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World Vision Relief & Development, Inc

**WORLD VISION  
RWANDA EMERGENCY AGRICULTURE  
PROGRAM**

**REAP II - FINAL REPORT**

GRANT # AOT-445-G-00-5081

FEBRUARY 17, 1995-MARCH 30, 1997

**Submitted to**

Ms Regina Davis-Tooley  
USAID/OFDA  
Washington, DC

**WVRD Headquarter's Contact**

Ms Jules L Frost  
220 I St NE, Suite 270  
Washington, DC 20002  
Tel (202) 608-1824  
Fax (202) 547-3743

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**World Vision Rwanda**

**RWANDA EMERGENCY AGRICULTURE PROGRAM--PHASE 2  
REAP II -FINAL REPORT**

GRANT # ACT-4005-G-00-5081-00  
February 17, 1995 - March 30, 1997

**1 INTRODUCTION**

The Rwanda Emergency Agriculture Program--Phase 1 was a partnership between OFDA and World Vision Relief & Development for the purpose of bringing about agricultural recovery REAP1 provided immediate post-war emergency supplies of seeds and tools to destitute farmers so that they could restart their crop production. It also provided for the multiplication and distribution of improved seeds.

The second phase of REAP continued the partnership for the purpose of restoring farmers' cropping systems, rehabilitating essential agriculture infrastructure, animal restocking and reactivating essential farmer support systems (warehouses, seed farms), with emphasis on the multiplication and distribution of high quality seeds of the most adapted and best performing varieties. The REAP 2 was awarded on February 17, 1995. The original grant end date was November 16, 1995. However, OFDA granted WVRD two no-cost extensions which resulted in the final end date of March 30, 1997.

**II PROJECT GOAL** The emergency reestablishment and revitalization of farming systems in Gikongoro, Kanazi and Ruhengeri/Gisenyi regions through the supply of seed and tool packs and reintroduction of selected, priority technologies for increasing the sustainability and profitability of farm enterprises.

**III OBJECTIVES**

**Objective 1** Procure and distribute seed and tool pack (agpaks) to 10,000 families in Kanazi, 20,000 families in Ruhengeri and 22,000 families in Gikongoro during the 1995B season (February-June 1995)

WV completed this objective (see the progress report for the February-July 1995 period) with the distribution of seed and tools to 12,000 families in Kanazi, 20,000 families in Ruhengeri and 22,000 families in Gikongoro. Of the 12,000 Kanazi families receiving seeds and tools, 5,000 families were newly arrived families (since the October 1994 distribution financed by REAP 1).

and 7,000 were vulnerable families. Of the 20,000 Ruhengeri beneficiaries, 8,000 families were newly arrived refugee families (to Nkuli, Mutura, Nyamugali and Cyeru communes). In addition, WV supplied seeds and tools to 12,000 families in Butaro commune, these families had received some support from ICRC the previous season but needed added support (based on a diagnostic survey conducted by WV in November 1994). In Gikongoro, seeds and tools were provided to 5,000 newly arrived refugee families and to 17,000 vulnerable families.

Some of the hoes and seeds were provided gratis by FAO and EU. FAO provided all the hoes and seeds of cabbage, onion, carrot, tomato, peas (Ugandan source), soybeans (NAM1 from Uganda) and 150 MT of mid-elevation bush beans (Rwandan source), EU provided the sorghum seeds. All other seed was purchased with REAP2 funding.

**Objective 2 Procure and distribute seed and tool packs to 17,000 returnee families in the prefectures of Kanazi, Gikongoro and Ruhengeri/Gisenyi during the 1996A season (October 1995 - January 1996 season)**

In September and October 1995 (1996A planting season), WV completed the objective by distributing seeds and tools to 25,859 farm families. Details are found in the progress report for September-December 1995 and in Table 1 attached.

Seeds and tools were distributed to 6,200 newly returned refugees and vulnerable families in 5 communes of Ruhengeri and 1 commune (Mutura) of Gisenyi. In Kanazi, 6,590 families received seeds and tools and in Gikongoro 13,069 families received seeds and tools.

**Objective 3 The original objective read Multiply and diffuse approximately 15 MT maize, 370 MT potatoes, 12 MT wheat, 2 MT peas and other planting materials of improved, adapted crop varieties**

**The modified REAP2 objective reads Multiply and diffuse approximately 27 MT of maize, 560 MT of Irish potatoes, 17 MT wheat, 15 MT of peas, 5 MT soybeans, 2 MT of sunflowers, 3 MT of sorghum and 400,000 cuttings of sweet potatoes**

During REAP2, WV multiplied and diffused the following seed quantities: 5.6 MT maize, 685 MT of Irish potatoes, 46 MT wheat, 1 MT peas, 28.4 MT soybeans, 4 MT sunflowers, 8.7 MT sorghum, 3 MT pigeonpea and 1,064,300 sweet potato cuttings. In addition, we multiplied and diffused 1.6 MT cowpeas and 30 MT beans and had planted cassava on 1.8 hectares (that should produce 89,000 cassava cuttings).

The production of peas, beans, peanut, maize, soybeans and sorghum was actually much greater than reported here. Very often, farmer contractors refused to honor the contract and would not sell 80% of the production, they preferred to trade or sell the improved seeds for a value more than what WV had agreed to pay (20-25% above prevailing market price).

The best way to multiply seeds of varieties new to farmers is on WV- controlled seed stations or under contract on Ministry of Agriculture seed stations. Farmer contractors can be used for multiplying new varieties but the contract would need to be for several seasons, the first season is to multiply seed for immediate farmer demand, the following seasons to multiply for sale to WV.

WV failed to meet the targets for multiplying maize and peas which are moisture-loving. Because most of the crop seasons (1996A, 1996B and 1997 A) received less than normal rainfall, maize and peas produced less than expected. Maize is a crop often eaten fresh, and is a favorite target for hungry farmers. On the other hand, farmer demand for maize and pea seeds was less than for the other crops. There are no improved varieties of peas that farmers did not already have access to. Ruhengeri is the major maize producing area and seed of the favorite variety Pool8A is readily available. There is a demand for this variety by Byumba farmers and WV was not able to meet their demands during REAP2.

WV exceeded targets for sweet potato cuttings and seeds of Irish potatoes, wheat, sorghum and soybeans. In addition, we provided seeds of peanuts, cowpeas and beans. Additionally, we multiplied seeds of dolichos (also called hyacinthe bean or lablab bean) that is used as a green manure and seeds (300 kg) of pigeonpea that is used as a food as well as green manure and animal fodder.

WV also multiplied and diffused seeds of the following vegetables:

Eggplant 92 kg of variety "Nyagatoryi"

Improved amaranthus 6 kg of "Red leaf" and 19 kg of "White leaf"

Ethiopian kale 2 kg of "Brassica", 8 kg of "Mbeya purple" and 6.8 kg of "Mbeya green"

Malabar spinach 1.6 kg "Green leaf" and 0.8 kg of "Purple leaf"

Most of the bean seed was distributed through farmer association stores. Seeds were packaged in 200 gram packets with a technical message describing the characteristics of the variety. The seed were sold at above market price. Only seeds of improved varieties had a high market demand.

**Objective 4 Receive, store, evaluate, introduce and diffuse approximately 200 improved crop varieties recommended and produced by the Seeds of Hope (SOH) initiative**

WV evaluated about 120 varieties of beans provided from SOH. Some of the best performing varieties that WV is multiplying and diffusing are climbing bean varieties Ngwinurare, Urunyumba3, NM82, RWR719, RWR221 and RWV296, and bush bean varieties RWK5, RWK10, RWR911, CAB19, IZO20532/63 and MCM5001.

The three maize varieties (Pool8A, Pool9A and ZM607) introduced under the SOH initiative have been and continue to be multiplied and distributed. Pool8A and Pool9A are recommended for high and medium elevation regions and ZM607 for low elevation (less than 1600 m) regions. Seeds of Pool8A are now widely available in Ruhengeri. There is still a strong demand for seeds.

of ZM607 which WV is still multiplying

**Objective 5· Increase capabilities of 18 agronomists and extension agents to service the farming community through WVRD-sponsored learning-by-doing, action and formal training conducted on-station and on-farm**

Recent graduates (A2 level) of most agriculture schools are poorly equipped to assist farmers. Most graduates have received little more than biology courses and little practical agriculture training. With little practical knowledge of agriculture, they are understandably not confident among farmers who know more than they. Therefore, WV has had to invest considerable time in training agronomists.

WV has trained agronomists in seed multiplication, agroforestry, crop production, soil conservation, fertility management, crop protection, PRA (participatory rural appraisal) and in business skills (for assisting farmer associations). Training has been in both theory and in developing practical skills. French and English language agriculture books and other agriculture publications were made available to the agronomists in each region. The booklets produced by INADES in both French and Kinyarwanda are particularly good.

In addition, on-farm evaluations of different varieties, crops and cultural practices continue to be an important activity for both training agronomists and to identify improved technologies. The agronomists themselves carry out the field trials and both agronomists and farmers together can observe and decide for themselves the best technologies.

We have also provided opportunities for agronomists from one region to visit WV and farmer activities in another. Such visits not only impart practical information but also motivate agronomists to perform better.

**Objective 6 Reactivate 4 agricultural field stations in the project areas**

WV reactivated Rwerere and Kinigi field stations of ISAR (Rwandan Institute of Agronomic Sciences) in Ruhengeri, and these farms are now completely managed by the Ministry of Agriculture. However, at the invitation of ISAR, we have returned to the Kinigi station where we are multiplying Irish potatoes. WV also repaired the animal stockpens at ISAR's Karama station (Gashora, Kanazi). WV is continuing to multiply seeds at the seed farm of the Mayange youth training center at Mbyo, Gashora, Kanazi.

Because of insecurity and logistical constraints, World Vision decided not to reactivate the Karama station located in the extreme southern part of Kanazi. Instead, WV reactivated 5 ha of a 15 ha seed station at Kuvumu formerly belonging to the BGM (Bugesera-Gisaka-Migonbo) project. This station was used for seed multiplication.

**Objective 7. Improve food security and stimulate the rural economy through improved**

**storage capabilities and basic structures for exchange of inputs and produce through the rapid rehabilitation of 24 pre-existing seed depots in Gikongoro and Kanazi prefectures**

Briefly, WV and association members have repaired 22 warehouses in Gikongoro (13), Kanazi (3) and Ruhengeri (6). These rehabilitated warehouse/stores are being used for selling farmer supplies such as fertilizer, lime, pesticides, seeds, etc (funded by WV-Japan and POSIVA). The availability of these inputs have made it possible for farmers to grow Irish potatoes and vegetables and other income generating crops that require inputs. The stores are managed by farmer associations which consist of representatives of many different farmer groups. In Gikongoro, some of the stores are now involved in seed multiplication and selling the seeds through the stores. Other stores are also being used for seed storage, that is, farmer harvests are stored until prices become more favorable.

Rehabilitation of the warehouses has had a very favorable impact on restoring agriculture production.

**Objective 8 Increase the productivity and sustainability of farm enterprises by integrating improved cultural practices, tree seeds with proven agroforestry potential, and erosion control measures into a standardized (by region) technical message transmitted directly to farmers by 60 extension agents and leader farmers**

During the war, some regions experienced a loss of trees. After the war, refugees returned to their farms and found homes destroyed. Consequently, the resulting housing reconstruction has placed additional demands on limited agroforestry resources. Furthermore, refugees returned to their farms to find that trees around their homesteads had been cut down and used for construction or firewood. This created scarcities and also exposed the land to degradation from soil erosion. The government has no plans to provide tree seedlings to farmers to replace trees now being lost. To meet this need, WV initiated a program to provide farmers tree seedlings. Rather than grow seedlings in a central nursery and distribute seedlings to farmers (logistically difficult and expensive), we provided the tree seeds directly to farmers (in groups) and trained them to grow their own seedlings in their own nurseries.

For farmers, the real selling point for growing agroforestry plants was their potential for improving soil fertility and for providing fodder for their animals during the dry season. In diagnostic surveys conducted by WV in October-November 1994 in Ruhengeri, Kanazi and Gikongoro, declining food production was most often cited by farmers as their primary problem before the war. Farmers recognized that declining food production was related to declining soil fertility partially caused by soil erosion and constant cropping. Thus, farmers were interested in planting agroforestry species that could be used for firewood and construction but also for improving soil fertility. Farmers were also keen to grow calliandra and leucaena species because, in addition to providing firewood and green manure for their soil, they could be used to provide fodder to animals. Later, WV made the planting of agroforestry species a condition before farmers could benefit from an animal restocking program.

Between May 1, 1995 and March 30, 1996, WV distributed approximately 119 kg of agroforestry seeds and 36,000 cuttings to about 2,000 farmers. No less than 479,900 seedlings were produced in farmers' nurseries. Details of species and numbers according to region are presented in Table 2. Most of these seedlings were transplanted to farmers' own fields, some were sold to other farmers or to NGOs.

WV provided about 60,000 pineapple slips to 21 associations (total of 564 women and 64 men beneficiaries) in three communes of Kanazi. The majority (42,000 slips) were provided on credit to 17 women groups in Kanzenze commune. These women groups will later reimburse to WV two slips for each one given. By this means, we hope to be able to assist twice the number of farmers in the future.

Pineapple plants provide not only a marketable fruit, but are also planted along the contour where they can assist in erosion control, particularly when properly mulched. The pineapple "industry" was set back during the war when many plants were destroyed. WV had to travel to Gitarama to find adequate quantities of pineapple planting materials.

In addition, about 250 farmers transplanted 1,740 seedlings of tree tomatoes and 1,200 seedlings of passion fruit. Tree tomatoes and passion fruits provide not only protection of the soil but the fruits are easily marketed.

In our diagnostic surveys in Kanazi and Murambi, farmers consistently requested citrus and other fruit trees. Before the war, ISAR provided about 800 grafted citrus trees per year. This activity has since stopped and citrus trees are no longer available from the government nor from the private sector. WV is working with an association of 80 older orphans in Kanzenze commune to raise and sell grafted citrus seedlings to meet a market need and as a long-term income generating activity. We provided the association about 3,800 seeds of citrus rootstock seed (from Florida). Seedlings will not be ready for grafting until next year when they will be grafted with limes, lemons, valencia orange, navel orange and mandarins (tangerines). WV also hopes to bring quality improvement to the oranges and tangerines. Previously, the only rootstock used in Rwanda was "Rough lemon" which gives high production but inferior (acid and insipid) fruit. In addition to "Rough lemon" we have also introduced "Swingle", "Carrizo" and "Trifoliate" rootstocks that produce slightly lower yields but significantly better quality fruit. These latter rootstocks are more moisture demanding than "Rough lemon" and will need to be heavily mulched or irrigated or planted at the bottom of hills or near lakes where soil moisture (and irrigation water) is more or less available throughout the year.

In Kibali, Byumba prefecture, WV is assisting two women's group to produce grafted avocado trees. Approximately 3,000 seeds have been planted, and these will serve as the root stocks.

**Objective 9- Procure and distribute seeds and tools to 41,700 returning refugee families in Ruhengeri/Gisenyi, Kanazi and Gikongoro regions (This objective was possible given OFDA's agreement to WV's request for the no cost extension of project from November 17, 1995 to June 30, 1996)**

This was accomplished during the January-March, 1996 quarter when WV distributed to 42,693 farm families the following 27,400 hoes, 85 MT beans, 32 MT peas, 27 MT wheat, 59 MT maize, 8 MT groundnut, 18 MT soybean, 33 MT sorghum and vegetable seeds (onion, carrots, kale, tomato, okra and cabbage)

A second no-cost extension of the grant to March 30, 1997 allowed for the preparation for the return of refugee families and the funding of seeds and tools for up to 25,000 refugee families in the regions where WV was operating. The surprise and massive return trek of up to 1.4 million refugees in November and December, 1996 forced us to divert attention from other agriculture activities to focus on the planning of the immediate survival needs of the refugees. In response, the agriculture program was conscripted to distribute emergency food to the returnees in Kanazi, Gikongoro, Ruhengeri, Byumba and Mutara regions. We also used this opportunity to distribute hoes and vegetable seeds.

In the regions where the agriculture program is currently operating, we anticipated distributing seeds and tools to approximately 44,000 families that included 27,000 refugee families (or 140,500 individual beneficiaries) (UNHCR estimates) and 17,000 vulnerable families (or 108,200 vulnerable persons identified by the government local authorities). The breakdown of these numbers by commune were given in the final quarterly report.

Although the project initially planned to distribute seeds and tools to approximately 44,000 families, the final number was twice that. Using REAP2 and REAP3 funds, we have distributed hoes and seeds to 91,312 families (approximately 456,560 individuals) of which we estimate 22,000 families were funded by REAP2. We also distributed hoes provided by UNHCR and FAO. Details of the distribution are shown in Table 3.

The greater number of families served was due to several reasons. The local authorities continually revised upwards the number of vulnerable (non-refugee) families within the communes. Furthermore, the final number of refugee families that registered at the communes was higher than what UNHCR and GOR estimated. The commune authorities are responsible for establishing the number of returned refugee families and vulnerable families and for preparing the beneficiary lists.

With the exception of the groundnut and vegetable seeds, all seeds were purchased from within Rwanda. Groundnut seeds could not be found in sufficient quantities by our local suppliers and we had to import them from Uganda. The project intended to distribute peanut seeds in Kanzenze commune but our local supplier could not find the needed quantity in Uganda. The low supplies of groundnut seed in both Rwanda and Uganda were due to the failed Oct - Dec rains.

**Objective 10: As part of an animal restocking program, procure and distribute 60 cows, 560 goats and 5000 chickens to benefit approximately 1,600 women from vulnerable families.**

In our October-December 1996 quarterly, the project recommended a change of this objective to state **"As part of an animal restocking program, procure and distribute 2,188 goats, 330 sheep, 539 pigs and 3,250 chickens to benefit approximately 3,000 women from vulnerable families"** The reason cited was the advantage of raising small animals over cows

Toward completion of the objective, the project has distributed a total of 2,188 goats, 341 sheep, 165 pigs and 3,250 chickens that immediately and directly benefit 2,665 beneficiaries (majority of whom are women) The true number of beneficiaries will be many times greater as all the beneficiaries are members of cooperative groups By the groups' own request and under an internal arrangement, two members of the group share a goat or a sheep and four members share a pig, such that at the first birthing, members of the group will share the offspring Thus, if a group has 24 members, the group would receive either 12 female goats or 12 female sheep or 6 female pigs, and, of course, one male of the species Thus, the true number of beneficiaries is approximately 5,600 households (assuming no animal mortality)

Insufficient funding and a lack of availability of quality animals prevented the project from purchasing and distributing 539 pigs (the target)

Before distributing animals, WV animal production specialists provided training to beneficiary groups in management and health care of the animals The project has found that training is essential to ensure low mortality and high productivity of the animals Training and follow up of the groups continued after animal distribution Training consisted of lectures, discussions, farmer-to-farmer visits and ambulatory clinics (groups march their animals to a central point at a certain time to have their animals examined by one of the animal health specialists) To facilitate monitoring of the goats, WV placed plastic, identifying ear tags on all goats distributed This made it easy to identify the goats and permitted accurate record keeping for both management and medical purposes

The animal distribution program had high visibility and was very much appreciated not only by the beneficiaries but also by the commune and prefecture government and the Ministry of Agriculture On two separate occasions (Ruhengeri and Byumba), the distribution of animals funded by OFDA was announced by Radio Rwanda Several groups receiving animals sent letters of thanks to World Vision and USAID Mentioned in the letters were thanks not only for the animals but also the training received The letter writers felt that, because they organized into groups, the activity brought a sense of solidarity and trust among the members that might have alluded them otherwise

Although this activity was planned and mostly completed before the resettlement of the refugees from outside Rwanda, any future animal restocking programs should continue to work with

groups consisting of old and new caseload refugees and genocide survivors and with an emphasis on targeting the "new villages" In this way we will not only promote food security but also foster reconciliation Special consideration should also be given to 1) child-headed households to facilitate their re-integration into the new society and to 2) families fostering orphans as an incentive and support for carrying this additional burden

## **OTHER ACTIVITIES**

WV collaborated with international agricultural research centers (IARCs), USDA-ARS and ISAR and other research/development organizations to introduce and evaluate new crops and varieties

### **Sweet potatoes**

WV has collaborated with the International Potato Center (CIP) and the Asian Vegetable Research and Development Center (Taiwan) to evaluate new sweet potato varieties We received 24 varieties from CIP (East Africa regional office in Nairobi) and 3 varieties from AVRDC (via WV-Taiwan) These varieties were screened at the SSS seed station at Muyumbu and the best 24 varieties were planted on farmers' fields in Kanazi, Gikongoro, Murambi and Ruhengeri Data from Gikongoro (see Table 6) and Muyumbu identified varieties that yielded as well as or more than the farmer's variety "Mugande" Some of these varieties have yellow or orange flesh tubers that have high levels of vitamin A In Rwanda, vitamin A deficiency is a major cause of childhood illnesses (weakened immunity to disease) including blindness In taste tests, farmers gave high scores to the local variety, however, some of the introduced varieties are also acceptable depending on the method of preparation In conclusion, farmers identified varieties that have high production, acceptable taste and have higher nutritional levels than local varieties Tainung 57 is particularly interesting as not only did it have good production and high consumer preference, but the leaves are edible (more tender than others), sweet potato leaves are particularly nutritious having high levels of protein, vitamins and minerals The vitamin A rich varieties will be promoted through commune nutrition centers

In Kanazi, the trial was conducted under severe stress--virus infestation, insect damage and limiting soil moisture The highest yielding varieties were Cemsa74-228 (9.2 MT), Mugande (8.4 MT), Yanshu 1 (7.7 MT), Jewel (7.3 MT), Kemb 37 (7.1 MT) and Cari 9 (6.4 MT) These were also top performers in Gikongoro and Muyumbu

In Nyarutovu, Ruhengeri, the top performers were Cemsa74-228 and Kemb 37 (25 MT) and Mugande and Naveta (27 MT)

## **Irish potatoes**

Irish potatoes naturally degenerate season over season as they pick up various bacterial and viral diseases and this degeneration results in progressive yield declines. To regenerate the variety, potato tubers must be grown under aseptic conditions by tissue culture in green houses in European countries and then air-freighted to Rwanda, specifically Ruhengeri. Both materials and transport costs are expensive. After one or two multiplications in Ruhengeri, the materials are sold to farmers throughout Rwanda. To plant one hectare of potatoes, a farmer needs 2,000 kg of potato seed. One can only imagine the staggering logistics involved in providing potato seeds to farmers. An attractive and comparatively inexpensive alternative exists. Irish potatoes also produce "true" potato seeds (TPS) from flowers. These seeds can be sown in seed beds and transplanted to the field where they produce mini-tubers. These mini-tubers can be replanted to produce normal size tubers that can be sold in the market or, if the quality is still good, can be replanted to produce another crop of potatoes. One hundred grams of TPS seed are enough to plant one hectare of potatoes. Thus, even poor farmers can afford TPS technologies.

In order to evaluate this new technology, CIP provided WV with 5 varieties of TPS for testing in Gikongoro. (Potato production in Gikongoro has always been constrained by insufficient planting material). Two TPS varieties (IP88001 and IP88006) were found to produce high yields and appeared to have good disease tolerance. In small plot trials and under recommended management practices, TPS yielded more than twice the yields that the best potato farmers might achieve (about 15 MT/ha). Farmers appreciate the simplicity of the technology. WV has ordered more seed from CIP in order to have multi-location evaluations and to train farmers.

## **Sorghum (high elevation)**

Sorghum varieties grown at elevations above 1500 m are a completely different type than those grown at lower elevations. The East African office of ICRISAT in Nairobi provided seeds of 7 high-elevation sorghum varieties for testing. These varieties are IS25545, MB30, ESX, IS25562, S87, Abareshya and IS9201. These varieties were tested at one location in Nyarutovu commune, Ruhengeri and three locations in Gikongoro. At Nyarutovu, the local variety produced almost twice the yield as the best performing introductions (S87 and IS25562). Some of the low yields were due to bird damage on early maturing varieties. However, farmers liked early maturity as a characteristic. Some of the varieties (S87, MB30, Abareshya, IS9201) were both early maturing and short-statured which resisted lodging because of high winds or high yield. These characteristics were appreciated by farmers. In Gikongoro, the performance of the varieties depended on location, but in general, the best performing varieties were MB30, S87 and Abareshya. These produced as well as or superior to the local variety. Abareshya produced the highest yields, but MB30 and S87 were more appreciated by farmers because panicles were larger and more compact. However, farmers requested to keep seed of all three of these varieties.

### **Sorghum (striga-resistant)**

In certain regions of Kanazi, Gitarama, Butare, Kibungo and Umutara, the parasitic weed *Striga* can completely destroy sorghum crops. Farmer and ISAR-recommended sorghum varieties are not resistant to striga. Farmers must remove striga plants at a very early stage if they hope to produce high yields of sorghum. World Vision and sorghum breeders at Purdue University teamed up to test three varieties (P9402, P9407 and P9408) of sorghum having *Striga* resistance. Over 100 farmers received seed of one or more of the striga varieties for comparing with their local variety.

### **Soybeans**

Soybean is a relatively new crop for Rwanda and, before the war, was widely promoted with success in Gikongoro, Gitarama and Butare as a food and cash crop. The grains were used to make soy milk and also were mixed with beans. The Tofu factory and feed mills were (and still are) major buyers. Soybeans were especially appreciated in regions where root rot diseases prevent high yield of bush and climbing beans. Trials in Kanazi and Gikongoro verified that 'Bossier' (the recommended variety) is still one of the best performing.

### **Maize**

In Gikongoro, farmers compared the local variety with Pool8, Pool9 and ZM607. Farmers most appreciated Pool 8 and Pool9.

### **Cowpea**

From IITA, we received 12 cowpea varieties for evaluation. Some varieties were for consumption of the dry or fresh grain and some were for consumption of fresh pods, and some were for both (dual purpose). Among the grain types, the local variety "Kinyama" was both the highest yielder and the most tolerant to diseases, especially "ascochyta" a foliar, fungal disease. At the request of IITA, WV sent seeds of Kinyama to IITA's breeders so they could use the variety to incorporate stronger ascochyta resistance into their own varieties. As "Kinyama" is the best performing variety, WV has been multiplying it in Kanazi and Murambi where it is much appreciated as farmers thought the seeds of this crop had been lost during the war.

### **Peanuts**

Peanuts is a major cash and food crop in Kanazi, Kibungo and Umutara regions. Through the cooperation of ICRISAT, Llongwe, Malawi, World Vision received 13 peanut varieties that we are evaluating against the local variety (HNG17) and two Ugandan varieties ("Red Beauty" and "Igola1"). The results suggest two of the ICRISAT varieties are quite high yielding.

## **Pigeonpea**

Pigeonpea has been promoted solely as a soil improvement species and not as a food and fodder crop. ICRISAT provided two early maturing varieties (KAT60 and ICPL87091) that are having high grain yields and wide adaptation across elevations. WV has tested and multiplied these two varieties since 1995. Both are early maturing, short-statured and high yielding but very susceptible to insect pests that attack the young pods. This is mainly due to the close arrangement of the flowers that results in the pods clustered together so that predators and parasites can not "get at" the pod-boring insects.

ICRISAT provided a set of 13 medium maturing and 13 late maturing varieties (actually land races) for testing in Kanazi. Preliminary results did not show any large differences between varieties within a set.

## **Vegetables**

**Amaranths** One of the most commonly consumed leafy vegetables at the farm level is amaranthus which grows as a weed. WV received two "domesticated" varieties from AVRDC. These are "Red leaf" and "White leaf", the latter being appreciated by farmers because of its better taste and its tenderness.

## **VI FUNDING**

All REAP2 funds are exhausted. There was not sufficient REAP2 funds to purchase all the seeds for beneficiaries in the communes where we have been operating over the past two years. Fortunately, REAP3 funding which started 27 January 1997 was used to purchase seeds not financed by REAP2.

## **VII CONSTRAINTS TO ACHIEVING OBJECTIVES**

The below average rainfall received in Gikongoro, Kanazi and Murambi regions during November and December 1996 prevented us from reaching our seed multiplication goals for the 1997A harvest season (January-March 1997) and thus all the objectives of the project.

## **VIII SEED AND TOOL DISTRIBUTION SOME LESSONS LEARNED**

Logistically and politically, the distribution of seeds and tools were fraught with challenges.

1) Local government authorities might charge their constituents to be included on the beneficiary lists. The major target of the distributions, the vulnerables, those without money were most likely not to be included on the list and became the excluded. Because of the Unaccompanied Children's program, WV often knew who were the most vulnerable in the community and could check the lists to see if those were included. If not, the "incomplete" lists were returned to the local authorities who were requested to review the lists to be sure the most vulnerable were

included WV staff would leave enough hints that we knew who these vulnerables were

2) Some local authorities did not have the courage to discriminate between the most vulnerable and the vulnerables. In some communes, a large proportion of the population was vulnerable and it would indeed be politically and socially difficult for the authorities to decide who would or would not be on the list. They could easily be accused of "favoritism". In those situations, the authorities might request seeds and tools be distributed to all households in the sector or commune to avoid having to make tough and unpopular decisions. In many cases, WV did do a blanket application.

A way to solve the problem of local authorities "charging a fee" to be on the beneficiary list and to avoid their having to make difficult decisions would be to give the responsibility of making the list to the population itself. In Byumba, groups consisting of the more vulnerable members of the population were given the responsibility to make the beneficiary lists. Although these groups would face the same problems and temptations as local government authorities, the groups know better who are the most vulnerable and the decisions are as "bottom up" as can be achieved.

Beneficiary lists must be made according to village (cellule or colline) and then grouped by secteur. When the beneficiaries come for their seeds and tools, they will be grouped by cellule and secteur to facilitate distribution. If there are 20 beneficiaries in cellule A, seeds and tools can be measured out for 20 families and the name of the cellule called. All the beneficiaries from cellule A can come forth to receive the seeds and tools, sign the beneficiary list and then the next cellule can be called. This system has worked much faster than any other. Seeds are given distributed volumetrically. That is, if each beneficiary is to receive 5 kg of bean seed, a volumetric container is found or shaped that will scoop up and weigh about 5 kg. Beneficiaries are advised to bring plastic or cloth sacs ahead of time to receive the seeds. In most cases, WV has sufficient plastic bags on hand.

3) In several instances, local authorities insisted that WV personnel not be present during the seed and tool distributions. In each case, WV argued that the local authorities should be present to assist in the distribution but that the donor has given the responsibility to WV to purchase, transport and distribute the agpaks and that if WV were not permitted to distribute them in a certain secteur or commune, WV would distribute them in some other secteur or commune, and we would write a letter to the Prefet explaining why. In every case, the local authority then permitted us to distribute the seeds and tools.

## **IX IMPACT**

A vital indirect benefit of these activities is increasing food security at the farm level which, in turn, has led to a general lessening of angst in farmers' lives. Farmers feel more in control and confident of their situation and are more open to discussions about medium and long-term plans and investments in their future. This was nearly impossible one year ago. Thus, farmers are in the process of initiating longer term programs such as restoring fruit production, planting of multi-

purpose trees and investing in erosion control Overall REAP 2 achieved it's goal of reestablishing and revitalizing the farming systems in Gikongoro, Kanazi and Ruhengeri/Gisenyi through the implementation of the various successful activities described in this report

## **X ACKNOWLEDGMENTS AND LAUDATIONS**

The agriculture program wishes to thank OFDA/USAID for financing this prodigious endeavor over the past 2 years and for the faith and confidence that it entrusted to WV's agriculture program to implement it, we were always conscious of this and, indeed, it spurred us to execute our responsibilities with the highest possible quality and professionalism

This project could not have accomplished as much as it did without the leadership and technical advice of Mrs Speciose Kantengwa who was responsible for overall management of the programs of seed multiplication, agpak distribution and evaluation of new varieties She also participated in most of the food security meetings

Mr Edwin Asante, agriculture project officer (and now site manager) at Gikongoro, evolved many of the seed multiplication strategies that are now being used in other sites

Mrs Felicite Nyiranshuti (agroforestry specialist/soil conservation) worked very hard to promote the replacement of multi-purpose trees and to give hope to many very poor women by assisting them to plant fruit trees for sale or for production

Dr David Kiala (now with WV-Mozambique) was a master procurer of bean and maize seed through the farmer associations that WV assisted in creating

Ms Jules Lynn Frost never failed to remind the agriculture program that its reports were due, then over-due, then late, then very late but, fortunately, never too late Most importantly, she always responded to needs, she could dash out letters faster than most of us could think of what to write She was a real friend

Every cog, big and small, is needed for a program to run well There are agronomists, assistant agronomists, drivers, mechanics, finance staff, procurement staff--too numerous to mention by name and their individual contributions--that worked diligently and honestly to achieve the objectives of this program and we thank them all

Respectfully submitted

James Hoopper  
Agriculture Manager  
World Vision--Rwanda

reapend

Table 1: Distribution of hoes and seeds in three regions of Rwanda 1996 A Season.

## RUHENGERI

A agpak 96 a lotus

COMMUNE	BENEFICIARIES	HOES	BEANS	PEAS	ONION	CABBAGE	CARROT	KALE
NKULI	1200	1200	2400	2400	3000	3000	3000	3000
CYERU	964	964	1928	1928	2410	2410	2410	
NYAMUGALI	1000	1000	2000	2000	2500	2500	2500	2500
NYARUTOVU	1000	1000	2000	2000	2500	2500	2500	2500
BUTARO	1000	1000	2000	2000	-		-	-
MUTURA	1036	1036	2072	2072	2600	2600	2600	2600
<b>TOTAL</b>	<b>6200</b>	<b>6200</b>	<b>12400</b>	<b>12400</b>	<b>13010</b>	<b>13010</b>	<b>13010</b>	<b>10600</b>

## GIKONGORO

COMMUNE	BENEFICIARIES	HOES	BEANS	MAIZE	SOYBEANS	CABBAGE	CARROTS	KALE	TOMATOES	OKRA	RHIZOBIUM
RWAMIKO	2706	2706	5274	5274	5274	275	6600	13125	7150		1316
MUBUGA	2641	2641	5282	5282	5282	325	6625	12900	6625		1321
KARAMA	3413	3413	6826	6826	6826		8550	8550	8550	5525	1695
NYAMAGABE	4309	4309	8618	8618	8618	12675	10800	8225	10700	1175	2155
<b>TOTAL GENERAL</b>	<b>13069</b>	<b>13069</b>	<b>26000</b>	<b>26000</b>	<b>26000</b>	<b>13275</b>	<b>32575</b>	<b>42800</b>	<b>33025</b>	<b>6700</b>	<b>6487</b>

## KANAZI

COMMUNE	BENEFICIARIES	HOES	BEANS	MAIZE	SOYBEANS	ARACHIDES	CARROTS	KALE	TOMATOES	OKRA	CABBAGE	ONION
KANZENZE	3541	3541	10623	5570	7533	5570	5775	5925	7325	7575	7575	7575
GASHORA	1171	1171	3513	2342	2342	2342	2925	2925	2925	2925	2925	2925
NDENDA	1878	1878	5634	3756	3756	3756	4275	4275	4275	4275	4275	4275
<b>TOTAL</b>	<b>6590</b>	<b>6590</b>	<b>19770</b>	<b>11668</b>	<b>13631</b>	<b>11668</b>	<b>12975</b>	<b>13125</b>	<b>14525</b>	<b>14775</b>	<b>14775</b>	<b>14775</b>

FINAL REPORT OF REAP II

TABLE 2 Agroforestry seeds distributed to beneficiaries by season and by commune between May 1995 and March 31, 1996 in Rwanda

A Ruhengeri region

COMMUNES	Species diffused	Seed per farmer or group (gr)	Beneficiary (no)	Total seeds (kg)	Season	Nurseries (no)	Comments
Nkuli	<i>Grevillea robusta</i>	3	150	0 5			
	<i>Sesbania sesban</i>	16	150	7 5	95A-95B	58	For individual farmers
	<i>Cedrela serrata</i>	1	150	0 15			
	<i>Alnus acuminata</i>	25	150	0 25		and	
	Local species	0	100	200,000 cuts		5	For groups
Nyarutovu	<i>Grevillea robusta</i>	25	100	1 5	96A-96B	7 nurseries	
	<i>Sesbania mancrantha</i>	10	100	8			
	<i>Sesbania sesban</i>	10	100	10			
	<i>Chaemacytosus palm</i>	0 025	100	2			
	<i>Alnus acuminata</i>	0 025	100	0 0025			
Nyamugali	<i>Grevillea robusta</i>	25	100	1 5		1nursery for	
	<i>Sesbania mancrantha</i>	10	100	4	96A-96B	10 families	
	<i>Sesbania sesban</i>	10	100	1			
	<i>Chaemacytosus palm</i>	20	100	2 0			
	<i>Alnus acuminata</i>	0 025	100	0 1			
Cyeru	<i>Grevillea robusta</i>	25	100	2 5	96A-96B	1nursery for	
	<i>Sesbania mancrantha</i>	10	100	2		10 families	
	<i>Sesbania sesban</i>	10	100	1			
	<i>Chaemacytosus palm</i>	20	100	2 0			
	<i>Alnus acuminata</i>	0 025	100	0 0025			
Butaro	<i>Grevillea robusta</i>	25	100	2 5	96A-96B	1nursery for	
	<i>Sesbania mancrantha</i>	10	100	2		10 families	
	<i>Sesbania sesban</i>	10	100	1			
	<i>Chaemacytosus palm</i>	20	100	2 0			
	<i>Alnus acuminata</i>	0 025	100	0 0025			
Nyarutovu	<i>Calliandra cal</i>	50	140	2 5	97A-97B	5 nurseries	
	<i>Grevillea robusta</i>	20	140	1 7			
	<i>Alnus acuminata</i>	0 5	140	0 001			
Kinigi	<i>Calliandra calothyrsus</i>	70	80	3 5	97A-97B	4 nurseries	
	<i>Grevillea robusta</i>	20	80	1 6			
	<i>Alnus acuminata</i>	0 1	80	0 1			

**Table 3 Quantities of seeds and hoes distributed in 4 regions in Rwanda for the 1996 B season (February - June 1996)**

**RUHENGERI/GISENYI**

COMMUNE	Nº BENEFIC	HOES Unit	BEANS kg	PEAS kg	WHEAT kg	MAIZE kg	PEANUT	CABBA gr	KALE gr	CARROT gr	ONION gr	TOMATO	SOYB	SORGHUM	OKRA
BUTARO	1960	1960	3920	3920	2940	3920	0	5880	5880	5880	5880	0	0	0	0
CYERU	1154	1154	2310	2310	1628	2310	0	3480	3480	3480	3480	0	0	0	0
NYAMUGARI	901	879	1802	1802	1353	1802	0	2640	2640	2640	2640	0	0	0	0
NYARUTOVU	814	814	1628	1628	1221	1628	0	2460	2460	2460	2460	0	0	0	0
NKULI	2128	2128	4256	4256	0	4256	0	6390	6390	6390	6390	0	0	0	0
KINIGI	1780	1780	3560	3560	2670	3560	0	5340	5340	5340	5340	0	0	0	0
NYAMUTERA	732	732	1464	1464	1100	1464	0	2220	2220	2220	2220	0	0	0	0
MUTURA	3001	2893	5786	5786	4350	6786	0	8700	8700	8700	8700	0	0	0	0
KARAGO	2000	2000	4000	4000	3000	4000	0	6000	6000	6000	6000	0	0	0	0
<b>TOTAL</b>	<b>14470</b>	<b>14340</b>	<b>28726</b>	<b>28726</b>	<b>18262</b>	<b>29726</b>	<b>0</b>	<b>43110</b>	<b>43110</b>	<b>43110</b>	<b>43110</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**GIKONGORO**

COMMUNE	Nº BENEFIC	HOES Unit	BEANS kg	PEAS kg	WHEAT kg	MAIZE kg	PEANUT	CABBA gr	KALE 0 gr each	CARROT gr	ONION gr	TOMATO gr	SOYB	SORGHUM	OKRA gr
KARAMA	520	1040	2600	1040	2600	1040	0	3120	3120	3120	3120	3120	1560	2600	0
NYAMAGABE	322	644	1610	644	450	644	0	1920	1920	1920	1920	1920	966	1610	0
RWAMIKO	62	124	310	124	310	124	0	390	390	390	390	390	186	310	0
MUBUGA	1096	2192	5480	2192	5480	2192	0	-	6600	6600	6600	6000	3288	5480	0
<b>TOTAL</b>	<b>2000</b>	<b>4000</b>	<b>10000</b>	<b>4000</b>	<b>8840</b>	<b>4000</b>	<b>0</b>	<b>5430</b>	<b>12030</b>	<b>12030</b>	<b>12030</b>	<b>11430</b>	<b>6000</b>	<b>10000</b>	<b>0</b>

**KANAZI**

COMMUNE	Nº BENEFIC	HOES Unit	BEANS kg	PEAS KG	WHEAT kg	MAIZE kg	PEANUT kg	CABB gr	KALE gr	CARROT gr	ONION gr	TOMATO gr	SOYB	SORGHUM	OKRA
KANZENZE	9162		5475	0	0	2098	0	0	0	0	0	0	3285	9350	0
GASHORA	3235		5950	0	0	2380	3570	3570	0	3570	3570	0	3570	5950	3570
NGENDA	5577		8685	0	0	2674	4011	4080	4080	4080	4080	0	4011	6685	4170
<b>TOTAL</b>	<b>17974</b>		<b>20110</b>	<b>0</b>	<b>0</b>	<b>7152</b>	<b>7581</b>	<b>7650</b>	<b>4080</b>	<b>7650</b>	<b>7650</b>	<b>0</b>	<b>10866</b>	<b>21985</b>	<b>7740</b>
DIVERS		793	1303	0	0	1459	639	3150	3180	3150	3150	0	1006	1005	3150
<b>TOTAL</b>	<b>17974</b>	<b>793</b>	<b>21413</b>		<b>0</b>	<b>8611</b>	<b>8220</b>	<b>10800</b>	<b>7260</b>	<b>10800</b>	<b>10800</b>		<b>11872</b>	<b>22990</b>	<b>10890</b>

**BYUMBA**

COMMUNE	Nº BENEFIC	HOES Unit	BEANS kg	PEAS	WHEAT	MAIZE kg	PEANUT	CABBA gr	KALE gr	CARROT gr	ONION gr	TOMATO gr	SOYB gr	SORGHUM gr	OKRA gr
KINYAMI	5000	5000	25000	0	0	10000	0	5000	1004	5000	0	0	0	0	0
MURAMBI	3249	3249		0	0	6498	0	3249	0	3249	0	0	0	0	0
<b>TOTAL</b>	<b>8249</b>	<b>8249</b>	<b>25000</b>	<b>0</b>	<b>0</b>	<b>16498</b>	<b>0</b>	<b>8249</b>	<b>1004</b>	<b>8249</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

<b>GRAND TOT</b>	<b>42693</b>	<b>27382</b>	<b>85139</b>	<b>32726</b>	<b>27102</b>	<b>58835</b>	<b>8220</b>	<b>67589</b>	<b>63404</b>	<b>74189</b>	<b>65940</b>	<b>11430</b>	<b>17872</b>	<b>32990</b>	<b>10890</b>
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