USAID-IITA/SECID CASSAVA PROJECT

Emergency Response to the Outbreak of the Cassava Mosaic Disease in the Democratic Republic of Congo

REPORT OF THE INTERNAL MIDTERM EVALUATION

APRIL 20TH – MAY 1ST, 2004

COMPILED

BY

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EXECUTIVE SUMMARY

The midterm evaluation of the USAID-funded project on the rehabilitation of cassava production in the Democratic Republic of Congo (DRC) was carried out between April 20th, and May 1st, 2004. Highlights of the observations and recommendations made by USAID evaluators for the remaining project's life include:

1. Development of new varieties

- IITA has developed several new varieties adapted to the conditions of Bas-Congo, Bandundu and Kinshasa provinces. It is recommended that the development of new varieties should continue by placing more emphasis on new uses such as starch and flour production, and enhanced nutritional value. Crop protection will continue as part of crop improvement with due emphasis on post-harvest pests and diseases.
- IITA should also include in this process, fertilizer application and soil fertility management trials.

2. Multiplication and distribution of planting materials

- IITA new cassava varieties, which have a high level of resistance against the three strains of the cassava mosaic disease (CMD) virus, should be multiplied and distributed to partners in replacement of the CMD-susceptible varieties that were multiplied and distributed as an emergency strategy.
- The tissue culture laboratory rehabilitated in Mvuazi is effectively contributing to the accelerated multiplication of new cassava varieties. IITA should decentralize postflask management activities to at least two new sites to speed up the delivery of new varieties to partners.

3. Processing, promotion and marketing of cassava-based products

- The evaluation team was particularly encouraged by the utilization of unfermented cassava flour, which is mixed with wheat flour in the preparation of a variety of food products readily accepted by consumers. It is recommended that IITA and its post-harvest partners should now ensure the labeling of the new food products and foster the development of trade names to promote these new products.
- The fortification of cassava-based food products should receive due consideration.
- The project should work closely with large-scale partners in the private sector, in addition to small businesses, to develop a bigger market for cassava, and IITA should engage in market studies to assist in product development, distribution and marketing.
- Post-harvest activities should be scaled up to other provinces. IITA should consider the introduction of manual chippers/graters for small processors in rural areas and should also link up with the other two USAID livelihood projects in DRC, which may have funds to finance the production of these processing machines.

4. Gender concerns

The Project has succeeded in involving women's associations in various activities, including on-farm trials, multiplication and distribution of planting materials, and development and promotion of cassava-based products, as exemplified by the work being done with the Association for Women Farmers (AFEPA) in Nkolo. It is recommended that the AFEPA model should be replicated in other project sites.

5. Evaluation of the project impact and future actions

- The impact of the project on cassava production cannot be evaluated in the first three years, but positive effects of the project activities, like the "penetration rate" of planting materials into nonparticipating farm communities, can be assessed. Economic impact and quantification of demand for planting materials should be emphasized in the next two years.
- IITA was advised to increase both germplasm development and post-harvest activities. New funds may be required, in addition to the 50 % of the funds earmarked for IITA in the 2- million budgets for years 4 and 5 of the project.
- The cassava project may continue with a second phase, which is expected to start in January 2007. IITA was encouraged to start preparing for this phase that will include legumes in addition cassava.

I. Introduction

Under a PIO grant to the International Institute of Tropical Agriculture (IITA), USAID is funding the Project on "Emergency Response to the Outbreak of Cassava Mosaic Disease in the Democratic Republic of Congo". IITA has also made a sub-agreement with the Southeast Consortium for the International Development (SECID) which is implementing the project's multiplication and distribution of planting materials. The internal midterm evaluation of the project was carried out from April 20th, 2004 to May 1st, 2004 in Bandundu, Kinshasa and Bas-Congo provinces.

The scope of work for the evaluation team, which was prepared by USAID and describes the terms of reference, was discussed in a meeting held in Kinshasa. The document briefly reviews the project background, objectives and expected results, describes the task of the evaluation team and outlines the content of the evaluation report.

Project background: the project was initially planned with a level of efforts of $3,000,000 over a period of 5 years and for three provinces only, but during 2002 USAID/DRC decided to expand the project to additional provinces, to increase the level of efforts such that the original budget would be spent within 3 years. USAID/DRC then planned for an additional $2,000,000 in funding for the last two years (2005 and 2006).

Project objectives: (1) to establish accelerated multiplication and distribution system of healthy planting materials of improved and proven varieties with resistance to cassava mosaic disease (CMD) in a participatory manner; (2) to diversify germplasm for resistance to CMD and other prevalent pests and diseases; (3) to promote more efficient production, marketing and processing technologies.

Expected outputs: (1) increased and sustained cassava production in targeted areas, (2) better cassava processing technologies introduced and adopted, (3) new CMD-resistant varieties developed and disseminated across the country, and (4) best option production practices adopted.

Task of the evaluation team: (1) evaluate implementation progress for the project to date, measuring achievements against the baseline study and project objectives, (2) assess the impact of the project on cassava production, marketing, processing, especially as regards gender concerns, (3) make recommendations for adjustments that may need to be made during the remaining 20 months of the project life, and for actions that may need to be undertaken by the project and USAID to prepare a sustainable support for cassava production, marketing and processing following the end of the project.

The evaluation team was composed of the following persons:

- USAID:
    - Eric Witte (Washington)
    - John Schamper (Kinshasa)
    - Raymond Lumbuenamo (Kinshasa)

SECID:

- Pierre Rosseau (Washington)
- Bernard Musangu (Kinshasa)
- Marc Tunieka (Bandundu), covered Bandundu province only
- Damase Kava-Zumbu (Bas-Congo), team member for Bas-Congo province only

IITA:

- Albert Lema (Kinshasa)
- N. Mahungu (Malawi), team member for Kinshasa province only
- Rachid Hanna (Cotonou), covered Bas-Congo province only
- Jean-Marie Nluta (Responsible for Bas-Congo)
- Jacques Kimfuema (Responsible for Bandundu)

II. Evaluation activities

2.1. Bandundu province

The following project sites were visited by the evaluation team in Bandundu from April 20th to April 24th, 2004.

Lusekele: SECID is multiplying cassava cuttings, with the farm community *Action Communautaire pour le Développement Intégré* (ACDI/Lusekele). Activities in Lusekele started in FY 2002 where five initial (INERA) varieties Sadisa, Mvuama, Mahungu, RAV and 85/0181 were introduced for multiplication. In FY 2004 also three IITA new cassava varieties (I 95/0211, I 96/0160 and I 96/1630) and the INERA improved variety K065 were introduced. No CMD symptoms were observed on IITA varieties, except for I 96/1630 for which few plants had previously shown CMD symptoms while the INERA variety K065 was reported to be susceptible to CMD. It was recommended that the variety K065 should no longer be multiplied and that I 96/1630 be replaced by I 96/0528, one of the varieties selected for Bandundu major agro-ecologies.

Kiakia: The *Association de Développement des Paysans de Kiakia* (ADPK), assisted by SECID, has established one multiplication and one production (tuberous roots) fields on this site. Five INERA varieties (*Sadisa, Mvuama, Mahungu, RAV* and 85/0181) are under multiplication on 2.75 ha, and the production field covers an area of 2 ha. The varieties were free from CMD symptoms as phytosanitation (roguing) is practiced regularly. During the wrap-up meeting, the Community requested the construction of a dryer for cassava fermented roots.

Tango-Gomena: 1ha of multiplication field was planted with INERA varieties by the *Association de Développement Communautaire* (ADECOM/Gomena). IITA had trained SECID partners on this site in the production and utilization of unfermented cassava flour. Using a manual cassava grater and press, community members are producing unfermented cassava flour. IITA is also improving the drying system by promoting the use of raised wooden platforms, and of polyethylene plastic sheets. The manual grater and press need to be improved.

Luwala: This is one of the first site involved in multiplication activities with SECID from the beginning of the project. IITA has established a dryer and raised drying platform with plastic sheets in this 110-member community (70 women and 40 men) to improve the drying of cassava fermented roots aimed at Kikwit market. Questions were raised for this dryer where fire wood is not available in sufficient quantities. Alternative drying methods should be investigated.

Kikwit: The team visited the SECID/IITA Office and a storage of several bags of unfermented cassava flour produced by IITA and partners. The flour is used by Project partners mainly in confectionaries. Members of a number of NGOs in Kikwit have been trained in the production and utilization of unfermented cassava flour, and two of these NGOS, were visited. They are making and selling doughnuts, cakes and other food products by incorporating 25 % - 30 % of cassava flour into these products. Consumers are readily accepting the products as they do not notice the difference between whole-wheat and the same products containing cassava flour. Consumers, are not, however, informed officially about the incorporation of cassava flour into these products. At Kianga, around Kikwit, three IITA new varieties and one new INERA varieties are being multiplied by a women's group (*Bureau de Promotion de la Femme*- BUPROF) assisted technically by SECID. These varieties, I 96/0160, I 95/0528 and I 95/0211, and MV 99/0395 (of INERA) were free from CMD symptoms.

Aten: 17 communities with up to 40 members each, are assisted by two organizations of the Catholic Mission of Aten: *Comité Paroissial de Développement d'Aten* (CPDA) and *Communauté des Soeurs de la Charité Namur d'Aten* (CSCNA). Soils in this area are very sandy and of low fertility. Famine and malnutrition problems are among the most severe in the province. Maize and millet are produced essentially for sale and cassava for home consumption. Cassava yields are, however, very low ranging from 3 to 5 tons per hectare for the local varieties. SECID have

established at this site one multiplication field with three new IITA varieties (I 96/0160, I 95/0211 and I 95/0528) and the new INERA yellow-fleshed variety (MV 99/0395). Planting materials will be ready for distribution in September-November 2004. There is a need to introduce the IITA variety I 92/0067 selected for the sandy soils of the Plateau de Bateke in Kinshasa province. It was reported that two IITA varieties, I 95/0211 and I 95/0528 drop the leaves and recover rapidly as a resistance mechanism against CBB, which is a major constraint on the sandy soils of this savanna ecology.

Impasi: A 32- member community is multiplying with SECID, cassava planting materials on 4 ha. The Community, *Groupe d'Action pour le Développement Intégré desImpasi*, is assisted by the Catholic Mission to improve cassava production which is substantially reduced by diseases and low soil fertility. IITA should extend on-farm trials to this area.

Kiyaka: Five on-station (research managed) and 19 on-farm (farmer managed) trials, as well as a demonstration field were established in Kiyaka area. Only on-station trials and the demonstration field were visited due to time constraint. No CMD symptoms were observed on the three IITA varieties previously selected for Bandundu province. As it was already stated at Lusekele, the INERA variety K065 which showed several plants with CMD symptoms should be removed from the multiplication/distribution system, despite the lack of CMD symptoms in some other sites.

Ngashi: This is the second pilot processing site for Bandundu. IITA had constructed a dryer for fermented cassava roots, in addition to the use of raised drying platforms and plastic sheets to accelerate the drying process. The farm community in Ngashi was involved from the beginning of the project, in the multiplication and distribution of cassava planting materials with SECID. Cassava being processed on this site is harvested from the community's multiplication fields established in 2001 and 2002.

2.2. Kinshasa province

The evaluation of the project in Kinshasa province started by a visit to the *Association des Boulangeries Artisanales du Congo* (ABAC) in Kinshasa. ABAC has a membership of 419 bakeries in Kinshasa alone, which utilize a total of 36 metric tons (= 800 bags of 45 kg each) of wheat flour per day. The Biamulu Bakery Unit visited by the evaluation team uses 1.13 mt (= 25 bags) of wheat flour/day. IITA has been testing with ABAC, the incorporation of unfermented cassava flour into bread, and final results have indicated that up to 20 % of cassava flour can be mixed with wheat flour. The product has been accepted by consumers who do not notice any difference with the 100 % wheat bread. By substituting 20 % of wheat flour by unfermented cassava flour, ABAC will need relatively large quantities (about 7.2 mt/day) of cassava flour. ABAC is, therefore, an important user of this product and will stimulate the production of cassava in the country. The team later proceeded to the Plateau de Bateke to visit on-station and on-farm trials and demonstration fields. The Plateau de Bateke is an excellent site for the evaluation of cassava varieties for their adaptation to sandy soils. This area is also the most important producer of yellow fleshed cassava sold on Kinshasa market. The yellow variety MV 99/0395 resistant to CMD is being promoted to replace the local variety that is being abandoned by farmers due to heavy CMD attack.

2.3. Bas-Congo province

Due to time constraint, the evaluation team did not visit project activities in Bas-Fleuve District and in Luozi area in Bas-Congo province. The following sites were visited:

2.3.1. Mvuazi:

a) Breeding trials: The team visited all breeding (on-station) trials established by IITA, from the seedling nursery to the uniform yield trial (UYT). Eleven clones are being evaluated in the UYT and will soon be evaluated in on-farm

trials. Five cassava varieties previously selected were evaluated for their aptitude to intercropping with groundnuts and soybeans. Cassava alone was still standing in the field as the two companion crops have been harvested.

b) Demonstration field: Two new IITA varieties (I 96/0160 and I 95/0211) and one improved INERA variety (MV 99/0038) are compared with a local (Boma) and an improved (RAV) checks. Another demonstration field was earlier visited in Nkolo-Fuma, in the JVL concession. Chemical fertilizer application was made on half of the field to evaluate the response of the varieties to chemical application.

c) Nucleus multiplication: Two IITA varieties (I 96/0160, I 95/0528) and two INERA varieties (MV 99/0038 and MV 99/0395) are being multiplied on a total of 1.5 hectares.

d) Crop protection: Two trials on crop protection were planted on this site, the first on mass rearing of the predaceous mite *T. aripo* in the field; stem tips harboring the predacious mite will be collected and used at other locations to release the predator. The second trial was set up to evaluate the effects of thrips infestations on root yield reduction.

e) Tissue culture (TC) laboratory: The evaluation team was particularly encouraged with the low cost rehabilitation of the TC laboratory and with the work being carried out in this facility. The team emphasized the need for this facility to continue (and expand even if it needs new resources) its capacity in the multiplication of new varieties for distribution to new areas. This will require decentralization of post-flask management of TC plantlets to other strategic locations in the target provinces to accelerate the production of IITA and INERA varieties. It was proposed that IITA explores the possibility of using the low cost TC system used by CIAT.

f) **Processing unit**: This unit was set up to demonstrate to potential processors and entrepreneurs, the processing techniques being promoted by the Project. The Unit is managed by a consultant hired by IITA, and processing activities are implemented in partnership with a women's association called *Action pour le Développement Intégré de la Femme au Congo* (ADIFCO). Members of the association were previously trained by the Project in various aspects of cassava processing and project development. The Unit produces unfermented cassava flour, which is being used in the preparation of various food products including cassava-wheat bread, doughnuts, cakes, biscuits, cassava meat pie. A platform is also demonstrated for accelerated dying of large quantities of cassava chips. The unit is also working with the Faculty of Pharmacy at the University of Kinshasa to identify cassava varieties which can produce good quality starch to be used in pharmaceutical industries. Previsions are also made to use cassava leaves and end-products as animal feeds. USAID suggested that IITA should explore the possibility to introduce manual graters-chippers in rural areas.

2.3.2. Nkolo:

This site situated near Mvuazi research station, is represented by a 45-member farm community, the Association of Women Farmers (AFEPA). AFEPA, with technical backstopping from a Catholic Sister, is a unique case of a partner group that is involved with the Project from the participatory evaluation of cassava varieties to the development and promotion of cassava-based products. The evaluation team visited AFEPA's field and processing activities:

Varietal evaluation: The team visited a mother-baby trial, managed by one woman and comprising a new series of 15 IITA varieties under evaluation with two checks (the local Boma and the improved RAV). The baby trials are constituted by 27 women farmers each evaluating, according to farmers' traditional practices, two of these varieties with the two checks.

Multiplication field: two new IITA varieties (MV 96/0038 and I 96/0160) and the INERA improved variety MV 99/0395) are under multiplication to provide planting materials to the Association members and to other farmers.

Cassava processing: After a short training of AFEPA members by the Project in the production of unfermented cassava flour and products development, this Association has established a "Cassava Restaurant" in the middle of the Nkolo market in order to enable the Association to generate some income, and to promote cassava-based products in this area. A variety of cassava-based food products are made and sold by AFEPA. Food products made from recipes developed by IITA Post-harvest Unit (and available in a booklet published by IITA) include cassava-wheat bread, doughnuts, cakes, biscuits, cassava meat pie (meat filling), cassava strips, etc.

2.3.3. Mbanza-Ngungu:

Six bakeries in this town are members of ABAC and have been evaluating the incorporation of unfermented cassava flour into bread. A total of 150 bakeries have been identified as potentials ABAC members. The evaluation team visited only 2 bakeries (*Boulangerie Bisengo* of Mr. Kelly Kiese and that of Mr. Ntula Khonde) which are presently making composite bread with 20 % of cassava flour. Like in other locations visited by the evaluation team, consumers have readily accepted the bread; some consumers prefer it to the 100 % wheat bread as it is heavier. Mixed flour bread can be conserved longer (up to 4 days) than 100 % wheat bread (less than 2 days). It was mentioned, however, that the non availability of sufficient quantities of unfermented cassava flour was a major constraint to increased utilization of this product. One of the 2 bakeries utilizes 28-30 kg of cassava flour/day. The needs of the 6 bakeries for unfermented cassava flour were estimated at about 750 kg/week. There is a need for the Project to include and train women, who are already making 100 % wheat flour doughnuts, in the production and utilization of unfermented cassava flour in order to ensure the promotion of cassava-based products in this town. USAID team recommended that the project should foster the development of trade names to promote food products.

2.3.4. Nzundu:

This farm community of 20 members is participating in cassava multiplication with SECID. In the January-April 2003 cropping season, the community established 5 hectares of production field and another 5 hectares of production field during the same period in 2004. These fields were established from planting materials multiplied in the previous years. IITA also organized a demonstration for members of this community, together with those from neighboring communities, on the production and utilization of unfermented cassava flour.

2.3.5. Kisantu:

Bakeries: There are 30 bakeries, members of ABAC in Kisantu, which use 4-5 bags of wheat flour/day. A substantial quantity of cassava flour can be used in Kisantu if these bakeries substitute 20 % of wheat flour by cassava flour. Due to time constraint, only one bakery was visited. ABAC members in Kisantu expressed the willingness to organize themselves into a group of cassava producers.

Flour mill: This factory was established in 2002 to process both maize and cassava into flour for Kinshasa market. The factory was closed few months later because maize supply was not sustained and cassava products were of inferior quality. As a partner of the cassava project, the owner of the factory is interested in rehabilitating this facility for the production of both fermented and unfermented cassava flour to be used for *fufu* and in confectionaries and bakeries, respectively. A good packaging equipment is in place and operational. The owner expressed the frustration in finding sufficient cassava to produce white cassava flour. IITA and INERA will make available to interested processors a list of varieties and the color of their flour.

III. Conclusions and recommendations

Observations made during the evaluation were discussed in a series of wrap-up meetings held at Lusekele, Kinshasa and Mvuazi. The meeting in Kinshasa held on 26/04/2004 was attended by Dr. N. Mahungu and Dr. R. Hanna, who joined the evaluation team for Kinshasa province and Bas-Congo, respectively. The general debriefing meeting was

held in Mbanza-Ngungu on 29/04/2004, at the end of the evaluation. During this last meeting, Mr. John Schamper outlined the main issues raised from the observations, and futures actions needed to be taken for years 4 and 5, and beyond this Project. USAID evaluators (John Schamper, Eric Witte and Raymond Lumbuenamo), have made very important remarks/suggestions, and a series of recommendations on the following areas: (1) development of new varieties and crop protection, (2) multiplication and distribution of planting materials, (3) marketing of cassava-based food products, (4) gender issues, and (5) the future actions required.

3.1. Development of new varieties:

The development of new cassava varieties should continue, and participatory on-farm evaluation should be intensified to expand to the eastern and northern parts of the country. Resistance to diseases and pests has been the main breeding objective for the past several years, although consumer acceptability of varieties was considered. The evaluation recommends that more emphasis should now be placed on development of new varieties for new uses such as starch and flour production, and enhanced nutritional value. Fertilizer application trials should also be part of the development of new varieties to determine cassava response to chemical fertilizer since cassava is becoming an important cash and industrial crop. The size of demonstration plots should be increased and on-farm trials, if possible done within the communities sponsored by SECID, more efficient for a better farmers' participation.

Crop protection activities will continue as part of crop improvement in order to develop multiple pest and disease resistant germplasm, ascertain the epidemiology of CMD and cassava brown streak disease (CBSD), determine the extent of cassava losses due thrips damage, and ensure the development and implementation of appropriate management tactics for the African root and tuber scale and the implementation of the biological control of the cassava green mite particularly in the eastern provinces for the latter. New emphasis should be placed on postharvest pests and diseases, and a repeat of the survey for pests and diseases should be conducted at the end of the present phase to determine the changes in pest and disease pressure in cassava production and in farmers' knowledge and perception of these changes.

3.2. Multiplication and distribution of planting materials.

During the first phase of the project (2001-2004), as an emergency strategy, INERA cassava varieties with low level of resistance against CMD and some susceptibility to the Ugandan strain of the African CMD virus (ACMDV-Ug), were multiplied and distributed to farm communities. Phytosanitation (starting with clean material and rouging all infected plants) is required for these varieties. Several IITA improved varieties, with a high level of resistance against all three virus strains are now available and are already being multiplied in Bas-Congo, Bandundu and Kinshasa provinces. The multiplication of these new varieties will soon be expanded to Equateur province. It is recommended that in years 4 and 5 of the project, multiplication and distribution activities should be focused on these new IITA varieties in both the new areas and sites previously involved in cassava multiplication.

The impact of these varieties will not be assessed in the first phase, but rather in the second phase, i.e. in 2006. SECID system of multiplication and distribution has been refined and will continue to be used in distributing new IITA varieties. FAO would also continue the system currently in use in multiplying and distributing planting materials. IITA will strengthen the multiplication and distribution system, by maintaining a regular influx of improved varieties to farmers particularly by following the model the Institute has established with the Women's Association (AFEPA) in Nkolo, to speed up the deployment of new varieties.

Postflask management of tissue culture (TC) materials: Good results are being achieved with the TC laboratory in Mvuazi to ensure the required accelerated multiplication of planting materials for the new varieties. While maintaining the high quality work in this laboratory, IITA should decentralize postflask management activities to speed up the delivery of new varieties to partners in other sites. Two locations were suggested for postflask management of TC plantlets from Mvuazi: Kiyaka (INERA station) in Bandundu, and Kisangani (with the University

of Kisangani) in Province Orientale. Training will be organized in post-flask management of TC materials at these two sites.

Release of new varieties: The Project (IITA Coordination Office) should compile necessary data on the performance of new IITA cassava varieties in different agro-ecologies (for at least 2 years) and communicate this information to INERA in order to ensure the official release of the varieties by the Government.

3.3. Development, promotion and marketing of cassava-based products:

Information to consumers: The promotion of unfermented cassava flour, which is used in a variety of food products, is the area that impressed most USAID evaluators. "*Casse-croûte*" (fast food or artisan) products respond especially well to the requirements of the livelihood projects, as they enable rural women to generate some income by selling these products. Consumers have readily accepted both bread and snacks (fast foods) made with various mixture of cassava flour, or at time 100 % cassava flour. However, apart from AFEPA in Nkolo which has set up a restaurant for the promotion of cassava-based products where it is clearly indicated that the products contain cassava flour, in most project sites, consumers are not formally informed. IITA and its post-harvest partners should now take appropriate actions to inform the consumers about the incorporation of cassava flour into different food products. Processors should also ensure proper labeling of new food products by including the names and various ingredients on the label.

Types of markets for new products: Both small and commercial businesses should be targeted for the promotion of new products. Small business should be involved mainly with the "fast food" type of products. A mixture of wheat and cassava flour should be blended and packaged, and sold to commercial partners. The Project should work closely with large-scale partners in the private sector such as *Minoterie de Matadi* (MIDEMA) to develop a bigger market for cassava, and Government institutions namely *Office Congolais de Contrôle* (OCC) and the Ministry of Commerce should also be involved (through INERA) to ensure required changes in standards for bread. IITA should engage in market studies to assist in product development, distribution and marketing. It was also recommended that post-harvest product development should be scaled up to other provinces, if resources permit, as post-harvest activities are carried out presently only in Bas-Congo, Bandundu and Kinshasa provinces.

Processing machines: Ten chippers/graters have arrived in the country and will soon be installed in selected project sites to increase the production and utilization of cassava flour. USAID evaluators encouraged the training of Congolese manufacturers being organized by IITA so that additional machines will be produced locally to reduce purchasing costs. They also recommended that IITA should consider the introduction of manual chippers/graters for small processors in rural areas where there is no electric power or fuel to run the motors is not readily available. IITA should link up with the other two USAID livelihood projects in DR Congo, which have small business development as one of their activities and may therefore have funds to finance the production of these processing machines, as well as for support of the development of small business for cassava product production and distribution. The utilization scheme of the processing machines should be well defined so that these machines are fully used. The graters/chippers should be installed as close as possible to the production areas to reduce transportation costs. One effective systems will be for the processors or communities to rent the machines and the money which is paid back can then be used by the community to maintain the machine or to purchase new machines.

Fortification of cassava-based food products: The Project should effectively address this issue because the wheat flour being used presently is enriched with vitamins and other food additives. In order not to imbalance the wheat-cassava mixture, cassava flour should also be enriched with the same ingredients. Contacts should be made with MIDEMA to know what is added in wheat flour and the procedure used to do the same for cassava flour. The Project should also liaise with a South African Group apparently involved in food enrichment in DRC. The food technology laboratory in Ibadan should conduct nutritional content texts for the different products to provide guidelines on the need (if any) and the amount of fortification of each of the products.

3.4. Gender issues: The Project has succeeded in involving women's associations in various activities, including on-farm trials, multiplication and distribution of planting materials, and cassava processing. USAID team was particularly impressed with the work being done with the Women's Association AFEPA in Nkolo. This whole-women association is involved in project activities from germplasm development to multiplication and products development and promotion. The AFEPA model should be replicated in other Project sites.

3.5. Evaluation of the project impact

The impact of the project on the production of cassava cannot be assessed, mainly because new IITA varieties will not be assessed in the first phase, but rather in the second phase (i.e. in 2006), as these varieties are just being diffused. The "penetration rate" (as Mr. J. Schamper put it) of planting materials into non-participating farm communities should, however, be assessed during the first phase. SECID should provide data on the sale of planting materials by participating communities to the post-harvest consultant hired by IITA so that this information will be used in assessing the "impact" (or positive effects) of the distribution of planting materials. Economic impact and quantification of demand for planting materials should be emphasized in the next two years.

USAID evaluators were informed that IITA has taken steps to assess the "positive effects" of the Project by commissioning two studies, one on the evaluation of the economic gain due to the incorporation of unfermented cassava flour into various food products, and the other, a more detailed evaluation of positive effects of the Projects in three provinces (Bas-Congo, Bandundu and Kinshasa) which is coordinated by an IITA agro-economist.

3.6. Future actions

Funding: Some questions were raised on the funding of the last two years of the project. As promised, USAID/Kinshasa will make funds (USD 2 million) available for years 4 and 5. The revised budget for years 4 and 5 earmarks about 50 % of the funds for each IITA and SECID. IITA was, however, advised to increase nucleus multiplication to accelerate the provision of planting materials to SECID, FAO and other partners, and also to intensify on-farm evaluation to cover additional provinces with the new varieties. IITA should also scale out post-harvest activities in new areas in the 3 provinces already covered by these activities, and move to other provinces. To achieve this increase of activities, additional funds may be required.

Beyond the project: The cassava work has started to yield good results in generating income and alleviating poverty, especially in rural areas. A second phase is expected after this Project, which will start in January 2007, if successful, and focus on an integrated agricultural production approach. This phase will also cover post conflict areas and include crop improvement, crop protection, farming practices and institutional development. Legumes should be included, in addition to cassava, to ensure a balanced diet for rural populations (Mr. J. Schamper referred to a concept note on groundnuts and cowpeas IITA Coordination Office sent earlier to him for comments before it is submitted to IITA and formerly to USAID). IITA was encouraged to start preparing for this phase, and USAID will send out a RFP later this year for which IITA may bid. In order to achieve a sustained impact beyond the project, INERA needs to continue carrying out good research and its research stations should be more autonomous. The Belgian Cooperation is about to provide funds for the rehabilitation of INERA infrastructure and research capacity. This Belgian initiative is in line with the preparation of the second phase.

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