note: not significant. P = .56

Insights from NGOs highlight why it is difficult to make a conclusion on whether seed relief of a single variety or a mixture of varieties might more benefit farmers. For the most part, mixtures disseminated by NGOs were in reality artificial mixtures: lots of mixes thrown together or mixes of local varieties with high proportions of K-20 added. They were not necessarily mixtures of varieties which farmers normally mix together. Second, most of the material was from mid to southern Uganda. Hence, there was not targeting of mixtures from "like to like" regions. Only MSF in the Butare distributed several kinds of mixtures--according to farmers' different planting conditions. The results from Butare only border on significance (Table 11).

Table 11. Be	an yields of	"aid" seed (only, 1995A,	Butare Prefecture.
--------------	--------------	--------------	--------------	--------------------

Type of Seed	N	Kg/Ha
Pure variety	7	464
Mixed varieties	5	784
TOTAL	12	598

note: not significant. P = .06

Might there be benefits of non-targeted mixtures? This is an important question to look at in the longer-term. Farmers have already started selecting out the components they like and discarding the non-starters. In the varietal assessment studies (SOH Assessment Document 2), farmers already mention retrieving coveted varietal components through sorting out the emergency aid relief mixtures.

CONCLUDING REFLECTIONS

Beans were purportedly one of the hardest crops hit during the April-June 1994 disruptions. Many farmers fled before the prime harvest period. Beans are also a good food for those on the run: pods are easy to snatch and provide immediate nourishment; dry grains are very portable. In such a context, it is remarkable that farmers were able to draw substantially on their own seed stocks for the 1995A season. The NGO seed, that of emergency relief, performed relatively well in such a stress situation. Even though a good proportion was sowed late (through mid-November), cases of complete failure few. A future challenge should be towards better targeting of seed. The distribution of pure seed (one variety) versus mixtures of varieties also needs to be explored further.

Some of the interpretation of the above survey depends on our better understanding the population interviewed. Was this population a needy one--it was listed on official registers to receive aid? Alternatively, was this population a privileged one--precisely because is made the aid "gift" lists. The answer is probably a bit of both and overall, we have no reason to believe that our NGO-linked sample was any worse or better off than the average Rwandan who was settled in-country and sowing 1995A.

The agricultural situation in Rwanda remains highly fluid. Within the last few weeks, refugees camps outside country have been emptied and tens of thousands of farmers have re-entered, hopefully to take up their hoes for the first time in more than a year. Unlike the resident population interviewed in this survey, few of these new returnees will probably have retained local bean seed stocks; in September, with luck, most will be sowing for the first time in three seasons.

The SOH initiative on seed and genetic assessments was first conceived within a "before and after" frame of reference. The April 1994 events effected significant agricultural disruptions. The SOH, NARS, and NGO community asked what it could do to help in the aftermath. It is now apparent that the disruptions in the agricultural cycle are continuing, albeit on a greatly-reduced scale. SOH and its partners might start to think of its work in terms of multiple seed/genetic baselines and, if necessary, multiple interventions.

REFERENCES

lyameremye, A.

n.d. Le secteur agricole durement touché. Traits d'union, Rwanda 5.

MINAGRI/UNREO//PNUD/FAO

1994 Compte-rendu de réunion, 16 décembre 1994: Opérations d'urgence et réhabilitation agricoles.

Sperling, L.

1995 SOH Assessment Document II. The impact of war on plant genetic resources: bean varietal assessment in Rwanda 1995A. Summary Report.

Sperling, L. (summary)

1994 Analysis of bean seed channels in the Great Lakes Region: South Kivu, Southern Rwanda, and select bean-growing zones of Burundi.CIAT African Occasional Publications Series, No. 13. Butare, Rwanda: CIAT/RESAPAC.

Sperling, L. and S. Munyaneza.

1995 The impact of improved climbing beans in Rwanda: intensifying production among smallholder farmers. <u>African Crop Science Journal</u> 3(2).

Prefecture	Commune	Secteur
Kigali	Shyorongi	Nzove Rutonde Kanyinya Shyorongi Muhondo
	Butamwa	Mwendo Butamwa Nyarubande
	Gikomero	Bumbogo Shango Gishaka
Byumba	Giti	Nyanza Bukure Bitunde Rwamko Karagali
Kibungo	Muhazi	Gishari Nyarubuye Nkamangina Nyarugali Munyiganya
MINAGRI/SWISS DISASTE	R RELIEF	
<u>Prefecture</u> Kibuye	<u>Commune</u> Mabanza	<u>Secteur</u> Gacaca Kibirizi Rubengera
	Mwendo	Muhigi Kigoma Gashali
	Bwakira	Rusengesi Mugunda
	Rutsiro	Gatoki Rugarambiro Rugote

ANNEX I Sites of 1995A Seed Relief Impact Assessments

b

Þ

CARE

WORLD VISION

•

Prefecture	Commune	Secteur
Kigali	Kanzenze	Kibungo Ntarama Kanazi Nyagihumke
	Ngenda	Ruhuha Kindama Rutonde Nyakayaga
	Gashora	Mwendo Gashora Mbyo
Gikongoro	Karama	Kiyumba Kiraro Muganza Cyanika Gitega
	Nyamagare	Gasaka Gikongoro Kibilizi
	Rwamiko	Ruramba Gisorora Gorwe Matyazo
	Mubuga	Ruseke Kamana Gisizi Gasare
Ruhengeri	Nyamugali	Mushongi Rubona
	Cyeru	Butare
	Nyarutovu	Kinyoma Kiliba Gakenke Gihioga
	Nkuli	Rukoma Kinhebo Lyinyo

٠

WORLD VISION cont.

*

Prefecture	Commune	<u>Secteur</u>
Gisenyi	Mutura	Mudende Tamira

MEDECINS SANS FRONTIERES/CIAT

Prefecture	Commune	Secteur
Butare	Shyanda	Gatoki
	Ruhashya	Gatovu Musasu
	Mbazi	Muhororo Kabuga Mutunda
	Mugusa	Mugogwe Kimuna
	Gishamvu	Buvumu Iriba Isholi
CATHOLIC RELIEF SERVICE	S/CIAT	
Byumba	Rutare	Kabira Rutare Kabera Kinjojo
	Kinyami	Nyamiyaga Cyuru Kinyami Nyinawimana
	Ngarama	Nimuri Ngarama

Nyagatare Gatsibo



Annex III Field Survey Instrument

lom	Prefecti	Prefecture			
Secteur	Enqueté HF	Autres	Date	No. de Fiche	01-16 WIG W-
Vez-vous cultive	é du haricot sur votre e	xploitation cette	e saison?		
)ui Non_	Si non, pourque	oi?			
³ ouvez specifiez :odes), Source: 1 2 3 4 5	les suivants: sources d . Propre Stock . Aide d'urgence (speci . Marché/Boutique . Voisin/Ami . Parents Autres: specifiez	e semences, kg fiez ONG)	s provenant de cha Type: Pur (Type: Nain: Type: Varié régio	que source, et type de sem P) ou Mélange de variétés s ou semî-volubiles(N) ou ité Locale (utilisée avant) (n (H) ou ne sait pas (?)	iences, vi (M) Volubiles L); Hors (
6					
6 Source		Kgs sémés		ТҮРЕ	
Source		Kgs sémés	Р/М L/H/?	T Y P E N/V	
6 Source A.		Kgs sémés	Р/М L/H/?	T Y P E N/V	
6 Source A. B.		Kgs sémés	Р/М L/H/?	T Y P E N/V	
6 Source A. B. C.		Kgs sémés	P/M L/H/?	TYPE N/V	
6 Source A. B. C. D.		Kgs sémés	P/M L/H/?	T Y P E N/V	

Pour les semences provenant de chaque source, indiquez si ces semences sont:

Ĵ. ٠....

1 = moins appreciés; 2 = même qualité 3 = plus appreciés que les semences que vous utilisez normalment. Expliquez vos raisons pour l'appréciation. IL'ordre de sources, A-E doit correspondre à l'ordre en haut).

Source	Appréciation (1 à 3)	Explications/Commentaires
Α.		
В.		
С.	•	
D.		
E.		

III. SUIVI SUR LE CHAMPS:	RENDEMENT DU HARICOT
---------------------------	----------------------

٦,

Source: 1. Propre Stock 2. Aide d'urgence 3. Marché/Boutique		4. Voisin/Ami 5. Parents 6. Autres: spec	Type: Pur (P) ou Nains ou cifiez	Mélange de variété semi-volubiles(N) ou	s(M) volubiles (V		
SOURCE/C	HAMPS	P/M	N/ V	Associé (O/N)	Partie en H. (1/4, 1/2, 3/4, tout)	Qtés consommés	Tasses/9
Α.							
B							
с.							
D.							
ε.							

Commentaires sur les différents champs (continuez à l'inverse):

IV. SUIVI GENETIQUE DE MELANGE LOCALE DU RWANDA (HARICOT)

- Comment est-ce que le mél.locale que vous avez maintenant compare avec celui que vous avez semé la fois pa 1 = moins appreciés; 2 = même qualité 3 = plus apprecié (encerclez la résponse)
- 2. Si le mélange actuel ne correspond pas avec celui utilisez avant, elaborez sur les différen
- 3. Triez les 3 variétés les plus importantes. Pour chaque, indiquez și elle était aussi important dans votre mél antérieur.

Noms de variétés importantes dans le mélange locale actuel	Aussi importante dans votre mélange antérieur?(Oui ou Non)	COMMENTAIRES
1		
2		
3		

4. Y a-t-il d'autres variétés clés, que vous aviez pendant le dernier semi, que vous avez perdues? Oui____Non_

Si oui, indiquez les noms des variétés et où vous pouvez les trouver maintenant.

- 3. Marché/Boutique 5. Parents 7. Ne sait pas
- 4. Voisin/Ami 6. Autres: specifiez

Noms de variétés clés- perdues	Où pouvez-vous les trouver maintenant?

V. COLLECTES DES ECHANTILLONS: ML 1_____ (N/V) ML2_____(N/V); PL1_____(N/V), PL 2_____ (

P"aide" 1_____ P"aide"2_____

Mélange "aide" 1_____ Mélange "aide"2_____;

Autres:______(Spécifiez)

V. SUIVI PRELIMINAIRE SUR LE MAIS: L'IMPACT DE L'AIDE

	Pref	ecture	Commune	
Secteur	Enqueté H	_ F #	AutresDate	No. de fiche
Avez-vous cultivé d Oui Non	u maïs sur votre Si non, pou	exploitati quoi?	ion cette saison?	
I. UTILISATION DE Pouvez specifiez les d'une variété amélic	<u>SEMENCES DE M</u> suivants: sources préé, indiquez le n	I <mark>AIS 199</mark> s de semé iom.	1 <u>5A</u> ences, kgs provenant de cha	ique source, et type de semences. S'il s'a
1. Propre Stock	4. Voisin/Ami		Type: localement procuré sait pas (?)	(L) (utilisé avant) hors de la région (H) ou
(specifiez ONG) 3. Marché/Boutique	6. Autres: spi	ecifiez	Type: Variété améliorée	(VA); Variété locale (VL)
 Alde d'argence (specifiez ONG) Marché/Boutique Source 	6. Autres: spi Kgs semés	ecifiez	Type: Variété améliorée VA/VL	(VA); Variété locale (VL) Nom de VA
 Alde d'argence (specifiez ONG) Marché/Boutique Source A, 	6. Autres: spi Kgs semés	L/H/?	Type: Variété améliorée VA/VL	(VA); Variété locale (VL) Nom de VA
2. Alde d'argence (specifiez ONG) 3. Marché/Boutique Source A, B.	6. Autres: spr Kgs semés	L/H/?	Type: Variété améliorée	(VA); Variété locale (VL) Nom de VA

1 = moins appreciés; 2 = même qualité 3 = plus appreciés

que les semences que vous utilisez normalment. Expliquez vos raisons pour l'appréciation.

(L'ordre de sources, A-C doit correspondre à l'ordre en haut).

Source	Appréciation (1 à 3)	Explication
Α.		
В.		
c.		

III. SUIVI SUR LE CHAMPS: RENDEMENT DE MAIS

Source:

- 1. Propre Stock
- 4. Voisin/Ami Type: Variété améliorée (VA); Variété locale (VL)

2. Aide d'ONG 5. Parents

3. Marché/Boutique 6. Autres: specifiez

SOURCE	VA/VL	Associé (O/N)	#Tiges	#Epis	Partie en M.(1/4, 1/2, 3/4, tout	Qté consommée	# Epis (réc. vert)	Tasses/9m2 (rec. secs)
Α.								
В.	*					,		
С.								

Commentaires sur les différents champs (continuez à l'inverse):



Annex XI

REMARQUES CONCERNANT LE GERMOPLASME LOCAL DE HARICOT POUR LA REUNION DE "SEEDS OF HOPE" A NAIROBI LE 26 ET LE 27 MAI 1995

M. GODDERIS, CONSULTANT FAO /KIGALI

1. La multiplication du germoplasme envoyé par le CIAT/RESAPAC au MINAGRI/FAO/SSS fin 1994

- 1.1. Les huit variétés suivantes dont les quantités de semences étaient considérées importantes par la FAO et par le projet SSS ont été multipliées: Umubano, A 321,H 75,PVA 779,Flor de Mayo,Kiliyumukwe,RWR 05, Urunyumba.
- 1.2. 71 variétés dont les quantités étaient considérées peu importantes, n'ont pas encore été multipliées mais sont conservées.

2. Sauvegarde et multiplication du germoplasme préservé en milieu paysan à l'intérieur du Rwanda

D'après les informations de quelques ONG (par exemple Austrian Relief Program, Prodeva/Terre Sans Frontières, FAO/Kisaro) il existe des sites tels que poches de vallée ou de colline où les paysans ont su sauvegarder leur germoplasme local . La FAO se chargera, avec la collaboration du PAM et de divers ONG, de la collecte de germoplasme local fin 95 B et de la multiplication à partr de 96 A .

3. Support financier et logistique pour l'ISAR

L'ISAR a besoin urgemment d'un soutient financier et logistique des instituts et des réseaux de recherche internationaux (CIAT/RESAPAC,CIP/PRASAPACE,ICRISAT) pour redémarrer son programme de multiplication des semences de souche correctement.

D'après le Directeur de Cabinet du Ministère de l'Agriculture et de l'Elevage, il est également urgent qu'un membre de l'équipe du CIAT/RESAPAC soit basé de nouveau de façon permanente à l'intérieur du Rwanda (à Kigali ou à Butare) pour assister l'ISAR: a) à l'encadrement du jeune chercheur inexpérimenté en matière de production

- de semences de haricot et en matière de recherche sur le haricot;
- b) à la réhabilitation des infrastructures permettant d'exécuter convenablement un programme de multiplication de semences et de recherche sur le haricot par un soutien financier et logistique.

FAO-RWANDA

--1

۵

RECAPITULATIE INTRANTS

1995 A

15/05/1995

مريدا و. مريدا و. م

INTRANTS	PROJETS		PO		QUANTITES		QUANTITES	STOCKS
• 1 \$		N°	Fournisseur	Quantité	RECUES	ALLOUEES	RETIREES	
Semences haricot	401/SWE			180	180	180	180	
(Tonne)	402/UK			253	253	252	253	
*	403/ITA			253	253	253	253	
• 3.4	405/FRA			74-	74	74	74	
·	407/WB			1 040	897	936	897	
							1 	
F 1 *	TOTAL			1 800	1 657	1 695	1 657	0
Houes	404/FIN			24 000	23 952	23 952	23 952	
(item)	405/FRA			8 000	000 8	8 000	8 000	
3 F. 🐮	407/WB		r	100 000	107 880	107 880	107 880	
2			······					
	TOTAL			132 000	139 832	<u>139 832</u>	139 832	0
Semences tomates	406/AUS		n	150,00	150,00	150,00	150,00	
(kg)	407/WB			300,00	300,00	298,70	300,00	
5° 6 -	TOTAL	*		450,00	450,00	448,70	450,00	0,00
Semences choux	406/AUS		•	600,00	600,00	600,00	600,00	
- (kg)	407/WB	•		1 200,00	1 200,00	1 184,50	1 200,00	
· * 1	TOTAL			1 800,00	1 800,00	1 784,50	1 800,00	0,00
Semences carottes	406/AUS			600,00	600,00	600,00	600,00	
(kg)	407/WB			1 200,00	1 200,00	1 084,10	1 179,00	
	TOTAL			1 800,00	1 800,00	1 684,10	1 779,00	21,00
Semences oignons	407/WB			1 000,00	1 000,00	980,75	993,00	
rouges (kg)	TOTAL			1 000,00	1 000,00	980,75	993,00	7,00
Semences oignons	406/AUS			500,00	500,00	496,65	500,00	
jaunes (kg)	TOTAL			500,00	500,00	496,65	500,00	0,00
Engrais	406/AUS			172,00	172,00	175,00	156,85	
(Tonne)	407/WB			343,00	343,00	324,55	308,75	
· ·								
	TOTAL			515,00	515,00	499,55	465,60	49,40

FAO-RWANDA

.

4

RECAPITULATIF INTRANTS

1220 D

15/05/1995

INTRANTS	PROJETS		PO			QUANTITES	QUANTITES	STOCKS
		N°	Fournisseur	Quantité	RECUES	ALLOUEES	RETIREES	
Semences haricot	407/WB		CEI	200	200	200	200	
(Tonne)			Business center	300	300	312	296	
	502/UK	1049702	Business centur	<u>(7%)</u>				
		Į			<u> </u>			
		L						
	TOTAL			500	500	<u>512</u>	496	4
Houes	404/FIN		Rwandex	5 700	<u> </u>	5 700	<u> </u>	
(item)		15149594	MAGRIC	11 415	11 415	11 415	11 415	
	407/WB		Export Trading	150 000	147 600	101 294	88 694	
			Drury LTD	40 800	40 800			
			Chillington	100 000	95 781			-
	408/NET		Drury	125 000	130 699	130 699	130 699	
			MAGRIC	14230	14230	14230	14230	· ·
			CEI	63000	63000	29364	30275	
	UNICEF			10000	10000	9994	10000	
	502/UK	1B49622	Ukilima Tools	35000				
	TOTAL			555 145	<u>519 225</u>	302 696	291 013	228 212
Engrais	407/WB		INTEREP	480,00	249,00	175,00	137,90	
(Tonne)	408/NET		INTEREP	250,00	520,90	500,55	170,10	
	502/UK	1C49631	INTEREP	57,00				
	TOTAL			787,00	769,90	675,55	308,00	461,90
Semences soja	408/NET		CEI	700,00	699,20	412,68	401,68	
(Tonne)	TOTAL			700,00	699,20	412,68	401,68	297,52
Semences petit pois	408/NET		CEI	500,00	499,60	382,30	380,70	
(Tonne)	TOTAL.			500,00	499,60	382,30	380,70	118,90
Semences blé	407/WB		Winchester	300,00	300,00	300,00	300,00	
(Tonne)	TOTAL			300,00	300,00	300,00	300,00	0,00
Semences maïs	502/UK	1C49628	Business Center	135				
(Tonne)	TOTAL		······································	135	0	0	0	0.00

f., ,

.

· · ·

.

QUANTITES TOTALE FOURNIES PAR LA FAO (septembre 1994 à mai 1995)

4	Ŧ
659 057 pièc	es
2 157 tonn	es
5 550 kg	-
699 tonn	es
500 tonn	es
300 tonn	es
0 tonn	es
1 285 tonn	es
	659 057 pièce 2 157 tonn 5 550 kg 699 tonn 500 tonn 300 tonn 0 tonn 1 285 tonn

QUANTITES TOTALES DISTRIBUEES (septembre 1994 à mai 1995)

Ťŧ		
Houes	430 845	pièces
Semences de haricot	2 153	tonnes
Semences maraîchères	5 522	kg
Semences de soja	402	tonnes
Semences de petits pois	381	tonnes
Semences de blé	300	tonnes
Semences de maïs	0	tonnes
Engrais	774	tonnes

QUANTITES TOTALES EN STOCKS AU :

15/05/1995

۰,

Houes	228 212	pièces
Semences de haricot	4	tonnes
Semences maraîchères	28	kg
Semences de soja	298	tonnes
Semences de petits pois	119	tonnes
Semences de blé	0	tonnes
Semences de maïs	0	tonnes
Engrais	511	tonnes

Organizationa	Beanc	Venetable	Make	C	Cardan	Sacathur	Wheel	Telab	Tantiliyan-	Phys. Nin-	Dithana	Soravera	Hoes
CAL BRUITSTICHT	176203	TEXTLORE	mage	3073		And Summer	Annals	11/50		A NY 200 Marca	L L/IND ACRO	- Sprayras	- 27.00
		seecs	34603	Becan	peas	seeds	seeds	pocaroes			000	((place)
ι Επιτροποίος το προστάτο που Γι παιτροποίος προστάτος προστάτος προστάτος προστάτος προστάτος προστάτος προστάτος προστάτος προστάτος προστά	am	av -s	000	0.00	ACTO	000		seegs	(M1)	(6.0)	(mar)	(preves)	
1 Already distributed		(A. K /	(211)			<u></u>	(mil)	(MI)				1	
	1			·	+		<u> </u>		1				
704/FA0			<u> </u>	1	1	1						1	
AFRICAIRE		67					<u> </u>	<u> </u>					
CRS	229	700		<u> </u>	+	14						1	75
GTZ	72	180	36		15	108							3.
WORLD VISION	10	100	8	2	<u> </u>	174							
KIGALI-VILLE/FAO	100			1	1				5				<u></u>
CRS/FAO	1			70		400						1	
CARITAS-FAO	i			16	4								
TROCAIRE/FAO	10			27			67		35				
CARE	39					56			100		*		57 9
ADRAHCR	50		30		Ì								
ADPR/FAO	10	*:		20	2								17.5
DRSA GISENYI/FAO				32	43				5				296
ACTION NORD SUD/FAO				22	11				25			<u> </u> [1.80
JTZ/FAO		**		<u>,</u> 1	36								
JTZ/CARE	31					63							33
SUISS DISASTER RELIEF/FAO				34	40		15		1			ļ	630
UISS DISASTER RELIEF											3		
AUSTRIAN RELIEF PROGRAM	10												
USTRIAN RELIEF PROGRAM/FAO				34	21		25		1				140
icr	109		52										
JRSA KIBUNGO/FAO	65	ļ			68							ļļ.	
	900	2200	178			265						ļĮ	700
ACTION NORD SUD/GTZ	42	80				24						l	
CARITAS/GTZ	60	200	30			120							
ARITAS SUISSE	370		120		120								284
OAVCEE	170		43			100							
ACCORD						42							170
VORLD WISION/CEE						50							
VORLD VISION/FAO	150			. 94	84		Ì					Ł	
RPICEE	120	Į	21										
RP/HCR			27		5	43						100]40
ARE/FAO	51								10			ļļ.	94
EP/FAO	75											-	
EE/CICR				90			[]		 	
CRADRSA KIBUNGO	57							1					

×

.

.

24/05/95 02:17 PM

.

COOPI/HCR	31		35										I
ISAR/FAO		-]]			l	- 60				
CARITAS SUISSE/FAO	40	200				-	100						
COMMUNE KICUKIRO/FAO	5			5	9						1	T	830
AGRO ACTION ALLEMANDE/CEE	207		31	4						1	1		
AGRO ACTION ALLEMANDE/FAO											T		10000
ACIST/FAO	1				2						1		1933
INTER SOS/FAO				9	18					1			17000
JOC/FAO						•					1		100
ADR/FAO	1				1								
CENTRE IWACU/CEE	8		4	4							l –		1
CARITAS RWANDA/CEE	Э										l		
CARITAS KABGAYIFAO											[1	2180
COOPICEE			- 11	20		1							1
DRSA GIKONGORO/FAO		•					92						
CENTRE IWACU/FAO	53					L			3				26000
AFRICARE/FAO					4					\$			
ASOFERWA/FAO	6			2	2				2				568
LWF													45000
LWF/FAO							L		1				
OXFAM QUEBECAUNICEF			·		ļ								20000
UNICEF/CSC						L	ļ	<u> </u>					2000
PROGRAMME SEMENCE/FAO							<u> </u>	<u> </u>					20
PRODEVA/FAO							<u> </u>		4	Ĺ			
5AP/FAO							L		1				
CSC GITARAMA/FAO					Į		<u> </u>	<u> </u>	20				140
CSC/FAO					Į		Į		20				20 000
PVK ·										<u>i</u>			5 000
P.NYABISINDU						İ		<u></u>					3 230
DOMAINE BERG FRIEDEN									2				30
COOPI+CRS/CEE										1 000		<u> </u>	12 000
A.A.A+1.VIA+ZOA+WORLD VISION/CEE							<u> </u>			1 000			21 492
ZOA	<u> </u>											26	
ADRA/FAO		·											3 300
ACTION NORD SUD													1 000
TROCAIRE													46 170
ADRA													6 000
PAPDIFAO													580
s/total 1	3 157	3 727	626	500	483	1 460	300	0	253	2 000	4	126	707 814
2 Stocks inside the country	<u> </u>		ł										
FAO				334	179		0		481				239 339
IIINICEF	300								·····			7 000	
UNHCR						422						<u>_</u>	
CICR									7			Ì	
SWISS DISASTER RELIEF		· ·					Ō				7		10 000

3

24/05/95 02:17 PM

											· · · · · · · · · · · · · · · · · · ·		
AUSTRIAN RELIEF			1	I]	1		I	[
CRS		1	· ·	1		328							s ¹
CARE-INTERNATIONAL			l		1		1						122.0
AFRICARE			1		İ	1			[3 7*
GTZ											2	100	
ADRA						`,	1						
CARITAS					1		T						
CEE	·		90	75				2 000	1 000	1 000	100		
													•
sticital 2	300	0	90	409	179	750	Û	2 000	1 488	1 000	109	7 100	375 1 <i>2</i> 2
TOTAL	3457	3727	716	909	662	2210	300	2000	1741	3000	113	7226	128212-
Total aveda	7 038	3 854	444	1 104	2 964	847	383	39 196	2 336	4 415	253	4 800	899 45
BILAN (Mas forsting to be pre-hilly	3 581	127	(272)	195	2 302	(1 363)	83	37 196	595	1 415	140	(2 426)	(382 6.

Ŋ.
ANNER XI

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL - CIAT PROJECT: SEED OF HOPE - RWANDA FINANCIAL STATEMENT FROM 1 JULY 1994 TO 30 APRIL 1995 IN U. S. DOLLARS

Initial balance - 97,444 Funds received from: Date: AIDAB - W.V AUSTRALIA On 16 Dec/94 55,736 IDRC On 02 Mar/95 - 52,667 ODA, UK On 18 Aug/94 76,000 - SDC, SWISS On 11 Nov/94 200,000 - USAID On 10 Jan/95 - 125,000 TOTAL INCOME 331,736 412,611 EXPENSES SEED RELIEF - 137,500 Product., multiplic., pack. 74,334 68,841 Storage 3,053 1,526 Distribution/Transport 15,401 7,735 Travel & Vehicle lease 14,656 28,710 Staff - assistants 8,891 13,977	- 55,736 52,667 76,000
Funds received from: Date: AIDAB - W.V AUSTRALIA On 16 Dec/94 55,736 IDRC On 02 Mar/95 52,667 ODA, UK On 18 Aug/94 76,000 SDC, SWISS On 11 Nov/94 200,000 USAID On 10 Jan/95 125,000 TOTAL INCOME 331,736 412,611 EXPENSES SEED RELIEF 74,334 68,841 Storage 3,053 1,526 Distribution/Transport 15,401 7,735 Travel & Vehicle lease 14,656 28,710 Staff - assistants 8,891 13,977	55,736 52,667 76,000
AIDAB - W.V AUSTRALIA On 16 Dec/94 55,736 IDRC On 02 Mar/95 52,667 ODA, UK On 18 Aug/94 76,000 SDC, SWISS On 11 Nov/94 200,000 USAID On 10 Jan/95 125,000 On 03 Mar/95 137,500 TOTAL INCOME 331,736 412,611 EXPENSES SEED RELIEF Product., multiplic., pack. 74,334 68,841 Storage 3,053 1,526 Distribution/Transport 15,401 7,735 Travel & Vehicle lease 14,656 28,710 Staff - assistants 8,891 13,977	55,736 52,667 76,000
IDRC On 02 Mar/95 52,667 ODA, UK On 18 Aug/94 76,000 500,000 SDC, SWISS On 11 Nov/94 200,000 200,000 USAID On 10 Jan/95 125,000 137,500 TOTAL INCOME 331,736 412,611 EXPENSES SEED RELIEF 74,334 68,841 Storage 3,053 1,526 Distribution/Transport 15,401 7,735 Travel & Vehicle lease 14,656 28,710 Staff - assistants 8,891 13,977	52,667
ODA, UK On 18 Aug/94 76,000 SDC, SWISS On 11 Nov/94 200,000 USAID On 10 Jan/95 125,000 USAID On 03 Mar/95 137,500 TOTAL INCOME 331,736 412,611 EXPENSES SEED RELIEF 74,334 68,841 Storage 3,053 1,526 Distribution/Transport 15,401 7,735 Travel & Vehicle lease 14,656 28,710 Staff - assistants 8,891 13,977	76 000
SDC, SWISS On 11 Nov/94 200,000 USAID On 10 Jan/95 - 125,000 On 03 Mar/95 - 137,500 TOTAL INCOME 331,736 412,611 EXPENSES SEED RELIEF - - Product., multiplic., pack. 74,334 68,841 Storage 3,053 1,526 Distribution/Transport 15,401 7,735 Travel & Vehicle lease 14,656 28,710 Staff - assistants 8,891 13,977	10,000
USAID On 10 Jan/95 On 03 Mar/95 - 125,000 137,500 TOTAL INCOME 331,736 412,611 EXPENSES SEED RELIEF - - - - - - - 137,500 Distribution/Transport 74,334 68,841 - <td>200,000</td>	200,000
On 03 Mar/95 137,500 TOTAL INCOME 331,736 412,611 EXPENSES SEED RELIEF 74,334 68,841 Product., multiplic., pack. 74,334 68,841 Storage 3,053 1,526 Distribution/Transport 15,401 7,735 Travel & Vehicle lease 14,656 28,710 Staff - assistants 8,891 13,977	125,000
TOTAL INCOME 331,736 412,611 EXPENSES SEED RELIEF	137,500
EXPENSES 74,334 68,841 Steed Relief 74,334 68,841 Storage 3,053 1,526 Distribution/Transport 15,401 7,735 Travel & Vehicle lease 14,656 28,710 Staff - assistants 8,891 13,977	646,903
Product., multiplic., pack. 74,334 68,841 Storage 3,053 1,526 Distribution/Transport 15,401 7,735 Travel & Vehicle lease 14,656 28,710 Staff - assistants 8,891 13,977	
Storage 3,053 1,526 Distribution/Transport 15,401 7,735 Travel & Vehicle lease 14,656 28,710 Staff - assistants 8,891 13,977	143,175
Distribution/Transport 15,401 7,735 Travel & Vehicle lease 14,656 28,710 Staff - assistants 8,891 13,977	4,579
Travel & Vehicle lease 14,656 28,710 Staff - assistants 8,891 13,977	23,136
Staff - assistants 8,891 13,977	. 43,366
	22,868
NARS/CAPACITYBUILDING/REHABILITATIONNars support/training36,40520,492Special training3,2004,800Special support to Run and in	56,897 8,000
	6,084
STRATEGIC RESEARCH SUPPORT Staff 15,212 - Operating	15,212
Research facilities 8.960 13.440	22,400
Consultancies 13,876 4,735	18.611
Coordination/meeting 6,085 -	6.085
Travel	· _
OPERATIONS & ADMIN. SUPPORT	
Operations/Administration 23,571 20,293	43,864
Contingencies 4,564	4,564
TOTAL EXPENSES 234.292 184.549	· · · · · · · · · · · · · · · · · · ·
BALANCE 97,444 228.062	418.041

APPENDIX 6

Report 4

Report of the Fourth Seeds of Hope Business and Coordination Meeting, ISAR, Rubona, 17 October 1995.

•

TABLE OF CONTENTS

- 1. INTRODUCTION
 - 1.1 Welcome
 - 1.2 Official Opening
 - 1.3 Agenda
- 2. CURRENT SEASON EXPECTATIONS IN RWANDA
- 3. BRIEF OVERVIEW OF SOH OBJECTIVES
- 4. ADMINISTRATIVE OVERVIEW OF SOH
- 5. **REVIEW OF SOH CGIAR PARTNER ACTIVITIES**
 - 5.1 Survey and Impact Assessment (Annex III)
 - 5.2 Potato/Sweet Potato CIP/PRAPACE (Annex IV)
 - 5.3 Maize CIMMYT (Annex V)
 - 5.4 Sorghum ICRISAT (Annex IV)
 - 5.5 Beans CIAT (Annex VII)
 - 5.6 Tree Seed Centre ICRAF (Annex VIII)
 - 5.7 Genetic Resources IPGRI
- 6. FAO/WORLD BANK REPORT
- 7. WORLD VISION RWANDA REPORT (Annex IX)
- 8. ISAR ACTIVITIES FOR 1996A AND 1996B
- 9. BUDGET REPORT (Table 1)
- 10. GROUP DISCUSSION ON SOH BUDGET AND FUTURE ALLOCATIONS
- 11. OTHER BUSINESS; NEXT MEETING
- 12. ANNEXES
 - L Participants
 - II. Agenda
 - III. Survey and Impact Assessments
 - IV. Potato/Sweet Potato CIP/PRAPACE
 - V. Maize CIMMYT
 - VI. Sorghum ICRISAT
 - VII. Beans CIAT
 - VIII. Tree Seed Centre ICRAF/CSIRO/SDC
 - IX. World Vision Rwanda Report

REPORT OF THE FOURTH SEEDS OF HOPE BUSINESS AND COORDINATION MEETING

Institut des Sciences Agronomiques du Rwanda (ISAR) Rubona, Rwanda

17 October 1995

1. INTRODUCTION

1.1 WELCOME

The meeting opened at 9 a.m. with Dr. W.R. Scowcroft as chair.

Participants (Annex I) were welcomed and introduced themselves and their affiliation.

1.2 OFFICIAL OPENING

Dr Alfred Mutebwa, Director General of MINAGRI officially opened the meeting and welcomed all participants on behalf of MINAGRI and ISAR. Dr Mutebwa made the following points during his welcoming comments:

- * Rwanda was on the road to recovery despite numerous problems which followed in the wake of the civil war of 1994.
- * The Director General thanked the international community for assisting Rwanda in recovering and rehabilitating her agricultural resource sector and restoring food security.
- * Dr Mutebwa reminded the participants that rehabilitation and rebuilding is a more difficult process than destruction more time and longer term commitment is needed.
- * He appealed to the international community to assist Rwanda to reconstruct her agriculture and not to stop half way but to put in place measures to ensure that the reconstruction of Rwandan agriculture would be sufficient to restore Rwanda to a position as before the war.

1.3 AGENDA

A provisional agenda was circulated, discussed and a revised version adopted (Annex II) for the meeting.

2. CURRENT SEASON EXPECTATIONS IN RWANDA

Mr Laurent Gashugi, MINAGRI, provided a general overview of the current situation in Rwanda and the expectations for the forthcoming 1996 A and B seasons.

After the second SOH meeting, ISAR began seed multiplication based on planting material including beans, cassava, seed potato, provided by MINAGRI, SOH, SSS, World Vision, FAO and others. SOH specifically provided beans, maize, sorghum and potato.

Several problems led to a lower than expected yield from this increase, including late arrival and therefore late planting of the seed, the lack of a specialist in ISAR at that time and lack of technical expertise in several NGOs which were involved in seed multiplication in Rwanda.

During the 1995B season recently finished the quantity of seed produced for planting purposes was estimated at 50% of that which was normally produced before the war. There appears to be no major concern about large scale future shortages of crop seed with the exception of potato, due to the low rate of natural increase for this crop.

To help overcome the shortage of potato planting material, the World Bank has provided US\$1 million to produce an estimated two million mini-tubers and cuttings outside Rwanda for importation into the country.

During **discussion** there was agreement that at least some of the multiplication of potato under the World Bank initiative should be carried out in Rwanda preferably on ISAR stations.

Further the meeting strongly urged that MINAGRI and ISAR should approach the World Bank to request that a small portion of the US\$1 million be used to rehabilitate potato seed multiplication infrastructure and training in Rwanda. The estimated amount is \$70,000 to \$100,000.

It was noted that before the war Rwanda had one of the most successful potato multiplication schemes in the region and was a very active contributor to the PRAPACE regional network.

3. BRIEF OVERVIEW OF SOH OBJECTIVES

This was the first SOH meeting that many of the participants had attended. The objectives of and partners in SOH were briefly reviewed by W.R.Scowcroft:

- The civil war in Rwanda which began in April 1994 had an immediate impact causing up to 1 million deaths, huge numbers of refugees and an estimated 2 million displaced people.
- Consequently the 1994B (January-July) crop growing season was devastated and the prospects for the 1995A (September-January) season appeared ominous with potentially dire consequences for food production.
- Seeds of Hope came into being to address this problem with the following objectives:
 - * Reintroduction of genetic diversity of the most important food crops;
 - * Provide technical support to NGO relief agencies;
 - * Assist rehabilitation of seed production facilities which includes training of human resources;
 - * Assess impact of the restoration of genetic diversity.
- SOH is a partnership of NARS (including the crop regional networks), NGOs, IARCs and donors.
- SOH was designed as a transitional initiative to help bridge the gap between emergency response to disaster and reestablishment of conventional development aid programs.

4. ADMINISTRATIVE OVERVIEW OF SOH

Dr Kande Mutungulu has been in the position of SOH coordinator for the past four months. He is located primarily in Kigali but also works closely with staff at ISAR headquarters in Rubona.

Dr Mutungulu thanked ISAR, the Government of Rwanda, the concerned IARCs, World Vision, FAO and other organizations for their support and assistance.

Referring to the previous strong collaboration between ISAR, the CGIAR Centers and the regional NARS, it is preferable that Rwanda rebuild its strength based on existing knowledge and technology rather than to start again.

To achieve that which is requested by ISAR, collaboration is essential. In particular ISAR and the CG centers can generate technology for effective dissemination to farmers and farming communities.

5. REVIEW OF SOH CGIAR PARTNER ACTIVITIES

5.1 SURVEY AND IMPACT ASSESSMENT (ANNEX III)

a. The surveys involve two major domains:

- SPECIFIC CROP PROFILES
- THE IMPACT OF WAR ON AGRICULTURAL PRODUCTION

For each domain the following information is acquired and assessed:

- * seed stocks
- * varietal profile
- * specific management practices
- * production constraints
- * seed channel/systems analysis

b. Seven SOH Assessment Documents have been produced:

EMERGENCY RELIEF IN RWANDA

- SOH 1 Assessment of Bean Seed Use 1955A: Summary Report.
- SOH 3 Assessment of Bean and Maize Seed Use 1995A In Care Zone of Action.
- SOH 4 Assessment of Bean Seed Use 1995A in World Vision Zone of Action.
- SOH 5 Assessment of Maize Seed Use 1995A in World Vision Zone of Action.
- SOH 6 Assessment of Maize Seed Use 1995A: Summary Report.
- SOH 7 Assessment of Sorghum Seed Use 1995B in Care Zone of Action.

VARIETAL EROSION ASSESSMENTS

SOH 2 The Impact of War on Plant Genetic Resources: Bean Varietal Assessment in Rwanda 1995A: Summary Report.

The SOH reports 1, 2, 3 and 4 formed part of the Third SOH Meeting, May 26-27, 1995.

SOH Reports 5, 6 and 7 are in Annex III.

c. The major lessons from the assessments can be summarized as follows:

- * Farmers were able to keep significant portions of their own stocks because food and seed aid was distributed quickly. For example, for 1995A 45% of bean and 25% of maize seed came from farmers' own stocks. However there was great heterogeneity depending on army activity and refugee movements.
- * Distributing varietal mixtures had the added advantage that:
 - production was stabilized;
 - farmers were able to recover or select out their "best varietal bets".
- * Targeting distribution of varieties based on source and adaptation to local conditions gave much higher yields than if distribution was not targeted based on varietal adaptation. This was particularly true for sorghum in cold temperature prone areas - those varieties with cold tolerance yielded morethan double those varieties which lacked tolerance.
- * Farmers were able to recover "lost" local varieties because the local seed channels began functioning quickly. For example, 30% of farmers said that they had lost varieties but that they could recover them from neighbors and families; only 4% said that they had irreversibly lost varieties.
- * Improved varieties that were lost seemed more difficult to recover than local varieties.

d. Phase II of the SOH assessments is being carried out in close consultation and collaboration with ISAR, MINAGRI and FAO. Activities include:

- * Comprehensive countrywide surveys of beans, sorghum and cassava;
- Detailed survey of potatoes in key production areas;
- * A large sample size will be taken with extensive geographic coverage including 800 to 900 households (300 for potatoes) sampled across 100 communes (2/3 of the communes in the country) in all ten prefectures (an average of 10 communes per prefecture).
- * Combined training and research of Rwandese technicians.

e. The overall impression of the impact of the war in Rwanda is as follows:

GENOCIDE led to vacating of land, a significant reduction in farm labor and theft from the fields by fleeing populations.

The CIVIL WAR per se had an impact on seed stocks because:

- the 1994B crop was essentially not harvested or late harvested;

- there was significant theft from fields and seed stocks;

- in season 1995A (after the war had finished) there were reduced areas under cultivation;

- in season 1995B (the season just finished in July) there appeared to be poor management of crops in the field.

Land area is opening up. Some previous farmer inhabitants have returned and new "immigrant" (returning refugees from the late 1950s/early 1960s emigration) farmers have come into some areas. In general there appears to be a higher number of dependents per household.

The 1996A Season has begun favourably and there appears to be a return to normalcy as far as the farming sector is concerned. There is some anxiety about the impact of the impending return during the next months of the many hundreds of thousands of refugees presently in Zaire.

Seed Distribution and Exchange Systems are starting to function as previously. For local varieties market prices are noticeably higher in areas which were more stressed by the war, eg the south west, than in less stressed areas where prices appear normal.

For improved varieties, there appears to have been little impact on those varieties which have been diffused for some time. For more recently released improved varieties, the process of diffusion has essentially halted because the SSS scheme ceased to operate (now returning to action through Belgium support) and Network/IARC activity severely curtailed since April 1994.

As determined from October 1995, "Varietally-Stressed" Areas result from compounding of one or more of the following factors:

* Harsh environments where production is normally low and where there is a narrow range of cultivars;

* Areas where disturbances were significant as a result of populations fleeing en masse and where war and insurgency was prolonged;

* Areas where crop production was compromised because of fear and insecurity led to poor and restricted management of crops;

* Areas where seed channels functioned imperfectly.

f. From the assessment and surveys future concerns for SOH include:

* Developing a more refined idea of what constitutes "Varietal Erosion". For example, varietal erosion can simply mean presence or absence of a variety or it could mean the inability to access a variety because of high prices and/or restricted availability.

* There seems a need to **expand the germplasm focus** to put it in the context of the nature of the seed distribution channels before and after disaster and to have some idea about the individual crop production parameters both before and after crisis.

* **Reestablishing seed distribution channels** would appear to take longer than the time frame given for Seeds of Hope.

During discussion points that were raised included:

* Extension of the survey to include tree seeds which generate considerable cash flow in some areas;

* The FAO-World Bank has conducted a survey on the impact of seed distribution and specifically sought to identify groups of people and communities which continue to be vulnerable;

* Many non-agronomic factors impact on restoration of crop production. For example, the lack of longer term security causes farmers to plant annual crops rather than perennial crops;

* The "new load" that will be imposed by refugees returning to their land and homes;

* Strategies to move seed of crop varieties from varietally unstressed to more stressed areas.

5.2 POTATO - CIP/PRAPACE (ANNEX IV)

a. All of the pre-basic and basic seed produced in Uganda (NARO), Kenya (KARI & CIP) and by CIP in Peru has been shipped to Rwanda. Total amounts include:

* Field multiplied basic seed - 8,600 kg cvs Cruza, Sangema.

* Elite tuberlets from stem cuttings - 560 kg cvs Sangema, Cruza and Mabondo.

* Pre-basic tubers from stem cuttings - 8,275 kg cvs Sangema, Cruza, Victoria.

* Seedling tubers from true potato seed (TPS) - 1,435 kg cvs 88001, 88006.

* TPS - 300qms cvs 88001, 88004, 88006.

b. Multiplication of potato in Rwanda is being undertaken by World Vision in Gikongoro, ISAR at Kinigi.

c. Through CIP, SOH has begun the rehabilitation of facilities at Kinigi. ISAR has appointed an officer-in-charge of the Rwanda National Potato Program.

d. A training course was carried out in Rubona, October 10 - 17. Twenty five technicians attended from ISAR and MINAGRI; senior scientists from CIP, national programs in Ethiopia, Uganda and Zaire and the PRAPACE coordinator assisted in the course.

e. CIP has begun the process of assisting ISAR to restore its potato germplasm collection and varietal selection program.

During **discussion** it was further emphasized that part of the new support from the World Bank for potato multiplication should be allocated to help ISAR rehabilitate potato multiplication facilities in Rwanda. Provided the World Bank agrees to provide some funds for rehabilitation then CIP will be able to provide training support to the refurbished facilities. Possibly only US\$60,000 is required to rehabilitate the rapid multiplication facility.

5.3 MAIZE - CIMMYT (ANNEX V)

a. Seed Multiplication: Multiplication of seed of three different varieties of maize (ZM607, TAMIRA, MAMESA) adapted for the 3 major agro-ecologies of Rwanda was completed in September, yielding 148 tons. All seed had been harvested, processed and shipped to Rwanda by October 11.

b. Seed Distribution: The 148 tons of seed sent to Rwanda will be distributed for the forthcoming season by:

- -World Vision
- -Catholic Relief Services
- -Red Cross

A pamphlet entitled "Maize in Rwanda" was prepared and provided to all NGOs distributing maize seed to assist them in targeting the three varieties.

c. Training: Francis Macharia, maize agronomist in the CIMMYT Crop Management Training Course lectured at the training course for ISAR researchers during the week of 4-8 September.

During **discussion** FAO pointed out that during 1995A and 1995B, 1,700 and 600 tonnes respectively was brought into Rwanda. It is not known what varieties were included in these imports and some concern was expressed about the varietal quality of the material. It was considered that some of this seed was also eaten.

5.4 SORGHUM - ICRISAT (ANNEX VI)

a. Seven tonnes of three sorghum varieties, respectively adapted to low, intermediate and high elevations in Rwanda has arrived in Kigali for distribution to farmers for the 1996A and B seasons.

b. Dr Mukuru, ICRISAT, visited Karama, Rwerere and Rubona stations to assess damage and likely chance of restarting sorghum variety testing and breeding. Multiplication of several highland varieties had begun at Rwerere and it was encouraging that 104 of 131 collections of highland sorghum had been saved.

c. Sorghum seed acquired in southwest Uganda (adapted to low temperature) appeared to perform quite well in highland areas of Gitarama. In contrast seed (provided by an NGO) that was not adapted to low temperatures had very low seed set (5-10%).

d. Multiplication of varieties and germplasm to help restore ISAR's breeding program has been completed and will be given to ISAR when storage conditions are suitable.

e. Training (7 weeks, May-July) was provided in Kenya for ISAR's new sorghum breeder/coordinator.

f. A video recording some of the work of SOH has been completed.

g. ICRISAT will provide additional support to ISAR to include:

Training; Technical support to ISAR's sorghum research program; Assistance in rehabilitating facilities at Karama; Provision of equipment and supplies to ISAR's sorghum program.

5.5 BEANS - CIAT (ANNEX VII)

5.5.1 Seed Production

a. More than 260 different lines of beans have been multiplied during the past 12 months in Tanzania, Malawi, Uganda and Kenya and then released in Rwanda through Service Semences Selectionnees for further multiplication by NGOs, FAO, ISAR and SSS as follows:

TYPE OF LINES	NO. OF LINES	AMOUNT (metric tons)
Rwandan local landraces	165	1.7
Released varieties and improved varieties in diffusion - Bush beans	11	0.8
- Climbing beans	8	4.6
Burundi varieties and mixtures	2	4.9
Released Uganda varieties	2	0.7
Advanced breeding lines	95	1.2

b. Since February 1995 (start of 1995B season) more than 100 lines were multiplied in Rwanda by various NGOs and ISAR. The resulting 2.3 tonnes of seed has been replanted for further increase.

c. Reserve supplies of seed have been multiplied in Malawi, Zaire, Tanzania, Uganda, Kenya and Colombia and will be supplied to Rwanda on advice from ISAR and SSS to replenish diversity to vulnerable areas and groups of people.

d. Three relatively fortunate circumstances which could not have been predicted prevailed to mitigate against precipitous loss of genetic diversity in beans. First, the war ended by August 1994 and a level of stability in rural areas was restored and sustained. Second, the 1995A and B seasons were favourable. Third the tremendous effort by NGOs, the UN and WFP in rapid distribution of food aid enabled farmers to conserve seed for planting rather than use it for food. Thus for the 1996A (Sept/Oct 1995) season 45% of the 12,000 tonnes of planting seed required came from farmers' own reserves. Of the remaining seed needs, 28% came from seed aid and 26% was purchased in local markets.

5.5.2 Genetic Diversity

a. A survey collection of 208 seed samples from farms in the eight main bean growing prefectures was made during March 1995. An analysis of the seed types and a description of variety characteristics were made. This data assists in determining

whether of not there had been a loss in the genetic diversity of beans within Rwanda.

b. The data was compared to a collection of beans made by E. Lamb in 1983. Due to the problems with trying to make a seed collection shortly after the war, it was not possible to get a perfect correlation between the sites that Lamb had sampled and those of the present survey. Additionally, the number of samples that were collected in March 1995 was determined to obtain values that would indicate if there had been genetic erosion on a country wide basis, and not on a prefecture by prefecture basis. This aspect of the data must be understood to interpret the data correctly.

c. In general, the results of the analysis to date (Annex VII) suggest that there has been an overall loss of on-farm variability compared to that which existed at the time of the Lamb collection. In part this was expected based on pre-war experience in Butare, where farmers were observed to be abandoning Andean genotypes due to susceptibility to root rots (Buruchara, personal communication). This observation was consistent with present results, since loss of Andean types was especially acute in Butare, as well as in Gikongoro. In this latter prefecture, soils are reported to be especially poor which may have contributed to the abandonment of Andean types, especially if root rots were present which exacerbated the effect of the poor soil fertility.

d. It may be difficult to distinguish between pre-war loss due to conscious or unconscious elimination by farmers, and that which resulted from the civil war. Imaginative work may be necessary with farmers to determine what variability they would like to recover from that which is now apparently lost or at low frequency.

5.6 TREE SEED CENTRE - ICRAF/CSIRO/SDS (Annex VIII)

a. Activities in tree seed collection and rehabilitating the Tree Seed Centre (TSC) in Butare are closely related to the SOH initiative.

b. Support by ICRAF and CSIRO Division of Forestry with funding (ca. US\$100,000) from AusAID and World Vision Australia and Swiss Development Cooperation , the objectives are:

- i. To assist in the rehabilitation of TSC and initiate collection, storage and distribution of tree seeds.
- ii. To assess status of agroforestry projects in Rwanda and rehabilitate research activities.

c. Since the war until 30 June 1995, 2,600 kilos of seed from many species has been collected. Subsequently, to 30 September, 1,660

kilos has been collected from 47 species.

d. Some seed has already been sold, mainly to NGOS including World Vision, Care International and the World Food Program.

- e. The main current difficulties include:
 - * Lack of transport (a vehicle was stolen)
 - * Insufficient research personnel
 - * Lack of appropriate seed storage facilities.

During **discussion** issues were raised about the stolen TSC vehicle, supply of personnel and questions about when ICRAF would resume research activities in Rwanda.

5.7 GENETIC RESOURCES - IPGRI

a. IPGRI's past activities in Rwanda and the region include:

- * Germplasm collection
- * Training
- * Development of conservation facilities including cold storage equipment in Rubona.

b. IPGRI's involvement in SOH is to monitor overall plant genetic resources conservation issues and to stimulate a nationally coordinated program in genetic resources conservation. A proposal was previously circulated to SOH participants.

c. An assessment of PGR facilities at Rubona, SSS and Ruhande has been made with the following conclusions;

Rubona - the cold storage room has been completely vandalized with loss of compressors, dehumidifiers and insulation panels.

SSS - there is some damage but the facilities are essentially intact. Seed storage facilities are short term only.

Ruhande - the tree seed centre facilities are in reasonable shape and could be used as backup storage for other crops.

d. Under the ICPPGR (International Conference and Programme on Plant Genetic Resources) a country report on the status of Rwandan Plant Genetic Resources was compiled in consultation with MINAGRI.

e. INIBAP is now integrated with IPGRI and can provide technical and scientific assistance to rehabilitate the banana collection and research program.

- f. Planned future activities include:
 - * Rehabilitation of the conservation facilities at Rubona.
 - * In-country training on germplasm conservation and use.
 - * Impact assessment on genetic resources.

6. FAO/WORLD BANK REPORT

a. The FAO intervention in Rwanda was for emergency operations only. Since August 1994, US\$9 million has been invested through FAO in emergency supply of crop planting materials, fertiliser, implements and to deal with livestock problems.

b. US\$4 million provided by the World Bank was devoted to seed acquisition and distribution, including US\$200,000 for seed multiplication in Rwanda. These funds assisted MINAGRI to cultivate 50 hectares for multiplication of which 21 ha was used to produce 21 tonnes of bean seed (cultivars not reported). Fifteen of these 21 tonnes are being marketed by farmers to help in the redevelopment of traditional market channels. The remainder is being distributed to farmers in vulnerable areas.

c. For season 1996A, FAO has planned to multiply bean seed and cassava and sweet potato cuttings.

d. For 1996B FAO activities in Rwanda will depend on availability of funds. The FAO program is now in its third and final stage.

During **discussion** a question was raised about the need to multiply either cassava or sweet potato. Several participants considered planting material of either of these crops was in short supply. For cassava, W V reported problems with sweet cassava varieties.

Concern was also raised about the IITA program to introduce large amounts of cassava. IITA representatives were not present to report on their activities.

MINAGRI was concerned that adequate phytosanitary controls were exercised for cassava. The main disease of concern for Rwanda was mealy bug, which can be controlled by Rogor, but frequently this is unavailable to farmers.

7. WORLD VISION RWANDA REPORT (ANNEX IX)

a. World Vision International (WVI) has a long term commitment to assist Rwanda through activities in agriculture, health, unaccompanied children, food and survival needs.

b. The WVI Rwanda Emergency Agricultural Program operates in the prefectures of Gikongoro, Kigali (Kinazi) and Ruhengeri-Gisenyi. WVI works closely with MINAGRI, ISAR research stations and SOH.

c. WVI has been the principal agent for diffusion of adapted and improved crop varieties supplied by the SOH partners:

* Seed of two well adapted bean varieties (Cal96-90kg; MCM5001-600kg) was supplied to farmers by CIAT for multiplication and assessment. Both varieties were well accepted in Gikongoro whereas MCM 5001 was preferred in Kanazi.

Smaller samples of five varieties supplied by CIAT were multiplied at Kinigi and are now under larger scale increase by farmers and other NGOs.

WVI played a pivotal role in recovering the bean germplasm in Rwerere which has now been increased along with different lines originating from Uganda (68 lines) and Tanzania (47 lines). This material is currently being distributed for evaluation in different agroecological regions of Rwanda.

* For potatoes, WVI responded to a request by MINAGRI to rescue the tissue cultured material at the PNAP lab in Ruhengeri. 50,000 minitubers of Sangema were rescued along with several varieties from Kinigi and Tamira stations. Along with minitubers of varieties adapted to Rwanda which were supplied by Belgium, this remarkable effort represents the only pure source of potato germplasm in Rwanda.

CIP has supplied WV with 7.4 tonnes of Cruza which has been distributed to farmers for further multiplication.

- * WV has increased maize (Pool 8A) recovered from farmer's fields near Tamira or supplied by CIMMYT and SSS. Harvested seed was distributed to ISAR Rwerere, PNAP and farmers.
- * WVI is also multiplying sweet potato in Gikongoro with FAO; sweet cassava in Kanazi with MINAGRI and sorghum at Kinigi with ICRISAT.
- * In agroforestry, WV began a small program in Nkuli commune to grow four tree species to supply firewood, animal forage, green manure, stakes for climbing beans and for erosion control.
- * WVI will continue to act as the key pipeline in transferring information from IARCs, ISAR and MINAGRI to farmers and reciprocally to provide feedback to ensure a more effective delivery of seeds, training and infrastructure support. WVI also provides an effective coordinating role between all the

players involved in assisting Rwanda restore agricultural productivity.

WVI will also assess impact of emergency aid both in its own right and in collaboration with SOH.

8. ISAR ACTIVITIES FOR 1996A AND 1996B

a. Dr Munyaganizi, Director of ISAR, warmly thanked the SOH partners for their assistance in rehabilitating ISAR facilities.

b. For the 1996A and B seasons ISAR has defined 18 projects dealing with the main crops. These projects are concerned with beans, potatoes, maize, sorghum, cassava, wheat and agroforestry. The respective ISAR research stations will focus on specific crops relevant to the agroclimatic region of the station such as potato and maize at Tamira; sorghum, cassava, sweet potato at Karama; banana/plantain at Kibungo. ISAR at Karama is also likely to produce sorghum for the brewing industry.

c. While restarting research is a priority, seed multiplication has begun at several stations partly to begin activities which will generate some income.

d. Lack of infrastructure is a bottleneck to implementing activities. The principal needs are communications (telephones), documentation and report preparation (computers) and vehicles.

9. BUDGET REPORT

a. The financial statement for the period 1 July 1995 to 30 September 1995 is in Table 1. The balance of US\$340,149 will be offset by future expenditure according to the approved budget thus:

US\$
126,866
200,880
45,000
46,700
67,738
27,989
-515,173
+340,149
-175,024

b. Pledges of support have been fully committed by:

USAID, United States	US\$400,000
SDC, Switzerland	US\$200,000
ODA, United Kingdom	US\$ 76,000

c. Remaining tranches due are:

AusAID/WV, Australia	US\$117,691	(est.	on	exchange	rate)
IDRC, Canada	US\$ 57,333	(est.	on	exchange	rate)
TOTAL DUE	US\$175,024				

d. Some forecast expenditure during Quarter 4 1995 will be used for infrastructure reestablishment of ISAR and training in-house and in relevant CGIAR centers as per the approved budget. Some reallocation of expenditure was agreed to in order to provide additional funds for infrastructure reestablishment and training as outlined in Section 10 following.

10. GROUP DISCUSSION ON SOH BUDGET AND FUTURE ALLOCATIONS

a. The original budget called for a total expenditure of US\$203,000 for training (US\$145,000) and facility rehabilitation (US\$58,000). To September 30, 1995 budget expenditure on these items is US\$110,350. The balance of US\$92,650 (less expenditure incurred during quarter 3, 1995 but not invoiced by Sept 30) will continue to be earmarked for rehabilitation and training costs.

b. The early success of seed multiplication aspects of SOH aided by the NGOs, UN, FAO and WFP and favourable growing conditions during 1995A and B means that seed multiplication activities by SOH can be reduced during 1996A. This will free up additional funds for rehabilitation and training purposes. The meeting unanimously agreed that this is the main priority for future expenditure.

c. Lively discussion ensued as to the best allocation of available funds between facility rehabilitation and training with priorities oscillating between 40%-60% for facility rehabilitation and reciprocally 60%-40% for training. It was resolved that ISAR would prepare a priority list of facility and/or equipment rehabilitation needs by November 1. This will be coordinated through Kande Matungulu.

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL - CIAT PROJECT: SEED OF HOPE - RWANDA FINANCIAL STATEMENT FROM 1 JULY 1994 TO 30 SEPTEMBER 1995 IN U. S. DOLLARS

TABLE 1

		1 Jul/94 To 31 Dec/94	1 January To 30 Jun/95	1 July To 30 Sep/95	Total To 30 Sep/95
INCOME Initial balance		•	97 444	210 399	*
Funds received from:	Date:				
AIDAB - W.V AUSTRALIA	- On 16 Dec/94	55,736	*	*	55,736
	- On 27 Jul/95	-	-	55,736	55,736
	- On 31 Aug/95	**	-	55,750	55,750
IDRC	- On 02 Mar/95	•	52,667	*	52,667
ODA, UK	- On 18 Aug/94	76,000	•	*	76,000
SDC, SWISS	- On 11 Nov/94	200,000	-	-	200,000
USAID	- On 10 Jan/95		125,000	+	125.000
	- On 03 Mar/95		137,500	-	137,500
	- On 28 Jul/95	-	-	137,500	137,500
TOTAL INC	OME	331,736	412,611	459,385	895,889
EXPENSES SEED RELIEF		4, o			• • • • • • • • • • • • • • • • • • • •
Product., multiplic., pack.		68,409	71,040	27,020	166,469
Storage		3,053	1,526	1,526	6,105
Distribution/Transport		9,796	9,805	8,182	27,783
Travel & Vehicle lease		9,114	18,364	10,324	37,802
Staff - assistants		3,591	1,795	1,795	7,181
NARS/CAPACITY BUILDING/REHABILITATIO	N				
Nars support/training		30,805	20,492	22,568	73,865
Special training		3,200	4,800	-	8,000
Special support to Burundi		6,084	-	**	6,084
STRATEGIC RESEARCH SI	TROACI				
Staff		15,212	5,030	5,456	25,698
Operating		11,329	3,069	5,556	19,954
Research facilities		8,960	13,440	-	22,400
Consultancies		19,176	13,135	14,585	46,896
Coordination/meeting		6,085	-	*	6,085
Travel		313	12,333	3,721	16,367
OPERATIONS & ADMIN. SU	IPPORT				
Operations/Administration		29,372	23,083	18,503	70 ,958
Travel		9,793	4,300	-	14,093
Contingencies			*		
TOTAL EXP	ENSES	234,292	202,212	119,236	555,740
BALANCE	G	97,444	210,399	340,149	340,149

IUAN A. GAF IC: Financial 7Controller

SOHMTG4/Oct 95/WRS

.

WILLIAM R. SCOWCROFT Project Officer

BASE-SURMATERS 11-Oct-05 F S 2 [9

11. OTHER BUSINESS; NEXT MEETING

11.1 Seeds of Hope II - Crop Seed Banks to Assist Restoration of Food Security in the Greater Horn of Africa

a. W.R.Scowcroft reported that USAID had agreed to fund an analysis of the technical requirements and likely costs of a Greater Horn of Africa Seeds of Hope initiative which when implemented will:

Provide a continuing technological response to disaster by reestablishing food security through rapid replenishment of adapted varieties of major food crops in the Greater Horn region of Africa.

b. The crops which provide 70% of calories and 60% of protein for the region include maize, wheat, sorghum, beans, cassava, potato, sweet potato and plantain along with sugar and milk. When implemented the initiative will likely comprise four major elements:

> Variety Seed Banks Seed Multiplication Capacity Crop Environment Domain Maps Partner Integration

c. It is anticipated that the first consultative meeting to set priorities for SOH II will be under the auspices of ASARECA.

d. The project will be managed and coordinated by W.R.Scowcroft on behalf of CIAT which will be the implementing agency for USAID.

11.2 Next Meeting

A date was not set for the next meeting.

11.3 Meeting Adjournment

In closing the meeting the Chair thanked all who attended for their open and committed participation in the meeting. In particular, thanks were given to Dr Munyaganizi and his staff at the ISAR Research Station, Rubona for hosting the meeting.

Dr Marie Claire Gahizi was thanked for assisting with translation of the proceedings.

Special thanks were also accorded Dr Kande Matungulu for ensuring the excellence of the local arrangements, accommodation and transport and for translation expertise.

The meeting closed at 6 PM.

ANNEXES

- I. Participants
- ll. Agenda
- III. Survey and Impact Assessment
- IV. Potato CIP/PRAPACE
- V. Maize CIMMYT
- VI. Sorghum ICRISAT
- VII. Beans CIAT
- VIII. Tree Seed Centre ICRAF/CSIRO/SDS
- IX. World Vision Rwanda Report

ANNEX I

PARTICIPANTS IN FOURTH S	EEDS OF HOPE MEETING, ISAR, RUBONA,	RWAND	A, 17 C	DCTOBER 1995
NAME	AFFILIATION	PHONE	FAX	E-MAIL
Mugunga Canisius, Head	Tree Seed Centre, PO Box 617, Butare, Rwanda	30644	30644	
Eric De Bock	Services Semences Selectionnes, BP 513, Butare, Rw	а		
Marie Claire Gahizi, translator	FAO, Kigali, Rwanda	73513		
Urs Galliker	Swiss Disaster Relief, Prog. Agric., Kibuye, Rwanda	68578	75738	
Laurent Gashugi, Directeur	Production Agricole, MINAGRI, Kigali, Rwanda			
Jean Francois Gascon, Coordinator	FAO, BP 1502, Kigali, Rwanda	73513	73527	
Antoine Golay	Cooperation Suisse, Swiss Embassy, Kigali, Rwanda	75534	72461	
Kande Matungulu, Coordinator SOH	BP 2281, Kigali, Rwanda	75109	75109	CIAT-RWANDA@CGNET.COM
Speciosa Kantengwa	World Vision Rwanda, Kigali, Rwanda	75762	76229	
Eugene F. Karasira, Chef Personnel	ISAR, BP 138, Butare, Rwanda			
Laurent Kayitare	Office President de la Republique, Rwanda	84805		
David K.Kiala	World Vision Rwanda, Kigali, Rwanda	75762	76229	
Dan Kiambi	IPGRI, PO Box 30677, Nairobi, Kenya	521514	521209	
H.M. Kidanemariam	CIP,Nairobi, Kenya	632054	630005	CIP-NBO@CGNET.COM
Stan B. King	ICRISAT, PO Box 39063, Nairobi, Kenya	747557	747554	S.KING@CGNET.COM
Pierre LePoint	Services Semences Selectionnes, Kigali, Rwanda	83922		
N.B.Lutaladio	CIP/PRAPACE, PO Box 22274, Kampala, Uganda	255306	241242	IITA-UGANDA@CGNET.COM
Mukiza-Ntezinana, Agronome	GTZ IPUR	77461		
Bikoro Munyaganizi, Director General	ISAR, Kigali, Rwanda	75783		
Alfred B. Mutebwa, Director General	MINAGRI, Kigali, Rwanda	85083	85054	
Staslas Muyango, Dir. Scientifique	ISAR, Kigali, Rwanda			
Amadu Niang	ICRAF, PO Box 30677, Nairobi, Kenya	521450	521001	ICRAF@CGNET.COM
Samson Ntegeyibizaza, Director	Regional des Serv. Agricoles, Kibuye, Rwanda	68578	68016	
Phemba Phezo	CIP/PRAPACE, PO Box 22274, Kampala, Uganda	255306	241242	IITA-UGANDA@CGNET.COM
Joel K. Ransom	CIMMYT, PO Box 25171, Nairobi, Kenya	632054	631499	CIMMYT-KENYA@CGNET.COM
Tabaro A. Runonge, Chef de Station	ISAR-Rubona, BP 138, Butare, Rwanda			
Denys Rutanu	Austrian Relief Program, Kigali, Rwanda	76141		
Maj. Rwigamba P.	21/c CO 67 Bn (Rubona), Rwanda			
Bill Scowcroft	CIAT-SOH, CRES, ANU, Canberra, Australia	2824354	282435	4/ BILLSCOW@CRES.
L.K.Sikka	CIP. PO Box 25171. Nairobi, Kenva	632054	30005	CIP-NBO@CGNET.COM
Louise Sperling	SOH, E-11/2 Vasant Vihar, New Delhi 110 057, India	6110827	462270	7 IDRC.SARO@CGNET.COM
Bereke Tuku	CIP/PRAPACE, PO Box 22274, Kampala, Uganda	255306	241242	IITA-UGANDA@CGNET.COM
Wayne Youngquist	CIAT, BP 259, Arusha, Tanzania	2268	8557	CIAT-RWANDA@CGNET.COM

ANNEX II

AGENDA FOR THE FOURTH SEEDS OF HOPE AND COORDINATION MEETING

17 OCTOBER 1995, ISAR, RUBONA, RWANDA

09:00	Welcome and Opening Agenda Approval and Arrangements	A. Mutebwa, DG-MINAGRI W. Scowcroft, SOH-CIAT
09:15	Current season expectations in Rwanda	L. Gashugie, MINAGRI
09:45	SOH administrative overview	K. Matungulu, SOH
10:15	Review of SOH/CGIAR Activities	W. SLOWGOR, SCH-CIAF
	Survey and impact assessment Potato/Sweet potato	L. Sperling, SOH H. Kidanemariam, CIP/PRAPACE
11:00	COFFEE	
11:15	Review of SOH/CGIAR Activities (cont) Maize Sorghum Beans	J. Ransom, CIMMYT S.King, ICRISAT W.Youngquist/S.Beebe,CIAT
12:30	LUNCH	
14:00	Tree seed center and resources	M.Canisius,TSC-ISAR/ A.Niano,ICRAF
	Genetic resources	D. Kiambi, IPGRI
14:40	FAO/World Bank Report	J. Gascon, FAO
15:00	World Vision activities in Rwanda	D. Kialla, WV Rwanda
15:20	ISAR activities for 1996A and B	B. Munzaganizi, ISAR
15:45	COFFEE	
16:00	Budget report	W. Scowcroft, SOH-CIAT
16:10	Group discussion on SOH budget and future	allocations
17:45	Other business; next meeting	

18:00 Meeting adjournment

ANNEX III

SURVEY AND IMPACT ASSESSMENT

SOH Assessment Document 5 - Assessment of maize seed use 1995A in World Vision zone of action	
SOH Assessment Document 6 - Assessment of maize seed use 1995A preliminary report	١.
SOH Assessment Document 7 - Assessment of sorghum seed use 1995 in CARE zone of action	B

	EMERGENCY RELIEF IN RWANDA		
	ASSESSMENT OF MAIZE SEED USE 1995A		
· · · · · · · · · · · · · · · · · · ·	IN WORLD VISION ZONE OF ACTION	>	

DRAFT DOCUMENT NOT FOR CITATION

WORLD VISION in collaboration with Seeds of Hope (SOH)

> Dr. Louise Sparling SOH Assessment Document 5 September 1995

ACKNOWLEDGMENTS

The recognition of the importance of impact assessments by the MINAGRI and, in particular, by the Directeur du Cabinet and the Directeur de la Production Agricole has been a welcome boost. WORLD VISION and SOH also note the special efforts of the interviewers, who confronted difficult situations with quick thinking and grace. This socio-economic assessment has been funded the International Development Research Centre. In guiding the analysis, M. Loevinsohn provided key assistance.

INTRODUCTION

7

The escalation of the Rwandan civil war in April 1994 resulted in the death of up to one million persons and the displacement another two million. Agriculture, the main occupation of upwards of 90% of the population, was acutely affected as civil disruptions peaked in the midst of the normal February-June growing season (the '1994B' season). Harvest losses overall during this period have been estimated as high as 60 percent (Dr. Iyameremye, nd).

The aid community, particularly non-governmental organizations (NGOs), and various United Nations agencies, responded swiftly and on a wide scale to the agricultural crisis. During the subsequent growing season, September 1994-January 1995 (the '1995A' season), large amounts of seed of key crops were distributed: 6970 MT of bean, 1707 MT of maize, and 7230 kg of vegetable seed. Seed distribution was complemented by distribution of hoes, fertilizer, and pitchforks (MINAGRI/UNREO/PNUD/FAO 1994). World Vision alone distributed 688 T of bean and 182 T of maize seed.

Members of the aid community, the Ministry of Agriculture (MINAGRI), and a group of the international and national agricultural research centers (NARS and IARCS) joined under a "Seeds of Hope" (SOH)¹ initiative have been keen to evaluate the role aid seed played for Rwandan farmers during the 1995A season and to take a frank look at its production performance. Such assessments of the impact of seed aid will help gauge farmers' additional seed needs, as well as guide relief strategies for future seed distribution.

While this report focuses on the results of maize seed relief in the World Vision zone of action, other reports consider the performance of bean, maize and sorghum seed distributions in select locales (*SOHAssessment Documents 1,3,4,6 and 7 respectively*). Beyond issues of seed <u>per se</u>. *SOH Assessment Document 2* examines the impact of the war on varietal diversity, specifically that of beans as of January 1995. In heterogenous agro-ecological environments such as Rwanda, where inputs are few and climatic fluctuations marked, longer-term production stability is very much tied to use of diverse well-adapted cultivars. As a third thrust, surveys in progress across all zones of Rwanda (N=800 households) are analyzing more comprehensive issues for four major crops:beans, cassava, sorghum and potato. Research compares pre-

International Agricultural Research Centers united in "Seeds of Hope" : International Center for Tropical Agriculture (CIAT) International Maize and Wheat Improvement Center (CIMMYT) International Potato Center (CIP and its network PRAPACE) International Center for Research in Agroforestry (ICRAF) International Institute of Tropical Agriculture (IITA) International Livestock Research Institute (ILRI) International Plant Genetic Resources Institute (IPGRI)

The Seeds of Hope Initiative was formalized in September 1995. Many Africa NARS have contributed germplasm, field space, and advice to the initiative (those of Ethiopia, Kenya, Malawi, Tanzania, Uganda, Zaire and Zimbabwe. In addition, some seven IARCs are strongly involved in the Rwandan Agricultural reconstruction (see list below)

and post-war varietal stocks, crop management strategies, seed system functioning and general production constraints. This latter document aims to define factors which make some regions and some populations more vulnerable than others in terms of being able to produce, save, and access seed of locally-adapted varieties.

SURVEY OVERVIEW AND METHODS

This survey assessing the impact of seed aid was conducted during the harvest of the first post-war planting season. In January 1995, SOH trained partners representing the MINAGRI/Swiss Disaster Relief (in the Prefecture of Kibuye) and four other NGOs: World Vision, CARE, Médecins sans Frontières, Catholic Relief Services. World Vision carried out a second training among its staff in northern Rwanda. Survey work started immediately after the training sessions and extended to the end of the maize harvest, early April 1995.

In the case of World Vision, interviews took place in four prefectures (Kigali, Gikongoro. Ruhengeri and Gisenyi), encompassing 12 communes and 39 sectors. The number of communes within each zone reflects World Vision's own relief emphasis, with extensive activities in three main regions. While the overall coverage is sufficient to permit extrapolation to World Vision's entire zone of action, findings within individual prefectures should be interpreted with caution due to relatively small sample sizes.

In order to follow-up on NGO activities, fieldworkers were asked to interview farming households who had received maize and bean seed aid. No other biases are apparent. Five households per commune were to be sampled.

Yield assessments were obtained through taking crop cuts on fields sown by farmers for normal production purposes. Both green harvest (pods/fresh seeds) and dry harvest were measured from plots 9m² or, if green consumption had already occurred, harvest had to be recalled. Intercropping densities were noted and appropriate area adjustments made.

FINDINGS: WORLD VISION MAIZE SEED AID

In the World Vision zone of action, maize is a primary crop in its designated communes in Ruhengeri and Gisenyi and secondary in its Kigali and Gikongoro zones. In primary zones maize is often sown in pure and when harvested eaten green or as dry grain. In secondary zones, single stalks are intercropped at low levels of density with a range of more important crops. The harvest is exclusively eaten green.

Quantity of seed planted from various sources

Farmers were asked to indicate the quantity of maize seed sown from all their sources during the 1995A period. "Own stock" indicates seed saved from the previous season, and most often represents a single local variety. Emergency aid, that distributed by World Vision, consisted of an improved variety from Uganda, "Longe 1". Seed from kin consisted of single, local varieties. Aside from Longe 1, only five farmers in the total sample, all from the north, grew improved varieties.

Table 1 summarizes the total quantity of maize seed sown from all sources as well as average quantities sown per farmer. Quantities sown are higher than those found in country-wide surveys (SOH Assessment Document δ), reflecting the prime importance of maize in World Vision's northern areas. A good share of maize came from relief aid, but farmers also drew a significant portion from their own stocks and from the market.

Source	Total Kgs sown	% Total seed	Avg kg. per farmer
Own stock	44.05	28.18	1.07
Emergency aid	73.88	47.27	1.80
Market	37.10	23.74	0.90
Friends/neighbors	1.26	0.81	0.03
Kin	au au		
TOTAL	156.29	100.00	3.81

 Table 1.
 Sources for maize seed sown (% seed sown) season 1995A, World Vision zone (Summary of 12 communes in 4 prefectures) (n=41 farmers).

While sample sizes are small, Table 2 suggests regional variation in use of maize seed sources. The case of Kigali, where relatively little seed came from "own stock", bears further consideration. (Question: do farmers in this zone normally grow maize the second season?) Interestingly, the market as a seed source played an important role in Gisenyi.

Table 2.Major sources for maize seed sown (% and kgs of seed sown), season 1995A, World
Vision zone, (Summary of 12 communes in 4 prefectures).

PREFECTURE	N		Major sources for seed					
		<u>Own stock</u> kgs. %		Em kgs	ergency aid 5. %	kgs.	<u>Market</u> %	
Kigali	15	5.8	15.4	31.9	84.6	-	-	
Gikongoro	11	10.8	33.6	20.0	62.5	-	-	
Ruhengeri	12	27.5	49.1	22.0	39.3	6.5	11.6	
Gisenyi	3		-		**	30.6	100.0	

Table 3 looks at the issue of maize seed acquisition from the perspective of the number of users, that is, the number of farmers who drew any seed at all from a given source. The range for use of "own stock" is wide. Again, the high figure for those using 'aid' seed stems from the deliberate bias of the survey towards World Vision recipients. (In Gisenyi, farmers did not received aid seed in the zone sampled.)

PREFECTURE	N	Farmers using seed from:		
		Own stock % farmers	Emergency aid % farmers	
Kigali	15	33	80.0	
Gikongoro	11	73 ~	100.0	
Ruhengeri	12	58	58	
Glsenyi	3	0	-	
TOTAL	41	49	73	

Table 3. Farm households (%) accessing the two major maize seed sources, 1995A, World Vision zone (Summary of 12 communes in 4 prefectures).

Type of maize seed sown

The survey tried to distinguish maize seed along two axis: was the seed local (either of local origin or varieties used before) or was the seed from elsewhere, that is, "foreign". Additionally, farmers were asked whether the variety itself was a farmer variety ("local") or whether it emerged from the research system (an "improved variety"). In Kinyarwanda, the notion of a researcher's variety or improved variety was translated as "imbuto ya kijyambere" or "imbuto y'indobanure".

Table 4 addresses the issue of whether local or foreign seed was sown. In this case "foreign seed corresponds exactly to that given by aid, with "local" grouped to include all the rest. The table shows that about half the seed sown was "local", obtained from own stocks, the neighborhood market, or, in a few cases, friends.

PREFECTURE	N	Local		- <u>-</u> Fo	reign"
		% seed sown	% farmers	% seed sown	% farmers
Kigali	15	15.4	33	84.6	80
Gikongoro	11	37.5	82	62.5	100
Ruhengeri	12	60.7	83	39.3	58
Gisenyi	3	100.0	100	0	0
TOTAL	41	52.7	66	47,3	73

 Table 4.
 Description of maize seed sown, local versus "foreign" (non-local), World Vision zone of action 1995A, (Summary of 12 communes in 4 prefectures).

The improved varieties found in the sample are listed in Table 5. Twelve percent of the farmers overall, and 33 per cent of those in northern zones, are currently using some improved cultivars. The table compares those cultivars noted in the survey countrywide (*SOH Assessment Document 6*) with those found with the World Vision zone.

Zones in eight prefectures (excluding Cyangugu and Gitarama)	World Vision zone
Nyirakagoli	Nyirakagoli
Ubusekera	
Mambo	Mambo
Muhondo	Muhondo
Gishambara	Gishambara
Kiroroshye	Kiroroshye
Kanwakabanyiginya	Kanwakabanyiginya
Mbagara	
Mamesa (Pool 8a)	Mamesa (Pool 8a)
Katoumani	
Bambou précoce or Bambou	Bambou
Ibisimisė	
lsega	lsega

Table 5. Maize varieties used by Rwandan farmers, 1995A

Ibismisé is apparently an improved variety distributed by Swiss Disaster Relief in the region of Kibuye. Katoumani, Bambou, Mamesa (Pool 8a) are names of varieties formerly distributed by ISAR. Isega is an improved variety originally emerging from the Burundian research system.

Farmer appreciation of maize seed from different sources

Appreciation scores were assessed on a scale of 1 to 3: "1"= less appreciated than that normally used; "2"= the same seed or of equal appreciation, and "3"= more appreciated. Both in terms of positive and negative characteristics, farmers mainly focused on yield, tolerance to disease and length to maturity. Table 6 summarizes the appreciation scores. Except In the Kigali (Bugesera area), emergency maize seed seemed to have fared well. Comments from Bugesera indicate high insect attack and late maturity as negative characteristics.

PREFECTURE	Total N	Own stock	Emergency aid
Kigali	16	2.20	1.36
Gikongoro	17	1.86	2.70
Ruhengeri	13	2.00	2.42
Gisenyi	2	2.5*	
TOTAL ··	48	2.05	2.07

Table 6. Farmers' appreciation scores of maize seed obtained from various sources.*

* Small sample size: less than five cases.

Yield of maize seed from major seed sources

The question of yield performance proved challenging as data ultimately was obtained only in areas where maize ears were consumed green. In addition, harvest data was not gathered in any of the farms in the northern areas, i.e. the prime maize-growing regions. Where assessments were made, interviewers counted number of ears on original stalks as well as the number eventually harvested. As such, we can only refer to the very crude measure of number of ears harvested per hectare. By that gross measure, maize seed delivered by World Vision performed at least as well as local stocks in the regions monitored, that is, Kigali and Gikongoro.

Table 7.	Maize ears harvested from the two major seed sources,	World zone of action 1995A.

Seed source	N	ears/ha*
Own stock	9	4136
Emergency aid	15	7148

* Yield data was received only from minor maize-growing regions. The two yield figures are not significantly different.

CONCLUDING REFLECTIONS: MAIZE SEED

Longe 1 seems to have been overall appreciated by farmers and to have yielded relatively well. Future follow-up surveys will show whether the variety is worth re-sowing.

While farmers obtained only about one quarter of their maize seed from their own stocks, the use of wellfunctioning markets to obtain another quarter (primarily local seed) is encouraging. Starting end of September 1995, three other varieties of aid seed will be distributed within the SOH/NGO collaboration. Pool 8a is already know to a small group of farmers. Pool 9a and ZM607 are novel introductions. Such a move should work to slightly enlarge the genetic base on offer to maize farmers.

REFERENCES

lyameremye, A.

n.d. Le secteur agricole durement touché. Traits d'union. Rwanda 5.

MINAGRI/UNREO/PNUD/FAO

1994 Compte-rendu de réunion, 16 décembre 1994: Opérations d'urgence et réhabilitation agricoles.

Sperling, L.

- 1995 SOH Assessment Document 1. Emergency relief in Rwanda: assessment of bean seed use 1995A: Summary Report.
- 1995 SOH Assessment Document 2. The impact of war on plant genetic resources: bean varietal assessment in Rwanda 1995A. Summary Report.
- 1995 SOH Assessment Document 3. Emergency relief in Rwanda: assessment of bean and maize seed use 1995A in CARE zone of action.
- 1995 SOH Assessment Document 4. Emergency relief in Rwanda: assessment of bean seed use 1995A in World Vision zone of action.
- 1995 SOH Assessment Document 6. Emergency relief in Rwanda: assessment of maize seed use 1995A: Summary Report.
- 1995 SOH Assessment Document 7. Emergency relief in Rwanda: assessment of sorghum seed use 1995A in CARE zones of Kigali and Gikongoro.

ANNEX I Sites of 1995A Maize Seed Relief Impact Assessments WORLD VISION ZONE OF ACTION

. .

<u>Prefocture</u> Kigali	<u>Commune</u> Kanzenze	<u>Secteur</u> Kibungo Ntarama Kanazi Kanzenze
	Ngenda	Ruhuha Kindama Rutonde
	Gashora	Mwendo Gashora Mbyo Rilima
Gikongoro	Karama	Kiraro Cyanika Gitega
	Nyamagare	Gasaka Kibilizi
	Rwamiko	Ruramba Rwamiko
	Mubuga	Ruseke Kamana Gisizi
Ruhengeri	Nyamugali	Mushongi Kabingo Mushubi
	Суеги	Butare
	Nyarutovu	Ruhinga
	Nkuli	Rukoma Lyinyo
Gisenyi	Mutura	Mudende

-


EMERGENCY RELIEF IN RWANDA

ASSESSMENT OF MAIZE SEED USE 1995A

PRELIMINARY REPORT

DRAFT DOCUMENT NOT FOR CITATION OR DISTRIBUTION

Seeds of Hope(SOH) in collaboration with: CARE World Vision Médecins sans Frontières Catholic Relief Services Swiss Disaster Relief/MINAGRI-Kibuye

> Dr. Louise Sperling SOH Assessment Document & Soptember 1995

ACKNOWLEDGMENTS

It is not easy to conduct field assessments under stress conditions such as post-war Rwanda. The recognition of the importance of impact assessments by the MINAGRI and, in particular, by the Directeur du Cabinet and the Directeur de la Production Agricole has been a welcome boost. SOH notes the special efforts of the interviewers, who confronted difficult situations with quick thinking and grace. In addition to personnel, the organizations of CARE, World Vision and Swiss Disaster Relief/MINAGRI-Kibuye offered substantial technical and logistical support. Médecins sans Frontières shared data from previous surveys and Catholic Relief Services supported followup work in zones from which they had already relocated. This socio-economic assessment has been funded by the International Development Research Centre.

INTRODUCTION

1

The escalation of the Rwandan civil war in April 1994 resulted in the death of up to one million persons and the displacement another two million. Agriculture, the main occupation of upwards of 90% of the population, was acutely affected as civil disruptions peaked in the midst of the normal February-June growing season (the '1994B' season). Harvest losses overall during this period have been estimated as high as 60 percent (Dr. Iyameremye, nd).

The aid community, particularly non-governmental organizations (NGOs) and various United Nations agencies, responded swiftly and on a wide scale to the agricultural crisis. During the subsequent growing season, September 1994-January 1995 (the '1995A' season), large amounts of seed of key crops were distributed: 6970 MT of bean, 1707 MT of maize, and 7230 kg of vegetable seed. Seed distribution was complemented by distribution of hoes, fertilizer and pitchforks (MINAGRI/UNREO/PNUD/FAO 1994).

Members of the aid community, the Ministry of Agriculture (MINAGRI), and a group of the international and national agricultural research centers (IARCS and NARS) joined under a "Seeds of Hope" (SOH)¹ initiative have been keen to evaluate the role aid seed played for Rwandan farmers during the 1995A season and to take a frank look at its production performance. Such assessments of the impact of seed aid will help gauge farmers' additional seed needs, as well as guide relief strategies for future seed distribution.

While this report focuses on the results of maize seed relief throughout Rwanda, other reports consider the performance of bean, maize and sorghum seed distributions in select locales (*SOH Assessment Documents 1,3,4,5 and 7 respectively*). Beyond issues of seed <u>per se</u>, *SOH Assessment Document 2* examines the impact of the war on varietal diversity, specifically that of beans as of January 1995. In heterogenous agro-ecological environments such as Rwanda, where inputs are few and climatic fluctuations marked, longer-term production stability is very much tied to use of diverse well-adapted cultivars. As a third thrust, surveys in progress across all zones of Rwanda (N=800 households) are analyzing more comprehensive issues for four major crops:beans, cassava, sorghum and potato. Research compares pre-and post-war varietal stocks, crop management strategies, seed system functioning and general production constraints. This latter document aims to define factors which make some regions and some populations more vulnerable than others in terms of being able to produce, save, and access seed of locally-adapted varieties.

The Seeds of Hope Initiative was formalized in September 1995. Many Africa NARS have contributed germplasm, field space, and advice to the initiative (those of Ethiopia, Kenya, Malawi, Tanzania, Uganda, Zaire and Zimbabwe. In addition, some seven IARCs are strongly involved in the Rwandan Agricultural reconstruction (see list below)

International Agricultural Research Centers united in "Seeds of Hope" : International Center for Tropical Agriculture (CIAT) International Maize and Wheat Improvement Center (CIMMYT) International Potato Center (CIP and its network PRAPACE) International Center for Research in Agroforestry (ICRAF) International Institute of Tropical Agriculture (IITA) International Livestock Research Institute (ILRI) International Plant Genetic Resources Institute (IPGRI)

SURVEY OVERVIEW AND METHODS

This survey assessing the impact of maize seed aid was conducted during the harvest of the first post-war planting season. In January 1995, SOH trained partners representing the MINAGRI/Swiss Disaster Relief (in the Prefecture of Kibuye) and four other NGOs: World Vision, CARE, Médecins sans Frontières², Catholic Relief Services. Survey work started immediately after the training sessions and extended to the end of the maize harvest, early April 1995.

The NGO and MINAGRI collaboration with SOH has allowed maize crop assessments to be made in most major agro-ecological of the country. We hope the survey has also helped to strengthen the research skills of NGO staff as well as to provide valuable and immediate feedback on aid delivered. The sample encompasses 8 of the 10 Prefectures, 27 communes and 103 households. (See Annex I and II for specific regions covered). As samples were selected along zones of specific NGO intervention, sample sizes are uneven across prefectures. Kigali is the best represented as it is a zone of action for both CARE and World Vision. No interviews took place in Cyangugu and Gitarama. While the overall coverage is sufficient to permit countrywide extrapolation, findings in zones of small sample size should be interpreted with caution.

In order to follow-up on NGO activities, fieldworkers were asked to interview farming households who had received maize seed aid. No other biases are apparent. Five households per commune were to be sampled.

Yield assessments were obtained through taking crop cuts on fields sown by farmers for normal production purposes. Both green harvest (fresh cobs) and dry harvest were to be measured from plots 9m² If green consumption had already occurred, such green culling had to be recalled. Intercropping densities were noted and appropriate area adjustments made.

FINDINGS

Quantity of seed planted from various sources

Farmers were asked to indicate the quantity of seed they sowed from all sources during the 1995A period. "Own stock" indicates seed saved from the previous season, and most often represents, well-adapted, location-specific maize varieties. Emergency aid, that distributed by the NGOs, consisted of an improved variety from Uganda, "Longe 1," which is generally suited for zones up to 1600 masl (J. Ransom, personal communication).

Table 1 summarizes the total quantity of maize seed sown from all sources as well as average quantities sown per farmer. About half the seed sown came from emergency aid, a quarter from own stocks and the rest from a variety of local sources.

2

While the MSF agronomic program closed up in January, SOH agreed to continue evaluating MSF work in their Butare zone of action. Results will be forwarded to MSF/Belgium, as well as to the local authorities.

Table 1.	Sources for maize seed sown (% seed sown) in Rwanda, season	1995A
	(n= 103 farmers).	

Source	Total Kgs sown	% Total seed	Avg kg. per farmer
Own stock	62.35	25	0.60
Emergency aid	135.33	55	1.30
Market	44.10	18	0.42
Friends/neighbors	1.70	<1	0.02
Kin	3.60	1	0.03
TOTAL	247.08	100.0	2.38

Table 2 suggests regional variation in the importance of the three major seed sources. Why so few farmers in Kigali saved their own seed is puzzling. (Several interviews showed that farmers who normally don't sow maize took advantage of the emergency aid gift. Was this a general trend in the Kigali area?) In Kibuye, an important maize-growing region, farmers say maize aid arrived too late to sow, but that local varieties could easily be found on the market. The market as a seed source was similarly important in Butare and Gisenyi. In the area surveyed in Gisenyi (by World Vision staff), it is unclear if farmers received aid seed at all.

PREFECTURE	N		Major sources for seed				
		2	<u>)wn stock</u> kgs. %	<u>Em</u> kgs.	ergency aid %	<u>Mar</u> kgs.	<u>ket</u> %
Kigali	35	5.80	8.01	63.08	87.15		
Byumba	14	9.50	28.36	22.50	67.16	1.50	4.48
Kibungo	5	4.50	38.30	7.25	61.70	•	-
Kibuye	8	1.75	33.33	-	-	3.25	61.90
Gikongoro	11	10.75	33.59	20.00	62.50	*	_
Ruhengeri	12	27.50	49.11	22.00	39.29	6.50	11.61
Gisenyî	3	-	-	44	and a	30.60	100.00
Butare	15	2.55	45.54	0.50	8.93	2.25	40.18

Table 2.	Major sources for maize seed sown (% and kgs of seed sown) in Rwanda, season
	1995A, by Prefecture (n= 103 farmers).

Finally, Table 3 looks at the issue of maize seed acquisition from the perspective of the number of users. In most of the prefectures, the majority of farmers saved some seed from their local stocks. In the small Gisenyi sample, no seed came from 'own stock', but local seed, from the market, filled an important gap. It was really only in Kigali prefecture that there was a heavy reliance on the single variety 'Longe I'.

PREFECTURE	N	Farmers using seed from:		
		Own stock % farmers	Emergency aid % farmers	Market % farmers
Kigali	35	17	89	0
Byumba	14	50	57	14
Kibungo	5	80	100	Û
Kibuye	8	50	0	63
Gikongoro	11	73	100	0
Ruhengeri	12	58	58	25
Gisenyi	3	0	0	100
Butare	15	40	7	33
TOTAL	103	41	61	17

Table 3. Farm households (%) accessing the three major maize seed sources, Rwanda, season 1995A, by Prefecture.

Type of maize seed sown

The survey tried to distinguish maize seed along two axis: was the seed local (either of local origin or varieties used before) or was the seed from elsewhere, that is, "foreign". Additionally, farmers were asked whether the variety itself was a farmer variety ("local") or whether it emerged from the research system (an "improved variety"). In Kinyarwanda, the notion of a researcher's variety or improved variety was translated as "imbuto ya kijyambere" or "imbuto y'indobanure".

Table 4 addresses the issue of whether local or foreign seed was sown. In this case, "foreign seed corresponds exactly to that given by aid, with "local" grouped to include all the rest. The table shows that slightly under half of the seed sown was "local", obtained from own stocks, the neighborhood market, or, in a few cases, friends.

Table 4.Description of maize seed sown, local versus "foreign" (non-local), Rwanda 1995A,
by Prefecture (n= 103 farmers).

PREFECTURE	N	<u>Local</u> % seed sown	% farmers	<u>Torei</u> % seed sown	gn" % farmers
Kigali	35	13	20	87	89
Byumba	14	36	64	64	50
Kibungo	5	38	80	62	100
Kibuye	8	76	88	24	25
Gikongoro	11	38	82	62	100
Ruhengeri	12	61	83	39	58
Gisenyi	3	100	100	0	0
Butare	15	91	87	9	13
TOTAL	103	45	60	55	63

The improved varieties found in the sample are listed in Table 5. Twelve percent of the farmers overall, and 33 per cent of those in the northern zones, are currently using some improved cultivars.

Table 5.	Maize varieties used by Rwandan farmers, 1995A (Zones in eight
	prefectures (excluding Cyangugu and Gitarama)

Nyirakagoli	
Ubusekera	
Mambo	
Muhondo	
Gishambara	
Kiroroshye	
Kanwakabanyiginya	
Mbagara	
Mamesa (Pool 8a)	
Katoumani	
Bambou précoce or Bambou	
Ibismisé	
Isega	

Ibismisé is apparently an improved variety distributed by Swiss Disaster Relief in the region of Kibuye. Katoumani, Bambou, Mamesa (Pool 8a) are names of varieties formerly distributed by ISAR. Isega is an improved variety originally emerging from the Burundian research system.

Farmer appreciation of maize seed from different sources

In order to understand better farmers reaction to "aid" seed versus that they usually get through other sources, recipients were ask to qualitatively compare seed used from different sources and comment on its positive or negative characteristics. A simple scale of comparison ranged from 1 to 3: "1" less appreciated than that normally used; "2" the same seed or of equal appreciation, and "3", more appreciated. Table 6 suggests scores by prefecture. Overall, aid seed was slightly less appreciated than own stock, with scores dramatically dipping only in Butare and Kigali (neither of which are prime maize-growing regions). The aid variety was negatively critiqued as being late-maturing and vulnerable to stemborers.

PREFECTURE	Total N	Own stock	Emergency aid	Market
Kigali	37	2.00	1.67	
Byumba	16	2.25	1.86	2.00
Kibungo	9	2.25*	2.00	-
Kibuye	8	2.25*	-	1.25*
Gikongoro	18	1.86	2.70	1.00*
Ruhengeri	16	2.00	2.40	1.70*
Gisenyi	7	2.50*	-	2.60
Butare	15	3.00	1.00*	1.60
TOTAL	126	2.23	1.97	1.80

 Table 6.
 Farmers' appreciation scores of maize seed obtained from various sources, season 1995A.

* Small sample size: less than five cases.

Yield of maize seed from major seed sources

The question of yield performance proved challenging as data ultimately was obtained only in areas where maize ears were consumed green. In addition, harvest data was not gathered from any farms in the northern areas, i.e. the prime maize-growing regions. Where assessments were made, interviewers counted number of ears on original stalks as well as the number eventually harvested. As such, we can only refer to the very crude measure of number of ears harvested per hectare. By that gross measure, maize seed delivered by NGOs performed at least as well as that from local stocks in Kigali, Byumba, Kibungo, Kibuye, Gikongoro and Butare prefectures (Table 7).

Table 7. Maize cobs (ears/ha) harvested from seed deriving from the two major sources, Rwanda, 1995A.

Seed source	N	Ears/Ha*
Own stock	31	8513
Emergency aid	45	8145

Harvest data was collected only from the minor maize-growing areas. The NGO responsible for major maize-growing regions was unable to collect yields. The two yield figures are not significantly different.

CONCLUDING REFLECTIONS

Longe 1 seems to have been overall appreciated by farmers and to have yielded relatively well. Future follow-up surveys will show whether the variety is worth re-sowing.

While farmers obtained just over a quarter of their maize seed from their own stocks, the use of wellfunctioning markets to obtain another 17% (primarily local seed) is encouraging. Starting end of September 1995, three other varieties of aid seed will be distributed within the SOH/NGO collaboration. Pool 8a is already know to a small group of farmers. Pool 9a and ZM607 are novel introductions. Such a move should work to slightly enlarge the genetic base on offer to maize farmers.

REFERENCES

lyameremye, A.

n.d. Le secteur agricole durement touché. Traits d'union, Rwanda 5.

MINAGRI/UNREO/PNUD/FAO

1994 Compte-rendu de réunion, 16 décembre 1994: Opérations d'urgence et réhabilitation agricoles.

Sperling, L.

- 1995 SOH Assessment Document 1. Emergency relief in Rwanda: assessment of bean seed use 1995A: Summary Report.
- 1995 SOH Assessment Document 2. The impact of war on plant genetic resources: bean varietal assessment in Rwanda 1995A. Summary Report.
- 1995 SOH Assessment Document 3. Emergency relief in Rwanda: assessment of bean and maize seed use 1995A in CARE zone of action.
- 1995 SOH Assessment Document 4. Emergency relief in Rwanda: assessment of bean seed use 1995A in World Vision zone of action.
- 1995 SOH Assessment Document 6. Emergency relief in Rwanda: assessment of maize seed use 1995A: Summary Report.
- 1995 SOH Assessment Document 7. Emergency relief in Rwanda: assessment of sorghum seed use 1995A in CARE zones of Kigali and Gikongoro.

ANNEX I Sites of 1995A Maize Seed Relief Assessments

CARE

۲

0

•

Prefecture	Commune	Secteur
Kigali	Shyorongi	Nzove Rutonde Kanyinya Muhondo Rugarama
	Butamwa	M wendo Butamwa Nyarubande
	Gikomero	Bumbogo Shango Gishaka
Byumba	Giti	Nyanza Bukure Bitunde Rwamko Karagali
Kibungo	Muhazi	Gishari Nyarubuye Nkamangina Nyarugali Munyiganya

MINAGRI/SWISS DISASTER RELIEF

Prefecture	Commune	Secteur
Kibuye	Mwendo	Kigoma Gashali
	Bwakira	Rusengesi Mugunda

WORLD VISION		
Prefecture	Commune	Sectour
Kigali	Kanzenze	Kibungo
		Ntarama
		Kanazi
		Kanzenze
	Ngenda	Ruhuha
		Kindama
• •		Rutonde
	Gashora	Mwendo
		Gashora
		Mbyo
		Rílima
Gikongoro	Karama	Kiraro
•		Cyanika
		Gitega
	Nyamagare	Gasaka
		Kibilizi
	Rwamiko	Ruramba
		Rwamiko
	Mubuga	Ruseke
		Kamana
		Gisizi
Ruhengeri	Nyamugali	Mushongi
		Kabingo
		Mushubi
	Суеп	Butare
	Nyarutovu	Ruhinga
	Nkuli	Rukoma
		Lyinyo
Gisenyi	Mutura	Mudende

1

MEDECINS SANS FRONTIERES/CIAT

Prefecture	Commune	Secteur
Butare	Shyanda	Gatoki
	Ruhashya	Gatovu Musasu
~~	Mbazi	Muhororo Kabuga
	Mugusa	Mugogwe Kimuna
	Gishamvu	Isholi
CATHOLIC RELIEF SERVICE	ES/CIAT	
Byumba	Rutare	Kabera Kinjojo
	Kinyami	Nyamiyaga Cyuru
	Ngarama	Mimuri Ngarama Nyagatare

•

٠





DRAFT DOCUMENT NOT FOR CITATION

CARE in collaboration with Seeds of Hope (SOH)

> Dr. Louise Sperling SOH Assessment Document 7 September 1995

ACKNOWLEDGMENTS

~ •

It is not easy to conduct field assessments under stress conditions such as post-war Rwanda. The recognition of the importance of impact assessments by the MINAGRI and, in particular, by the Directeur du Cabinet and the Directeur de la Production Agricole has been a welcome boost. CARE and SOH also note the special efforts of the interviewers, who confronted difficult situations with quick thinking and grace. This socio-economic assessment has been funded the International Development Research Centre. In guiding the analysis, M. Loevinsohn, K. Matungulu, A. Maxman provided key assistance.

SURVEY OVERVIEW AND METHODS

1

This survey assessing the impact of sorghum seed aid was conducted during the harvest of the first post-war major sorghum planting season (95B, or January- July 1995). In May/June 1995, "Seeds of Hope" (SOH)¹ trained five interviewers from both CARE and SOH personnel. Survey work started immediately after the training sessions and extended to the end of the sorghum harvest, late July 1995.

The survey had two main goals: To look at the general performance of the aid seed distributed in relation to what the farmer obtained elsewhere; second, to compare the performance of two types of aid seed. CARE distributed local Rwandan varieties purchased with its own funds as well as local Ugandan varieties purchased with funds from the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). The latter were considered more appropriate for high altitude regions.

To meet these dual aims, the interviews were originally scheduled to take place in high and mid and altitude zones of the prefecture of Gitarama. The Rwandan varieties were distributed in the mid altitudes (communes: Mukingi, Runda and Musambira). The Ugandan material was distributed in the higher zones (communes: Nyakabanda, Nyabikenke and Buringa). When field interviews showed that the high altitude Ugandan material had only been planted in Nyabikenke (the other regions not sowing sorghum during 1995B), the research team decided to sample one other high altitude zone. The high altitude communes in Kigali (Shyorongi, Mbogo and Mugambazi) received the CARE local Rwanda varieties.

In order to follow-up on CARE's activities, fieldworkers were asked to interview farming households which had received sorghum aid seed aid. No other biases are apparent. Each household was visited twice: first, for an overall interview and sorghum plot demarcation; second, for specific yield measurements during time of harvest.

Yield assessments were obtained through taking crop cuts on fields sown by farmers for normal production purposes. Two 2x 2 m squares were demarcated and harvests were collected and weighed separately for each plot. Intercropping densities were noted and appropriate area adjustments made. Conversions were also made from full panicle weight (head with seed) to actual grain yield.

The Seeds of Hope Initiative was formalized in September 1995. Many Africa NARS have contributed germplasm, field space, and advice to the initiative (those of Ethiopia, Kenya, Malawi,Tanzania, Uganda, Zaire and Zimbabwe. In addition, some seven IARCs are strongly involved in the Rwandan Agricultural reconstruction (see list below)

International Agricultural Research Centers united in "Seeds of Hope": International Center for Tropical Agriculture (CIAT) International Maize and Wheat Improvement Center (CIMMYT) International Potato Center (CIP and its network PRAPACE) International Center for Research in Agroforestry (ICRAF) International Institute of Tropical Agriculture (IITA) International Livestock Research Institute (ILRI) International Plant Genetic Resources Institute (IPGRI)

FINDINGS: SORGHUM SEED SOWN

Quantity of seed planted from various sources

Farmers were asked to indicate the quantity of seed they sowed from all sources during the 1995B period. "Own stock" indicates seed saved from the previous season, and most often represents, well-adapted, location-specific pure or mixed varieties of sorghum. As indicated above, emergency aid distributed by CARE included local Rwandan and local Ugandan sorghum varieties. All save the higher zones of Gitarama received the Rwandan types. Within the survey sample, only Nyabikenke (higher altitude, Gitarama) sowed the local Ugandan types. "Market" seed is most likely local seed.

Table 1 summarizes the total quantity of sorghum seed sown from all sources as well as average quantities sown per farmer. Of particular note is the large quantity of seed coming from farmers' own stocks, that is, over half of the total quantity sown. Given that many farmers were dislocated just at 1994B harvest time, this a surprising and welcome finding. Of the 54 farmers sowing within the sample January and February 1994, 24 (44%) were unable to harvest any of their grain due to April-July events. Only 8 (15%) harvested on time, with the rest harvesting late and obtaining either most of their harvest (31%) or relatively little (9%). The substantial use of "own stock' is a promising sign in terms of encouraging production stability and the preservation of local varietal diversity.

This survey also shows that CARE seed provided another third of the total seed sown. The heightened importance of the aid contribution would be expected as the sample was targeted towards recipients of CARE relief. In terms of actual seed sown, gifts or borrowed seed from neighbors and kin were negligible as a source. Kin and friends, however, have proved important for recovering specific varieties that were lost (see "Varietal Use/Loss Analysis" below)

Source	Total Kgs sown	% Total seed	Avg kg. per farmer
Own stock	121.00	52.96	2.02
Emergency aid	81.75	35.78	1.36
Market	19.75	8.64	0.33
Friends/neighbors	2.00	0.88	0.03
Kin	4.00	1.75	0.07
TOTAL	228.50	100.0	3.81

Table 1. Sources for sorghum seed sown (% seed sown) season 1995B, CARE zone (Summary of 7 communes in 2 prefectures) (n= 60 farmers).

Table 2 suggests differences in seed source use among communes. While sample sizes are small, it is evident that some areas could rely much more on their own stocks than others. For instance, of the 10 farmers sowing in Runda 95B, 7 had lost their entire harvest and 1 had collected "but a handful" during the disruptions of the previous sorghum season 94B. In contrast, all those interviewed in Mbogo harvested the 94B season either "at the normal time" or "slightly late". Thus over short geographic distances, here about 25 km, farmers were very differently affected by the April to July 1994 disturbances.

COMMUNE	N	Major sources for s <u>Own stock Emergency aid</u> kgs. % kgs. %			seed kgs.	<u>Market</u> %	
<u>Gitarama</u> Mukingi	10	21.5	59	9.6	26		
Runda	10	2.0	6	19.0	56	12.8	38
Musambira	10	8.8	35	16.5	65		-
Nyabikenke	5	1.3	28	2.8	61	-	-
<u>Kigali (North)</u> Shyorongi	7	25.0	77	7.5	23	-	
Mbogo	5	29.0	84	5.5	16		
Mugambazi	13	33.5	55	31.0	34	7.0	11

Table 2.Major sources for sorghum (% and kgs of seed sown), season 1995B CARE zone,
(Summary of 7 communes in 2 prefectures).

Finally, Table 3 looks at the issue of sorghum seed acquisition from the perspective of the number of users. On average, 57% of farmers were able to draw on at least some of their own seed stocks. The high use of market seed and aid seed in Runda is again explained by the strong effects of 94B. Sixty per cent of those in Musambira also lost all their harvest in 94B, explaining the high reliance on aid seed 95B. In Nyabikenke, it seems that farmers used aid seed to plant during their off season as many usually sow in the valley bottoms of the Nyabarongo during the "C" period (starting in July and harvesting from December onwards). Again, the high figure for those using 'aid' seed stems from the deliberate bias of the sample.

COMMUNE	N	Farmers using seed from:		
		<u>Own stock</u> % farmers	Emergency aid % farmers	<u>Market</u> % farmers
<u>Gitarama</u> Mukingi	10		80	-
Runda	10	10	100	40
Musambira	10	40	100	-
Nyabikenke	5	40	80	-
<u>Kigali</u> Shyorongi	7	86	86	_
Mbogo	5	100	100	-
Mugambazi	13	77	87	23
TOTAL	60	57	90	20

 Table 3.
 Farm households (%) accessing the three major sorghum seed sources, 1995B, CARE zone (Summary of 7 communes in 2 prefectures).

Type of sorghum seed sown

Types of sorghum seed sown can be described along several axes: Was the seed sown a pure variety or mixture of varieties?; Second, was the seed local, or foreign, that is are the varieties known as locally-adapted to the specific site? Each parameter has consequences for production gains and production stability.

The pure versus mixture issue is described in Table 4, with roughly half the seed sown in pure and half in mix. Farmers indicate that much of the aid seed was a mix of several varieties, although some farmers sorted the mix and planted pure. No figures are immediately available on the pure versus mixed variety ratio in pre-war Rwanda.

COMMUNE	N	<u>Pure van</u> % seed sown	<u>riety</u> % farmers	<u>Mixed v</u> % seed sown	<u>arieties</u> % farmers
<u>Gitarama</u> Mukingi	10	45	70	55	80
Runda	10	39	50	61	80
Musambira	10	35	40	, 65	90
Nyabikenke	5	67	60	33	40
<u>Kigali</u> Shyorongi	7	40	57	60	71
Mbogo	5	84	100	16	100
Mugambazi	13	37	54	63	92
TOTAL	60	46.5	58	53.5	82

Table 4.Description of sorghum seed sown, pure variety versus mixed varieties,
season 1995B CARE zone (Summary of 7 communes in 2 prefectures).

Table 5 describes sorghum seed sown 1995B along the second parameter of local versus foreign varieties. Farmers classified their own stocks as local, but also recognized much of the emergency aid seed as "local". Farmers in the same region sometimes classified aid seed as "local" or "foreign" according to their familiarity with the varieties.

.

COMMUNE	N	Local		*Forei	gn"
		% seed sown	% farmers	% seed sown	% farmers
<u>Gitarama</u> Mukingi	10	84	90	16	40
Runda	10	65	. 60	35	60
Musambira	10	58	60	42	50
Nyabikenke	5	44	40	56	60
<u>Kigali</u> Shyorongi	7	88	86	12	57
Mbogo	5	84	100	15	100
Mugambazi	13	66	100	34	87
TOTAL	60	73	78	27	63

Table 5. Description of sorghum seed sown, local versus "foreign" (non-local), CARE zone of action 1995B, (Summary of 7 communes in 2 prefectures).

Farmer appreciation of sorghum seed from different sources

In order to understand better farmers reaction to "aid" seed versus that they usually get through other sources, recipients were ask to qualitatively compare the various types of seed used and comment on their positive or negative characteristics. A simple scale of comparison ranged from 1 to 3: "1" less appreciated than that normally used; "2" the same seed or of equal appreciation, and "3", more appreciated. Both in terms of positive and negative characteristics, farmers mainly focused on yield, head size, porridge quality and maturity cycle. Almost a third of farmers commented favorably that the aid seed looked and performed like their own varieties.

Table 6 suggests scores by prefecture. Overall, they indicate that the sorghum seed distributed by CARE was slightly less appreciated than seed from farmers' own stocks. Ratings, however, varied significantly by region. The Rwandan varieties were well received in mid-altitude Gitarama as were the Ugandan varieties at the higher altitudes. Farmers in the higher altitudes of Kigali, however, (communes: Shyorongi, Mbogo and Mugambazi) generally assessed the varieties as ill-adapted and more suitable for lower regions. It seems that CARE's and ICRISAT's Gitarama strategy of targeting certain varieties for higher altitudes was appreciated. Yield figures confirm farmer assessments (see section below "Yield of sorghum seed...").

COMMUNE	Total N	Own stock	Emergency aid	Market
Mukingi	14	2.00	2.00	-
Runda	15	2.00**	2.40	2.25**
Musambira	14	2.00**	1.90	-
Nyabikenke	ô	2.00**	2.25**	-
Shyorongi	12	2.00	1.50	*
Mbogo	10	1.80	1.00	-
Mugambazi	23	2.20	1.70	1.33**
TOTAL	94	2.02	1.87	1.86

Table 6. Farmers' appreciation scores of sorghum seed obtained from various sources."

* The cases exceed the number of farmers as some farmers used several sources of seed.

** Small sample size: less than five cases.

Yield of sorghum seed from major seed sources

Yield data was collected from 196 "usable" measurements. This figure compares very favorably to the former scope of on-farm trials in CARE's region and is also relatively large considering the staggered harvests. Table 7 summarizes sorghum yields data for all sites sampled and shows no yield differences among seed obtained from different sources. (Yield figures are higher than normal and probably result from extrapolating from small plot sizes).

Table 7. Sorghum yields of seed from all sources, CARE 1995B, (Summary of 7 communes in 2 Prefectures N=196).*

Seed source	N	Kg/Ha
Own stock	69	2114
Emergency aid	105	2132
Market	14	1991
Neighbors/Friends	4	2031
Kin	4	1181

* Yield differences among sources are not significant. P= .74

Among communes, yields differences of seed from different sources were also not significant, with two important exceptions. With the higher altitude zones of Kigali, aid seed gave inferior yields to seed from farmers own stocks (Table 8). Second, aid seed in Kigali (comprised of local Rwandan varieties), gave inferior yields to aid seed distributed in the higher altitudes of Gitarama (comprised of local Ugandan varieties) (Table 9.). Targeting varieties from one high altitude zone (i.e. southern Uganda) to another seems to have brought positive results.

Table 8:	Yield of sorghum seed from two major sources, season 1995B. CARE zone in 3 Kigali	ا در	w	2
	communes	**		

Type of seed	N	Kg/Ha*	bas
Own stock	42	1943	[
Emergency aid	42	1503	المرايله
Market	6	1420	

* Yield differences significant at P <.01

Table 9.	Sorghum y	ields of ai	id seed in hig	nh altitude zone	s 1995B, CARE .
	warshimin 1				

Type of seed	N	Kg/Ha*
Local varieties (Rwanda)		
Shyorongi	12	1126
Mbogo	10	1561
Mugambazi	20	1670
Local varieties (Uganda)		
Nyabikenke	7	3400

* Yield differences significant at P< .05

FINDINGS: VARIETAL USE/LOSS ANALYSES

Overall quality of current local varietal stocks

Farmers were asked to compare the local varieties they are sowing now with those they sowed immediately pre-war. The aim was to get an idea of the overall performance of their local varietal profile and to document specific changes (both positive and negative) which may have occurred. Their current local varieties (whether in a varietal mix or pure) could have been selected from their own stock, from seed distributed through relief aid, from varieties obtained on the market, from kin or neighbors, or combinations of these sources. Table 10 shows that the sorghum stocks held by farmers as of July 1995 rate well as compared to those held immediately before the war in 1994.

Table 10. Assessment of quality of Rwandan sorghum varieties now in farmer's possession (N=60).

How do your current varieties compare with those you sowed 19948?	% Farmers
Less appreciated	10.0
Same quality	80.0
More appreciated	1,70
No local varieties left	8.30

General satisfaction with varietal profiles should not mask the fact that some farmers did lose key varieties during the dramatic 1994 events. Table 10 shows that 8% of farmers in CARE's Kigali and Gitarama zones (5 cases) had no local varieties left at all. (Note: In this region, almost half the farmers did not harvest their sorghum 1994B). Table 11, encompassing both farmers with no local stocks as well as those who retained good amounts of local seed, indicates that about a quarter of the farmers interviewed experienced loss of specific, highly-desired varieties. Farmers suggest that there was selective pillaging from their fields, with the region's best bets disappearing the fastest. By July 1995, one year later, farmers sampled had already reaccessed most cultivars (or suggested they could re-access specific cultivars) through two principal locales: friends or nearby markets.

Have you lost any key varieties (because of last outbreak of civil un- rest)?	% Farmers
Yes	28
No	72
If yes, How can you now re-obtain these local varieties? (N= 37 cases from 17 farmers)	% Responses
Market	14
Friends/Neighbors	76
Relatives	-
Other	3
Don't know	8

Table 11. Farmers' loss of varieties during April to July 1994 period (N=60).

Ending on a cautious note, Table 12 lists varieties which farmers were not able to locate in their specific zones during the time of the interview. These varieties may or may not exist in the local region. Two seasons after the events, many farmer still don't want to venture far from their home fields and it not clear that their search to re-obtain varieties has been extensive.

Table 12. Local varieties which individual Rwandan farmers were not able to access as of July 1995.

Name of Variety		Sites of loss		
	Prefecture	Commune		
Nyirakigufi	Gitarama	Nyabikenke		
Umweru	Gitarama	Runda		
Mwamikazi	Gitarama	Runda		

DISCUSSION AND CONCLUSIONS

Within the sampled population, farmers have been able to retain significant amounts of their own sorghum seed and, if loss has occurred, most feel they can re-access many of the desired cultivars through functioning local channels. Nationwide-surveys currently in progress 1996A (N=800 households) should help put these regional findings in a broader perspective.

As for the aid seed <u>per.se</u>, some sorghum varieties were better targeted than others and gave more promising yield results. The Ugandan local varieties, those supported with ICRISAT funds, might also have been more effectively distributed in zones where sowing in season "B" is more common. However, overall, the sorghum seed did make important contributions to farmers seed stocks.

ANNEX I Sites of 1995B SORGHUM Seed Relief Impact Assessments CARE ZONE OF ACTION

Prefecture	Commune	Secteur
Kigali	Shyorongi	Shyorongi Rusiga
		Kanyinya
	Mbogo	Ruhanya
		Binaga
	Mugambazi	Kanyoni
		Murambi
Gitarama	Mukingi	Mubororo
		Kamusenyi
		Nyakabuye
	Runda	Sheli
		Ruyenzi
		Kinyambi
	Musambira	Gatizo
		Nyarubako
		Gihembe
		Birambo
	Nyabikenke	Mahembe
		Kigwaguro



SEEDS OF HOPE

CIP/PRAPACE Progress Report May - October, 1995

Since the last meeting in Nairobi, all of the pre-basic and basic potato seed produced in collaboration with KARI in Kenya and with NARO in Uganda has been shipped into Rwanda. The final quantities were:

Source	Date Shipped	Variety	Type of Seed	Kg.
NARO, Uganda	June	Cruza	Field multiplied basic	6,800
NARO, Uganda	June	Sangema	Field multiplied basic	1,800
CIP/KARI, Kenya	August	Sangema	Elite tuberlets from stem cuttings	360
CP	2 8	Cruza	Elite tuberlets from stem cuttings	55
j)	17	Mabondo	Elite tuberlets from stem cuttings	145
NARO, Uganda	September	Sangema	Pre-basic tubers from stem cuttings	1,075
59	11	Cruza	Pre-basic tubers from stem cuttings	4,200
12	31	Victoria	Pre-basic tubers from stem cuttings	3,000
11	September	88001	Seedling tubers from TPS	690
₿r.	B	88006	Seedling tubers from TPS	735
CIP Headquarters	October	IP88001	TPS	100g
CIP Headquarters	October	IP88004	TPS	100g
CIP Headquarters	October	IP88006	TPS	100g

The basic seed shipped from Uganda in June was given to World Vision, which distributed it to farmer-multipliers in the Gikongoro region. According to the arrangements, the farmers sell 80 percent of their harvest back to World Vision, which distributes it to other farmers in the same region as seed.

The elite and pre-basic seed shipped from Kenya and Uganda in August and September was given to ISAR, which will multiply it at the farm at Kinigi.

The TPS from CIP will be planted in seedling nurseries by ISAR.

ISAR developed a budget for \$22,500 for seed multiplication and associated costs of rehabilitating facilities for the 1996A season. A first payment has been made, and the rest will be transferred directly to ISAR.

Mr. Gervais Ngerero has been named by ISAR as the officer in charge of PNAP, the national potato program. Mr. Ngerero was spnsored by CIP to go to Kenya in July for a one-week orientation to CIP's regional breeding and selection program.

A training course in seed production was organized in Rubona from October 10 - 17. It was attended by 25 technicians from ISAR and MINIGRI. Three senior scientists from CIP, the PRAPACE coordinator, and four scientists from the national potato programs of Ethiopia, Uganda, and Zaire provided lectures and demonstrations.

51 potato genotypes have been sent to ISAR to start the process of reestablishing their germplasm collection and varietal selection programs. The shipment consisted of 30 advanced clones for screening for late blight reistance, and 21 clones for selection for adaptation to warmer areas of Rwanda.

CIP has provided information to ISAR on the sweetpotato genotypes which have been tested in Rwanda in the past, with indications of which of them showed promise. On this basis, additional germplasm will be selected and shipped into Rwanda in the next few months. CIP has invited ISAR to send the officer in charge of the sweetpotato program to Nairobi for an orientation visit before the end of the year.

Budget status

Through October 15, 1995, disbursements have been as follows:

Seed multiplication by NARO in Uganda, including transport	19,550
Seed multiplication by CIP/KARI in Kenya	8,100
Multiplication in Rwanda, including meetings	14,560
Training in Rwanda	13,360
Administrative costs	1,280
Subtotal	56,850
Committed expenses can be estimated as follows:	
Contribution to transport costs for potato seed survey	1,500
Balance due on \$22,500 budget submitted by PNAP/ISAR 96A season	12,500
Balance of costs of training course	4,000
Familiarization trip to Nairobi by sweetpotato scientist	1,500
Administrative costs	500
Subtotal	20,000
Total	76,850

Some additional funds are available for ISAR, which will be transferred on the basis of a supplementary budget.

Seeds Of Hope-Maize Report for the October, 17 Meeting Rubona, Rwanda

Submitted by J. K. Ransom, CIMMYT

Since the last SOH meeting in May, 1995 the following activities related to the maize component of the SOH project have been carried-out:

SEED MULTIPLICATION: Multiplication of seed of three different varieties of maize adapted for the 3 major agro-ecologies of Rwanda was completed in September. All seed had been harvested, processed and shipped to Rwanda by October 11 (the arrival of the last consignment is still awaited).

Due to unusual disease pressure on the farms where seed was multiplied, the relative proportion of the 3 varieties differed from that requested. The final amounts of seed shipped are:

ZM607	24	tons
Tamira (Pool 9a)	117	tons
Mamesa	7	tons

SEED DISTRIBUTION: Of the 148 tons of seed produced and shipped to Rwanda, the following organization have taken seed to be distributed this season:

-World Vision -Catholic Relief Services -Red Cross

A pamphlet entitled, "Maize in Rwanda" was prepared and provided to all NGO's distributing maize seed to assist them in targeting the three varieties.

TRAINING: Francis Macharia, maize agronomist in the Crop Management Training Course was sponsored to give lectures at the training course for ISAR researchers during the week of 4-8 September.

BUDGET: Our expenditures do date are in line with the budget contained in the original proposal.

ICRISAT'S SEEDS OF HOPE REPORT FOR 1 JUN - 30 SEP 1995

ACTIVITIES

1. Visit to Rwanda

S.Z. Mukuru travelled in Rwanda 23-27 July, visiting ISAR's Karama, Rwerere, and Rubona research stations and its headquarters in Kigali. Buildings damaged during the war are still in a state of disrepair at Karama and Rubona. ICRISAT plans to assist ISAR's sorghum program at Karama with repairs to some houses, offices, storage facilities, and work areas normally used to support sorghum research. Multiplication of seed of some highland sorghum varieties (BM1, BM10, BM27, BM33, and Mukimpundu) was in progress at Rwerere, a station which received relatively little damage during the war. However, these varieties were showing a severe attack by leaf diseases, especially ladder leaf spot. It was encouraging to learn from Rwerere staff that they were able to save seed of 104 of the 131 collections of highland sorghum germplasm that were at Rwerere prior to the war.

The breeder/coordinator for ISAR's Sorghum Improvement Program is stationed at Karama. One of his major bottlenecks is lack of transport to visit sorghum research and production sites. Currently, he has to walk 17 kilometers from Karama to the main road and another 13 kilometers to Myamata for access to public transport. ICRISAT is looking into possibilities of using SOH funds to help in the alleviation of the transport problem facing ISAR's sorghum research.

Dr. Mukuru gained the impression that farmers were reasonably well satisfied with the performance of the SOH acquired sorghum seed which had been distributed to farmers in highland sorghum production areas of Gitarama Prefecture. However, results of the SOH sorghum survey in this area should provide a better understanding of this situation. The sorghum seed distributed to farmers had been acquired from highland sorghum production areas of southwest Uganda in August-Oct 1994, as this was the only way to acquire large quantities of seed of adapted sorghum (tolerance to low temperature) for highland areas of Rwanda in time for sowing for the 1995 B season (Dec-Feb sowing). Dr. Mukuru observed farmers' fields of sorghum with very low seed set (5-10%) in Maraba commune of Butare Prefecture (about 1700 m asl). He was told that the seed sown had been provided by an NGO, CARITAS, which had received it from GTZ. Ergot disease was severe in these fields, not surprising for a situation involving limited pollen production and cool temperatures.

SOHMTG4/ICRISAT.RPT PAGE 1

2. Multiplication of breeder seed

We completed multiplication at Kabete, Kenya, of sorghum varieties and germplasm suitable for ISAR's sorghum breeding program for highland production areas of Rwanda. This seed will be given to ISAR when the program is in a position to store or use it.

3. Shipment of seed to Kigali from Kenya

Over 7 tons of seed of three sorghum varieties adapted to low, intermediate, and high elevations of Rwanda was sent to Kigali for distribution to farmers and for further multiplication in Rwanda. Unfortunately this shipment by road from Nairobi was delayed for over 2 months by the transporter and therefore it did not arrive in time for use during 1995 C season. This seed will be used during the 1996A and B seasons.

4. Training

We provided 7 weeks of training (May-Jul) in sorghum research to ISAR's sorghum breeder/coordinator. The training was conducted in Kenya at three locations where ICRISAT conducts field research for low, intermediate, and high elevations of sorghum production in the EA region.

5. Seeds of Hope Video

Mr. Edward Milner and Mr. Eric McGaw (ICRISAT) finished shooting footage for the Seeds of Hope video in Rwanda and southwest Uganda. The video has now been completed and should serve as a useful record of work under Seeds of Hope.

Future Plans

During 1 Oct-31 Dec we intend to do the following:

- 1. Train four ISAR scientists and technicians in sorghum field research techniques. The training will be conducted from 29 Oct to 3 Dec and will involve three of our sorghum research sites in Kenya Kiboko, Kabete, and Alupe. These sites will allow the trainees to become involved in research involving all stages of crop development. The sites are representative of much of the elevation range of sorghum production in Rwanda.
- 2. Provide technical and support assistance to ISAR's sorghum research program.
- 3. Finalize plans to: 1) repair sorghum research facilities at Karama, 2) provide two threshers and field supplies for ISAR's sorghum program, and 3) acquire a pickup truck for the ISAR sorghum program.
- 4. S.B. King intends to visit Rwanda before the end of 1995.

SOHMTG4/ICRISAT.RPT PAGE 2

Other comments

- 1. Having an SOH Coordinator in Kigali during the past quarter has been very helpful to ICRISAT in planning and implementing its activities in Rwanda, including communicating with ISAR and other SOH partners in Rwanda.
- 2. It would be useful if some SOH funds assigned to ICRISAT could be carried over into 1996 for sorghum research and seed production during the 1996 B season in Rwanda.

Expenditures (Jul - Sep 1995)

Activity	Amount (USD)	
Seed relief	2,170,60	
Strategic research support	2,106.64	
Total	<u>5,218.24</u>	

SOHMTG4/ICRISAT.RPT PAGE 3

٠

Bean Presentation at SOH Meeting, 17 October 1995, Kigali, RW by, W. Youngquist and S. Beebe

1. Seed Production (W. Youngquist

Within SOH, the initial objective of CIAT was to produce a wide range of bean germplasm to supply seed for the following needs:

1. resupply local landraces that disappeared as a result of the social unrest to maintain the genetic diversity found within Phaseolus vulgaris which contributed to yield stability in Rwanda;

2. resupply seed of released varieties for groups looking to multiply seed for wide distribution;

3. resupply the bean program in ISAR with its breeding materials and advanced bean lines.

Table 1. indicates the type of seeds produced and the quantity which has either been sent to Rwanda or produced in Rwanda by SOH. This is a slight increase over our prediction of seed production made during the January 1995 SOH meeting, which was largely due to the production within Rwanda. However, this is still below our initial plans (August 1995) which had been to produce up to 50 mt of seed. This was due to delays in planting and incliment weather conditions last year which drastically lowered seed yield. Additional production has occurred under SOH in various countries and was either shipped to another country for further multiplication or else stored as a reserve stock of seed should there be a crop failure during the current round of seed production in Rwanda: Malawi 0.5 mt (to Tz); and Zaire 0.5 mt, Tanzania 0.5 mt, Uganda 0.2 mt, Kenya 0.2 mt (held in reserve). This seed will be shipped to Rwanda as needed.

Fortunately, the war ended relatively early in July 1994. Coupled with the great effort by NGO's, WFP, UN, etc. to get food aid into the country, the farmers were generally able to conserve some of their own seed for planting which was approximately 45% of the 12,000 mt needed for planting. The rest came from seed aid (28%), or else was purchased on the local market (26%) where the original source cannot be determined. Thus, the need to restore genetic diversity was greatly reduced.

With the reestablishment of some stability in the farming sector in late 1994 and a request for seeds from the Ministry of Agriculture, it was decided that most of our seed should be sent to Rwanda for the 1995B season (starting February/March 1995). Our seed was delivered to SSS (Service Semences Sélectionnées) and then given to various NGO's, FAO and some was multiplied by SSS. These groups were able to plant 35-40 ha for bean seed production of released varieties (released either in Rwanda or Burundi). Seed from advanced lines (various sources, though most from the Rwanda breeding program) were given to ISAR/CIAT for multiplication at Rubona. Table 1. SOH Bean Seed Available in Rwanda - Comparison of expected production in January 1995 and shipments sent from February to October 1995 plus bean production within Rwanda under SOH.

	Expected production Jan. 1995		Actual Shipments, FebOct. 1995	
Category of Seed	Identification and No. Lines	metric tons	No. Lines (source)	metric tons
Rwandan Local Landraces	A. 150 types from local mixtures (U. Scheidegger)	0.3	115 (TZ) 50 (MW)	1.4 0.3
	B. 280 lines collected 1983 (B. Lamb)	0.1	0 - quarantine restrictions	seed exists in Cali, CO.
Released Varieties (improved and local) or	25	3.0	11 (UG)	0.8
improved varieties in diffusion (Bush)			17 (RW)	0.2
Advanced Breeding Lines	50		60 (TZ)	0.6
			35 (UG)	0.6
			87 (RW)	0.9
Rwandan Mixtures	Rwamagana and Nyamata		2 (RW)	0.1
Released varieties and	8 varieties	4.6	2 (TZ)	2.7
diffusion (Climbers)			6 (UG)	1.9
			9 (RW)	1.0
Released Varieties from Burundi	5	3.0	3 (TZ)	3.6
Released Varieties from Uganda	2	0.7	2 (UG)	0.7
Burundi mixtures	9 mixtures (+/- 70 lines)	1.3	9 (TZ)	1.3
Total		13.0	approx. 260*	16.1

*- excludes Burundi and Ugandan materials and duplicates from various sites, but includes advanced lines of various origin.
II. Genetic Diversity (S. Beebe)

Following on the survey collection of seed during March 1995, analysis of the seed types and a description of variety characteristics were made. This data assists in determining whether of not there had been a loss in the genetic diversity of beans within Rwanda. The data was compared to a collection of beans made by E. Lamb in 1983. Due to the problems with trying to make a seed collection shortly after the war, it was not possible to get a perfect correlation between the sites that Lamb had sampled and those of the present survey. Additionally, the number of samples that were collected in March 1995 was determined to obtain values that would indicate if there had been genetic erosion on a country wide basis, and not on a Prefecture by Prefecture basis. This bias in the data must be understood prior to interpreting the data.

Elizabeth Lamb left two sorts of "identifiers" for the grain types collected: 1) a description based on seed form, color, color pattern, seed coat brilliance and size; 2) color photos - which incidentally are excellent for capturing subtle nuances of seed color - and which are likewise linked to the forementioned descriptors. Since the interpretation of grain color, form, etc based on word descriptions is always a bit subjective, the grains from the SOH collections were compared with the photos in most cases. Then, the word description of that grain type, as defined by Lamb, was used to compare to Lamb's data on frequency of those same types on a prefecture level.

Lamb reported those grain types which appeared in 25% or more of the samples collected in a prefecture. No data is available on types with a lower frequency. We were therefore comparing the common types in 1984 with those in 1995, looking for those which had either dropped from prominence or perhaps had increased in frequency. Of these latter types, in most cases we cannot say that these are "new" since these may have existed previously but at a frequency less than 25%.

In Table 2, the frequencies of samples per prefecture are compared for the Lamb and SOH collections. Based only on sample size, and assuming that each is a random sample, collections from Butare, Gikongoro and Kibuye are quite comparable. For the prefectures of Byumba, Kigali and Ruhengeri there are fewer SOH samples, although sample size is probably large enough at least to draw general conclusions with confidence. For the prefectures of Cyangugu, Gisenyi, Gitarama and Kibungo the size of the SOH sample is either very small or non-existent.

	Lamb collection	SOH collection
Butare	27	42
Gikongoro	35	34
Kibuye	29	25
Byumba	65	28
Kigali	80	44
Ruhengeri	77	23
Gisenyi	47	5
Kibungo	80	7
Cyangugu	75	
Gitarama	34	

Table 2. Number of on-farm samples by prefecture.

The situation in Butare and Gikongoro (Table 3) was rather similar and indicated that the profiles of the bean mixtures was quite different in 1984 and in 1995. In the Lamb collection, 19 types were recognized in each of the two prefectures at a frequency of 25% or more. Based on seed morphology, it is possible to assign these to the Andean or Mesoamerican gene pool. In 1984, Andean types predominated in both prefectures (11 of 19 in Butare, 12 of 19 in Gikongoro). By 1995, 7 and 11 of the Andean types displayed far lower frequencies or were not detected at all in Butare and Gikongoro respectively. Additionally, 1 and 4 Mesoamerican types were reduced in frequency or lost. This result is especially striking in the case of Butare, since the SOH sample was actually 50% larger than that in the Lamb collection, and yet detected fewer types.

In Butare no "new" types were detected as rising to importance in the mixtures, that is to say, no types were found in 25% of the mixtures which were not reported in 1984. In effect, therefore, mixtures were less variable than in 1984. In Gikongoro, the only "new" types appeared to be introduced climbing beans. Indeed, Gikongoro was the prefecture where mid-altitude climbing beans seemed to have enjoyed the widest adoption, based on the frequency of readily recognized introductions G2333, Puebla and Vuninkinge. In particular, Puebla was now the bean type of widest distribution of all in Gikongoro, occuring in 59% of the collections. Curiously, it was recovered both as a pure variety, but mostly in mixtures with non-climbing beans. It is possible that it is being cultivated both with and without support.

In Kibuye, bean cultivars had also changed with respect to those found in 1984. Previously 17 types appeared as prominent, 6 Andeans and 11 Mesoamericans. In 1995, 3 Andeans and 6 Mesoamerican types had suffered a marked reduction in frequency. However, several other grain types had increased in frequency, including 1 Andean (Kilyumukwe type) and 1 Mesoamerican. Additionally, G2333 now was detected in 32% of collections, and Vuninkinge in 20%. Therefore, Kibuye was the prefecture that appeared to have the second highest degree of adoption of introduced climbers.

Byumba also displayed a pattern that was suggestive of cultivar changes, with 3 of 7 Andeans and 4 of 6 Mesoamericans presenting far lower frequencies. One Andean and 2 Mesoamerican types had increased. Kigali displayed a similar pattern, with the loss or reduction of 4 out of 11 Andeans and 4 out of 6 Mesoamericans, but without the addition of other important grain types. Ruhengeri presented a loss or reduction in 5 out of 9 Andeans and 2 out of 2 Mesoamericans, but with the appearance of 1 Andean and 2 Mesoamerican types.

In general, these results suggest that there has been an overall loss of on-farm variability compared to what existed at the time of the Lamb collection. In part this was expected based on pre-war experience in Butare, where farmers were observed to be abandoning Andean genotypes due to susceptibility to root rots (Buruchara, personal communication). This observation was consistent with present results, since loss of Andean types was especially acute in Butare, as well as in Gikongoro. In this latter prefecture, soils are reported to be especially poor, and this may have contributed to the abandonment of Andean types, especially if some degree of root rots was present which exacerbated the effect of the poor soil fertility. It may be difficult to distinguish well between pre-war loss due to conscious or unconscious elimination by farmers, and that which resulted from the civil war. Some imaginative work may be necessary with farmers to determine what variability they would like to recover, of that which is now apparently lost or at low frequency.

Prefect.	Seed	Frm	P.Colo:	rColor	Bright	Size	A:M	1983	1995	
BUTARE	1	rp	mc	rg	b	р р	м М	61	35	
	2	lp	mc	rĝ	b	g	А	39	14	
	3	10	mc	rg	b	ģ	Α	29	4	
	4	rp	mc	n	ь	p	м	43	24	
	5	rõ	mc	n	b	p	М	61	28	
	6	rp	mc	br	b	p	M	25	14	
	7	rõ	mc	br	b	$\tilde{\mathbf{p}}$	М	50	26	
	8	ro	mc	jbr	b	p	A	46		
	9	10	mc	jbr	b	q	А	57	36	
	10	rp	mc	rsbr	m	p	м	36	47	
	11	ro	zb	cr/n	b	p	Α	57	2	
	12	lo	zb	jbr/n	ď	ğ	A	39	17	
	13	10	tl	rg/n	d	g	A	32	21	
	14	rp	tt	cr/n	b	p	М	68	38	
	15	lp	tp	cr/n	b	ğ	A	29		
	16	rō	hỉn	ງ່	b	ģ	А	64		
	17	10	hin	Ť	b	ā	A	39	4	
	18	lo	hin	jv	b	ā	Α	25		
	19	rp	hijbr	ĉr	b	p	м	25		
BYUMBA	1	rp	mc	rq	b	q	м	52		
	2	lp	mc	rq	b	â	A	63	53	
	4	rp	mc	n	b	ã	м	32		
	20	rp	mc	n	m	Ď	M	52	21	
	21	lp	mc	n	Ъ	à	A	43		
	7	ro	mc	br	b	ā	M	38		
	22	lp	mc	pr	ь	à	A	40	32	
	23	rĩ	mc	rân	b	ā	A	32		
	24	1p	mc	rqn	b	a	A	68		
	25	lp	zb	cr/n	Ъ	á	A	70		
	13	10	tl	ra/cr	b	ā	A	53	28	
-	14	rp	tt	cr/n	b	ğ	M	45	42	
	26	rp	tt	cr/br	ь	r D	M	30		
	8	ro	mc	ibr	b	r D	A		25	
	46	rp	me	ra	m	r D	M		43	
	36	rp	mc	crbr	b	r D	M		25	
		- £		~~~		E-	*4		4.5	

Table 3. Bean seed evaluations: B. Lamb collection 1983 vs SOH collection 1-3/95

•

•

•

•

0

0

.

0

Table 3. con't.

Pref.	Seed	Frm	P.Colc	rColor	Bright	Size	A:M	1983	1995
GIKONGO	RO 1	rp	mc	ra	b	α	м	66	6
	2	lp	mc	rq	b	å	A	37	3
	3	lõ	mc	rg	b	q	A	31	
	4	ro	mc	n	b	à	м	89	52
	21	lp	mc	n	b	q	А	31	
	34	10	mc	n	ь	ģ	А	51	
	6	rp	mc	br	b	p	м	31	3
	7	ro	mc	br	b	p	м	51	
	35	$\mathbf{r}\mathbf{p}$	mc	cr	ъ	p	м	49	
	8	ro	mc	jbr	b	p	А	54	6
	9	10	mc	ງີ່br	b	ġ	A	60	
	36	rp	mc	crbr	b	р	м	34	21
	11	ro	zb	cr/n	b	р	A	63	9
	25	lp	zb	cr/n	b	g	A	57	3
	37	10	zb	rg/n	b	g	A	34	3
	13	10	tl	rg/cr	b	g	A	31	9
	38	$_{1p}$	tl	cr/pr	b	g	A	34	
	14	rp	tt	cr/n	b	p	м	57	29
	16	ro	hln	Ċ	р	g	A	57	
	Puel	ola							59
	G23:	33							32
KIBUYE	1	rp	mc	ra	d	ŋ	м	73	
	22	lp	mc	pr	ь	à	A	58	24
	4	rp	mc	'n	b	á	M	46	52
	20	rp	mc	n	m	p	м	27	
	5	ro	mc	n	b	p	М	42	
	21	10	mc	ń	b	ģ	A	42	
	6	ro	mc	br	b	p	М	46	32
	10	\mathbf{rp}	mc	rsbr	m	р	М	42	16
	49	lp	zb	cr/n	b	р	М	38	
	13	lo	tl	rg/cr	b	g	A	46	8
	14	rp	tt	cr/n	b	p	м	31	32
	50	ro	tt	cr/n	Þ	p	м	31	
	51	ro	tp	cr/n	b	Р	м	38	
	16	ro	hln	j	b	g	A	54	4
	2	lp	mc	rg	b	g	A		28
	46	rp	mc	rg	m	р	м		52
	3	10	mc	rg	b	g	A		32
	Vun:	inkiı	nge				м		20
	G23.	33					м		32

I

Table 3. con't.

Pref.	Seed	Frm	P.Colo	rColor	Bright	Size	A:M	1983	1995
KIGALI	2	lp	 mc	rg	b	 g	A	37	22
	20	$r\bar{p}$	mC	n	m	p	М	33	29
	5	rō	mC	n	b	p	м	26	
	7	ro	mc	br	b	р	М	38	
	22	lp	mc	pr	b	g	А	42	25
	8	ro	mc	jbr	b	р	А	45	20
	24	lp	mC	rgn	b	g	А	25	
	36	rp	mC	crbr	b	р	м	46	
	52	rp	mC	rscr	b	р	м	24	
	25	lp	zb	cr/n	b	g	A	47	30
	12	lo	zb	jbr/n	ъ	g	A	30	
	13	10	tl	rg/cr	b	g	A	30	45
	38	lp	tl	cr/pr	b	g	A	34	
	14	rp	tt	cr/n	b	р	М	43	20
	53	ro	hln	j	ь	р	A	58	30
	54	10	hln	j	b	р	А	34	5
	18	lo	hln	jv	b	g	A	39	41
RUHENGER	I 2	lp	mC	rg	b	g	А	62	26
	21	lp	mC	n	b	g	A	43	4
	35	$\mathbf{r}\mathbf{p}$	mc	cr	b	р	м	41	
	22	lp	mc	\mathbf{pr}	b	g	A	58	21
	36	rp	mC	crbr	b	р	м	39	9
	25	lp	zb	cr/n	b	g	A	49	13
	13	lo	tl	rg/cr	b	g	A	46	9
	55	lp	tl	cr/n	b	g	A	32	
	15	lp	tp	cr/n	b	g	A	49	
	56	lp	hln	jbr	b	g	A	29	
	57	lo	hln	br	b	g	A	26	4
	8	ro	mC	jbr	b	р	A		26
	20	rp	mC	n	m	Р	М		39
	6	ro	mC	br	ь	Р	м		30
	1	$\mathbf{r}\mathbf{p}$	mc	rg	b	p			26
	Puel	bla							9
	MCM	500:	1						13
<pre>Formrp=round flat; ro=round oval; lp=long flat; lo=long oval Color(Pattern color)mc=mono; zb=zebra; tl=mottled; tt=speckled; tp=flecked; hl=dark hilum ring</pre>									

Color...rg=red; n=black; br=brown; j=yellow; rs=pink; cr=cream; pr=purple; gr=gray; bleu=blue; Brillo...seed brilliance: b=brilliant; m=dull Tamano...Size: p=small; g=large A:M...Andean or Mesoamerican (my owm best guess) 1983,1995...% of mixtures in which the respective type appears

ANNEX VIII: TREE SEED CENTRE/ICRAF/CSIRO

PROGRESS REPORT ON ACTIVITIES OF THE TREE SEED CENTRE (TSC)

SEEDS OF HOPE MEETING, ISAR, RUBONA OCTOBER 17, 1995

1. INTRODUCTION

The aim of TSC is to make available forest and agroforestry quality seed to meet customers needs and to do tree improvement practices so as to achieve tree qualities that are fit for various uses. To achieve this, TSC conducts such activities as:

- * Research on tree improvement activities, mainly selection and management of forest and agroforestry seed sources, management and evaluation of provenance and species trials and the establishment of such trials if needed.
- * Tree seed collection, processing, testing, conservation, storage and seed supply to customers both within the country and abroad.
- * Germination tests for new seed deliveries and periodically to check the viability of seed in storage.
- * Phenological observations of forest trees of interest.

Emergency relief activities of the TSC following the civil war in 1994 have been made possible through generous financial assistance by Swiss Development Cooperation (SDC) and CSIRO, Australia. CSIRO support is provided by AusAID and funds are channelled to TSC through ICRAF. While TSC funding is independent of SOH, support from the AusAid for TSC was mobilised through the efforts of World Vision Australia and CIAT.

The ICRAF/CSIRO/SDS project objectives are:

- 1. To assist in rehabilitation of TSC and initiate tree seed collection, storage and distribution activities of TSC.
- 2. To asses status of the tree planting and agroforestry projects initiated by ISAR/ICRAF, CSIRO or SDC and assist with the rehabilitation of research activities.

The main customers for TSC are the various NGOs in the country such as World Vision, Care International, World food Programme and to a lesser extent individual farmers.

The implementation of activities is less than efficient because of a number of ongoing problems including:

SOHMTG4/TREE SEED CENTRE.RPT PAGE 1

- * Lack of transport facilities
- * Lack of enough research personnel
- * Matching of imported seed delivery with time requirement by customers
- Lack of appropriate seed storage containers

Efforts are being made to overcome these issues.

2. MAIN ACTIVITIES BY TSC TO DATE

Following the civil war in Rwanda, TSC, like all other services in the country ceases operations. Rehabilitation of TSC was made possible through financial assistance by SDC and CSIRO/ICRAF and thus was able to recommence activities in November, 1994.

Initially activities were devoted to rehabilitating facilities such as offices, library, seed store, laboratories and the cold room for seed storage. The previously existing seed stocks had been vandalized and mixed up because the air-tight containers used to store the seed had been stolen during the war.

Efforts were made to separate the mixed seed which resulted in approximately 2,200 kgs of seed from 56 species and provenances being saved as pure seed. Germination tests were conducted on this material. Table 1 shows the species, quantity and germination percent of the pure seed after separation.

Seed collection activities resumed in February, 1995 particularly for seeds that mature early. By June 30, 1995 some 544 kg of seed of various species had been harvested (Table 2).

SOHMTG4/TREE SEED CENTRE.RPT PAGE 2

Table 1. List of pure seed after separation

Activity Ruhona 2,4 86 2,4003 Access albals Areas memorylon Afrique (n Suit) Gatar(Cyangugu) 40,0 73 122/395 Access memorylon Afrique (n Suit) Bater 0.35 55,2 22/395 Access medianization Mukage (Zaire) Mukage (Zaire) Mukage (Zaire) 0.35 55,2 22/395 Africas is block Infe Athoreum 11,0 1100 112,2 33 32,2 22/395 Africas is block Infe Athoreum 11,0 1100 112,2 33 32,2 32,3 32,2 33 32,2 33 32,2 33 32,2 33 32,2 33,3 32,2 33,3 32,2 33,3 32,2 33,3 <t< th=""><th>SPECIES</th><th>PROVENANCE</th><th>LOCALITY</th><th>QUANTITY (Kg)</th><th>% germination</th><th>Date</th></t<>	SPECIES	PROVENANCE	LOCALITY	QUANTITY (Kg)	% germination	Date
Actes interves (mode) Kilver (Kilver Barrer (mode) (mode) </td <td>Aberia caffra</td> <td>Inda</td> <td>Rubona</td> <td>2,4</td> <td>86</td> <td>24/4/95</td>	Aberia caffra	Inda	Rubona	2,4	86	24/4/95
Accel and and many Afrique cli Suid Convertigency (springle) in 1 of 1 of 2 of 2 <thof 2<="" th=""> of 2 <thof 2<="" th=""> <th< td=""><td>Acacia albida</td><td>Inde</td><td>Without</td><td>4,0</td><td>51</td><td>24/4/95</td></th<></thof></thof>	Acacia albida	Inde	Without	4,0	51	24/4/95
Access instanticion Arthus to same Basar Cargeory for Same 21 22 220 Attizzie isbart Muluop (Zairc) Adverse printing 23 58 420 Attizzie isbart Filiage chiantis Inde 12 100 22003 Attizzie isbart Filiage chiantis Inde 12 1100 126 22003 Attizzie isbart Carstenin Guatemah Yakisoda 11 1100 126 22003 Attizzie isbart Carstenin 12 1100 12 22003 13 13 1100 126 22003 Callinde caluation Carstenin 13 61 15 61 15 61 15 61 15 61 15 61 15 61 15 61 15 61 15 63 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 1	Acacia Meanasil	A friens du Sud	Kibuye Galaga(Guanguan)	14,1	80	15/3/95
Accesspin Trainfolions Mulungu (Zafre) Arboretom + Ginzerna 22.5 78.4 22.6 Albizzi chiowsis Inde Arboretom + Ginzerna 1.2 81 264/05 Albizzi chiowsi Inde Arboretom + Ginzerna 1.2 81 264/05 Albizzi chiowsi Gattemala Hipping 1.1 100 PL/g 264/05 Albizzi chiowsi Gattemala Hipping 1.1 81 264/05 Calmine observa Gattemala Hipping 1.1 100 PL/g 100 PL/g 264/05 Cassi depectabilis Philippines Arboretom 15.3 1340 PL/g 244/05 Cassi depectabilis Petroris R.S.A Arboretom 2.0 0.3 1340 PL/g 244/05 Cassering ginesa Ethiopia Petroris R.S.A Arboretom 3.3 40 57.095 Cassering ginesa Ethiopia Petroris R.S.A Arboretom 3.3 40 57.095 Cassering ginesa Ethiopia Petroris R.S.A Arboretom 3.3		Andre ur ann	Rutare	0,0	67	2213193
Altbrizi Entropy Protection 1,25 76 224495 Alturas exuminata Gustermain 1,10 11.00 PLg 15,30 126497 Alturas exuminata Qustermain National 13,31 31,3224 324935 Calling regin Philippines An. Mathematic 13,31 31,32735 31,32735 Calling regins a constraint of the participantization of the partipantization of the partipantization of the partipanti	Acrossmus fraxinifolius	Mulungen (Zaïre)	Arboretum + Gitarama	23.5	58.54	22/3/93
Athizas isbibik Inde Athoretoim 112 81 226409 Cajamar cited Outernah Nabitidu 11,0 11000 1100 1100	Albizzia chinensis		Nyakabuye	1.25	76	26/4/95
Altras acuminata Guatemala Nyabisindu 11.0 1160 PL/ze 53/35 Calinan erfan Philippinez Art., Kh.; Git. 54, 74 61.56 184/95 Casian after Boare 3,1 61 152/95 Casia afters Boare 3,1 61 152/95 Casaria factoring complemining Casaria complemining 0,15 1340 172/95 Casaria factoring future Arthoretun 3,6 1152/95 1340 PL/ge 24/495 Casaria factoring future Kitorii (Burundi) Arthoretun 3,0 61 152/95 Casaria factoring future Boare 1,0 1,	Albizzia lebbek	Inde	Arboretum	1.2	81	26/4/95
Cajanare cilolayrau ci	Alnus acuminala	Guatemala		11,0	1160 PL/g	15/3/95
Callindre celektyreus Philippines Arb., Kh.; Git. 54, 74 61,56 18/40/5 Cassi darnet Bagarana 0,7 54 18/30/5 17/20/5 Cassi darnet Bagarana 0,7 54 18/30/5 15/20/5 Cassi darnet Cassi darnet 0,7 54 18/30/5 15/20/5 Cassi darnet Pretoria R.S. A Arboretum 3,6 13/40 PL/g 24/40/5 Cassi darnet monthine Pretoria R.S. A Arboretum 2,0 0,7 0,3 3/3/95 Cassi darnet monthine Pretoria R.S. A Arboretum 1,0 53 69 57/20/5 Corelaria N'3 tornation Danonack Arboretum 1,0 57/20/5 <	Cajanus cajan		Nyabisindu	18,1	43	3/2/95
Calificat robusta Arboretum 13.6 31 17/203 Casas adrea Dagamente 0,1 5.6 15/205 Casas adrea Arboretum 0,1 5.6 15/205 Casar adrea etc. Ripper 18,5 13.6 15/205 Casar adrea etc. Ripper 18,55 13.6 17/203 Casar adrea etc. Ripper 18,55 13.6 17/203 Casar adrea etc. Ripper 18,55 13.6 17/203 Casar adrea etc. Ripper 10,0 0,3 93 3/3/95 Contract of the etc. Advoctum 10,0 5.2 57/205 Contract of the etc. Advoctum 1,0 50 57/205 Contract of the etc. Advoctum 1,0 1,0 57/205 Contract of the etc. Advoctum 1,0 1,0 1,0 1,0 Data etc. Data etc. Advoctum 1,0 1,0 1,0 1,0 Data etc. Petclof 4 Calherine <td>Calliandra calothyrsus</td> <td>Philippines</td> <td>Arh., Kib.; Git.</td> <td>54,74</td> <td>61,56</td> <td>18/4/95</td>	Calliandra calothyrsus	Philippines	Arh., Kib.; Git.	54,74	61,56	18/4/95
Lassa santa. Casa char. Degrams (b) 0,1 (c) 1,1 (c) 1,1 (c) 1,1	Califiris robusta		Arboretum	15,6	51	17/3/95
Casar spectron Poter	Cassia siamea		Bugarama	0,9	54	18/5/95
Chararria equicel/Gia Fetoria R.S.A Arboretum 3.6 Casarria suberosa Kisozi (Burundi) Arboretum 2.0 Casarria suberosa Risozi (Burundi) Arboretum 2.0 Casarria suberosa Batar 16,8 93 3/3/95 Casarria suberosa Batar 16,8 93 3/3/95 Contanaccy/isse galinensis Ebiopia Batar 16,8 93 3/3/95 Contanaccy/isse galinensis Ebiopia Batar 16,8 93 3/3/95 Contanaccy/isse galinensis Danenserk Arboretum 10,0 52/295 Copressas besthani Danenserk Arboretum 10,0 52/295 Desmodyum instantum Petford Costanta 25,0 124 PL/g 52/295 Eucalyptus canadblensis Petford Costanta 25,0 124 PL/g 24/495 Eucalyptus canadblensis Petford R.S.A. Arboretum 20 1004 PL/g 24/495 Eucalyptus canadblensis Petford Costanta 17,2 1920/gr 24/495 Eucalyptus canadblensis Petford Arboretum 17,2 1920/gr 24/495 Eucalyptus canadblensis Petford R.S.A. Arbore	Cassia specialitis Castarina curninghaminna		Athoretum	0,1 0,15	01	15/2/95
Casardina subcrosta Pretoria R.S. A Arboretum 3.6 District a plane Casardina subcrosta Kistoria (Burundi) Arboretum 2.0 0.3 Casardina subcrosta (7) 0.3 0.3 Casardina subcrosta (7) 0.3 0.3 Casardina subcrosta (7) 0.3 0.3 Constanti subcrosta Batare 10.6 50 Constanti subcrosta Parterina (Standina Standina Standi	Casuarina commissionitation Casuarina envisetitolia	*****	Kihuve	18.55	1340 PL/a	24/4/05
Casarding Janua Kisozi (Burundi) Arhoretum 2.0 Construit Janua (7) 0.3 93 Construit Janua Bularo 16.8 93 Construit Janua Marcertum 10.6 50 Construit Janua Danensat/k Arhoretum 10.6 Construit Janua Danensat/k Arhoretum 10.1 Construit Janua Danensat/k Arhoretum 10.1 Detensofum Instant Danensat/k Arhoretum 10.0 Detensofum Instant 1157 PL/S 24/495 Euclyptus anderos Rahoretum 12.1 24/495 Euclyptus anderos Arhoretum 12.2 24/495 Euclyptus anderos Arhoretum 12.2 24/495 Euclyptus anderos/philos Zinbabwe Arhoretum 12.2 Euclyptus anderos/philos Zinbabwe Arhoretum 12.2 Euclyptus anderos/philos Zinbabwe Arhoretum 1.3	Casuarina montana	Pretoria R.S.A	Arboretum	3.6	13401678	298919J
Casatoria glauca Cordela servita Chenaceytius palmensis Chenaceytius palmensis Chenaceytius palmensis Chenaceytius palmensis Corpersus behaviti Capresus behaviti Carbotic Euclyptus caradidu Casatori Euclyptus forerea Euclyptus foreforent Euclyptus forerea Euclyptus	Casuarina suberosa	Kisozi (Burundi)	Arboretum	2.0		
Cedera seriata Contancescipusa palenesis Contantia N°3EbiopiaButiric Rweree Nysbisindu16,8933/3/95Contantia N°3 Contantia N°3Danemark EpagareNysbisindu10,6505/2/95Cupressus benthemii Cupressus benthemiiDanemark EpagareNysbisindu10,6505/2/95Cupressus benthemii Demarkt Enalyptus ernaldulensis Detaroptus ernaldulensis Petford + Catherine Detaroptus ernaldulensis Detaroptus ernaldulensis Detaroptus ernaldulensis Petford + Catherine Petford - Catherine <b< td=""><td>Casuarina glauca</td><td>· · ·</td><td>(ľ)</td><td>0.3</td><td></td><td></td></b<>	Casuarina glauca	· · ·	(ľ)	0.3		
Channesytisus palmensis Corolateris N*3EbiopisReverse Nyabisindu Arhoretum17,7 10,65052/95Copressus bastanica Cupressus bestanica Eucappus canadularitiesDanemack EspagneNyabisindu Arhoretum1,0 2,0324 PL/g57/295Cupressus bestanica Eucappus canadularitiesPatford + Caherine Bastanput intradiationalis Eucappus canadularitiesPatford + Caherine Gastore35,0 35,0324 PL/g57/295Eucappus canadularitiesPatford + Caherine Bastanput intradiationalisPatford + Caherine Bastanput intradiationalis201004 PL/g24/495Eucappus canadularitiesPatford + Caherine Bastanput intradiationalisRuhona Arhoretum18,21820/g24/495Eucappus canadularitiesPatford + Caherine Patford + CaherineRuhona Arhoretum18,21926/gr24/495Eucappus carinodora Eucappus carinodoraZimbabwe ArhoretumArhoretum17,21936/gr24/495Eucappus carinodora Eucappus carinodoraZimbabwe ArhoretumArhoretum2,47424/495Eucappus carinodora Eucappus carinodoraZimbabwe Arhoretum1,76215/395Eucappus carinodora Eucappus carinodoraZimbabwe Arhoretum1,76215/395Eucappus carinodora Eucappus carinodoraZimbabwe Arhoretum1,76215/395Eucappus carinodora Eucappus carinodoraZimbabwe Arhoretum1,76215/395Eucappus proincita Eucappus proincitaZimbab	Cedrela serrata		Butare	16,8	93	3/3/95
Crotalaria N ³ Danemark 10.6 50 57/95 Cupressus busianicu Arboretum 1.0 49 52/95 Cupressus bendhemii Danemark Nyabisindu 25.0 324 PL/g 57/95 Desmodium incinatum Egagan Nyabisindu 25.0 324 PL/g 57/95 Desmodium incinatum Patford + Catherine Gashore 33.7 2 Eucalyptus cincrea Patford + Catherine Gashore 33.7 2 Eucalyptus cincrea Patford + Catherine Kibuye, Gikongoro 14.0 1457 PL/g 24/4095 Eucalyptus sindeni Ruhona Arboretum 17.2 1926/gr 24/4095 Eucalyptus sinderoxylon Zimbabwe Arboretum 17.2 1926/gr 24/4095 Eucalyptus sinderoxylon Zimbabwe Arboretum 3,4 74.% 24/405 Eucalyptus sinderoxylon Zimbabwe Arboretum 3,4 74.% 24/405 <td>Chamaccytisus palmensis</td> <td>Ethiopia</td> <td>Rwerere</td> <td>17,7</td> <td></td> <td></td>	Chamaccytisus palmensis	Ethiopia	Rwerere	17,7		
Copressas busianca Danemark Arboreture 5,3 49 5/2/95 Cupressas benchamii Danemark Esgains 1,0 1,0 1,0 Cupressas benchamii Petford + Catherine Gashors 33,7 1,0 1,0 Eusalyptus canaldulensis Petford + Catherine Gashors 33,7 1004 PL/g 24/4/95 Eusalyptus canaldulensis Petford + Catherine Staburg 3,5 1004 PL/g 24/4/95 Eusalyptus canaldulensis Petford + Catherine Staburg 10,0 24/4/95 Eusalyptus gendis Ruhona Arboreture 1,0 24/4/95 Eusalyptus gendis Zimbabwe Arboreture 1,2 1306/gr Eusalyptus gendis Zimbabwe Arboreture 1,2 1306/gr Eusalyptus gendis Zimbabwe Arboreture 2,3 24/4/95 Eusalyptus gendis Zimbabwe Arboreture 2,3 24/4/95 Eusalyptus gendis Zimbabwe Arboreture 2,3 24/4/95 Eusalyptus gendis Zimbabwe Arboreture 2,3 2,4 Eusalyptus gendis Zimbabwe Arboreture 2,3 2,4 Eusalyptus gendis Zimbabwe Arboreture <	Crotalaria N°3		Nyabisindu	10,6	50	5/2/95
Cupresus scendralmiDatemark EspagneAboretum1,0 1,0Demodium incinatumEspagneNyabisindu25,0324 PL/g5/2/95Demodium incinatumPetford + CatherineNyabisindu25,0324 PL/g5/2/95Eustyptus canafdulensisPetford + CatherineNyabisindu25,0324 PL/g5/2/95Eustyptus canafdulensisPetford + CatherineNyabisindu25,0324 PL/g24/4/95Eustyptus maideniRuhonaArboretum8,4g24/4/95Eustyptus grandisRuhonaArboretum18,21820/g24/4/95Eustyptus grandisZimbabweArboretum17,2193/gg24/4/95Eustyptus fereitornisArboretum1,2193/gg24/4/95Eustyptus fereitornisArboretum1,71193/g24/4/95Eustyptus fereitornisArboretum1,71193/g24/4/95Eustyptus protingYilmorin (f)Arboretum2,67.4Eustyptus punctataZimbabweArboretum1,762Eustyptus protingZimbabweArboretum1,215/3/95Eustyptus protingZimbabweArboretum1,215/3/95Eustyptus protingZimbabweArboretum1,215/3/95Eustyptus protingZimbabweArboretum1,215/3/95Eustyptus protingZimbabweArboretum1,215/3/95Eustyptus protingZimbabweArboretum1,215/3/95Eust	Cupressus lusitanica		Arboretum	5,3	49	5/2/95
Lupressis serupcivitiesLapsgrifeNyabisindu1,032,0324 PL/g5/2/95Buendymus ramiddensisPeford + CatherineGashore33,71004 PL/g24/4/95Buendymus ramiddensisPeford + CatherineGashore30,71004 PL/g24/4/95Buendymus ramidensisPeford + CatherineArboretum201004 PL/g24/4/95Buendymus ramidensiPretoria R.S.A.Kibuye, Gittongoro101004 PL/g24/4/95Buendymus ramidensiRuhonaArboretum8,4182 DL/g24/4/95Buendymus ramidensiZimbabweArboretum1,71936/gr24/4/95Buendymus releationZimbabweArboretum3,47,48Buendymus releationZimbabweArboretum3,47,48Buendymus releationZimbabweArboretum1,715/3/95Buendymus recrynchaPretoria R.S.A.Arboretum1,715/3/95Buendymus recrynchaPretoria R.S.A.Arboretum1,715/3/95Buendymus recrynchaPretoria R.S.A.Arboretum1,715/3/95Buendymus recrynchaZimbabweArboretum1,715/3/95Buendymus recrynchaZimbabweArboretum1,215/3/95Buendymus recrynchaPretoria R.S.A.Arboretum1,41Buendymus recrynchaZimbabweArboretum1,41Buendymus recrynchaZimbabweArboretum1,5715/3/95Buendym	Cupressus bennamii	Danemark	Arboretum	1,0		
DemolationPetfordPetfordSyntastinu23.03.4 PLgSyntastinuBuealyptisCannot LensitisPetfordCashora33.73.53.7BuealyptisPetfordPetfordS.A.Arboretum3.03.4 PLg3/2/95BuealyptisPetfordPetfordS.A.Arboretum3.1201004 PLg24/4/95BuealyptisBuealyptisRuhonaArboretum8.49.224/4/9524/4/95BuealyptisBuealyptisBuealyptis18.21820/g24/4/9524/4/95BuealyptisBuealyptisSterestinu8.49.219.30/g24/4/95BuealyptisBuealyptisSterestinu8.419.219.30/g24/4/95BuealyptisSterestinuArboretum17.219.30/g24/4/95BuealyptisSterestinu4.115.7119.31/g15/3/95BuealyptisSterestinuArboretum2.674.515/3/95BuealyptisBuealyptisArboretum2.16215/3/95BuealyptisBuealyptisArboretum2.16215/3/95BuealyptisBuealyptisArboretum1.24/4/9515/3/95BuealyptisBuealyptisArboretum2.16215/3/95BuealyptisBuealyptisArboretum2.16215/3/95BuealyptisSterestinu1.2Arboretum1.24/4/95BuealyptisBuealyptisArboret	Cupressus sempervirens	Espagne	Nava b 2 min dan	1,0	222 00 1	# 10 10 F
Eucalytus carmiduleratisPetfordCantolineDataEucalytus interesPrefordR.S.A.Arboretum201004 PL/g24/495Eucalytus maideniRuhonaArboretum8,4ng24/495Eucalytus grandisRuhonaArboretum13,21930/grEucalytus grandisRuhonaArboretum17,21930/grEucalytus sideroxylonZimbabweArboretum17,21936/grEucalytus sideroxylonZimbabweArboretum4,424/495Eucalytus sideroxylonZimbabweArboretum4,424/495Eucalytus sideroxylonZimbabweArboretum2,624/495Eucalytus sideroxylonZimbabweArboretum2,624/495Eucalytus pitularisVilmotin (F)Arboretum2,624/495Eucalytus pitularisVilmotin (F)Arboretum2,615/3/95Eucalytus pitularisZimbabweArboretum2,162Eucalytus pitularisZimbabweArboretum2,162Eucalytus pitularisZimbabweArboretum2,34Eucalytus pitularisZimbabweArboretum2,162Eucalytus pitularisZimbabweArboretum2,162Eucalytus pitularisZimbabweArboretum2,34Eucalytus pitularisZimbabweArboretum2,162Eucalytus pitularisZimbabweArboretum1,762Eucalytus pitularisZimbabwe	Fucationani inclusioni Fucationali camaldulensis	Petford & Catharine	Gaebora	23,0	324 FL/g	5/2/95
Due signus cineres Pretoris R.S.A. Arboretum 10 (004 PL/g) 244/95 Due signus signa Ruhona Arboretum 14.5 1457 PL/S 244/95 Due signus signa Arboretum 15.2 1920/g 244/95 Due signus sideroxylon Arboretum 17.2 1930/g 244/95 Due signus sideroxylon Arboretum 4.4 112 244/95 Due signus sideroxylon Arboretum 4.4 11320/g 244/95 Due signus sideroxylon Arboretum 4.4 11320/g 244/95 Due signus sideroxylon Arboretum 3.4 74.8 244/95 Due signus sideroxylon Arboretum 2.6 2.6 Due signus s	Eucatypius camaidulensis	Petford	Clashola	33,7		
Eucasjpus grandis Ruhons Kibuye, Gikongoro 14.0 1457 PL-3 24/4/95 Eucalypus grandis Ruhons Arboretum 18,2 1820/g 24/4/95 Eucalypus sideroxylon Zimbabwe Arboretum 17,2 1936/gr 24/4/95 Eucalypus sideroxylon Arboretum 17,2 1936/gr 24/4/95 Eucalypus sideroxylon Arboretum 17,2 1936/gr 24/4/95 Eucalypus sideroxylon Arboretum 5,7 1193/g 15/3/95 Eucalypus sideroxylon Zimbabwe Arboretum 2,4 24/4/95 Eucalypus punctat Zimbabwe Arboretum 2,3 15/3/95 Eucalypus punctat Zimbabwe Arboretum 2,1 62 15/3/95 Eucalypus punctat Zimbabwe Arboretum 2,1 62 15/3/95 Eucalypus projingua Pretoria R.S.A. Arboretum 2,1 62 15/3/95 Eucalypus puncinata Zimbabwe Arboretum <td< td=""><td>Eucalyptus cinerea</td><td>Pretoria R.S.A.</td><td>Arboreum</td><td>20</td><td>1004 PL/m</td><td>24/4/05</td></td<>	Eucalyptus cinerea	Pretoria R.S.A.	Arboreum	20	1004 PL/m	24/4/05
Eucalyptus stafigna Eucalyptus saligna Eucalyptus sideroxylon Ruhona Arboretum 18.2 18.20/g 24/4/95 Eucalyptus sideroxylon Zimbabwe Arboretum 17.2 1936/gr Eucalyptus sideroxylon Zimbabwe Arboretum 17.2 1936/gr Eucalyptus sideroxylon Zimbabwe Arboretum 17.2 1936/gr Eucalyptus sideroxylon Zimbabwe Arboretum 17.2 193/gr Eucalyptus sideroxylon Zimbabwe Arboretum 3.4 74.% Eucalyptus sideroxylon Zimbabwe Arboretum 2.4 Eucalyptus sideroxylon Zimbabwe Arboretum 2.4 Eucalyptus sideroxyncha Zimbabwe Arboretum 2.3 Eucalyptus sideroxyncha Zimbabwe Arboretum 1.7 Eucalyptus sideroxyncha Zimbabwe Arboretum 1.7 Eucalyptus sideroxyncha Zimbabwe Arboretum 1.7 Eucalyptus sideroxyncha Zimbabwe Arboretum 2.1 62 Eucalyptus sideroxyncha Zimbabwe Arboretum 1.7 62 Eucalyptus sideroxyncha Zimbabwe Arboretum 1.7 62 Eucalyptus sideroxyncha Zimbabwe Arboretum 1.7 62	Eucalyptus maideni		Kibuye, Gikongoro	14.0	1457 PL/S	24/4/95
Eucatypus saligna Eucatypus sideroxylon Eucatypus sideroxylon Eucaty	Eucalyptus grandis	Ruhona	Arboretum	8,4	g	24/4/95
Eucalyptus sideroxylonZimbabweArboretum17,21936/grEucalyptus ideroxylon?Arboretum4,424/4/95Eucalyptus ideroxylonZimbabweArboretum5,71193/g15/3/95Eucalyptus ciritodoraZimbabweArboretum2,674.50Eucalyptus punctataZimbabweArboretum2,315/3/95Eucalyptus clozianaAustralieArboretum2,315/3/95Eucalyptus clozianaAustralieArboretum1,762Eucalyptus clozianaAustralieArboretum2,162Eucalyptus clozianaZimbabweArboretum2,315/3/95Eucalyptus clozianaPretoria R.S.A.Arboretum2,315/3/95Eucalyptus propinguaPretoria R.S.A.Arboretum1,762Eucalyptus invellerisnaZimbabweArboretum1,215/3/95Eucalyptus propinguaPretoria R.S.A.Arboretum1,215/3/95Eucalyptus sovepinesAustralieArboretum1,215/3/95Eucalyptus inovepinesAustralieArboretum0,41,2Eucalyptus inovepinesAustralieArboretum0,415/3/95Eucalyptus inovepinesAustralieArboretum0,61,2Eucalyptus inovepinesAustralieArboretum1,215/3/95Eucalyptus inovepinesAustralieArboretum0,415/2/95Eucalyptus inovepinesAustralieArboretum1,215/2/95	Eucalyptus saligna		Arboretum	18,2	1820/g	24/4/95
Eucalyptic sideroxyton?1,224/4/95Eucalyptic sterictormisAustralicArboretum5,71193/g24/4/95Eucalyptic sterictormisZimbabweArboretum5,71193/g15/3/95Eucalyptic spliularisVilmorin (F)Arboretum2,315/3/95Eucalyptic spliularisZimbabweArboretum2,315/3/95Eucalyptic spliularisZimbabweArboretum2,315/3/95Eucalyptic spliularisZimbabweArboretum1,715/3/95Eucalyptic spliularisZimbabweArboretum1,715/3/95Eucalyptic spliulariaZimbabweArboretum2,915/3/95Eucalyptic spliulariaZimbabweArboretum2,162Eucalyptic spliulariaZimbabweArboretum1,715/3/95Eucalyptic spropinguaPretoria R.S.A.Arboretum1,215/3/95Eucalyptic sormutaZimbabweArboretum1,215/3/95Eucalyptic sormutaZimb + Pretoria R.S.A.Arboretum0,61,2Eucalyptic sormutaZimb + Pretoria R.S.A.Arboretum0,61,2Eucalyptic soresAustralicArboretum1,57415/3/95Eucalyptic soresAustralicArboretum1,57415/3/95Eucalyptic soresAustralicArboretum1,215/3/95Eucalyptic soresAustralicArboretum1,215/3/95Eucalyptic soresitaNyungweArboretum	Eucalyptus sideroxylon	Zimbabwe	Arboretum	17,2	1936/gr	
Decasyptics incredingAustralieArboretum4.424/4/95Eucalyptus maculataZimbabweArboretum3.474 %Eucalyptus punctataZimbabweArboretum3.474 %Eucalyptus clozianaAustralieArboretum2.3Eucalyptus clozianaAustralieArboretum2.3Eucalyptus clozianaAustralieArboretum2.3Eucalyptus botryoidesZimbabweArboretum2.9Eucalyptus portionaZimbabweArboretum2.9Eucalyptus portionaZimbabweArboretum2.3Eucalyptus portionaZimbabweArboretum2.1Eucalyptus portionaZimbabweArboretum2.3Eucalyptus portionaPretoria R.S.A.Arboretum2.3Eucalyptus propinguaPretoria R.S.A.Arboretum0.4Eucalyptus propinguaPretoria R.S.A.Arboretum0.4Eucalyptus faovepinesAustralieArboretum0.4Eucalyptus faovepinesAustralieArboretum0.4Eucalyptus faovepinesAustralieArboretum0.4Eucalyptus faovepinesAustralieArboretum0.4Eucale versifoliaEucale versifolia1.574Eucale versifoliaEucale versifolia1.574Eucale versifoliaEucale versifolia5.291Eucale versifoliaCanela RIO Grande1.275Finus eliotiiMahatsingo3.172185/95Freating	Eucalyptus sideroxylon		?	1,2		
Decasyptios entitionAttoretum3,41937g1937g1937gEucasyptis pitularisZimbabweArboretum3,474.%Eucasyptis pitularisVilmorin (F)Arboretum2,6Eucasyptis pitularisZimbabweArboretum1,7Eucasyptis pitularisPretoria R.S.A.Arboretum1,7Eucalyptis potrotaPretoria R.S.A.Arboretum2,9Eucalyptis potrotaZimbabweArboretum2,1Eucalyptis potrotaZimbabweArboretum2,1Eucalyptis propinguaPretoria R.S.A.Arboretum1,2Eucalyptis propinguaPretoria R.S.A.Arboretum1,2Eucalyptis propinguaPretoria R.S.A.Arboretum0,4Eucalyptis propinguaEucalyptis propingua0,41,2Eucalyptis propingaAustralieArboretum0,4Eucalyptis propingaAustralieArboretum0,4Eucalyptis panculataZimb + Pretoria RSAArboretum1,2Eucalyptis patensAustralieArboretum1,5Eucalyptis patensAustralieArboretum1,5Eucalptis patensAustralieArboretum1,2Eucalptis patensAustralieArboretum1,2Eucalptis patensAustralieArboretum1,2Eucalptis patensAustralieArboretum1,2Eucalptis patensAustralieArboretum1,2Eucalptis patensAustralieArboretum1,2Eucalptis	Eucalyptus tereucortas	Australia	Arboretum	4,4	11001	24/4/95
Eucajptus pilularisLimorin (F)Arboretum3,4/4 %Eucajptus pilularisZimbabweArboretum2,3Eucalptus pilularisZimbabweArboretum2,3Eucalptus clexianaAustralieArboretum1,8Eucalptus globius var. glob.Pretoria R.S.A.Arboretum2,9Eucalptus longifoliaZimbabweArboretum2,915/3/95Eucalptus propinguaPretoria R.S.A.Arboretum2,162Eucalptus propinguaPretoria R.S.A.Arboretum2,34/4 %Eucalptus propinguaPretoria R.S.A.Arboretum0,42,3Eucalptus panculataZimb + Pretoria RSAArboretum0,44/4 %Eucalptus panculataZimb + Pretoria RSAArboretum0,41/7Eucalptus laovepinesAustralieArboretum0,41/715/3/95Eucalptus laovepinesAustralieArboretum0,83/3/95Eucalptus laovepinesAustralieArboretum0,83/3/95Flemingia congestaNyungweArboretum5,2,67/4,7515/2/95Leucaena leucocephalaPretoria R.S.A.Arboretum5,2,67/4,7515/2/95Markamia platicalyxMahatsingo1,57417/5/95Prozopis juliforaCanela RIO GrandeRibuye1,279Prozopis julifora2,57018/5/952/57018/5/95Sesbania sculesta?Arboretum1,37218/5/95 <td>Eucalyptus cartosofa Eucalyptus maculata</td> <td>7 imbahuya</td> <td>Arboretum</td> <td>3,1</td> <td>L193/g</td> <td>15/3/95</td>	Eucalyptus cartosofa Eucalyptus maculata	7 imbahuya	Arboretum	3,1	L193/g	15/3/95
Encalypus punctataZimbabweArboretum2.73Bucalypus ClozianaAustralieAnthoretum1.8Bucalypus ClozianaPretoria R.S.A.Arboretum1.7Bucalypus globilus var. glob.ZimbabweArboretum2.9Eucalypus longifoliaZimbabweArboretum2.1Bucalypus longifoliaZimbabweArboretum2.3Eucalypus longifoliaZimbabweArboretum2.1Eucalypus longifoliaZimbabweArboretum1.7Eucalypus longifoliaZimbabweArboretum1.2Eucalypus propinguaPretoria R.S.A.Arboretum0.4Eucalypus patienaZimb + Pretoria RSAArboretum0.45Eucalypus patensZimb + Pretoria RSAArboretum0.45Eucalypus patensAustralieArboretum0.4Eucalypus patensButare, Cyangugu16.1.415/3/95Flemingia congestaNyungweArboretum5.291Flewingia encocephalaPretoria R.S.A.Arboretum5.291Markhamia platicalyxKibuye1.76022/3/95Markhamia platicalyxMahatsingo1.4538915/2/95Arboretum3.77.518/5/9521/95Sesbania scheraIndeNyabisindu19,817/5Sesbania schera1.050-18/5/95Sesbania schera1.050-18/5/95Sesbania schera1.050-18/5/95<	Eucalyntus pilularis	Vilmorin (F)	Acharetum	3,4	14 70	
Eucalyptus icozians Eucalyptus macroryncha Eucalyptus botryoidesAustralie Pretoria R.S.A.Arboretum Arboretum1.7 2.9 2.11Eucalyptus botryoides Eucalyptus propinqua Eucalyptus propinqua Eucalyptus propinqua Eucalyptus provinqua Eucalyptus inovepines Eucalyptus inovepines Australie Australie Arboretum Arboretum Arboretum Arboretum Arboretum1,7 2,7 4,7 4,7 4,7,7 4,7,7 4,7,7,8,7,7,8,7,7,8,7,7,8,7,7,8,7,7,8,7,7,8,7,7,8,7,7,8,7,7,8,7,7,8,7	Eucalyptus punctata	Zimbabwe	Arboretum	2,3		
Eucalyptus macroryncha Eucalyptus botryoidesPretoria R.S.A.Arboretum1.7 2.9 Arboretum15/3/95Eucalyptus botryoides Eucalyptus botryoidesZimbabwe Zimbabwe Zimbabwe Eucalyptus propinguaArboretum Arboretum2,1 2.3 Arboretum62Eucalyptus propingua Eucalyptus propingua Eucalyptus cornuta Eucalyptus cornuta Eucalyptus cornuta Eucalyptus lawepinea Eucalyptus cornuta Eucalyptus alowepinea Eucalyptus alowepinea Eucalyptus cornuta Eucalyptus alowepinea Eucalyptus alowe	Eucalyptus cloeziana	Australie	Arboretum	1.8		
Eucalyptus globilus var. glob. Eucalyptus longifoliaZimbabwe ZimbabweArboretum Arboretum2,9 2,115/3/95Eucalyptus longifoliaZimbabwe ZimbabweArboretum Arboretum2,1 1,76215/3/95Eucalyptus propinqua Eucalyptus propinquaPretoria R.S.A.Arboretum Arboretum2,3 2,315/3/95Eucalyptus propinqua Eucalyptus patens Eucalyptus laovepinesZimb + Pretoria RSA ArboretumArboretum 0,40,4 412Eucalyptus patens Eucalyptus laovepinesAustralieArboretum Arboretum0,45 412Eucalyptus laovepines Eucalyptus laovepinesAustralieArboretum Arboretum0,8 43/3/95Eucalyptus laovepines Eucalyptus laovepines Eucalepitus accephalaNyungwe Arboretum161,4 415/3/95Leucaena leucocephala Pretoria R.S.A.Pretoria R.S.A. ArboretumArboretum 45,291 4Maesospis eminii Prus patulaPretoria R.S.A. KibuyeKibuye17,0 60 422/3/95Markamia platicalyx Prosopis julifora Sesbania seeban Sesbania seebanInde 37,375 75 18/5/9518/5/95 70 18/5/95Prosopis julifora Sesbania seuleati Pretoria R.S.A.Inde Arboretum37,3 75 18/5/9510 9Prosopis julifora Sesbania seuleati Pretoria R.S.A.Inde Arboretum17,2 75 18/5/9518/5/95 70 75 70 75 76 76 76 77 75 76 76 76 77 7618/5/95 70 75 70 75 76 76 	Eucalyptus macroryncha	Pretoria R.S.A.	Arboretum	1.7		
Eucalyptus bolryoidesZimbabweArboretum2,162Eucalyptus propinquaZimbabweArboretum1,762Eucalyptus propinquaPretoria R.S.A.Arboretum2,3Eucalyptus ruellerianaArboretum0,4Eucalyptus paniculataZimbabweArboretum0,6Eucalyptus soroutaZimbabweArboretum0,6Eucalyptus cornutaZimbabweArboretum0,6Eucalyptus paticulataZimbabweArboretum0,6Eucalyptus soroutaZimbabweArboretum0,6Eucalyptus patiensAustralieArboretum0,6Eucalyptus laovepinesAustralieArboretum0,8Flemingia congestaNyungweArboretum1,5Grevillea robustaButare, Cyangugu161,415/3/95Leucaena diversifoliaPretoria R.S.A.Arboretum52,6Fretoria R.S.A.Arboretum5,291Markhamia platicalyxKibuye, Kibungo1453Markhamia platicalyxKibuye17,060Pinus gatula1,27917/5/95Pinus elliotiiMahatsingo?3,172Prosopis julifora?Arboretum37,575Seshania seuleata?Arboretum37,575Seshania seuleata?Arboretum37,575Seshania seuleata?Arboretum37,575Seshania seuleata2,57018/5/95Seshania seuleat	Eucalyptus globilus var. glob.		Arboretum	2,9		15/3/95
Eace splus song totalZintosoveArboretum1,7Eucalyptus propinguaPretoria R.S.A.Arboretum2,3Eucalyptus spaniculataZimb + Pretoria R.S.A.Arboretum0,4Eucalyptus paniculataZimb + Pretoria R.S.A.Arboretum0,6Eucalyptus sorutaZimb + Pretoria R.S.A.Arboretum0,6Eucalyptus laovepinesAustralieArboretum0,8Eucalyptus laovepinesAustralieArboretum0,8Eucalyptus laovepinesNyungweArboretum0,8Flemingia congestaNyungweArboretum1,5Grevilla robustaPretoria R.S.A.Arboretum5,2Leucaena diversifoliaPretoria R.S.A.Arboretum5,2Leucaena leucocephalaPretoria R.S.A.Arboretum5,2Markhamia platicalyxArboretum5,291Mimosa scabrellaCanela RIO GrandeKibuye1,7,0Pinus platia1.0eNyabisindu19,8Prosopis juifilora?Arboretum37,5Sesbania sculeata?Arboretum37,5Sesbania sculeata?Arboretum37,5Sesbania sculeata1.0eNyabisindu19,82242,19 Kg1,050-2242,19 Kg1,050	Eucalyptus bolryoides	Zimbabwe	Arboreium	2,1	62	
Eucarpitus programaPretoria R.S.A.Amoretum2,3Eucarpitus muelleriana1,2Eucarpitus muelleriana1,2Eucarpitus panena2,3Eucarpitus panena2,3Eucarpitus panena2,3Eucarpitus panena4Eucarpitus panena1,2Eucarpitus panena1,5Eucarpitus panena1,1 </td <td>Eucalyptus tonghona</td> <td>Limosowe Designin D.C.A</td> <td>Arboretum</td> <td>1,7</td> <td></td> <td></td>	Eucalyptus tonghona	Limosowe Designin D.C.A	Arboretum	1,7		
Lucal priorAutoretum1,2Eucal priorArboretum0,4Eucal priorAustralieArboretumEucal priorIndocetum0,45Eucal priorAustralieArboretumEucal priorAustralieArboretumEucal priorIndocetum0,45Eucal priorAustralieArboretumFlemingia congestaNyungweArboretumGrevilleaButare, Cyangugu161,4Eucal prior5,291Leucaena diversifoliaPretoria R.S.A.ArboretumLeucaena leucocephalaPretoria R.S.A.ArboretumMaesospis eminiiCanela RIO Grande1,2Pinus patitisMahatsingo?Pinus patitisIndeProsopis juliflora?Sesbania sesbanIndeSesbania sculeata?Zetucata2,5Zorda grandis?Zetuca grandis1,0Son agrandis1,0Sesbania sculeata2,5Zetuca grandis1,0Sesbania sculeata2,5Zetuca grandis1,0Sesbania sculeata2,5Sesbania sculeata2,5Zetu agrandis1,0Sesbania sculeata2,5Sesbania sculeata2,5Zetu agrandis1,0Sesbania sculeata2,5Sesbania sculeata2,5Sesbania sculeata2,5Sesbania sculeata2,5Sesbania sculeata2,5Sesbania scul	Fucalynus muelleriana	riciona R.S.A,	Arborelum	2,3		
Eucalyptus cornutaZimb + Pretoria RSAArboretum0,4Eucalyptus patensAustralieArboretum0,65Eucalyptus laovepinesAustralieArboretum0,45Eucalyptus laovepinesAustralieArboretum0,8Elenandrophragma excelsumNyungweArboretum0,8Flemingia congestaNyungweArboretum1,5Grevillea robustaButare, Cyaogugu161,415/3/95Leucaena diversifoliaArboretum5,291Leucaena leucocephalaPretoria R.S.A.Arboretum5,291Maesospis eminiiStatus1,279Markhamia platicalyxKibuye, Kibungo14538915/2/95Mimosa scabrellaCanela RIO Grande1,279Pinus elliottiiMahatsingo?0,954 %Prosopis juliflora?Arboretum37,575Sesbania scubataIndeNyabisindu19,8-Sesbania aculeata2,57018/5/95Sesbania aculeata4,09,418/5/95Tectona grandis-1,050-2242,19 Kg	Eucalyptus paniculata		Arboretum	1,2		
Eucalypus patens Eucalypus laovepines Entandrophragma excelsumAustralieArboretum Arboretum0,8 	Eucalyptus cornuta	Zimb + Pretoria RSA	Arboretum	0,4 0.6		
Eucalyptus laovepinesAustralieArboretum1,2Entandrophragma excelsumArboretum0,83/3/95Elemingia congestaNyungweArboretum0,83/3/95Grevillea robusta1,57415/3/95Leucaena diversifoliaArboretum52,674,7515/2/95Leucaena diversifoliaArboretum5,29115/2/95Leucaena diversifoliaArboretum5,29115/2/95Leucaena leucocephalaPretoria R.S.A.Arboretum5,29115/2/95Maesospis eminiiKibuye, Kibungo14538915/2/95Markhamia platicalyxKibuye17,06022/3/95Mimosa scabrellaCanela RIO Grande1,27917/5/95Pinus patulaProsopis juliflora?3,17218/5/95Sesbania macrantha?Arboretum37,57518/5/95Sesbania aculeata?Arboretum37,57518/5/95Sesbania aculeata10/5/95.Tectona grandisLeucataProsopis julificraProsopis julificraSesbania aculeataLeucaena<	Eucalyptus patens		Arboretum	0.45		
Entandrophragma excelsumNyungweArboretum0,83/3/95Flemingia congestaNyungweArboretum1,574Grevillea robustaButare, Cyangugu161,415/3/95Leucaena diversifoliaArboretum52,674,7515/2/95Leucaena leucocephalaPretoria R.S.A.Arboretum52,29115/2/95Maesospis eminiSaberetum5,29115/2/9514538915/2/95Markhamia platicalyxKibuye, Kibungo14538915/2/9512/95Minosa scabrellaCanela RIO Grande1,27917/5/95Pinus patulaMahatsingo?3,17218/5/95Prosopis juliflora?0,954 %-Sesbania sesbanIndeNyabisindu19,8-18/5/95Sesbania aculeata?Arboretum37,57518/5/95Sesbania aculeata?Arboretum37,57018/5/95Tectona grandis1,0502242,19 Kg18/5/95	Eucalyptus laovepines	Australie	Arboretum	1,2		
Pretningia congestaNyungweArboretum1.574Grevillea robustaButare, Cyangugu161,415/3/95Leucaena diversifoliaArboretum52,674,7515/2/95Leucaena leucocephalaPretoria R.S.A.Arboretum5,29115/2/95Maesospis eminiiKibuye, Kibungo14538915/2/95Markhamia platicalyxKibuye, Kibungo14538915/2/95Mimosa seabrellaCanela RIO Grande1,27917/0Pinus patulaMahatsingo?3,17218/5/95Prosopis juliflora?Nyabixindu19,8-18/5/95Sesbania sesbanIndeNyabixindu37,57518/5/95Sesbania aculeata?Arboretum37,57518/5/95Tectona grandis2242,19 Kg-	Enlandrophragma excelsum		Arboretum	0,8		3/3/95
Bittere, Cyangugu161,415/3/95Leucaena diversifoliaArboretum52,674,7515/2/95Leucaena leucocephalaPretoria R.S.A.Arboretum5,29115/2/95Maesospis eminiiSituye14538915/2/95Markhamia platicalyxKibuye14538915/2/95Mimosa seabrellaCanela RIO Grande1,27917/50Pinus elliottiiMahatsingo?3,17218/5/95Prosopis juliflora?0,954 %18/5/95Sesbania sesbanIndeNyabisindu19,818/5/95Sesbania aculeata?Arboretum37,57518/5/95Sectona grandis1,050-2242,19 Kg10	Gravillas robusts	Nyungwe	Arboretum	1,5	74	
Detacha diversional Leucaena leucocephala Maesospis eminii Maesospis eminii 	Leucenn diversifalia		Bulare, Cyangugu	161,4		15/3/95
Maesospis emini Maesospis emini Markhamia platicalyx Minosa scabrella1/100/14 K.S.A.Arboretum Kibuye5,29115/2/95Markhamia platicalyx Minosa scabrellaCanela RIO GrandeKibuye14538915/2/95Minosa scabrella Pinus elliottii Prosopis juliflora Sesbania scubata Sesbania aculeata Sesbania aculeata Tectona grandisCanela RIO GrandeKibuye17,06022/3/95Mahatsingo1,27917/5/9517/218/5/9517/5/9518/5/95Sesbania sesban Sesbania aculeata Sesbania aculeata Sesbania aculeata1ndeNyabisindu Arboretum19,8-18/5/95Tectona grandis22,57018/5/95-2242,19 Kg2242,19 Kg	Leucaena leucocenhala	Protonin P.S.A	Arboretum	52,6	74,75	15/2/95
Markhamia platicalyx Mimosa scabrellaCanela RIO GrandeRiduye, Kiduigo14338915/2/95Mimosa scabrella Pinus elliottijCanela RIO GrandeKibuye17,06022/3/95Pinus elliottij Prosopis juliflora Sesbania sesbanMahatsingo717,5/9517/5/95Sesbania macrantha Sesbania aculeata Sesbania aculeata Tectona grandisInde954 %1Tectona grandis27918/5/951Z242,19 Kg222291	Maesospis eminii	Piciona R.S.A.	Kihuma Kihuman	5,2	91	15/2/95
Mimosa scabrella Pinus patula Pinus elliottijCanela RIO GrandeRiotyc17,000222/3/95Pinus patula Pinus elliottijMahatsingo1,27917/5/95Prosopis juliflora Sesbania sesban93,17218/5/95Sesbania macrantha Sesbania aculeata Sesbania aculeata Tectona grandis1ndeNyabisindu19,8-Tectona grandis4,09418/5/952242,19 Kg	Markhamia platicalyx		Kibuye, Kibungo	1403	89	15/2/95
Pinus patula Pinus elliottii Mahatsingo Kibuye 17,4 27,4 19 Pinus elliottii Mahatsingo ? 3,1 72 18/5/95 Prosopis juliflora ? 0,9 54 % - Sesbania sesban Inde Nyabisindu 19,8 - 18/5/95 Sesbania aculeata ? Arboretum 37,5 75 18/5/95 Sesbania aculeata 4,0 94 18/5/95 Tectona grandis 1,0 50 - 2242,19 Kg - - -	Mimosa scabrella	Canela RIO Grande	· subtry to	17,0	00	22/3/95
Pinus elliottii Mahatsingo 11/3/93 Prosopis juliflora ? 3,1 72 18/5/95 Sesbania sesban Inde Nyabisindu 19,8 - 18/5/95 Sesbania aculeata ? Arboretum 37,5 75 18/5/95 Sesbania aculeata ? Arboretum 37,5 75 18/5/95 Sesbania aculeata 2,5 70 18/5/95 1,0 50 - Tectona grandis 1,0 50 - 2242,19 Kg 2 -	Pinus patula		Kibuye	27 4	19	17/5/04
Prosopis julifora ? 0.9 54 % 18/5/95 Sesbania sesban Inde Nyabisindu 19,8 - 18/5/95 Sesbania aculeata ? Arboretum 37,5 75 18/5/95 Sesbania aculeata 2,5 70 18/5/95 1.0 50 - Tectona grandis 2242,19 Kg 2242,19 Kg - - - -	Pinus ellionij	Mahatsingo		3.1	77	18/5/04
Josephilis scipari Inde Nyabisindu 19,8 - 18/5/95 Sesbania acuteata ? Arboretum 37,5 75 18/5/95 Sesbania acuteata . <	Prosopis julillora Sanbaria analan		?	0,9	54 %	- 10,0175
Sesbania aculeata 7 18/5/95 Sesbania aculeata 4,0 94 18/5/95 Sesbania aculeata 2,5 70 18/5/95 Tectona grandis 1,0 50 - 2242,19 Kg 2 2 5 -	Scauente macrantha	Inde	Nyabisindu	19,8		18/5/95
Sesbania aculcata 4.0 94 18/5/95 Tectona grandis 2,5 70 18/5/95 1.0 50 - 2242,19 Kg -	Sesbania aculeata	f	Arborctum	37,5	75	18/5/95
Z.5 70 18/5/95 1.0 50 - 2242,19 Kg - -	Sesbania aculcata			4,0	94	18/5/95
2242,19 Kg	Tectona grandis			2,5	70	18/5/95
2242,19 Kg	······································		N	1,0	30	-
				2242,19 Kg		

Table 2. List of seeds harvested locally in the period Feb. - June, 1995

SPECIES	PROVENANCE	QUANTITY (kg)	% germinstion	Date
Acrocarpus fraxinifolius	Arboretum	12.85	58	22/3/95
Callitris robusta	Arboretum	15,6	51	17/3/95
Calliandra calothyrsus	Arboreium	4,0	60	3/6/95
Calliandra calothyrsus	Rubona	5.0	61	3/6/95
Calliandra calothyrsus	Shyanda	47,0		-
Cedrela serrata	Arborelum	20,0		~
Chamaccytisus palmensis	Rwerere	30,0	57	
Cassia spectabilis	Butare (U.N.R)	15,0	-	~
Flemingia congesta	Arboretum	1,5		
Grevillea robusta	Shyanda	150,0		
Eucalyptus grandis	Arboretum	7,25	1820 PL/g	24/5/95
Eucalyptus saligna	Arborelum	18.2	1936 PL/g	24/5/95
Eucalyptus tereticornis	Arboretum	15,3	1193 PL/2	24/5/95
Eucalyptus maideni	Gisovu(Kibuye)	100,0	, i	-
Eucalyptus microcorys	Arboretum	1,5		-
Pinus patula	Gisovu(Kibuye	30,0	-	
Enlandrophragma excelsum		3,0		-
Markhamia platycalyx	Kibuye	17	79 %	22/3/95
Leucaena diversifolia	Arboretum	12,0	91 %	15/3/95
Sesbania macrantha	Arboretum	35,0	94 %	18/5/95
Sesbania aculeata	Arboretum	2,5	70 %	18/5/95
Sesbania sesban	Kibuye	1,0	-	-

Other duties done within the period include :

- visiting and assessment of various seed sources all over the country.

- Drying, processing, germination test and storage of seed that were obtained in the period.

- Pretreatment tests for dormant seeds eg. Chamaecytisus <u>Palmensis</u>.

- Processing of research data collected before the war that were not yet processed. - Advertisement of TSC's activities and services it can

offer was made through - Letters

- supply of seed catalogue to various organs and individuals.

ICRAF was requested to edit TSC's seed catalogue in bronchure form. No response to date has been given.

The total amount of money collected through seed selling up to 30/6/1995 was 1.266.144 FRW (Table 3).

CDECIES	OULANTTOY	PEVENITE (FOW)
	- WORKLITT	
Aberia caffra	0.2	856
Acacia mearnsii	9	17100
Acacia melanoxylon	6	95280
Acrocarpus fraxinifolius	0.3	1863
Alnus acuminata	3	212156
Calliandra calothyrsus	9.7	109917
Callitris robusta	0.5	4000
Cassia spectabilis	2.9	9702
Casuarina equisetifolia	1.55	4050
Cedrela serrata	4.2	13260
Chamaecytisus palmensis	5	165000
Cupressus lusitanica	0.3	594
Desmodium incinatum	2	24840
Eucalyptus camaldulensis	1	4060
Eucalyptus grandis	10.5	39585
Eucalyptus maideni	16	43900
Eucalyptus saligna	21	63140
Eucalyptus tereticornis	6	24360
Flemingia congesta	1.4	2800
Grevillea robusta	10.2	116116
Leucaena diversifolia	55.6	289772
Maesopsis eminii	0.5	320
Pinus patula	0.2	2977
Sesbania macrantha	0.5	655
Sesbania sesban	6.6	11266
Emballage		8575
TOTAL	174.15	1266144

<u>Table 3</u>: Quantity and species of seed sold revenue obtained by TSC up to 30/6/1995

Starting from 1/7/1995 onwards, TSC continued its routine activities. Tables 4 and 5 show species and quantities of seed harvested in the period and that sold and corresponding revenue respectively.

Table 4: List and quantity of seed harvested (1/7-30/9/1995)

SPECIES	PROVENANCE	QUANTITY(KG)
Acacia mearnsii	Rwerere + Gitarama	189.9
Cedrela serrata	Arboretum de Ruhande	30.0
Chamaecytisus palm.	Rwerere	11.5
Cassia spectabilis	Butare	20.9
Cupressus Jusitanica	Arboretum de Ruhande	15.5
Eucalyptus grandis	Arboretum de Ruhande	4.5
Eucalyptus saligna	Arboretum de Ruhande	5.2
Entada abyssinica	Muyaga (Butare)	0.6
Entandrophragma exc.	Arboretum de Ruhande	1.7
Leucaena diversifolia	Arboretum de Ruhande	76.4
Calliandra calothyrsus	Shyanda (Butare)	203.4
Entada abyssinica	Mugusa (Butarc)	2.3
Grevillea robusta	Shyanda (Butare)	47
Sesbania seshan	Shyanda (Butare)	99
Thebrosia vogelii	Butare	30
	695.9	

Table 5. List of species seed sold and their respective unit price and total revenue obtained from 1/7 - 30/9/1995

SPECIES	QUANTITY (KG)	UNIT PRICE (FRW)	TOTAL REVENUE (FRW)
Alnus acuminata	1.1	87040	95744
Acacia mearnsii	1.0	1900	4900
Acrocarpus fraxinifolius	0.2	3260	652
Cassia spectabilis	10.1	3960	39996
Calliandra calothyrsus	22.1	12420	274482
Chamaecytisus palmensis	8.0	33000	264000
Cedrela serrata	1.0	5100	5100
Eucalyptus maideni	2.0	2440	4880
Eucalyptus tereticornis	4.0	4060	16240
Eucalyptus saligna	5.0	3080	15400
Eucalyptus camaidulensis	14.2	4060	57652
Grevillea robusta	41.2	12760	525712
Leucaena diversifolia	17.0	5240	89080
Pinus patula	1.0	29770	29770
Sesbania sesban	5.08	2620	13310
Sesbania macrantha	4.0	2620	10480
Tehrosia vogelii	4.0	3000	12000
TOTAL	145.06		1456398

3. THE MAIN PROBLEMS FACED BY TSC

As mentioned in the introductory part of this paper, the main problems faced by TSC include:

- . Lack of transport facility
- . Lack of enough research personnel
- . Matching of imported seed delivery with time requirement by customers
- . Lack of appropriate seed storage container, as these are not available in the country

4. CONCLUSION/RECOMMANDATION

We are requesting our sponsors to let us buy at least one car so as reduce our transport problems. We also request higher authority to let us have more scientists, at least one technician who will help in research activities.

As seen from this report, Seeds of Hope relates to TSC in the sense that both intends to ensure availability improved seed for the betterment of the society.

Pury FLUGUNGA CANISIUS The Head, Tree Seed Centre P.o. Box 617, BUTARE RWANDA.

WORLD VISION AGRICULTURAL PROGRAM, WHAT DO WE DO AND PERSPECTIVES PRESENTED TO THE MEETING OF SEED OF HOPE HELD AT RUBONA, RWANDA ON 17 OCTOBER 95.

By Dr. D.K.Kiala and S.Kantengwa

World Vision International is a non governmental organization (ONG)which operates in more than 90 countries in the world. It is a christian humanitarian organization with the mandate to alleviate the suffering of the population. In Rwanda,WVI is committed for a long term i.e. it will continue to build on the life-saving activities of today for a more stable transition period and development. WV has activities in sectors of agriculture, health, unaccompanied children, food and survival inputs. Through the agreements reached with the Ministry of Agriculture(MOA) and the Seed of Hope(SOH) initiative, WV has become the main agency in extending the crop and farming improvements available through international agricultural research and development institutions which formerly operate in Rwanda. The agriculture branch of WV operates in Rwanda under the designation of Rwanda Emergency Agriculture Program in the following prefectures:Gikongoro,Kigali (Kanazi), and Ruhengeri-Gisenyi.

In collaboration with Seed of Hope, WV act as principal operational unit for diffusion of improved crop varieties supplied by SOH initiative. For that WW is called on to multiply improved crop varieties for direct distribution to Rwandan farmers. Mixing in with multiplication is an active selection, cleaning, adaptation, and sorting process i.e. crop improvement. WV received through CIAT for multiplication and evaluation by farmers 90 kg and 600 kg, respectively of two varieties of improved beans seeds, Cal 96 and MCM 5001. Based on a limited number of interviews, we found that the two varieties have been well accepted in Gikongoro, while only variety MCM 5001 was accepted in Kanazi. Kanazi farmers very much appreciated the high yield of MCM 5001 expressed by the high number of pods produced per plant. Cal 96 is an early maturing variety. In both prefectures farmers continue to multiply the varieties. WV also received from CIAT for verification and validation 50 kg of Umubano, 50 kg of Urunyumba, 5 kg of Vunikingi, 5 kg of Flora and 2 kg of Ngwinurare. The materials were multiplied and evaluated at Kinigi station and are now being multiplied by farmers and other NGOs. WV recovered the only existing beans germplasm in Rwerere station. In addition to this germplasm, WV received from CIAT different lines of beans originated from Uganda (68 varieties) and Tanzania (47 varieties). The materials have been harvested and ready to be distributed in different Rwanda ecological zones for multiplication and diffusion. The primary results from the evaluation of the materials by the expert farmers in Kanazi and Rwerere show that farmers were selecting seeds which were comparable to their own varieties in color, size and shape. Seeds of small size were selected for poor soils and those of big size for rich soils. Most of the female farmers did not select climbing beans because of work involved in stacking.

The MOA requested WV taking over tissue-cultured mini-tubers which were in danger of rotting in their PNAP laboratory in Ruhengeri. At least 50,000 tissue-cultured mini-

tubers, variety Sangema, were recovered and planted at Kinigi station. Also in collaboration with the MOA 50,000 minitubers of Cruza and 15,000 minitubers of Sangema were received from Vitrobio, Belgium to complete the germplasm. From Kinigi station WV was able to recover 2,500 kg of Sangema and 1,000 kg of Cruza. From Tamira station, WV recuperate and recovered 5,000 kg of Mabondo, 5,000 kg of Mizero, 7,000 kg of Kirundo and 5,800 kg of Cruza. All these materials were planted either at Kinigi station or given to contract farmers for multiplication. All of the potatoes which WV is maintaining and multiplying represent the only pure source of potatoes germplasm in Rwanda and will continue to be the source of all seed potatoes for Rwanda farmers.

In collaboration with CIP (June 95), WV received 7,430 kg of potatoes seeds variety Cruza. The materials were distributed to 17 associations of farmers in Gikongoro for multiplication and will be harvested soon. WV also received from CIP 600 kg of minitubers from stems cutting of three varieties: Mabondo Sangeme and Cruza which u_{12} awaiting to brake the dormancy.

During the conflict, all the breeder stocks of maize varieties were pillaged, WV has been able to recover relatively pure seeds of Pool 8A from farmers fields near Tamira station. At WV's request CIMMYT-Kenya was able to provide 5 kg of Pool 5A from their headquarters in Mexico and the seeds are now being multiplied at Kinigi station. Later SSS provided WV with 30 kg of Pool 8A. At least 20,000 oobs of Pool 8A were harvested and distributed to ISAR Rwerere, PNAP Ruhengeri and farmers. The full and half sibs materials are being tested in progeny test at Kinigi station.

In collaboration with FAO, WV is multiplying sweet potato in Gikongoro with contracted farmers. With MOA, WV is multiplying sweet cassava in Kanazi.

From ICRISAT, WV received 2 kg of Cyatanobe, which is under multiplication at Kinigi station.

WV will act with SOH as a pipeline of information down to and up from the farmer level i.e. it will feed back information about desirable and undesirable technology, and feed forward information about acceptability and adoption of technology. We collected information about the destiny of the seeds and tools we distributed. Preliminary data showed that K20 beans seeds were well appreciated by farmers in Kanazi and most planned to plant them again in the future. In Gikongoro and Ruhengeri, the highland mix did not perform as well as the farmers'own varieties. It was observed that at Gikongoro, most of the seeds distributed were consumed.

WV will continue to carry out on-farm verification/validation trials of promising technologies for adaptation. ZM 607 maize variety and Pool 9A for example will be distributed to farmers for multiplication and evaluation.

In agroforestry WV initiated a small program with 300 farm families in Nkuli commune to grow 4 species of trees (*Grevillea abusta, Calliandra calothyrsus, Alnus sp. and Sesbania sesban*), which will meet farmers' needs for firewood, animal forage, green manure, stakes for climbing beans and erosion control. The program included training of both men and women farmers, training of agronomists, visits to the agro-forestry station at Rwerere and follow-up evaluation. WV used the experiences to enhance agro-forestry activities on a large scale. W will continue to collaborate with the MOA and ISAR and serves as a highly mobile and responsive team of technicians to meet the needs of both MOA and ISAR. It will continue to oversee the re-launching of basic seed multiplication activities on-farm level and if necessary on-station level.

WV has been designed to allow efficient turnover of operation to MOA and ISAR. As those institutions get structured WV will hand over some of its activities in other to consider those most essential for continued development. It is intended to reduce its involvement in germplasm maintenance of beans and potatoes. In that view, WV is handing over beans and potatoes germplasms to ISAR for management. However, WV will continue to work with the respective research groups of the SOH initiative, the MOA and ISAR in order to achieve similar results with maize, sorghum, cassava, soybeans and wheat.

APPENDIX 7

Report 5

Report of the Ad Hoc Meeting Among CGIAR Centers on SOH I Activities November 1995-February 1996, ILRI, Nairobi, 13 February 1996.

SOH RWANDA/PCR/JULY 96/WRS

1 .

REPORT OF THE AD HOC MEETING AMONG CGIAR CENTERS ON SOH I ACTIVITIES FOR THE PERIOD NOVEMBER 1995 - FEBRUARY 1996

HELD AT ILRI, NAIROBI 13 FEBRUARY 1996

This meeting which opened at 9:00am was called by Dr W.R. Scowcroft at short notice to provide a brief update of activities by CGIAR Centers, decide allocation of SOH funds assigned to CGIAR Centers for training and equipment and facility refurbishment and to confirm the extension of Dr Kande Matungulu as SOH I coordinator jointly with the SOH II initiative for the Greater Horn of Africa.

CGIAR Center representatives present were:-

CIP/PRAPACE - Dr Peter Ewell, Dr N. Lutaladio CIAT - Dr Wayne Youngquist ICRISAT - Dr Stan King IPGRI - Dr Frank Attere, Dr Dan Kiambi SOH - Dr Bill Scowcroft, Ms Caroline Polak Scowcroft, Dr Kande Matungulu Apologies from CIMMYT, ICRAF and IITA.

I. ACTIVITY REPORTS

A. BEANS - CIAT

This report includes observations made during the period 14-18 February immediately following the 13 february meeting in Nairobi.

In general there are signs of improvement in the physical infrastructure at Rubona, though the site is still occupied by military personnel. At Ruhengeri only minimal improvements have occurred and the situation with land at the ISAR Kinigi farm is disconcerting where most of the 300 hectare site has been occupied by the Ministry of Defense and Ministry of Rehabilitation.

(i) Bean Meeting with ISAR. This meeting held 15 February reviewed trials from last season. Though the bean seed had been harvested, it had not yet been weighed. Field evaluations had indicated a number of lines that had good pod load and low disease incidence (Table 1). Generally, the season at Rwerere was good and acceptable at Karama. At Rubona the climbers did better than the bush beans. The check variety for bush beans is Urugezi and appeared to be the top line at Rubona. Disease incidence at Karama and Rubona was minimal, but anthracnose was severe at Rwerere, seriously affecting Urugezi.

The Rwandan bean trials to be planted in the 1996B season (planting 2-3/96) are listed in Table 1. The bush varieties RAB 487, RAB 494 and RWR 911 and the climbers LAS 328, RWV 296 and RWV 295 will be put into 'pre-diffusion' seed multiplication for wider on-farm testing. Dr. Buruchara is conducting trials with students at the University of Rwanda in Butare and will have the following pathology trials at Rubona and elsewhere:-

- * Evaluation of Core Collection and other IBN entries for root rot resistance;
- * On-farm evaluations of promising root rot resistant entries in collaboration with WVI;
- * Evaluation of BCMV and ALS nurseries.

Dr. Youngquist will continue the crossing of Fusarium and root rot tolerance into released susceptible lines and into the collection of BRC climbers from Cali. The collection of lines from the BSM tolerant population from Arusha will be planted for evaluation and multiplication. The number of trials proposed is a definite strain on the program, but they can be managed. On farm sites will be limited due to transportation constraints.

(ii) Collaboration with FAO/World Bank. The FAO/WB facilitator, Mr Daniele Donati indicated that the lines A321, H 75, and RWK 5 were giving good results in the field and were being found to be highly acceptable by consumers. It is interesting to note that H 75 and A321 (lines released in Burundi but not Rwanda) were initially met with indifference by SSS and MINAGRI since they were not 'Rwandan' materials. RWK 5 was a line in initial release in Rwanda (1994) and was not previously well known. Other lines that were being increased: Ngwinurare, Vuninkingi, Umubano and Flor de Mayo, were reported as doing well. All of these lines came from seed supplied by SOH-CIAT and has just been harvested from about 40 ha of land distributed among various small holders. SSS was also multiplying some of this seed under their own management.

(iii) Collaboration with World Vision. World Vision has indicated that the seed of Cal 96 and MCM 5001 (taken to Rwanda 9/94 from Uganda) has been distributed to at least 1000 farmers. MCM 5001 is doing particularly well in the Karama area (where BCMV is a problem) and CAL 96 is doing well in the Gikongoro area.

(iv) Other

Limited plantings are underway in Arusha, Tanzania and Eastern Zaire as a security measure to ensure sufficient seed is available to continue to supply vulnerable areas.

Impact analysis will continue during 1996B and additional targeted genetic collections will be made in April for analysis of the change or otherwise in quality and quantity.

The lack of funding for ISAR continues to be a serious problem. In the short term (1 year), it seems that a manageable program can be maintained that will supply a nucleus of material and trained people for ISAR. However, committed longer term funding from traditional donors will be required to sustain the program.

TABLE 1. Leading bean lines (based on vegetative characteristics) from advanced and intermediate 1996A variety trials at Rubona, Rwerere and Karama.

Trial	Туре	Rubona	Rwerere	Karama
Essai Comparitive (advanced)	Climbers	RWV 378 RWV 377 LAS 432	LAS 405 RWV 378 LAS 400	
	Bush	RWR 1742 RWR 1802 RWR 1783	AND 932 RWR 1668 MORE 92038 RWR 1802	RWR 1783 RWR 1802 A 783
2nd Phase (intermediate)	Climbers	CAB 19 NG 224-4 [*] RWV 411	RWV 407 ASC 58 Melange-Buberuka	
	Bush	IZO 20 1518 RWR 1893* RWK 5*	RWK 10 RWR 189	RWK 10 IZO 20523/6B

* Material showed Anthracnose problem at Rwerere

TABLE 2.Trials proposed for planting during 1996B season (2/96-7/96) at
Rubona, Rwerere and Karama

- I. Breeding Trials
 - A. Line evaluations
 - 1. PRELAAC 7&8
 - 2. VEF 93 and IBN 94
 - 3. Pre-triage
 - 4. Triage
 - 5. Essai comparitif variétal
 - 6. Essai comparitif multilocal (Phase I et II)
 - 7. Pre-diffusion multiplication
 - 8. Segregating populations
 - B. Breeding Nursery Fusarium and root-rot
 - C. Bean Stem Maggot Breeding materials evaluation
 - D. On-farm evaluations

II. Pathology Trials

- A. Root rots evaluation of core collection materials
- B. BCMV nursery
- C. ALS nursery

B. SORGHUM - ICRISAT

1. ISAR requested ICRISAT for additional seed of a mid-altitude sorghum variety for distribution to Rwandan farmers. ICRISAT was unable to meet this request beyond the 600 kg supplied in August 1995 because Rwandan authorities had requested some time ago that additional seed multiplication for Rwanda be carried out in Rwanda by ISAR or MINAGRI.

2. At ISAR's request, ICRISAT-Kenya sorghum scientists assisted ISAR's sorghum improvement coordinator with development of workplans for the 1996B season, including additional multiplication in Rwanda of seed of key sorghum varieties and development of a research agenda and experiments. Research planned includes the testing of over 200 lines at three elevations (Karama, Rubona, Rwerere) for adaptation to Rwandan conditions and surveying for *Striga hermonthica* in major low to mid-elevation areas of sorghum production.

3. Two scientists and two technicians received 5 weeks of practical training in sorghum research in Kenya 20 October - 3 December 1995. Using three kenya locations they gained experience in all aspects of field research from layout and sowing to harvest and data recording.

4. Arrangements have been made for an ISAR sorghum breeder to do a 6-month inservice training course at the ICRISAT Asia Center during May to November 1996, with particular emphasis on sorghum breeding and computerized data analysis and report writing.

5. From SOH funds allocated to ICRISAT, \$US10,500 has been provided for rehabilitation of sorghum research facilities and housing (Karama, Rubona, Rwerere), for seed multiplication (6 ha) and research. The funds will be issued through the office of the SOH Coordinator in Kigali. ICRISAT also expects to provide a used double cab pickup, a used computer/printer and additional field supplies for ISAR sorghum research by about March 1 1996.

6. ISAR sold 6 tonnes of variety 5DX160 to a Kigali brewery. This seed had been multiplied in Kenya by SOH. With ISAR's encouragement, the brewery is using the seed to re-establish contracts for farmers to supply sorghum grain to the brewery for producing clear beer. Funds from the sale of this seed is being used to help fund ISAR research SOH is financing part of the ISAR sorghum multiplication program at Rubona, Karama and Rwerere. In addition ICRISAT, as part of SOH, is assisting ISAR to test 200+ lines at three different locations

C. POTATO/SWEET POTATO - CIP

In September 1995, CIP and the PRAPACE network shipped into Rwanda the last of the pre-basic potato seed produced by NARO in Uganda and KARI-CIP in Kenya. This material is being further multiplied in the 1996A season by ISAR, with help from funds provided from SOH through CIP. True potato seed (TPS) was supplied in October 1995 to ISAR. Seedling tuberlets produced in nursery beds in Ruhengeri from this material will be distributed. Additional TPS has been supplied to World Vision, which will use it to produce seedling tuberlets in the Gikongoro region.

A training course on the "Production of Potato Seed in Rwanda" was held in Rubona October 8 - 18. It was attended by 26 technicians from ISAR, the Ministry of Agriculture, the Extension Service, and the Ministry of Defense. The goal was to provide these technicians with the information they will need to participate actively in the multiplication and distribution of certified seed produced from the basic seed supplied by SOH. The course was taught by experienced seed scientists from CIP and from three NARS in the region linked to Rwanda through the PRAPACE network: Ethiopia, Uganda, and Zaire. It was organized by Mr. Gervais Ngerero, Head of ISAR's national potato program (PNAP), with support from Dr. Kande Matungulu of SOH. Lodging and dining facilities were provided by the Rubona station, and the course was very successful.

Mr. Jean Baptiste Muhinyuza of ISAR's plant production department attended a CIP regional course on "Potato Seed Technology and Virology" in Nairobi November 24 - December 8. This course provided him with the knowledge to work with the potato seed program to maintain realistic phytosanitary standards. He has since been transferred from Rubona to Ruhengeri to carry out these functions. The balance of the SOH funds assigned to CIP will be used for three purposes: 1) to provide operational support for seed multiplication in the 1996b season; 2) to bring the newly appointed head of ISAR's sweet potato program to Nairobi for orientation, and 3) for the rehabilitation of the tissue culture lab and screen houses at the PNAP station at Ruhengeri. Replacement screens for the screen houses have already been ordered. Other equipment will be ordered and shipped in consultation with the other SOH partner institutions.

D. GENETIC RESOURCES - IPGRI

IPGRI has continued to assess damage to facilities in Rubona and will be providing seed money during 1966 to refurbish facilities and carry out training programs in Rwanda.

2. ALLOCATION OF REMAINING FUNDS FOR TRAINING AND EQUIPMENT AND FACILITY REFURBISHMENT

Based on budget analysis it was estimated that sufficient funds (including the 10% identified at the Rubona meeting in October 1995 for training, equipment and refurbishing) remained to complete the impact assessment analysis, to employ Dr Kande Matungulu for an additional 4 months on SOH I business and to carry out training activities and supply basic equipment and carry our rudimentary refurbishment. In December 1995 ISAR submitted a list of equipment requirements which was more extensive than available funds could accommodate. Consequently it was agreed that the limited funds from SOH should be targeted to a specific purpose. After discussion it was agreed that the specific target would be to refurbish the tissue culture facility at Ruhengeri

The agreed allocations for equipment and training are as follows:-

EQUIPMENT

A. Laboratory rehabilitation

· · · · · · · · · · · · · · · · · · ·	\$US estima	ited
Laminar flow hood	5,000	
Autoclave	10,000	
pH meter	500	
Balance	2,500	
Stereo microscope	2,500	
Water Distillation	3,000	
Air conditioner	1,500	
Light and shelving	2,500	
Refrigerator	1,200	
Freezer (chest type)	800	
Generator (4-5 KVA)	4,000	
Small items of equipment	3,000	
Glassware	5,000	
Chemicals	7,000	
Lab furniture	2,000	
Lab refurbishment and repairs	5,000	
Sub-total	55,500	
B. Computers x 2	6,000	
C. Photocopiers x 2	3,000	
D. Screen mesh for glasshouse	3,000	Already being purchased
_	*****	
Total equipment	67,500	

TRAINING

A.	CIMMYT		10,000
В.	ICRISAT		6,500
С.	CIP		1,500
D.	CIAT		7,000
E.	IPGRI		7,000
			100 00 - 100 000 000 000 000 000
		Total training	32,000
			Antonia and a community of the stand
		TOTAL	99,500

3. CONSULTANCY FOR KANDE MATUNGULU TO WORK JOINTLY WITH SOH I AND SOH II

Discussion during the past months with CIAT (Wayne Youngquist, Rupert Best, Roger Kirkby) and advice from other centers, ASARECA (Geoffrey Mrema), ICRAF (Bruce Scott) and WRS iterated to a position where Kande Matungulu's contract would be extended from February 24 until September 30, 1996. During the seven month extension he would spend four months on SOH I activities and three months working on SOH II. In particular he would devote as much time as possible to SOH II during March and April while WRS was working in the region. ICRAF agreed to continue the employment contract for Dr Matungulu under the same terms and conditions as for the initial contract. A copy of the agreed to Terms of Reference is attached.

For work on SOH II Kande will work in Nairobi or Entebbe and for SOH I he will operate mostly from Kigali, Rwanda.

4. SOH I VIDEO

This video which was produced by Acacia Productions under guidance from ICRISAT was fully financed by the SOH I project. While the video gave excellent coverage of the contributing CGIAR Centers and their respective crop inputs to SOH I, there was some concern that other partners such as NGOs and the national programs were not given adequate credit. Some disquiet was also expressed that interview commentary by Rome based senior personnel may have reflected recording convenience rather than the real leadership behind SOH.

Nevertheless, it was agreed that the cost to remedy these shortcomings was not justified and that the video should be distributed to relevant organisations and interested people.

W.R.Scowcroft

SOH I Project Leader

SOHRPTS/MTG5.FEB13

Terms of Reference Coordinator for the Seeds of Hope I and GIS/Local Resource Scientist for Seeds of Hope II

This is a seven month appointment, combining the duties of the SOH I Coordinator (4 months) with responsibility to Dr Wayne Youngquist, CIAT, and the duties of the SOH II GIS/Local Resource Scientist (3 months) with responsibility to Dr WR Scowcroft, SOH II Project Consultant.

These 'Seeds of Hope' projects have similar interests relating to preservation and distribution of adapted and valued crop varieties. Genetic diversity can suffer during periods of natural or social disturbances, and rapid reestablishment of sustainable farming systems rely heavily on the availability of adapted germplasm.

The principal activities assigned to this position will be:

1. Coordinate seed activities for SOH I in Rwanda. These include (but not limited to):

- a. represent the IARCS in Rwanda to facilitate their research activities
- b. serve as liaison between the institutions involved in the project which include: the IARC's, FAO/WB, MINAGRI, ISAR, SSS, and NGO's.
- c. facilitate seed movements into and out of Rwanda
- d. coordinated training activities related to SOH
- e. coordinate the purchase of commodities and facilities rehabilitation at ISAR research stations as authorized under SOH
- f. work closely with ISAR on multiplication of seed stocks.
- g. preparation of the SOH Newsletter.

2. Work with the SOH II Consultant to develop Greater Horn of Africa regional strategies to:

- a. establish seed storage facilities for crop varieties and other breeding materials for particular climatic areas
- b. produce crop-environment domain maps which integrate crop variety characteristics with agro-climatic descriptors within the region
- c. devise models of seed production systems that will be economically cost effective to run and maintain and be effective for the production of the needed varieties.
- d. ensure effective planning and implementation of the emergency restoration of adapted crop varieties to target areas.

The SOH II work will be based out of Nairobi and Entebbe for two months and the other five months out of Kigali where the work activities will be split between the two projects.

APPENDIX 8

;

Report 6

Consolidated Report of Seeds of Hope Activities for the Period February-June 1996, June 1996.

REPORT 6 CONSOLIDATED REPORT OF SEEDS OF HOPE ACTIVITIES FOR THE PERIOD FEBRUARY - JUNE 1996

A meeting for this terminal period was not considered necessary. The following report is consolidated from the several reports provided by the respective CGIAR centers and the SOH Coordinator for activities carried out for the period to 30 June 1996. The report on cassava by IITA covers the period from May 1995.

1. SEED MULTIPLICATION

ISAR is now responsible for most of the seed multiplication in Rwanda. The respective CGIAR centers have provided operating funds for the seed increase as well as technical support. In total about 50 hectares of land on ISAR stations has been bought into seed production. Probably this was only possible because of the SOH I presence.

The SOH I coordinator, Dr Kande Matungulu, has provided a continuing presence in Rwanda to assist ISAR scientists and technicians, the majority of whom are newly recruited to ISAR and frequently lack technical field knowledge. With funding support from SOH I, seed multiplication has been carried out for the following crops:

i. Potatoes. Three varieties and four clones have been multiplied on 20 ha in Kinigi (Ruhengeri) and Rwerere with support through CIP, Nairobi.

i. Sorghum. Nine hectares of sorghum varieties are being multiplied in Rwanda with financing provided by SOH through ICRISAT as follows:

- Karama (1,400 masl) 3 ha of cultivar 5DX160 to yield 6 tons for sale to a Kigali brewery;
- Rubona (1,680 masl) 3 ha of cv lkinyaruka expected to produce 5-6 tons for mid-elevation areas;
- Rwerere (2,100 masl) 2.7 ha of five varieties (Mutimounda, BM1, BM10, BM27, BM33) to yield 6 tons for highland areas.

III. Maize. Through CIMMYT, two varieties (Pool 9A, ZM 607) were multiplied in Rubona on four ha in the 1996a season.

iv. Beans. Some of the more promising varieties of beans were multiplied on ISAR stations in Rubona, Karama and Rwerere on behalf of ISAR on a total of more than 15 hectares.

v. Cassava

This extended report on cassava multiplication covers the period since May 1995.

A two-stage multiplication scheme was proposed to produce adequate quantities of basic seed material in neighbouring countries as foundation stock. These were to be transported into Rwanda for further multiplication and distribution. The first stage was carried out in collaboration with national cassava programs in Uganda, Tanzania and Burundi. Conditions permitting, the second phase was to be implemented inside Rwanda.

The following influenced the strategy used for cassava multiplication:

* Multiplication was limited to varieties specifically adapted to the different agro-climatic conditions of Rwanda;

* Cassava has a very low multiplication ratio, is bulky and therefore required large areas to produce useful quantities of material;

- * Long distance transport exposes the cuttings to physical damage and extreme care is needed;
- * It was necessary to establish secondary and tertiary multiplication sites in Rwanda using rapid multiplication techniques;

* The percentage of planting material distributed or used for further multiplication would depend on the physical infrastructure and human resources available in the country.

Each in-country multiplication plot was to be rationed successively after every 3-4 months and used for expansion. About 4 million mini-cuttings were expected to be generated. These were to be transported to Rwanda to establish other multiplication and demonstration plots and the rest distributed to Rwandese farmers.

Stocks from the initial multiplication sites had to be moved across national borders. Quarantine inspection is particularly important for movement of cassava and the SOH Coordinator was requested to make the necessary arrangements with the Quarantine Unit of the Ministry of Agriculture, in collaboration with the Director General of ISAR to obtain the necessary phytosanitary permits. It is important to note that Burundi and Rwanda had developed an arrangement whereby planting materials were permitted to move freely between the two countries and not others.

A number of varieties which had either been released by the Rwanda national cassava program or were local cultivars of Rwanda origin were identified during surveys conducted in areas of Tanzania and Uganda which bordered

Rwanda. Varieties (aliases in parentheses) found in Uganda were Rutamizi (Gakiza or Eala 07), Machunda (Mulundi), Mpologoma (Kiryumukwe), Bukalasa (Bukalasa) and Musoropiyo (Musoropiyo). Musoropiyo and Bukalasa are cultivated largely by farmers in the Kibungo and Bugesera regions of Rwanda. The Tanzania cassava program identified a much larger number of clones; Rubona, Rushigiwinkuba, Kumalampunu (bitter) and Mlekimani, Imidebe, Bukalasa, Kahinji and Nusurupia which are sweet. Gitamisi (Eala 07), Creolinha, Maguruyinkware, Mpambayabashengezi I and II were sourced in Burundi.

Since some of the varieties identified were not resistant to all major biotic stresses, it was imperative that the initial multiplication plots were located in areas with minimal biotic stress. Planting of multiplication plots in Uganda and Tanzania started in 1994 with an initial target of 20 hectares per country. Multiplication in Burundi started in March 1995. Since the objective of the exercise was production of planting material, planting densities were doubled.

Multiplication plots were provided by the Agricultural and Local Councils of the Ntungamo district in Uganda and the Rusomo prison and Catholic mission in Tanzania as their contribution to the initiative. This was very much appreciated. Multiplication was begun but its expansion was interrupted by a strong request from the Director General of ISAR to immediately initiate multiplication in Rwanda as a prelude to rehabilitation of research activities at the different stations. Therefore, expansion of the initial multiplication plots ceased. Total areas which had been planted, at the time of the request, varied within each country. Uganda (Nyarutuntu, Kayonza) and Tanzania (Rusomo, Rubale) had planted 10ha each instead of the 20ha initially targeted for each country.

The Karama research station was targeted to be the major primary multiplication site in Rwanda. This was to be extended to the other major cassava growing regions. It was expected that the rehabilitation would have favoured an efficient in-country implementation and control of the multiplication and distribution activity in Rwanda. However, the Rwanda incountry multiplication was disrupted because the stage of development of the plants under multiplication was not conducive for ratooning and there was no Rwandese staff attached to the cassava program.

Transfer of the planting materials has been frustrated for almost two years due to the lack of import permits and phytosanitary certificates from Rwanda. Earlier attempts to transport material from Tanzania, in collaboration with Rwanda-based NGOs, were fruitless as the consignment was rejected at the border. The different names used in Rwanda and Tanzania for the variety being transported later emerged as the main cause for rejection. This was compounded by Rwandan emphasis on pulse and cereal crops as needing more attention. Cassava and sweet potatoes were erroneously thought to be still intact without much genetic erosion from the civil disturbance.

The difficulty in transfer of material was repeatedly brought to the attention of the SOH Coordinator and Director General of ISAR at a number of meetings. Regrettably no action was taken to enable transport of material into Rwanda. The SOH coordinator submitted documents to the Ministry of Agriculture in July 1996 for processing, in the hope that planting materials can soon be moved into Rwanda. Arrangements are under way to prepare the planting material for transfer into Rwanda in time for the next growing season (1997A) in anticipation that the transfer is approved.

Requests for planting material in Rwanda is enormous. However, without the necessary authorization, transfer of the available planting material cannot be done. As a stop-gap measure, part of the multiplication plots in Tanzania have been ratooned and distributed to Rwandese refugees camped close to the sites while those in Uganda continue to be maintained for transportation into Rwanda when the necessary permits and documentation are obtained.

vi. Other SOH related seed multiplication

* The SOH I CGIAR partners also supplied seed to a number of NGOs who are currently multiplying the seed. These NGOs include World Vision Rwanda (WVR), CARE, Agro-Action Allemande (AAA), GTZ, Salvation Army, Oxfam and SSS. This seed has been and will continue to be multiplied by farmers under contract to the respective NGO.

* A wide range of crops have been multiplied by the NGOs. In addition to crops which SOH I has addressed (beans, sorghum, maize, potato, sweet potato and cassava), WVR, for example, is also multiplying wheat, soybeans, groundnuts and pigeon peas. In the current 1996B season World Vision has 47.4 hectares of land under seed multiplication in Rwanda of which 65% is represented by beans, maize and potato varieties originally supplied by SOH I. Some of the World Vision seed multiplication effort was impeded by the drought in Kinazi during the 1996A season.

* The multiplication of sorghum variety 5DX160 is being carried out by the brewing company, Bralirwa, in Kibungo, Bugesera, Gitarama and Butare under contract to farmers. The 5.8 tonnes of seed for this purpose was previously grown in Kenya by ICRISAT using SOH funding with support from KARI, University of Nairobi and a private seed company.

The sale of seed for this contract production which was in operation before the escalation of the civil war in 1994 will generate much needed income for ISAR operations. Of equal importance is that more than 100 farmers in 15 communes are involved in contract seed production during the current 1996B season. The presence and effort of ICRISAT through the SOH initiative in Rwanda made it possible to restore this commercial aspect of sorghum production considerably earlier than previously thought possible.

2 CROP VARIETY AND EXPERIMENTAL TRIALS

The variety evaluation and agronomy trials have been carried out on ISAR stations as collaborative efforts between ISAR and the respective SOH partners. The presence of SOH which provided technical support, funding and encouragement to ISAR scientists had a major impact on reestablishing research and development far earlier than otherwise would have been possible. Other trials have been carried out by NGOs using material supplied by the SOH partners.

i. Beans. Twenty-six nursery and bean variety trials are now underway on ISAR stations in Rwanda with the guidance of CIAT. The majority of the trials are in Rubona with some trials in Butare and Gikongoro. The trials include evaluation of advanced populations of beans resistant to the main diseases in Rwanda, i.e. angular leaf spot, bean common mosaic virus, anthracnose, root rot; selected lines from the International Bean Nursery; populations with presumptive tolerance to low phosphorus or low nitrogen; and several early generation populations.

These bean trials have been managed well by local technicians. There was a degree of variability due to poor soil fertility of the trial area used. The main diseases observed included BCMV, ALS, some ascochyta, rust and occasional FLS. Though experiencing some moisture stress, the station trials are expected to have normal yields.

Ten populations of climbing beans with BCMV resistance were distributed to 10 farmers for on-farm evaluation and selection. On-farm evaluation and selection is an increasingly important feature of development research. To be able to introduce this aspect of development R&D so soon after the civil war is a tribute to ISAR and to the international community operating through SOH.

World Vision is continuing the evaluation of bean varieties and their adaptation in the regions of Gikongoro and Kanazi. According to WV the "SOH bean varieties", MCM5001 and RWK11 were clearly superior to other varieties under the prevailing conditions.

ii. Sorghum. Sorghum trials and nurseries are being carried out by ISAR as part of their work plan at Karama, Rubona and Rwerere with support and guidance from ICRISAT. The trials based on seed supplied by ICRISAT as part of SOH are designed to obtain information on adaptation to various environments, yield potential, disease resistance, response to mineral fertilizer and tolerance to low temperature and to provide necessary field experience for the new ISAR staff.

iii. Maize. Field trials are in progress in Rubona as part of SOH to: (a) evaluate the response of two main varieties (ZM 607, Pool 9A) to mineral fertilizer; and, (b) compare old Rwandan land race varieties such as Nyirakagoli and Bambou Precoce with the reintroduced newer varieties, ZM 607 and Pool 9A.

3 TRAINING ACTIVITIES

Training activities as part of SOH initiated during the first half of 1996 are:

i. The Head of the ISAR Maize Program, Mr Claver Ngaboyisonga, is attending a 4 month course on Maize Improvement at CIMMYT, Mexico.

ii. The Acting Head of the ISAR Bean Research Program, Mr Musoni Augustin, is attending a CIAT/CIMMYT crop management course from February to June 1996 at Egerton University, Nairobi.

iii. CIP arranged for the new head of ISAR's Sweetpotato Program, Mr Ndirigue, to visit the national sweetpotato programs in Uganda, Kenya and Tanzania to become familiar with research objectives in the region.

iv. A newly recruited scientist from the ISAR Sorghum Program is at the ICRISAT Asia Centre, Hyderabad from May-November, 1996 on an in-service training course which emphasises field experimentation, sorghum breeding, data analysis and report writing.

v. A number of students from the Rwandese National University, Butare are completing "Ingenieur Agronome" thesis projects on beans, maize and agroforestry respectively. These projects were initiated through SOH.

vi. A training course on cassava multiplication and crop production for extension personnel from the Ministry of Agriculture and some NGOs planned for September 1995 was cancelled because it was not possible to transfer cassava cuttings into Rwanda.

vii. The head of the cassava program and two technicians are planning to participate in a regional course on root crops research and management in Kampala, 12 August - 6 September, 1996.

4 REHABILITATION OF FACILITIES

- i. The tissue culture facility at the ISAR station in Ruhengeri is being refurbished through an SOH allocation of \$US45,000 to purchase laboratory equipment, computers, a photocopier and to carry out minimal repairs to the laboratory and associated buildings damaged during the war. CIP has taken the lead in planning and implementing the acquisition of equipment in close consultation with ISAR and the SOH Coordinator. The equipment arrived in Rwanda in early July 1996 and the refurbishment will be completed as soon as possible.
- ii. At the ISAR station in Karama, ICRISAT is providing funds to repair doors, windows and to paint laboratories and two of the station houses.

- iii. Doors are being repaired and chairs are being provided through SOH for the ISAR station at Rubona.
- iv. A great deal of work is required to restore ISAR facilities to a state of reasonable functionality. Commitments by donors to restore developmental R & D programs at ISAR is urgently needed otherwise there is the risk that research to restore and sustain food security could languish because of the lack of adequate physical infrastructure.

5 IMPACT ASSESSMENT SURVEYS

The impact assessment analysis being conducted by Dr Louise Sperling continued through the first half of 1996 and an Interim Technical Report: Socio-Economic Assessments April 1996 which covers the results of this assessment to date is in Appendix 1.

WR Scowcroft Canberra, Australia

July 8, 1996

APPENDIX 9

، د د

Project Completion Report

Support to the Rwandan Tree Seed Centre at Butare, 27 February 1996.

PROJECT COMPLETION REPORT FOR CGIAR 'SEEDS OF HOPE' INITIATIVE---SUPPORT TO THE RWANDAN TREE SEED CENTRE AT BUTARE BY WORLD VISION AUSTRALIA AND AUSAID

DATE OF REPORT

27 Feb 1996. Report compiled by Mr D.J.Boland, project manager for CSIRO.

SITUATION

a) situation before the war--and the evolving Australian linkages

Before the start of the Rwandan civil war The Rwanda Tree Seed Centre (RTSC) was considered one of the better-managed national TSCs in Africa. The RTSC is part of the Institut Des Sciences Agronomiques du Rwanda (ISAR) which is the main agricultural/forestry research body in Rwanda. The RTSC had the responsibility of providing tree seeds for reforestation in Rwanda and was also supplying seed of highland species to neighbouring African countries. Seed of both exotic and indigenous species were held in stock. The RTSC had received strong financial and technical support for many years from Swiss Intercooperation. Quite remarkably the RTSC was perhaps the only tree seed centre in Africa to be fully self-financed before the war (letter from Swiss Intercooperation 19 May 1995).

Before the war the RTSC had a short, but productive, history of research collaboration with the Australian Tree Seed Centre (ATSC) in Canberra which is part of CSIRO Forestry and Forest Products. This collaboration was unusual for a country such as Rwanda which had previously developed a strong francophone European linkage in forestry. The ATSC collaboration mainly revolved around the cultivation, utilisation and domestication of three remarkable Australian tree species *viz. Eucalyptus grandis, E. camaldulensis* and *Grevillea robusta*. This collaboration was no doubt initially enhanced by the OIC (Mr Antoine Kalanginaire) who had good English language and technical skills. Mr Kalinganire obtained his M.Sc in tree improvement at the University of Bangor, Wales, UK. Mr Kalinganire first visited Australia in August 1989 to attend a IUFRO Tropical Tree Seed Research Workshop in Gympie Qld. At that time Mr Kalinganire visited Dr C. Harwood in Canberra for 1 week to work on genetic variation in *G. robusta* using isozymic techniques.

The timber of *Grevillea robusta* is much appreciated in Rwanda by resource poor farmers for use as poles, construction materials and fuelwood for cooking. *G. robusta* is better known in Australia as silky oak and is widely used here as ornamental street and garden trees. The species grows fast and also produces a high value cabinet timber. The significance of *Grevillea* in Rwandan farming systems is that the species

vrows well in association with staple food crops. This tree/crop association is crucial for human survival (food/cooking/heating) in this densely populated highland country where farm sizes are small and food cropping is intensive and almost continuous.

Australia's first serious forestry contact with Rwanda was through Dr Harwood, ATSC, who made a technical advisory visit to the RTSC in Sept 1990 as part of the 'Seeds of Australian Trees' project (AusAID funded). The ATSC, through Dr C. Harwood and again with AusAID support, invited Mr A. Kalinganire, to Australia in May 1993 on a short term professional attachment. As a result of this visit Mr Kalinganire produced a report titled 'Improved Seed Production for Rwanda with Reference to Early Results of *Grevillea robusta* and *E. camaldulensis* Provenence Trials in Rwanda.

Before the Rwandan war, staff of the CGIAR International Centre for Research in Agroforestry (ICRAF), based in Nairobi Kenya, had had very close contact with the RTSC and ISAR. ICRAF were actively researching and developing agroforestry technologies in Rwanda based on *Grevillea robusta* and other non Australian species. These included technologies such as contour coppiced hedge-rows using *G. robusta* to control soil erosion on very steep hillsides. This was a new and novel use for *G. robusta*. ICRAF relied almost exclusively on the service of the RTSC to provide seed for their research work in Rwanda and in neighbouring Uganda and Burundi. In addition a staff member from the ATSC (Mr D. Boland) was permanently based at ICRAF, in Nairobi, developing the new ICRAF Multipurpose Tree Germplasm Resource Unit. Mr Boland's four year tenure at ICRAF overlapped the period of the Rwandan civil war.

The advance of the then rebel army on Butare around June-July 1994 resulted in two significant events for this project. First was the international rescue of Mr A. Kalinganire, his wife and two children leaving Butare on 2 July 1994. This rescue was led initially by the ATSC in an unprecedented association with ICRAF and several other international tree seed centres and donors. This was successful and the fact is that all other members of the Kalinganire family (on both sides) were killed in the fighting. Those killed also included Mr Kalinganires brother-in-law in Butare on the day of the family's rapid departure from Rwanda (about an hour before) to Kenya and safety. ICRAF arranged for Mr Kalinganire's interim employment in Kenva for 12 months to research Grevillea in western Kenya (from 19 July 1994). During this period Swiss Intercooperation granted Mr Kalinganire a Ph.D scholarship to continue his research on Grevillea robusta at the Department of Forestry Australian National University in Canberra. This study is based on field work being conducted at ICRAF in Kenya (Mr Kalinganire is there now for 12 months--his family remains in Australia). Antoines wife Annie, who is a trained professional agroforester, now works part-time as a volunteer with the ATSC in Canberra. Both East Africa and Australia will eventually benefit from Mr Kalinganire's research on Grevillea.

b) situation immediately after the war

The second event of note to this project was the breakage and looting of internal fittings of the RTSC during the war. All doors and windows were broken and the interior of the RTSC ransacked. Major items of TRSC equipment lost included fax

nachines, cars, photocopier, generator for the seed storage cool-room, and computers. Equipment left intact included an oven, petri dishes (for seed germination testing), a Sartorius balance (for weighing seed), a computer screen, an old printer (ICRAF report of 14 Nov 1994 details the situation). Quite surprisingly some electronic equipment was later returned to the RTSC by those who said that they took various items of equipment for safe keeping. Remarkably all seed documents were left intact and this has been of great value in restarting the RTSC operations. Looters left a total of 3369.33 kgm of seed scattered and mixed on the floor of the seed store. Looters were intent on stealing the seed containers (tins, jars etc) for other use.

The only RTSC personnel remaining immediately after the war were Mr J. Damascene N'Dayambaje (coordinator of reforestation which includes the RTSC), Mr N. Laurent (accountant), Mr Kabandana (seed storeman), Mr s U. Beta (cashier) and just 4 seed climbers.

The war also meant a breakdown in the private (on farm) and Government protection of trees and forests. During the war wood was urgently required for cooking and house construction and many trees were destroyed. This relationship between war and trees can be vividly seen around the refugee camps and was discussed in an article by D. Boland in Agroforestry Today. As trees take a long time to grow to maturity (5-30 years) it is important to resow as early as possible.

The ATSC and ICRAF are very proud of our links with Swiss Intercooperation in the rehabilitation of the RTSC. This was always vital due to the short term nature of the AusAID/WVA support and the corresponding need for the RTSC to re-establish a longer term relationship with a foreign donor. The Swiss are naturally hoping that Australian assistance will continue but are aware of its short term nature. Our project was able to relay funds (first via ICRAF) and seeds to the RTSC through the Swiss Intercooperation office in Kigali. Their support sustained the project when all other avenues failed to materialise. There is absolutely no doubt that the 'Seeds of Hope' project strengthened the resolve of the Swiss to resume aid to the RTSC after a lapse of several months. Most donors are still concerned that further aid contributions to Rwanda may be lost if the war restarts.

b) situation at the RTSC now

The situation at the RTSC has improved markedly. The RTSC building has been repaired and 2062.25 kg of seed was salvaged from the 3369.33 kgm of seed scattered over the seed store floor. Over 1307 kg of seed had to be discarded as being irretrievably mix or unidentifiable. This seed salvage operation was far from ideal as seed from different seed lots of the same species may have been mixed. Nevertheless the best was made of a bad situation and seed was available for immediate use. The building was protected by the military and the field seed stands where largely left intact. New collections were organised and a collection programme developed. A new O.I.C., Mr Canisius Mugungu, took over control of the RTSC during the later part of 1995. Mr Mugungu returned in 1995 after the war from Tanzania where he had been working as a professional forester for the Tanzanian Government. Although he has had little practical experience in seed handling and seed technology he is firmly in charge and leading the new era for the RTSC. Most recently Mr C. Mugunga spent

two weeks training in Kenya at ICRAF and the Kenya Tree Seed Centre at Muguga (20km from Nairobi) to further develop his seed technology skills.

The vehicle situation, so necessary for the seed collection activities, has been poor. The only vehicle that the centre had was supplied by the Swiss and this vehicle was taken by the Rwandan military. The Swiss Government complained and refused for a long time to replace this vehicle demanding that the vehicle be returned. This severely curtailed seed collection activities for several months. Other SOH project members had to support the Swiss position on this matter and not undermine their stand. Just before Christmas 1995 the Swiss relented and agreed to purchase a second hand vehicle after realising that their demands on the Government would not be met. WVA has also provide funds to purchased a second second-hand vehicle. The logic of these moves is that second hand vehicles are less likely to be stolen.

A major shortfall has been work on the assessment of field provenance tree species trials which has been difficult due to their remoteness from Butare and vehicle shortages. Although these trials were part of the RTSC activities their management was not directly part of the 'Seeds of Hope' project.

A good overview of the situation in Rwanda in agricultural/forestry research sector shortly after the war finished is explained in a trip report dated July 1995 from A. Niang to ICRAF/CSIRO. Before the war ISAR had 45 national scientists and 16 expatriates. In July 1995 Dr Niang identified 26 scientists at ISAR of whom 23 (88%) were new and inexperienced in research. Dr Niang reported then that the Seeds of Hope project was the only donor-funded activity taking place at ISAR.

AUSAID ASSISTANCE

When the project was originally conceived the ATSC (CSIRO) anticipated that various items would be required (see Table 1) and prepared an appropriate budget. Originally there was a strong emphasis towards restocking seed supplies, developing field trial designs to establish seed orchards and seed production areas, re-equiping the forest nurseries, a visit by an Australian staff member and suppling computers to maintain seed store records and for anlysis of trial results. It should be remembered that this list was put together without the benefit of knowing what were the real needs of the RTSC after the war and how best ICRAF and CSIRO could contribute to the rehabilitation of the RTSC.

Once Dr A. Niang, ICRAF, assessed the real situation at the RTSC in Butare a new budget was drawn up in collaboration with all parties. This budget was slightly modified a few times afterwards to better reflect changing priorities. Table 2 became the penultimate list of items to be covered in the SOH project. Dr Niang believed that emphasis should be given to the general rehabilitation of the RTSC and seed supplies and no attention given to developing new research trials in the first year. This is the major difference between Tables 1 and 2. The rehabilitation of the RTSC was supported by two Australian donors *viz* AusAID and WVA. Swiss Intercooperation also assisted in the rehabilitation process and their financial contribution for various items can be seen in Table 2.
AusAID assistance amounted to a total of A\$79,662 of which A\$24,155 was provided by WVA (see Table 2). The various individual items funded by Australia can be seen in Table 2. These included staff salaries (two scientists plus assistants), maintenance and purchase of a second hand vehicle, station and office supplies, purchase of seed in Rwanda, in Australia and overseas, ICRAF backstopping missions to Rwanda, travel costs to CSIRO. It is of note that neither ICRAF nor CSIRO charged a management fee or salaries to manage the project and contributed much through their individual labours to the success of the project.

The vehicle purchase is estimated at US\$10,000 (A\$14,084) and the training of Mr Mugongu in Kenya cost US\$2000 (A\$2817) and both items will be covered by WVA as both were not included in the revised budget for the project presented to AusAID in July 1995.

It would be appreciated if AusAID representative based in Kenya could visit the RTSC and inspect progress.

KEY OBJECTIVES

The scope of services (as determined from AusAID Exchange of letters N145/0018 to be provided under 'Seeds from Hope' project are as follows-

- 1. pool the technical expertise of international agricultural research centres in order to re-introduce seed and planting material of crop varieties adapted to Rwanda's environment.
- 2. build up seed supplies and distribute to farmers in Rwanda.
- 3. develop national technical capacity through training programmes focusing on the Institut des Sciences Agronomique de Rwanda.
- 4. provide technical advice and support to relief agencies on food aid and agricultural rehabilitation.
- 5. analyse the impact of the project in order to define strategies for future disasters.
- 6. assess the condition of the Rwanda National Tree Seed Centre, in particular the infrastructure, equipment, stock of tree seeds, field trials and seed orchards.
- 7. assist in the re-establishment of the Rwanda National Tree Seed Centre, including the supply of appropriate tree seed from Australian and non-Australian sources. (this term of reference was refined in telephone consultation with Bruce Coombe on the 8 Dec 1994 and included in the first progress report to WVA from CSIRO Division of Forestry Oct-Dec 1994).

8. provide other services as further detailed in the Organisation's Project proposal 29 August 1994.

PROGRESS AGAINST OBJECTIVES

An analysis of the key objectives are as follows

1. Pool the expertise of CGIAR centres

The ICRAF component was led by Dr Kwesi Atta-Krah who is the ICRAF programme leader for the Agroforestry Research Network for Africa in the East Africa Highlands. He was ably supported by two ICRAF colleagues, Dr Amadou Niang and Ms Claire Momoh, in Nairobi. Both Drs Atta-Krah and Niang made several visits to the RTSC in Butare and made comprehensive reports giving appropriate direction to the project and facilitated administrative and technical arrangements.

Several meetings of the CGIAR centres (CIAT, ICRAF and others) were held in Kenya and Rwanda to discuss the 'Seeds of Hope' initiative. The first was held on 21-22 Sept 1994 (D Boland was invited but was unable to attend) to discuss the CGIAR initiative. Dr C. Harwood (CSIRO) attended the second meeting at International Centre for Research into Animal Diseases (ILRAD) in Nairobi in January 1995. Dr Atta-Krah attended the third meeting in Nairobi. Dr Niang (ICRAF) attended the 4th 'Seeds of Hope' meeting in Rwanda during the period 15-20 October 1995.

Dr A. Niang (from ICRAF) represented ICRAF/CSIRO at first meeting of the CGIAR 'Seeds of Hope' consortium held in Kigali, Rwanda, in Feb 1995. This meeting was attended by Rwandan Minister for Agriculture and Livestock (Dr A. Iyamuremye) and various contributions by CGIAR staff, by specific crops, were discussed. This meeting was immediately followed by a meeting with Mr T. Habyambere (Director General Forestry), Swiss Intercooperation (and SDC) and ICRAF to plan inputs by Swiss and Australian donors to the 'Seeds of Hope' initiative. Swiss Intercooperation agreed to allow ICRAF to transmit funds for the project into Rwanda via their offices.. A formal agreement between ICRAF and Swiss Development Co-operation was signed on 6 April 1995. These meetings laid the platform for the ICRAF/CSIRO collaboration that was to follow. Dr Niang returned to RTSC during the period 26 March-2 April 1995 at which time the RTSC was operational once again. Dr Niang again visited the RTSC in the period between the 18-23 July 1995 and again between the 15-20 Oct 1995.

2. Build up seed supplies and distribute to farmers

2.1 Local activities. Table 3 provides a list of seed stocks currently in store at the start of the project after the seed salvage operation on the floor of the RTSC.

A seed catalogue was produced listing species available and this was distributed to tree seed users in Rwanda and other countries. A letter was also written and circulated to all relevant Rwandan organisations using tree seed, informing them of

he recommencement of activities at the RTSC. A document was also produced on species seed germination rates and appropriate germination methods. Dr A. Niang from ICRAF led all three activities and provided the necessary technical input. These documents are available upon request.

The RTSC recommenced seed collections in Rwanda after the start of the project. A total of 1163.05 kgms of seed was collected by the RTSC in 1995. A list of species and weight of seed collected is given in Table 4. Table 5 indicates a list of species and seed (483.7 kgms) by local collectors and purchased by the RTSC. The RTSC is relying on local collectors to collect seed under guidelines formulated by the RTSC.

During 1995 the RTSC sold 486.06 kg of seed of forestry and agroforestry species (see Table 6). This seed was mostly sold to NGOs dealing with reforestation programmes in the country. This is a very creditable performance and one to be commended in the first year of operation after the war.

2.2 External activities.

The RTSC was not able to sell any seed to any foreign country in 1995 (as was the situation before the war). CSIRO was instrumental in obtaining and supplying seed of several Australian, African and Central American species (see Table 7).

3. Develop national technical capacity through training.

The RTSC undertook training of local seed collectors during the year to enhance the capacity of local seed collectors to help restock the RTSC. This required on-the-spot training and supervision of local seed collectors by RTSC staff. The main point to pursue for RTSC staff with local collectors was the need to collect good quality seed and to maintain good documentation.

Mr C. Mugungu traveled to Kenya for two weeks for seed technology training with the Kenya Tree Seed Centre in early Feb 1996. Although this was not in the original budget it was considered necessary to bring the expertise of Mr Mugungu up to international standard. The need for training for Mr Mugungu was indicated in the 3rd Project Progress Report

4. Provide technical advice and support to relief agencies.

Both ICRAF and CSIRO were in close contact with Swiss Intercooperation in regard to the project. Swiss Intercooperation formally acknowledged the support of CSIRO/ICRAF in a fax dated 19 May 1995.

ICRAF staff were able to provide advice in Rwanda to several NGOs on species to plant and where to obtain seed for agroforestry and forestry species (ICRAF to provide more details). As stated previously a list of species available was circulated to all agencies thought to be interested in purchasing seed.

5. Analyse the impact of the project in order to define strategies for future disasters.

The project has been most useful in getting the RTSC functional again after the chaos brought about by the war. The SOH project was a fairly quick response to need in a

commodity (tree seed) not normally considered an emergency item. Nevertheless the project has had an undoubted impact and has quickly provided seed for rebuilding Rwanda's forest estate. Perhaps the most significant result has been the capacity of the RTSC to once again start charging for seed and recovering some costs and thus given hope to the new staff at ISAR.

Perhaps on the negative side were the administrative response delays (within the project team) caused by the long chain of command from CSIRO to the various organisations involved in SOH. The reporting chain of command was from CSIRO to ICRAF to RTSC to ICRAF to CSIRO to WVA to AusAID. It is appreciated that tree seed was a late inclusion in the SOH project but we were pleased that it received the focus it deserves by WVA and AusAID. The fact is, however, that both CSIRO and ICRAF each had a strong personal commitment to rehabilitating the RTSC and in assisting its staff in its hour of need.

The participation of ICRAF has been crucial to the success of the project. The closeness of ICRAF HQ to Rwanda and the frequency of visits there by Dr A. Niang has helped greatly. In addition his French language skills, familiarity with Rwanda (he lived there many years before the war and escaped himself) and Rwandan public institutions was a great help to the SOH project. Dr K. Atta-Krah had a strong professional interest in the project and his overall guidance was crucial to the success of the project. Ms Momoh provided fine secretarial backup support to all project members.

6. Assess the condition of the RTSC.

The RTSC has once again become functional and is supplying seed for planting needs. A major shortfall is the maintenance of the Seed Orchards and Seed Production Areas. There is a need to develop more seed orchards and seed production areas in the future. This was accorded low priority in the first 12 months of the project. There is a pressing need to access some trials and seed sources in the more remoter and more dangerous parts of the country.

An indication of the project success so far can be judged by the fact that a quantity of seed roughly equivalent to the weight lost by looters has been collected. This statistic is not that meaningful as seed weight per seed varies enormously amongst species but nevertheless is indicative of progress made.

7. Assist in the re-establishment of the RTSC, and seed supply from Australia and other countries.

ICRAF had the major task of making regular contact with the RTSC and supervising the rehabilitation process. Dr Niang provided professional expertise to the younger RTSC staff. CSIRO provided advice on selection of seed sources of Australian species for Rwanda and obtained seed from National Seed Stores holding seed of species that the RTSC requested. These seed stores were in Zimbabwe and Honduras. Seed was obtained and dispatched to the RTSC (see Table 7). 't is notable that 35% of the value of all seed sold (therefore in demand) is seed of species having an Australian origin. *G. robusta* was the most important Australian species sold.

8. Provide other services as detailed in project proposal.

Nothing of importance to report under this line item.

PROBLEMS ENCOUNTERED AND SOLUTIONS FOUND

The major difficulties initially were-

a) determining the real needs of the RTSC initially. No substitute for on the ground visits made by Dr Niang.

b) finding a mechanism to channel project funds into Rwanda from ICRAF and onto the RTSC and still maintaining appropriate accountability. This was achieved through the Swiss Intercooperation office in Kigali. This group also kindly handled faxes from Australia to the RTSC when direct communications were cut. They also acted as a conduit for seed parcels sent into Rwanda for the RTSC from overseas.
c) reports from RTSC in French language for Australian audience. No solution although the final quarterly report was completed by Mr Mugungu in English language.

d) theft of the RTSC vehicle was the most serious problem as all seed collections are dependent upon vehicular transport. We got around this problem to some extent by loan of other ISAR vehicles for trips and more recently through purchase of two second-hand vehicles.

Overall project difficulties-

a) perhaps the reporting chain as discussed earlier. It is possible that this chain was not appropriate for an emergency relief operation. Although to be fair to all participants we still achieved a good result in the end.

b) CSIRO involvement in the project could have been strengthened through a visit to the RTSC which was not possible due to the small funding allocation.

c) although both CSIRO and ICRAF guaranteed in-kind financial assistance to the project (in terms of staff time to run the project, communication costs, extra travel costs by ICRAF, etc) it may have been better for AusAID/WVA to allocate some funds to both ICRAF and CSIRO for part of the project management costs.

PRESENTATION OF FINANCIAL REPORT

The Financial report is shown in Table 6.

AUSTRALIAN INVOLVEMENT

The Australian involvement largely revolved around monitoring project activities and in prparing the four quarterly reports, an project completion report, to WVA and AusAID. This involved regular communication with ICRAF and the RTSC tracking project progress. The ATSC was also involved in the acquisition of seed for the RTSC from Central America, Africa and Australia to help build up stocks of species in critical demand.

Dr C. Harwood visited ICRAF in Jan 1995 for initial project discussions with the CGIAR centres (including ICRAF) on the direction and management of the project.

OVERALL IMPACT OF THE PROJECT

The Australian financial assistance has been much appreciated by the RTSC. The RTSC has successfully got going again although lack of a vehicle for several months of the project has been a problem for the seed collectors. Many details on the impact of the project have been provided previoually in this report.

FUTURE PLANS

CSIRO understands that the CGIAR Centres do not wish to extend the project and further understands that they believe that the project could take the form of bilateral assistance through other means. The ATSC has no further plans to support the Rwanda Tree Seed Centre although non-specific requests for support have been made by both RTSC and ICRAF to CSIRO. Due to the emergency nature of the project it has been a little difficult to manage both financially and technically. No funds were provided for CSIRO management contributions (we did not ask for them in order to keep costs down) and no provision was made for the CSIRO project leader (Mr D. Boland) to visit Rwanda once the violence subsided during 1995 in order to make an on-the-spot assessment of the RTSC. A visit by the AusAID regional representative to the RTSC is welcomed.

The time is now right for a reappraisal of the aid linkages to the RTSC. The most sensible link is a direct route from WVA to RTSC perhaps using a scientist from ICRAF or CSIRO as a consultant. This would lessen the communication trail that was necessary earlier in order to funnel money and technical support to the RTSC in the immediate post war situation. A visit by one Australian and one ICRAF technical expert would be justified to assess what future actives should take place.

Table 1.Original budget proposal put to WVA and AusAID to support the
Rwandan Tree seed Centre.

Item	Rationale		Estimated Cost
Staff backup	Back-up for design and implementation	2 persons for 3 months each	40,000
Supply of seed of Australian species	Seed for establishment of seed production areas	E. Camaldulensis Grevillea robusta Acacia melanoxylon	15,000
Supply of seed of non Australian species			5,000
Provision of nursery establishment kits and manuals		3 @ \$500 (including air shipment)	1500
Establishment costs for for SPAs	Includes nursery costs	5 ha @ \$3000 per ha	15,000
Visit	Visit to assist establishment of SPA's	1 person for 4 weeks (TA and airfares only)	7,500
Equipment	Computer and printer for record keeping and data analysis		5,000
TOTAL			89,000

PS to Table

L.	Estimated ATSC contribution Staff costs @40,000	\$40,000
2.	Estimated World Vision seeds of Hope Contribution	\$49,000
3	Total	\$89,000

Table 2

A' C DED BUDGET FOR REHABILITATION OF THE RWANDA TREE SEED CENTRE IN US\$

		Swiss SUIS	CSIRO	CSIRO	TOTAL
1 Building repair		3850		AVO	3850
2 Equipment		5050			5050
Vehicle					
Office		450			450
Library		460			460
3. Staff					7 192 199
Scientists (2) 2x	x450x6	2700	270) 3803	5400
Technicians (2)	2x415x6		498) 7014	4980
Accountant 1x3	20x6	1920			1920
Librarian 1x280)x6	1680			1680
Storekeeper 1x1	130x6	780			780
Secretary 1x180	0x6	1080			1080
Field assistants	(4) 4x105x6		252) 3549	2520
Driver 1x180x6	5	1080			1080
Watchman guar	rds (16) 16x90x6	8640			8640
Climbers (10) 1	0x90x6		540	7606	5400
Casual laborers		10,700	500	7042	15700
4. Per diem		750	500) 7042	5750
5. Vehicle maintenance fue	1	3260	300	4225	6260
6. Vehicle insurance		400			400
7. Station & office supplies		1130	70	986	1830
8. Library supplies		75			75
9. Field supplies		3300	100) 1408	4300
10. Scientific, supplies		5140	250	3521	7640
11. Other repairs (office eq	uip)	150			150
12, water electricity		770	130) 1831	2070
13. Postage telephone fax		630	160) 2254	2230
14. Other		1200			1200
15a Seed purchase direct by	y Rwanda		3000) 4225	3000
15b Seed purchase by CSIF	RO Aust spp.		345.	4,863	3453
15c Seed purchase of non-A	Aust spp		756	10648	7560
16. ICRAF backstopping m	iissions		4000	5634	4000
17. Travel costs for CSIRO	1		284	3 4011	2848
Total budget as per amende	ed proposal	50145	5656) 79662	106705

FOOTNOTE 1. We received the first tranche of A\$69,014 (US\$49,000) in Dec 1994

2. A second tranche of A\$10648 has been committed to CSIRO in August 1995.

#. Total commitment is A\$79,662 (US\$56,560) based on US\$0.71/A\$1.00.

4

Table 3

SEED STOCK SITUATION ON 31/12/1994

	ESSENCE	PROVE ~	UNIT PHICE	SITUATION	VALUE	SITUATION	VALUE	+ /	Des
end enfin n 1388 2.6 8959 2.4 7251 62.2 7251 62.2 7251 62.2 7251 62.2 7251 62.2 7251 62.2 7251 62.2 7251 62.2 725 7361 Accta managrafi (Bick weith) A 303 56.6 17150 14.1 4222 42.3 12.8 7230 72 7270 0.5.5 22000 0.1 77 Accta managrafi (Bick weith) A 7000 1.5 2133 1.2 2133 1.2 2133 1.2 2134 1.2 334 Abits distancia A 2000 54.4 10320 77.7 1.1 334 1.2 334 1.2 1.3 1.3 1.3 1.2 1.3 1.3 1.2 1.3 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.3 1.4 1.3 1.4 1.3 1.2 1.3 1.2 <		NANCE	(FRW/Kg)	ON 06/04/94	ON 06/04/94	ON 25/11/94	ON 25/11/94	SEED (Kg)	VALUE IFRWA
-Acta Babéa 1 13359 4 53459 53459 3347 Accia Doct (Black writing) A 2000 56 27150 14 6220 17 1000 Accia Doctyrina H 5002 57 287504 14 20200 17 1000 Accia Doctyrina H 5002 57 287504 14 20200 17 1000 Accia Doctyrina H 1000 122 2131 17 2450 11 32405 11 32405 11 32405 11 32405 11 32405 11 32405 11 32405 11 32405 11 32405 11 32405 11 32405 11 32405 11 32405 11 32405 11 3251 12 1000 56 79 11 3251 10 11 3251 10 11 3251 10 11 3251 10 11 3	eria caffra	A	3138	2.6	8159	2.4	7531	0.2	628
Acade motodi Access podsynche A 2000 (1) 1000 (1) 1000 (2) 10000 (2) 10000 (2) 10000 (2) 1000	"acia albida	1	13359	4	53438	4	53438		
Acces Description Description <thdescription< th=""> <thdescription< th=""> Descrip</thdescription<></thdescription<>	Acacia hockii	٨	2523	1.55	3911		(1.55	3911
Accession subscreption In 707 0.46 1318 0.336 0.000 7.5 22500 0.7 7 Abbles inbrands A 1700 1.25 2133 1.23 2133 1.23 2133 1.23 2133 1.23 2133 1.23 2133 1.23 2133 1.23 2133 1.23 2133 1.23 2133 1.23 2133 1.23 2133 1.23 2133 1.23 2133 1.23 2133 1.23 2133 1.23 2133 1.23 2133 1.23 21333 2133 2133 21	Acacia meamsil (Black wattie)		303	50.0	17150	14.1	4272	42.5	12078
Actua changes A 1000 7.5 2200 7.5 2200 0.1 7 Abtic hinners A 1706 1.25 213 1.25 213 1.25 213 1.25 213 1.25 213 1.25 213 1.25 213 1.25 213 1.25 213 1.25 213 1.25 213 1.25 213 1.25 <td>Academ melanoxyton</td> <td>н 0</td> <td>707</td> <td>0.45</td> <td>318</td> <td>40</td> <td>202000</td> <td>17</td> <td>85884</td>	Academ melanoxyton	н 0	707	0.45	318	40	202000	17	85884
Abbe showing A 1700 1.22 2133 1.22 2133 Abbe showing N 3223 1 35455 1 35455 Ahus accumieds N 32200 1 354555 1 354555 Calling accumients N 2200 552 135457 20 3557 <td>Actoramen fervinikolisa</td> <td>Å</td> <td>3000</td> <td>7.5</td> <td>22500</td> <td>75</td> <td>22500</td> <td>9,1</td> <td>71</td>	Actoramen fervinikolisa	Å	3000	7.5	22500	75	22500	9,1	71
Abba bebes n 2235 1.2 3.04 1.2 3.04 1.2 3.04 Capana calan A 3000 1220 77740 16.1 10082 10.4 800 7410 Caline caranta N 2000 5.2 11.3 3245 11.5	Albizia chinensis	Å	1706	1.25	2133	1.25	2133		
Afrue acommana I 32235 11 354485 11 354855 Calinota scionymu A 3200 24.2 133477 220 83100 24.7 7400 Calinota scionymu A 3200 54.2 133477 200 83100 52.7 13357 Calinota scionymu A 32500 0.7 1413 57.0 57.0 57.0 57.0 57.0 57.0 57.0 59.0 50.0	Albizia lebbek	R	253	1.2	304	1.2	304		
Calantes calan A 000 12.9 173740 18.1 10088 104.8 000 Calling planca R 2000 55.1 3213 S100 24.7 7410 Calling planca R 2000 55.1 3213 S100 24.7 1330 Calling planca A 1200 57.7 1313 977 0.7 131 Casadra cannes A 1200 57.7 0.37 59.7 0.37 59.7 <td< td=""><td>Alnus acuminata</td><td>1</td><td>32235</td><td>11</td><td>354585</td><td>11</td><td>354585</td><td></td><td></td></td<>	Alnus acuminata	1	32235	11	354585	11	354585		
Caling active	Cajanus cajan	٨	600	122.9	73740	16.1	10860	104.8	62880
Callite gubanta (a) 2000 0.53 13545 (b) 5.2.3 13545 Casta expectable A 1173 8.7 9770 8.7 9770 0.7 101 Casta expectable R 1002 58.6 5962 3.1 3100 55.7 7.75 56.7 Casta expectable R 1002 58.6 5962 3.1 3100 5.6 5962 Castaria sociation R 1002 5.3 10.5 21/1 0.06 6.6 7 5.6 5062 3.6 6553 15.9 3.435 15 5.3 50.6 3.6 6553 15.0 3.435 15 3.435 15 3.435 15 3.435 15 3.4353 15 3.4353 15 3.4353 16.0 3.4353 16.0 3.4353 16.0 3.4353 16.0 3.4353 16.0 3.4353 16.0 3.4353 16.0 3.4353 16.0 3.4353 16.0 <td>Calliandra calothyrsus</td> <td></td> <td>3000</td> <td>54.4</td> <td>163200</td> <td>29.7</td> <td>89100</td> <td>24,7</td> <td>74100</td>	Calliandra calothyrsus		3000	54.4	163200	29.7	89100	24,7	74100
Lambre pineles yn C. robuska Cassa duran 2. Cassa duran 2.	Califyin calcarata	К	2590	52.3	135457			52.3	135457
Cases descension Ph. C. Moultany A 1123 0.7 0.77 0.7	California glassical (anna Carabumba)	G	2923	1.1	3213			1.1	3215
Casardra carbonista II 1002 5980 5980 50820 1.1 5180 587 221 60.55 221 60.55 221 60.55 221 60.55 221 60.55 221 60.55 221 60.55 221 60.55 221 60.55 221 60.55 221 60.55 221 60.55 221 60.55 221 60.55 77.75 665 Casuarina guberota R 1005 1.5 55.5 81.863 11.6.5 227.67 77.00 <td< td=""><td>Cassis siernes</td><td></td><td>1123</td><td>8.7</td><td>9770</td><td>87</td><td>9770</td><td>0.7</td><td>1813</td></td<>	Cassis siernes		1123	8.7	9770	87	9770	0.7	1813
Casaurine curring-burname R 1005 0.2 302 0.15 277 0.05 Casaurine glacca I 12504 0.35 4376 0.3 3771 0.55 Casaurine montane R 1006 0.3 6455 3.6 6509 650 Consume sortane R 1475 555 91865 10.65 20.70 20.7 20.90 20	Cassia spectabilis	R	1002	59.8	59920	3.1	3108	567	50013
Casaurine equisettibila A 1855 22.25 33731 15.5 23773 7.75 Deg Casaurine functiona T 12506 0.35 4576 0.3 4550 3650	Casuarina cunninghamiana	R	1808	0.2	362	0,15	271	0.05	
Casadram ordina I 12504 0.35 4376 0.3 5771 0.05 650 Casadram ordina suberosa R 1000 1.9 3485 1.9 34455 1.9 34455 1.9 34455 22780 38.7 5700 Codent server R 1470 5802 310605 1.0.5 1005 22780 38.7 5700 Codent server R 1470 5802 310605 1.5 5003 3.2 3980 Codent server R 1051 4.2 4414 1 1051 3.2 3980 Copressa paramidiafra I 1463 0.6 1196 0.6 1196 0.6 1196 0.8 1194 0.6 12 3980 1.5 1.2 3980 1.5 1.2 3980 1.5 1.6 1.7 4.66 1.6 1.7 4.66 1.6 1.7 4.66 1.6 1.7 4.66 1.6 1.7 4.6	Casuarina equisetifolia	٨	1285	26.25	33731	18,5	23773	7.75	9959
Cassardna mortana H 1008 3.6 6509 3.6 6509 3.6 6509 Codenia sunta A 1475 55.2 81045 11.3 2445 38.7 2000 Codenia sunta A 1475 55.2 81045 11.3 2445 38.7 2000 Corbon macrotachys F 707 0.8 556 10.6 0.5 1000 Corbon macrotachys F 2100 0.5 1005 3.3 0.5 1000 Cappesse benchance F 0.66 0.3 5.3 0.03 1.2 3600 Cappesse benchance A 1000 54.4 54400 1.2 3070 0.4 4.8 Desmodum incinatum A 3076 0.2 3.7 4001 0.5 11.4 0.95 11.4 0.95 11.4 0.95 11.4 0.95 11.4 0.95 11.4 0.95 11.4 0.95 11.4 0.95 1.4	Casuarina glauca	1	12504	0.35	4376	0.3	3751	0.05	625
Categories R 1478 1478 1478 3465 1.9 3465 1.9 3465 2000 Corbon macrostachys A 1777 3000 31568 10.0 10.05 2001 2001 2000 2001	Casuarina montana	R	1808	3.8	6509	3.6	6509		
Locassa avra. (***) Locassa avra. (***) Locassa avra. (****) Locassa avra. (*****) Locassa avra. Loc	Casuarina suberosa	R	1808	1.9	3435	1.9	3435		
Description Dist Dis Dist Dist	Contein serrata	H A	1475	55.5	61883	16.8	24780	38,7	57083
Coston magabiticary: n 2100 D.G. TODE D.G. TODE D.G. D.G. TODE D.G. D.G. TODE D.G. D.G. TODE D.G. D.G. <td>Croton macrostachys</td> <td>Â</td> <td>1003</td> <td>309.7</td> <td>310629</td> <td>10.6</td> <td>10632</td> <td>299,1</td> <td>200097</td>	Croton macrostachys	Â	1003	309.7	310629	10.6	10632	299,1	200097
Corporation for the second s	Croion menaiocarous	A	2100		1005			Q.8	500
Curpressus function P OPS 0.1 SSS0 S.3 SON3 D.2 D.2 <thd.2< th=""> <th< td=""><td>Cupressus benthami</td><td>R</td><td>1051</td><td>4.2</td><td>4414</td><td>1</td><td>1051</td><td>0.5</td><td>1095</td></th<></thd.2<>	Cupressus benthami	R	1051	4.2	4414	1	1051	0.5	1095
Cupressus pyremidalin I 1440 0.0 1104 0.0 1104 0.0 1104 0.0 1104 0.0 1104 0.0 1104 0.0 1104 0.0 1104 0.0 1104 0.0 532 0.0 532 0.0 534 532 0.0 534 532 0.0 534 532 0.0 534 532 0.0 534 534 544 557 605 527 605 527 605 527 605 62 627 72 646 62 622 666 62 666 62 666 62 666 62 665	Cupressus Iusitanica	A	959	6.1	5850	5.3	5083	3.2 6 R	3365
Cupressus sempervirens i 1460 0.35 523 0.35 523 79505 12 Enbade abyrsinica A 1000 54.4 54400 54400 5440 Enbade abyrsinica R 1200 52.4 5460 544.6 54400 544.6 54400 544.6 54400 544.6 54400 544.6 544.6 544.6 544.6 544.6 544.6 544.6 544.6 544.6 544.6 544.6 544.6 544.6 544.6 544.6 544.6 544.6 542.6 0.05	Cupressus pyramidalis	I 1	1493	0.8	1194	0.8	1194	5.0	'0'
Destination A 3078 37 113386 25 76050 12 Beers Ended abyrshika A 1000 54.4 54400 5440 5420 55502 3377 40012 0.05 6 55002 337 40012 24405 1007 955 1140 7.9 955 1140 7.9 955 1140 7.9 955 1140 7.9 955 1140 7.9 955 1140 7.9 955 1140 7.9 955 1140 7.9 955 1140 7.9 955 1140 7.9 955 1140 7.9 955 1120 120 12445 1.7 2465 1.7 2465 1.7 2465 1.7 2465	Cupressus sempervirens	L.	1493	0.35	523	0.35	523	1	
En anadropiragem ascelatum A 1000 54.4 5440 54.6 54.4 5440 55.4 5440 55.4 5440 55.4 55.2 55.5 57.5 57	Desnodum incinatum	A	3078	37	113086	25	76950	12	36936
Eucarphysis Eucarphysis	Entada abysarinca	A	1000	54.4	54400			54.4	54400
Eucarphyse catephyse (action) (1) (200 0.05 0.07 0.05 0.07 0.05 0.05 0.05 0.	Fucabotus botrosidas	n B	1460	1.2	2051	0.8	1787	0.4	884
Eucarphyse canaktviensis (m. p. Netord) 1214 41.6 5002 3.7 40012 7.9 950 Eucarphyse cinorea R 1251 19.7 24645 19.7 24645 19.7 24645 19.7 24645 19.7 24645 19.7 24645 19.7 24645 19.7 24645 19.7 24645 19.7 24645 19.7 24645 19.7 24645 19.7 24645 19.7 24645 19.7 24645 19.7 24645 19.7 2465 19.7 2465 19.7 2465 19.7 2465 19.7 2465 19.7 2465 19.7 2465 19.7 2465 19.7 2465 19.7 2465 19.7 2465 19.6 24.6 19.7 2465 19.7 2465 19.7 2465 19.7 2465 19.7 2465 19.7 2465 19.6 24.6 19.6 19.6 19.6 19.6 19.6 19.6 19.6 19.6 <td>Eucalvotus calophyla</td> <td>R</td> <td>1213</td> <td>0.05</td> <td>30/0</td> <td>2.1</td> <td>3070</td> <td>0.05</td> <td></td>	Eucalvotus calophyla	R	1213	0.05	30/0	2.1	3070	0.05	
Eucarppus canalationsis (pro. Pielord) i 1200 0.96 1140 0.96 1140 0.2 2445 Eucarppus chiodora R 1213 5.9 7157 5.7 0014 0.2 2.44 Eucarppus chiodora R 1213 5.9 7157 5.7 0014 0.2 2.44 Eucarppus clobulus R 7 725 3.2355 2.9 2277 0.1 7 Eucarppus grandis R 1212 0.2 0006 6.2 0036	Eucalyptus camaidulensis	R	1214	41.0	50502	33.7	40912	70	0501
Eucappus cineres R 1251 19.7 24045 24045 Eucappus ciceriana R 1213 5.0 717 5.7 6014 0.2 244 Eucappus ciceriana R 1222 1.8 2200 1.8 2200 0.1 7 Eucappus ciceriana R 1212 0.2 0006 6.2 0006 1.7 2465 1.7 2465 1.7 2465 1.7 2465 1.7 2465 1.7 2465 1.7 2465 1.7 2465 1.7 2465 1.7 2465 1.7 2465 1.7 2465 1.7 2465 1.7 2465 1.7 2465 1.7 2465 1.6 20.0 22.0 1250 1.7 2465 1.7 2465 1.7 2465 1.6 20.0 22.0 1250 1.2 1754 1.2 1754 1.2 1746 1.4 20.0 22.0 22.0 22.0 22.0 22	Eucalyptus camaldulensis (pro. Pteford)	11	1200	0.95	1140	0.95	1140		
Eucarphysis chiodonia R 1213 5.0 7157 5.7 001 0.2 2.4 Eucarphas globulus R 765 3 2355 2.9 2277 0.1 7 Eucarphas grandis R 1212 0.2 6068 6.2 9069 0.1 7 Eucarphas grandis R 1402 1.2 1754 1.2 1754 Eucarphas macromycha R 1402 1.2 1754 1.2 1754 Eucarphas macromycha R 1402 1.7 2465 1.7 2465 Eucarphas macromycha R 1402 1.7 12465 1.7 2465 Eucarphas macromycha R 1402 1.7 2465 1.7 2465 Eucarphas macromycha R 1402 1.2 1754 1.2 1754 Eucarphas macromycha R 1212 0.6 24667 20.0 20.0 2466 Eucarphas macromycha R 1402 1.2 1754 1.2 1754 Eucarphas macromycha R 1402 1.2 1754 1.2 1754 Eucarphas paneutata R 1402 2.55 30728 2.55 3728 2.55 Eucarphas paneutata R 1402 2.35 3.4366 2.3 3363 0.05 7 Eucarphas paneutata R 1402 2.35 3.266 1.55 2266 Eucarphas paneutata R 1402 2.35 3.276 2.55 Eucarphas paneutata R 1402 2.35 3.266 2.3 3363 0.05 7 Eucarphas satigna (acchie) A 500 2.1 1050 2.1 Eucarphas satigna (acchie) A 500 1.2 1623 11.2 1523 2.55 Eucarphas satigna (acchie) A 500 1.2 2.1523 1.2 1523 2.55 Eucarphas satigna (acchie) A 500 1.2 2.1627 1.2 2.1627 1.2 2.1627 1.3 2.16 Eucarphas satigna (acchie) A 500 1.2 3.6 150 1.2 1.55 3.200 1.61.4 45420 1.1.9 5105 1.2 3.6 150 1.1.9 5105 1.2 3.6 150 1.1.9 5105 1.2 3.6 150 1.2 3.6 150 1.1.9 5105 1.2 3.6 150 1.	Eucalyptus cinerea	R	1251	19.7	24845	19.7	24645	4	
Eucarphis pickardovergina R 1222 1.8 2200 1.8 2200 1.8 2200 1.8 2200 1.8 2200 1.8 2200 1.8 2200 1.8 2200 1.8 2200 1.8 2200 1.8 2200 1.8 2200 1.8 2200 1.8 200 1.2 1.7 2465 1.2 200 1.2 200 1.4 200 1.2 30 1.5 200 1.2 3 0150 1.2 3 0150 1.2 3 0150 1.2 3 0150 1.2 3 0150 1.2 3 0150 1.2 3 0150 1.2 3 0150 1.2 0.0 1.2 1050 1.2 1000000 1.2 2000 1.2 2000 1.2 2000 1.2 2000 1.2 2000 1.2 2000 1.2 2000 1.2 2000 1.2 2000 1.2 2000 1.2 2000 1.2 2000 1.2 2000 1.2 2000 1.2 2000 1.2 2000 1.2 200 1.2 0000 1.2 200 1.2 0000 1.2 0.2 200 1.2 000000 1.2 0.2 200 1.2 000000 1.2 0.2 200 1.2 0000000000	Eucalyptus citriodora	R	1213	5.9	7157	5,7	6914	0.2	243
Licelarybits Rescues R 785 3 2355 2.9 2277 0.1 7 Eucalybits Barvespins R 1402 1.2 1056 6.2 9698 1.7 2465 1.2 1.7 2465 1.2 1.7 2465 1.2 1.6 1.2 1.6 1.2 1.6 1.6 1.2 1.5	Eucalyptus cloeziana	R	1222	1.8	2200	1.8	2200		
Licaspipus grands H 1212 0.2 6608 6.2 9638 Eucaspipus tongifolia R 1462 1.7 2465 1.7 2465 Eucaspipus tongifolia R 1462 1.7 2465 1.7 2465 Eucaspipus macroancha R 1462 3.3 4825 3.3 4425 Eucaspipus macroancha R 1462 3.3 4825 3.3 4425 Eucaspipus macroancha R 1462 3.3 4425 3.4 445 Eucaspipus macroancha R 1462 1.2 1754 1.2 1754 Eucaspipus paraculata R 1462 1.2 1754 1.2 1754 Eucaspipus paraculata R 1462 1.2 1754 1.2 1754 Eucaspipus paraculata R 1462 2.3 34.85 1.740 Eucaspipus paraculata R 1462 2.3 34.85 1.55 226 Eucaspipus		A	785	.3	2355	2,9	2277	0.1	79
Eurosippicus torgifolia n 1462 1.2 1/74 1.2 1/75 Eurosippicus macrosyncha R 1462 1.7 2465 1.7 2465 Eurosippicus maideni (recolitée) R 1462 1.7 2465 1.7 2465 Eurosippicus maideni (recolitée) R 500 43 21500 14 7000 20 1450 Eurosippicus maideni (recolitée) R 502 34.85 17446 34.85 17446 Eucatippicus maideni (recolitée) R 1212 0.4 485 34.85 17446 Eucatippicus maideni (recolitée) R 1462 1.2 1754 1.2 1754 Eucatippicus maideni (recolitée) R 1462 2.5 3728 0.4 485 Eucatippicus patents R 1462 2.3 3303 0.05 7 Eucatippicus patents R 1462 2.3 3303 0.05 7 Eucatippicus patents R 1462<	Eucarphus grandis Eucalyntis Iogenings	H D	1212	8.2	9938	8.2	9938	*	
Eucalyptus mecrographa P 1.45 1.7 2483 1.7 2483 Eucalyptus maculas R 1462 3.3 4825 3.3 4825 Eucalyptus maculas R 1462 3.4 4825 3.3 4825 Eucalyptus maculas R 122 2.0.6 24667 34.85 17464 Eucalyptus microcurys R 122 2.0.6 24667 20.6 22.0 Eucalyptus microcurys R 1422 0.4 485 0.4 455 Eucalyptus paniculas R 1462 0.45 653 0.445 653 Eucalyptus paniculas R 1462 2.3 3363 0.05 7 Eucalyptus subratis R 1462 2.2 3216 2.1 105 Eucalyptus subratis R 1462 2.2 3216 2.1 105 Eucalyptus subratis R 1462 2.2 3216 2.1 105 Eu	Eucalvotus Iongilolia	ß	1462	1,2	1/34	1.2	1754	l	
Eucasyptus maciani n 1402 1.1 2403 1.4 2403 Eucasyptus maideni (ach. locale) A 500 43 21500 14 7000 20 1450 Eucasyptus maideni (ach. locale) A 502 24.85 1746 20.0 24.95 1754 20.0 24.95 1754 20.0 24.95 1754 20.0 24.95 1754 20.0 24.95 1754 1.2 1754 20.0 24.95 24.95 20.0 24.95 20.0 24.95 20.0 24.95 20.0 24.95 20.0 24.95 20.0 24.95 20.0 20.0 24.95 20.0 20.0 20.0 20.0 24.95 20.0	Eucalyptus macroryncha	8	1402	1.7	2403	1.7	2485		!
Eucapybus maideni (secoltáe) R 500 43 2150 14 7000 29 1450 Eucapybus microcorys R 1212 20.6 24067 34.85 1746 34.85 1746 20.6 24067 34.85 1746 20.6 24067 34.85 1746 20.6 24067 34.85 1746 20.6 24067 34.85 1746 20.6 24067 34.85 1746 20.6 24067 34.85 1746 20.6 24067 20.6 24067 20.6 24067 20.6 24067 20.6 24067 20.6 24067 20.6 24067 20.6 24067 20.6 24067 20.6 24067 20.6 24067 20.6	Eucalyptus maculata	R	1462	3.3	4825	3.3	2700		
Eucatyptus maideni (ach. locale) A 502 34.85 1746 34.85 1746 Eucatyptus microcorys R 1212 20.6 24007 20.6 24007 Eucatyptus microcorys R 1212 0.4 485 0.4 485 Eucatyptus paniculata R 1212 0.4 485 0.4 485 Eucatyptus paniculata R 1462 2.55 3728 2.55 3728 Eucatyptus polyanthemos R 1462 2.35 34.85 1.55 2260 Eucatyptus safigna (acch. locale) A 500 2.1 1050 2.1 1050 Eucatyptus safigna (acch. locale) R 500 1.2 1523 1.2 1523 Eucatyptus safigna (acch. locale) R 1200 1.2 1523 1.2 1523 Eucatyptus safigna (acch. locale) R 1200 1.2 1523 1.2 1523 Eucatyptus safigna (acch. locale) R 1200 1.2	Eucalyptus maideni (recoltée)	я	500	43	21500	14	7000	20	14500
Eldenybus microcorys R 1212 20.6 24067 20.6 24067 Eucalybus paniculata R 1402 1.2 1754 1.2 1754 1.2 1754 1.2 1754 1.2 1754 1.2 1754 1.2 1754 1.2 1754 1.2 1754 1.2 1754 1.2 1754 1.2 1754 1.2 1755 205 0.45 653 0.45 653 0.45 653 0.15 2266 1.55 2266 1.55 2266 1.55 2266 1.55 2266 1.55 2266 1.55 2266 1.55 2266 2.1 1055 10.2 10.5 10.5 1.55 2266 2.1 1055 10.2 10.5 10.2 10.5 10.2 10.5 10.2 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5	Eucalyptus maideni (ach. locale)	A	502	34.85	17495			34.85	17495
Eucaryptus nituementaria H 1402 1.2 1754 1.2 1754 Eucaryptus paniculata R 1212 0.4 485 0.4 656 Eucaryptus paniculata R 1402 0.45 653 0.45 656 Eucaryptus polyanthemos R 1402 2.55 3728 2.55 3728 2.55 2016 7 Eucaryptus polyanthemos R 1402 2.2 3216 2.3 3033 0.05 7 Eucaryptus safigna (acch. locale) A 500 1.2 1523 1.2 1523 1.2 1523 Eucaryptus safigna (acch. locale) R 500 1.2 1523 1.2 1523 1.2 1523 Eucaryptus safigna (acch.locale) R 1206 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1534 1.5 244.5 20694 11.9 5100 1.1.9 5100 1.1.	Eucaryptus microcorys	R	1212	20.6	24967			20.6	24967
Eucaryptus patiena R 1212 0.4 485 0.4 485 Eucaryptus piturais R 1462 0.45 656 0.45 656 Eucaryptus polyanthemos R 1462 2.55 3728 2.55 3728 2.55 3728 2.55 3728 2.55 3728 2.55 3728 2.55 3728 2.55 3728 2.55 3728 2.55 3728 2.55 3728 2.55 3728 2.55 3728 2.55 3728 2.55 3728 2.55 3728 2.52 2.1 1050 2.1 1050 2.1 1050 2.1 1050 2.1 1050 2.1 1052 1.2 1523 1.2 1523 1.55 2.266 3130 31470 24.5 2.969 11.9 51051 11.9 51051 11.9 51051 11.9 51041 11.9 51041 11.9 51041 11.9 51041 11.9 51041 11.9	Eucalyptus muelkinana	R	1462	1.2	1754	1.2	1754		
Eucalyptus pituralis R 1402 2.55 3728 2.55 3728 Eucalyptus propingua R 1462 1.55 3226 3363 0.05 7 Eucalyptus propingua R 1462 2.25 3216 2.2 3216 2.1 105 Eucalyptus saligna (recoltée) A 500 1.2 6150 12.3 6150 2.1 105 Eucalyptus saligna (recoltée) R 500 1.2 1523 1.2 1523 2162 24.5 29064 24.5 29064 24.5 29064 113.9 51051 11.9 51051 11.9 51051 11.9 51051 11.9 51051 11.9 51051 11.9 51051 11.9 51051 11.9 51051 11.9 51051 11.9 51051 11.9 51051 11.9 51051 11.9 51051 11.9 51051 11.9 51051 11.9 51051 11.9 51051 11.9 51051 </td <td>Eucavotus pateos</td> <td></td> <td>1212</td> <td></td> <td>485</td> <td>0,4</td> <td>485</td> <td></td> <td></td>	Eucavotus pateos		1212		485	0,4	485		
Eucalyptus polyanthemos R 1462 1.55 2266 3726 1.55 2266 Eucalyptus propingua R 1462 1.55 2266 3128 1.55 2266 Eucalyptus protata R 1462 2.23 3216 2.2 3216 2.1 1050 Eucalyptus saligna (ach. locale) A 500 2.1 1050 2.1 1050 Eucalyptus sideroxylon (importée) I 1266 1.2 1523 1.2 1523 21267 21627 21627 21627 21627 24.5 2966 24.5 29664 11.3 341000 34100 34100	Eucalyptus piluralis	R	1-90-2	2.45	3728	0.45	658		Į
Eucalyptus projingua R 1462 2.35 3436 2.3 3363 0.05 7 Eucalyptus punctata R 1462 2.23 3216 2.2 3216 7 Eucalyptus saligna (acch.locale) A 500 2.1 1050 7 Eucalyptus saliden agronomic (importée) R 500 12.3 6150 12.3 6161.4 464200 11.3 34170 13.4 34170 13.8 64735 11.9 51051 11.9 51051 11.9 12.4 603 12.3 4663 <t< td=""><td>Eucalyptus polyanthemos</td><td>R</td><td>1482</td><td>1.55</td><td>3740</td><td>₹,95</td><td>3728</td><td>155</td><td></td></t<>	Eucalyptus polyanthemos	R	1482	1.55	3740	₹,95	3728	155	
Eucalyptus ponctata R 1462 2.2 3210 2.2 3216 2.1 Eucalyptus saligna (ach. locale) A 500 2.1 1050 2.1 1055 Eucalyptus saligna (recoltée) R 500 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1533 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.7 913 1.7 913 1.7 913 1.7 913 1.7 913 1.7 913 1.7 913 1.7 913 1.7 913 1.7 913 1.7 913 <td>Eucalyptus propingua</td> <td>B</td> <td>1462</td> <td>2.35</td> <td>3436</td> <td>2.3</td> <td>3343</td> <td>1.35</td> <td>2400</td>	Eucalyptus propingua	B	1462	2.35	3436	2.3	3343	1.35	2400
Lucatyptus saligna (ach. locale) A 500 2.1 1050 10.1 2.1 105 Eucatyptus saligna (racoltiée) R 500 1.2 150 1.2.3 6150 2.1 105 Eucatyptus sideroxylon (importie) I 1266 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.2 1523 1.3 1.3 1.3 1.3 1.3 1.1 9.3 1.1 9.3 1.1 9.3 1.1 9.3 1.1 9.3 1.1 9.3 1.3 1.3 1.3 3.3 1.1 9.3 1.2 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.2 1.3	Eucalyptus punctata	R	1482	2.2	3216	2.2	3216	0.93	1
Eucaryptus saligna (recolfée) R 500 12.3 6150 12.3 6150 Eucaryptus sideroxyfon (importée) I 1269 1.2 1523 1.2 1523 Eucaryptus sideroxyfon (importée) R 1260 17.2 21827 17.2 21827 Eucaryptus ideroxyfon R 1212 24.5 20694 24.5 20694 Eucaryptus ideroxyfon R 1212 24.5 20694 24.5 20694 Eucaryptus ideroxyfon R 1212 24.5 20694 11.9 51051 11.9 51051 11.9 51051 11.9 51051 11.9 51051 11.9 51061 11.9 51061 11.9 51061 11.9 51061 11.9 51061 11.9 51061 11.9 51061 11.9 51061 11.9 51061 11.9 51061 11.9 51061 11.9 51061 11.9 11.9 11.0 11.7 9131 11.7 9131 11.7	Lucalyptus saligna (ach. locale)	٨	500	2.1	1050			2.1	1050
Eucarpus scency/on (importée) I 1269 1.2 1523 1.2 1523 Eucalyptus ideroxi/on (importée) R 1209 17.2 21827 17.2 21827 Eucalyptus ideroxi/on (importée) R 1209 17.2 21827 17.2 21827 Eucalyptus ideroxi/on (importée) R 1209 17.2 21827 17.2 21827 Eucalyptus ideroxi/on (importée) R 1212 24.5 20664 24.5 2968 Jacarands minosasfolia (ach. locale) A 1332 45.4 60473 46434 464200 113.9 34170 Leuceana glauca R 1332 59.36 79066 22.1 20437 37.26 4963 Leucana glauca R 1229 3.2 4963 3.2 4663 Leucana feucocephala R 1246 3.8 4735 1.7 913 Leucana feucocephala R 1246 3.4 436900 1453 435900 10 <td< td=""><td>Eucalyptus saligna (recoltée)</td><td>R</td><td>500</td><td>123</td><td>6150</td><td>12.3</td><td>6150</td><td></td><td>1</td></td<>	Eucalyptus saligna (recoltée)	R	500	123	6150	12.3	6150		1
Eucariphis tereficomis R 1279 17.2 21827 17.2 21827 Growitza nobusta R 3000 275.3 825900 161.4 484200 113.9 34170 Jacaranda mimosaefolia R 4200 11.9 51051 11.9 5105 Leucaena diversifolia (recoltée) A 1332 59.36 79068 22.1 29437 37.20 4963 Leucaena glauca R 1259 3.2 4963 3.2 4963 Leucaena feucocephaia R 1264 3.8 4735 3.8 4735 Leucaena feucocephaia K0 I 5371 1.7 9131 3.2 466 Leucaena feucocephaia K0 I 5371 1.7 9131 3.8 4735 Maesopais emini A 300 1463 438900 1453 435900 10 300 Pinus cocephaia R 10.05 0.5 0.5 0.5 0.5 0.5 0.5 <td< td=""><td>Eucaivotus sideroxyton (importée)</td><td></td><td>1269</td><td>1.2</td><td>1523</td><td>1.2</td><td>1523</td><td></td><td></td></td<>	Eucaivotus sideroxyton (importée)		1269	1.2	1523	1.2	1523		
Grewilia robusta In 1412 24.5 24094 24.5 29094 Jacaranda mimosaefolia R 3000 275.3 825000 161.4 484200 113.9 34170 Leucaena diversifolia (recolitée) A 1332 59.30 79068 22.1 29437 37.26 4963 Leucaena glauca R 1529 3.2 4863 3.2 466 Leucaena leucocephala R 1246 3.8 4735 3.6 4735 1.7 913 Leucaena leucocephala K0 I 5371 1.7 9131 3.2 466 Leucaena leucocephala K0 I 5371 1.7 9131 10 300 1463 435900 10 3000 10 3000 10 3000 10 300 1463 435900 10 300 13.6 1.7 913 Mimosa scabrella I 0.5 1.2 13.6 1.7 913 1.7 913 1.9	Eucalyphis benticomis	сц Га	1209	17.2	21827	17.2	21827		
Jacaranda mimosaefolia R 4000 11.9 5051 161.5 468200 113.9 34170 Leucaena diversifolia (acc. locale) A 1332 45.4 60473 11.9 51051 Leucaena diversifolia (recoltée) R 1332 45.4 60473 45.4 60473 Leucaena giauca R 1332 59.36 79068 22.1 29437 37.26 4963 Leucaena leucocephala R 1246 3.8 4735 3.8 4735 3.8 4735 1.7 913 Mesopsis eminii A 300 1463 43800 1453 435900 10 300 Mimosa scabrelia I 15 1.2 13.8 1.7 913 Mimosa scabrelia I 0.5 3.1 1.9 1.9 1.9 Pinus editotii (var. eliottii) I 5 3.1 1.9 1.9 1.9 Pinus editotii (var. eliottii) I 5 3.1 1.9	Gravilles robusts	R	1212	24.5	26034	101 -	184000	24,5	29694
Leucaena diversifolia (ach. locale) A 1332 45.4 60473 11.9 5105 Leucaena diversifolia (recoltée) R 1332 45.4 60473 145.4 60473 Leucaena glauca R 1332 59.36 79068 22.1 29437 37.26 4963 Leucaena leucocephala R 1246 3.8 4735 3.8 4735 Leucaena leucocephala K0 I 5371 1.7 9131 1.7 9131 Meesopsia eminii A 300 1463 438900 1453 435900 10 300 Newtonia buchananii R 700 7.6 5320 1.2 13.8 7.6 532 Pinus caribaea I 0.5 3.1 1.97	Jacaranda mimosasfolia	R	4290	11.9	51051	101,4	404200	113.9	341700
Leucaena diversifolia (recoltée) R 1332 59.36 79068 22.1 29437 37.26 4963 Leucaena glauca R 1529 3.2 4963 3.8 4735 3.2 4893 Leucaena leucocephaia R 1246 3.8 4735 3.8 4735 3.2 4893 Leucaena leucocephaia K8 I 5371 1.7 9131 1.7 913 Mesopsis eminii A 300 1463 438900 1453 435900 10 300 Nimosa scabrelia I 15 1.2 13.8 10 300 10 300 10 300 10 300 10 300 10 300 10 300 10 300 10 300 10 300 10 300 10 300 10 300 13.8 7.6 5320 10.5 10.5 3.1 1.9 10.7 10.7 10.7 10.7 10.7 10.7<	Leucaena diversifolia (ach. locale)	٨	1332	45.4	60473			45.4	80479
Loucaena giauca A 1529 3.2 4993 3.8 4735 3.8 3.8 4735	Leucaena diversifolia (recoltée)	R	1332	59.36	79068	22.1	29437	37.26	49630
Concentra reucocophala FI 1246 3.8 4735 3.8 4735 Leucaena leucocophala K0 I 5371 1.7 9131 1 1 9131 1 1 9131 1 1 300 1463 438900 1453 435900 10 300 Merzopais emini A 300 1463 438900 1453 435900 10 300 Newtonia buchananii R 700 7.6 5320 13.8 14.7 14.7 14.7 14.7 14.7 14.7 14.7 14.7 14.7 14.7 14.7 14.7 14.7	Laucaena glauca	Ä	1529	3.2	4893			3.2	4893
Maesopsis emini A 300 1483 438900 1453 435900 10 300 Newtonia buchananii I 15 1.2 13.8 10 300 300 300 1483 435900 1453 435900 10 300 300 300 300 10 300 300 10 300 300 10 300 300 10 300 300 10 300 300 10 300 300 10 300 300 10 300 300 10 300 300 10 300 300 10 300 300 10 300 300 10 300 300 10 300 300 10 300	Loucaona Mucocephala	IN .	1248	3.8	4735	3.6	4735		1
Mimosa scabrella A 300 1463 438900 1453 435900 10 300 Newtonia buchananii R 700 7.6 5320 1.2 13.8 13.8 Pinus caribaea I 0.5 7.6 5320 7.8 532 Pinus elilotti (var. elitotti) I 5 3.1 1.9 0.5 Pinus kesiya I 0.5 3.1 19.7 19.7 Pinus occarpa R 0.12 0.12 0.12 0.12 Pinus patula R 11296 84.7 958771 24.7 279011 60 67776 Perygota mildbraedii R 4623 8.6 42336 8.6 42346 8.6 42346 8.7 36.8 42346 8.6 42346 1.5 752 2.8 1402 2.8 1402 2.8 1402 2.8 1402 2.8 1402 2.8 1402 2.8 1402 2.8 1402 2.8 </td <td>Maesonals eminii</td> <td></td> <td>5371</td> <td>1.7</td> <td>9131</td> <td></td> <td></td> <td>1.7</td> <td>9131</td>	Maesonals eminii		5371	1.7	9131			1.7	9131
Newtonia buchananii R 700 12 1.2 13.8 Pinus caribaea I 0.5 7.6 5320 7.6 532 Pinus caribaea I 0.5 0.5 0.5 0.5 0.5 Pinus celiotti (var. elliottii) I 5 3.1 1.9 0.5 Pinus cocarpa I 18.7 19.7 19.7 0.12 0.12 Pinus patula R 0.12 0.12 0.12 0.12 0.12 Prosopis julifora I 4586 0.0 4127 0.9 4127 0.12 Perygota mildbraedii R 4623 8.6 42336 6 42336 6 42336 6 4234 5.5 40281 54.5 33773 Sesbania sculeata I 6197 61 378017 6.5 40281 54.5 33773 Sesbania sesban A 600 24 14400 19.8 11680 4.2 252	Mimoaa scabrelia	lî l	300	1463	438900	1453	435900	10	3000
Pinus caribasa 1 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 1.00 1.00 1.00 0.5 0.12 0.15 0.15 </td <td>Newtonia buchananii</td> <td>B</td> <td>700</td> <td>15</td> <td>6220</td> <td>1.2</td> <td></td> <td>13.5</td> <td></td>	Newtonia buchananii	B	700	15	6220	1.2		13.5	
Pinus elliottii (var. elliottii) 1 5 3.1 0.5 Pinus kesiya 1 18.7 19.7 19.7 Pinus occarpa R 0.12 19.7 0.12 Pinus patula R 11296 84.7 956771 24.7 279011 60 67776 Pinus patula R 11296 84.7 956771 24.7 279011 60 67776 Prosopis juliflora 1 4586 0.0 4127 0.9 4127 0.9 4127 0.6 67776 Pisrygota mildbraedii R 4423 8.6 42336 6 4233 6.6 4233 Sesbania aculeata 1 6197 61 378017 6.5 40281 54.5 33773 Sesbania sesban A 501 29.5 14780 1.5 752 28 1402 Spathodea campanulata R 1475 2.8 4130 2.8 4132 2.8 413	Pinus caribaea	h l		0.5	55660				5320
Imus kesiya I 18.7 1.5 Pinus occarpa R 0.12 19.7 0.12 Pinus patula R 11296 84.7 958771 24.7 279011 60 67776 Pinus patula R 4023 8.6 42336 6.8 42336 6.8 42336 8.6 4233 8.6 42336 8.6 4233 8.6 4233 8.6 4233 8.6 4233 8.6 4233 8.6 4233	Pinus elliotti (var. elliottii)	 1		5]	31		U,5 1 O	
Pinus patula Pinus patula<	irmus kesiya	1		19,7				197	1
Prosopiaula R 11296 84.7 958771 24.7 279011 60 67776 Prosopis juliflora I 4586 0.9 4127 0.9 4130 1402 1402 1402 1402 1402 1402 1402 1402 1402 1402 1402 1402 1402 1402 1402 1402	Pintos a chat	8		0.12				0.12	ļ
I 4586 0.0 4127 0.9 4127 Plerygota mildbraedii R 4423 8.6 42336 8.6 4032 8.6 4032 8.6 4102 8.6 4.0 4.0 8.6 4.2 2.6 4102 8.6 4.1 2.6 4133<	Promonie indelore	A	1 1296	84,7	956771	24.7	279011	60	677760
Sesbania aculeata II 4623 8.6 42336 8.6 42336 Sesbania macrantha I 6197 61 378017 6.5 40281 54.5 33773 Sesbania macrantha A 501 29.5 14780 1.5 752 26 1402 Spathodea campanulata R 1475 2.8 4130 2.8 11880 4.2 252 Techona grandis 1 1 1 2.8 4130 2.8 4130 2.8 413 Tephrosia vogelit A 1000 40.5 40500 1 40.5 4050 Tetractinia articulata R 2023 1.2 3508 1.2 3508	Pervola mikihrandi		4586	0.9	4127	0.9	4127		, in the second s
Sesbania macrantha A 0197 61 378017 6.5 40281 54.5 33773 Sesbania sesban A 501 29.5 14780 1.5 752 28 1402 Spathodea campanulata R 1475 2.8 4130 2.8 11880 4.2 252 Techona grandis 1 1 1 2.8 4130 2.8 413 Tephrosia vogelit A 1000 40.5 40500 1 40.5 4050 Tetractinis articulata R 2023 1.2 3508 1.2 3508	Sosbania aculeata	int i	4923	8.6	42336			8.6	42338
Senbania sesban A BOUT 215.3 14760 1.5 752 28 1402 Spathodea campanulata R 1475 2.8 14400 19.8 11880 4.2 252 Tectoria grandis 1 1 1 2.8 4130 2.8 4130 2.8 4130 2.8 413 2.8 413 2.8 413 2.8 413 2.8 413 1	Sesbania macrantha		6197 504	61	378017	6.5	40281	54,5	337737
Spatnodes campanulata R 1475 2.8 4130 11000 4.2 252 Tectora grandis 1 1 1 2.8 4130 2.8 4130 2.8 4130 2.8 4130 2.8 4130 2.8 4130 2.8 4130 1 2.8 4130 1	Sesbania sesban	Ă I	800	29.0	14/80	1.5	752	28	14028
Tephrosia vogeli 1 1 1 2.0 110 Tephrosia vogeli A 1000 40.5 40500 1 40.5 4050 Tetractinis articulata B 2023 1.2 3508 1.2 3508	opamodea campanulata	R	1475	2.8	4130	1 14, 0	11000	4.2. 2 A	4190
Tetracinis articulata A 1000 40.5 40500 40.5 4050 1.2 3508 <td>Tephronia yrannis</td> <td></td> <td>-</td> <td>1</td> <td></td> <td>1</td> <td></td> <td>2.0</td> <td>7100</td>	Tephronia yrannis		-	1		1		2.0	7100
	Tetractinia articulate	A	1000	40,5	40500			40.5	40500
			2923	1.2	3508			1.2	3508

,

A = LOCALLY BOUGHT I = IMPORTED R = COLLECTED BY T.S.C

÷

ļ

* s

· .

Species	Provenance	Quantity (Kgm)
Acrocarpus fraxinifolius	Arboretum de Ruhande	15.4
Acacia meamsii	Rwerere & Gitarama	189.9
Alnus acuminata	Rwerere	3.1
Cedrela serrata	Arboretum de Ruhande	37
Cassia spectabilis	Butare arboretum	28.4
Callitris robusta	Butare arboretum	15.6
C. calcarata	Gishamvu	16.5
Calliandra calothyrsus	Arboretum de Ruhande	6.7
Chamaecytisus palmensis	Rwerere	32.3
Cupressus lusitanica	Arboretum de Ruhande	15.5
Eucalyptus grandis	Arboretum de Ruhande	29.2
E. saligna	Arboretum de Ruhande	53.3
E. microcorys	Arboretum de Ruhande	25.5
E. maidenii	Gisovu (Kibuye)	80
Entada abyssinica	Mugusa (Butare)	0.6
Entandrophagma excelsum	Arboretum de Ruhande	1.0
Jacaranda mimosaefolia	Butare	2.35
Leucaena diversifolia	Arboretum de Ruhande	121.1
Maesopsis eminii	Kibungo	465.0
Sesbania sesban	Rwerere	3.0
Pinus patula	Gisovu (Kibuye)	21.6
TOTAL		1163.05 kgm

Table 4. List of species and seed collected in 1995 by RTSC

Table 5.List of species and seeds bought from local seed collectors and
purchased by RTSC.

Species	Provenance	Quantity (kgm)	Unit price (FRW/Kgm)	Total Cost (FRW)
Calliandra calothyrsus	Butare (Shyanda)	203.4	6,000	1,220,400
same	Butare	20	4,500	90,000
Cassia spectabilis	Butare (Shyanda)	73	1,500	109,500
Entada abyssinica	Butare (Shyanda)	2.3	1,000	2,300
Grevillea robusta	Butare (Shyanda)	99	5,000	280,000
Sesbania sesban	Butare (Ngoma)	39	800	79,200
Tephrosia vigelli	Butare (Shyanda)	56	900	27,000
TOTAL		483.7		1,808,400

Species	Quantity (Kgms)	Price/kgm (FRW)	Total Revenue (FRW)
Aberia caffra	0.2	4.28	856
Acacia mearnsii	35	1.9	66.5
A. melanoxylon	10.5	15.88	166.74
Acrocarpus	0.5	3.26	1.63
fraxinifolius			
Alnus acuminata	4.2	87.04	365.568
Calliandra	61.88	12.42	768.55
calothyrsus			
Callitris robusta	0.5	8	4
Cassia spectabilis	13.0	3.96	51.48
Casuarina	1.8	4.5	8.1
equisetifolia			
Cedrela serrata	6.0	5.1	30.6
Chamaecytisus	13.0	33	429
palmensis			
Cupressus	10.3	3.96	40.788
lusitanica			
Desmodium	3	12.42	37.26
incinatum			
Eucalyptus	15.2	4.06	61.712
camaldulensis			
E. grandis	18.5	4.06	75.11
E. maidenii	27.5	2.44	67.1
E. saligna	38.5	3.08	118.58
E. tereticornis	9	4.06	36.54
Flemingia congesta	1.4	2	2.8
Grevillea robusta	58.1	12.7	741.356
Leucaena	83.1	5.2	435.444
diversifolia			
Maesopsis eminii	80.5	1.28	103.04
Pinus patula	5.2	29.77	154.804
Sesbania sesban	12.68	2.62	33.222
S. macrantha	4.5	2.62	11.79
Tephrosia vogelii	4	3	12
TOTAL	486.06		3,824.57

Fable 6.List of species and seed sold by the RTSC in 1995.

.

Species	Date	Supplier	Quantity	Value
			(Kgm)	(\$)
Eucalyptus	23 Jan 1995	CSIRO	4.0	A\$4,000
camaldulensis				
provenances				
(Petford and				
Katherine)				
Pinus kesiya	29 May 1995	Forest Tree	6.0	US\$1056
seed orchard		Seed Centre		
seed		Zimbabwe		
Pinus oocarpa	29 May 1995	Forest Tree	6.0	US\$1188
seed orchard		Seed Centre		
seed		Zimbabwe		
E.	Dec 1995	CSIRO	3.75	A\$4745 (this
camaldulensis				includes the
(bulk lot)				E.grandis
				below)
E. grandis	Dec 1995	CSIRO	637777777777	6337793333
(bulk lot)				
Chamaecytisus		W. Aust.		A\$1500
palmensis		'Kimberley		
1		Seeds'		
Mimosa	10 Aug 1995	Tropical Seeds	10	US\$1500
scrabella		Honduras		
Alnus	10 Aug 1995	Tropical seeds	10	US\$1,200
acuminata		Honduras	47 m	

Fable 7.List of seed supplied to RTSC from sources outside Rwanda and
organised by CSIRO.

<u>end</u>