

# Terminal Evaluation Report

on

## International Training Course Cultivation and Processing of Cassava and Tropical Fruit Production in Brazil

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**JICA Brazil Office**

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- Project information
- Summary of Input
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## Summary

I. Outline of the Project: To train 72 people from developing countries of Portuguese language, in tropical fruits and cassava agricultural and processing.		
Country :Brazil		Project title: International Courses on Tropical Fruits and Cassava Agricultural and processing
Issue/Sector: Agriculture		Cooperation scheme :
Division in charge : EMBRAPA Cassava and Fruit (CNPMPF)		Total cost : R\$ 1,365.034.00 Cost per participant: R\$ 20,373.00 Share of Japan' contribution: 49%
Period of Cooperation	(R/D):	Partner Country's Implementing Organization : ABC
	(Extension): (F/U)	
Related Cooperation:		

### 1 Background of the Project

EMBRAPA/CNPMPF is a national research institution responsible for the national Brazilian researches on cassava and tropical fruit cultivation. This research center has a good experience in agronomical research, but not in processing. To realize its researches in fruit and cassava, the EMBRAPA/CNPMPF has around 30 researchers for cassava and more than 50 in tropical fruits. The EMBRAPA /CNPMPF is located in the state of Bahia, a Brazilian state with a majority of its population from African origin. This is also the state with the biggest cassava production and cassava flour consumption, in Brazil. For fruit and cassava, this state has a very big tradition in small familiar production, in dry lands, conditions which can be compared with some African regions.

### 2 Project Overview

The EMBRAPA/CNPMPF has trained 32 technicians in the course on cassava (2001 and 2003) and 35 technicians in the course on fruit cultivation (2002 and 2004) in the following countries: East Timor, Angola, Mozambique, Guinea-Bissau, Sao Tome and Principe and Cape Verde. The 4 courses have been realized by the researchers of EMBRAPA/CNPMPF from Cruz das Almas, Bahia, Brazil. Further to EMBRAPA, participated from the courses the Brazilian Foreign Office, threw the Brazilian Agency of Cooperation (ABC) and the JICA, as supporting and funding agencies

#### ( 1 ) Outputs of the Training Program

Output 1: Training of 32 people from countries of Portuguese language from Africa and Asia (East Timor), in modern technologies of cultivation of cassava and tropical fruits.

Output 2: Training of 32 people from countries of Portuguese language from Africa and Asia (East Timor), in modern technologies of cassava processing.

Output 3: Contribute for the development of fruit and cassava production, in the countries of origin of each participant, by the adoption of the technologies learnt in the course.

## ( 2 ) Inputs

Japanese side (\*):

Long-term Expert:	0.00
Equipment:	0.00 Yen
Short-term Expert	0.00
Local cost	0.00 Yen
Trainees received:	133,909.00 R\$
Others :	535,638.00 R\$
Total cost:	669,547.00 R\$

(\*): **The value is the total expenses for the four courses held.**

Host Country's Side(\*\*) :

Counterpart as lecturers staff:	36.00 R\$/hour per course (average)	
Equipment:	0.00 R\$ Local currency (	Yen)
Land and Facilities	33,390.00 R\$ Local currency (	Yen)
Others:	360,097.00 R\$ Local currency (	Yen)
Total cost:	695,487.00 R\$	

(\*\*): **The value is the total expenses for the four courses held.**

## II. Evaluation Team

Members of Evaluation Team	Marney Pascoli Cereda	
Period of Evaluation	10/ 02/2005 to 10/ 03/2005	Type of Evaluation: Terminal

## III. Results of Evaluation

### III-I. Achievement of the Training Program

#### 1 ) Output 1

Achieved

The infrastructure and the level of technical knowledge of the CNPMF/ EMBRAPA researchers was enough to disclose the knowledge during the training. The trained people have been evaluated before and after the training, and it has been possible to quantify the increase of knowledge in specific points. The number of correct answers in the evaluation made by EMBRAPA/CNPMP increased in around 50% for both cassava and fruit cultivation after the training course.

#### 2 ) Output 2

Partly Achieved

EMBRAPA/CNPMP is not specialized in post-harvest technology of cassava. The selected products for technological transference didn't include the main African products, such as chips, chips flour and *gari*. Even if the last one is quite similar with Brazilian flour, part of its process is different and could have been approached, which has not been done. The trained people have been evaluated before and after the training, and it has been possible to quantify the knowledge in specific points is an average value of 60%. Nevertheless, as the knowledge is not focused on African technologies, its value is limited, which explained the classification as partly achieved.

#### 3 ) Output 3

Partly achieved

This output is very difficult to be analyzed without visits to the countries of the participants. Nevertheless, the very general aspect of this point let us imagine that it has been very difficult to achieve.

### **III-2. Evaluation Results**

#### **( 1 ) Analysis on the Achievement in terms of Outputs**

The infrastructure and the level of technical knowledge of the CNPMF/EMBRAPA researches was enough to disclose the knowledge during the training. The participants were evaluated before and after the training, and it has been possible to quantify the increase of knowledge in specific subjects in an average of 50%.

In the training on cassava processing there were two flaws. The products selected for technology transfer didn't approach the main African cassava products as cassava chips and the typical cassava flour named gari. The gari is similar to the Brazilian cassava flour, but it has a specific process. The trained people have been evaluated before and after the training, and it has been possible to quantify the increase of knowledge in specific points in an average value of 60% for processing. Nevertheless, the increase of knowledge was not based on typical African products, which limit the importance of this result.

Finally the third output was difficult to evaluate, even through visits to the countries to verify personally the implantation of the knowledge acquired during the courses. The output was too general and without any quantified criterion.

#### **( 2 ) Relevance**

The themes selected for the courses were important for targeted countries. The cassava crop is linked to food safety and the fruit crop may allow an alimentation of better quality. Both crops are high labor activities, which is very important for these countries.

The participants' selection criteria were very well established and very pertinent but the characteristics of each country and the selection in the local level interfere a lot in the level of the participants. Many of them failed in sending the evaluation questionnaire because they do not work anymore in the training area or were already working, at the moment of the selection, in bureaucratic function.

This evaluation is based on the fact that only a few trainees answered the questionnaires, even after various phone calls, which show a low interest in the follow-up of the activities, even with the good relevance of the subject, particularly for production.

Regarding processing, the subject was very relevant, but the chosen technologies were not so relevant, as they were for products which are not important for Africa (Brazilian cassava flour is a totally different product that African cassava flour, even if they have a similar name).

### **2. Factors promoting sustainability and impact**

#### **(1) Factors concerning to Planning**

It was not possible to evaluate the sustainability and impact once the answers to the evaluation questionnaires were very few and not from all the countries. Just to Cape Verde, through a visit done by an EMBRAPA/CNPMF researcher, it was possible to establish that the knowledge received in the course on Cassava Crop has been used very well. In Tropical Fruits it was not possible to get any information.

For other training courses, there will be the need to explain better how the evaluation of the impact and of the sustainability will be made, such as questionnaires and visits in the countries. Explanation about the importance of these points will be necessary.

The localization of the institution responsible for the training, with its climate and culture similar to African's ones, was a very positive point. The didactical material and the practical training offered to the participants for both cassava and tropical fruits, were also very positive factors, reinforced by the good knowledge of researches in agriculture and the importance of the selected crops for the participants' countries.

## *(2) Factors concerning to the Implementation Process*

The main factor to promote the implementation process of the courses was the availability of funds, with the help of JICA, to allow the participation of professionals from different countries. The second important factor is the infrastructure of the EMBRAPA/CNPMPF, which turned possible to receive all the participants and to implement the training courses.

For the EMBRAPA/CNPMPF researchers, the concentration in a unique country for each course, with more participants, could have been more efficient and could allow to reach a larger critical mass to implant the processes of changes.

### **3. Factors inhibiting sustainability and impact**

#### *(1) Factors concerning to Planning*

Maybe one factor inhibiting sustainability and impact in relation to planning was the lack of preparation of training with local processes for cassava processing (output 2). In this case, the technologies learnt in the training courses can be of very little use for participants, who will never use them again.

#### *(2) Factors concerning to the Implementation Process*

It was not identified any factor inhibiting sustainability and impact in regard to the implantation process.

The establishment of an objective very difficult to verify (output 3), even with direct visits in the different countries, was not an inhibiting factor but some point which made difficult a good evaluation.

For processing of cassava, the lack of experience from researches or previous knowledge's of local reality (African reality), from EMBRAPA/CNPMPF researches, turn less efficient the part of the training course. The participants had a good formation for typical Brazilian products and not products from their countries, which could have been done with only a few modifications in the training.

The selection of the participants by their own country is also an inhibiting factor, harming the final output of the training.

### **4. Conclusion**

For other training courses, it would be good to have only quantified objective, turning them easier to be verified. Objectives such as national improvement, without any more information, lack of precision and are impossible to verify.

It could also be good to have more information about the real conditions of the country, focalizing the training about the real necessities of the participants.

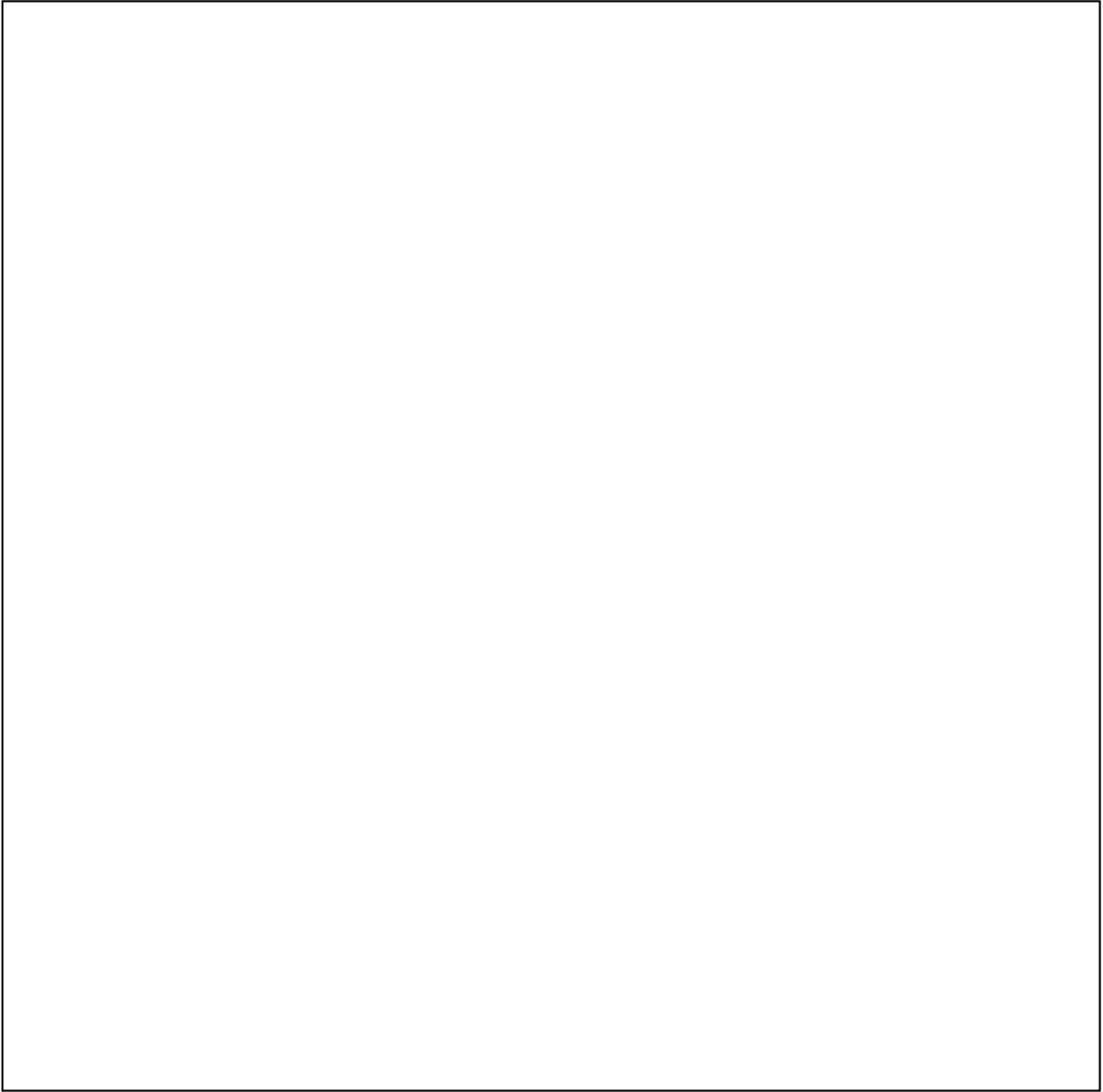
The good selection of the participant is important and it could be good to ask for a pre-selection of the country, with more names that the final necessity. Like that, the host country could make a final selection, based on the curriculum of each participant, avoiding people with bureaucratic functions.

Finally, it would be necessary to convince the participant of the necessity of the evaluation and involve their chiefs in the evaluation. The evaluations should be made 12 months after a longer period, people seem to lose any interest in answering questionnaires and in further contacts with the host country.

The four courses offered by EMBRAPA/CNPMPF researchers were well planned, mainly regarding the agricultural part and correctly implanted. There were problems in the participants' selection, problems that reflected later when answers to the evaluation questionnaires were needed.

Regarding the impact and sustainability, the participants has been offered all the conditions to





## Chapter 1 Outline of Evaluation Study

### 1-1 Objectives of Evaluation Study

a. Evaluate the results obtained in the training of 32 technicians in the course on cassava cultivation (2001 and 2003) and 35 technicians in the course on tropical fruit cultivation (2002 and 2004) in the countries: East Timor, Angola, Mozambique, Guinea-Bissau, Sao Tome and Principe and Cape Verde.

The 4 courses have been realized by the researchers of EMBRAPA/CNPMPF from Cruz das Almas, Bahia, Brazil. Further to EMBRAPA, participated from the courses the Brazilian Foreign Office, threw the Brazilian Agency of Cooperation (ABC) and the JICA, as supporting and funding agencies.

### 1-2 Members of Evaluation Study Team

The Evaluation Study Team comes from the CeTeAgro, a Center with the objective to select and develop technologies in agribusiness including Dr. Marney Pascoli Cereda Agronomist and Food Technology specialist (contracted) and Olivier François Vilpoux, Agronomist and Management specialist.

### 1-3 Period of Evaluation Study

January 10th to March 10th

### 1-4 Methodology of Evaluation Study

1. Questionnaire for all participants of the courses, by fax or E-mail, when possible.
2. Telephone interview of 4 participants from Angola, Mozambique and Cape Verde.
3. Interview with researchers from EMBRAPA/CNPMPF.
4. Documents and reports analyses.  
The information's that have been obtained in an indirect way, through documents and reports are (Other Materials Concerned):
  - a. Techniques absorbed and implanted in Cape Verde;
  - b. Increase of multilateral contacts between the countries participating to the course and Brazil;
  - c. Visits of technicians, entrepreneurs and agronomists from the countries participating to the course in Brazil;
  - d. Consultancy requests from the countries participating to the course in Brazil;
  - e. Common projects proposals, between the countries participating to the course and Brazil.

## Chapter 2 Outline of the Training Program

### 2-1 Background of the Training Course

EMBRAPA/CNPMPF is a national research institution responsible for the national Brazilian researches on cassava and tropical fruit cultivation. This research center has a good experience in agronomical research, but not in processing. To realize its researches in fruit and cassava, the EMBRAPA/CNPMPF has a team of 74 researchers that works in both the subjects, with some people more specialized in one. Of this team, around 30 researchers were selected for cassava cultivation training, excluding 6 technicians and more than 50 researchers were selected to give the training in tropical fruits cultivation. The EMBRAPA /CNPMPF is located in Bahia state, the Brazilian state with a majority of its population from African origin. This is also the state with the biggest cassava production and Brazilian cassava flour consumption, in Brazil. For fruit and cassava, this state has a very big tradition in small familiar production, in dry lands, conditions which can be compared with some African regions.

### 2-2 Summary of Initial Plan of the Training (4 courses)

(1) Course Title	International Training Course on Cassava Cultivation and Processing
(2) Number of Participants a year	14
(3) Duration	3 weeks
(4) Year of Cooperation	2001 (years)

(1) Course Title	International Training Course on Tropical Fruit.
(2) Number of Participants a year	17
(3) Duration	3 weeks
(4) Year of Cooperation	2002 (years)

(1) Course Title	International Training Course on Cassava Cultivation and Processing
(2) Number of Participants a year	18
(3) Duration	3 weeks
(4) Year of Cooperation	2003 (years)

(1) Course Title	International Training Course on Tropical Fruit.
(2) Number of Participants a year	18
(3) Duration	3 weeks
(4) Year of Cooperation	2004 (years)

Requirement for Application (\*)

(1) Level of knowledge and/or technique which participants are expected to have	Graduation or Technical in Agriculture
(2) Desirable Current Position/Duties	Prepared to work with technologies transfer
(3) Years of experience in the sector/issue in question	At least 1 year
(4) Age limit	Not specified
(5) Target Countries	Developing Country of Portuguese language

(\*): For both cassava and tropical fruit crops.

## Chapter 3 Outputs of the Training Program

### 3-1. Implementation frameworks (\*)

**Output 1:** Training of 32 people from countries of Portuguese language from Africa and Asia (East Timor), in modern technologies of cassava and tropical fruits cultivation.

**Output 2:** Training of 32 people from countries of Portuguese language from Africa and Asia (East Timor), in modern technologies of cassava processing.

**Output 3:** Contribute for the development of fruit and cassava production, in the countries of origin of each participant, by the adoption of the technologies learnt in the course.

(\*) **From the booklet of curses announcement: Cassava and Tropical Fruits**

### 3-2. Achievement in terms of Activities

	2001	2002	2003	2004	Total
Number of Applicants	18	18	18	18	72
Number of Participants	14	18	17	18	67
Countries participated	5	6	6	6	6
Duration (weeks)	3	3	3	3	12

### 3-3. Achievement in terms of the Outputs of the Training Program

	2001	2002	2003	2004	Average	Note if any revision in criteria during the course duration
Output 1	3	3	3	3	3	The criteria was not revised during the course duration
Output 2	1	-	1	-	1	The criteria was not revised during the course duration
Output 3	2	2	2	2	2	The criteria was not revised during the course duration

\*Achieved : 3. Partly Achieved : 2. Not Achieved : 1; Do not apply: -

### 3-4 Achievement in terms of input

- Total cost: R\$ 1,365,035.00 (Total for the four trainings - 2001 to 2004)
  - Total number of participants: 14 + 17 + 18 + 18 = 67
  - Cost per participant: R\$ 20,373.00 (R\$ 7,004.00 for Training Expenses + R\$ 13,369.00 for Other Expenses)
- Share of Japanese Contribution: 49%

Japanese Side:

Short-term experts	00 person
Training expense	R\$ 133,909.00
Others	R\$ 535,638.00
Total cost	R\$ 669,547.00

P.S.: These values are the total expenses for the four training courses.

Host Country's Side:

Share of Contributions (51% for Brazilian side, with 25.5% from the ABC and 25.5 from the EMBRAPA)

Lecturers, Staff per course	R\$ 36.00 (average)
Training expense	R\$ 335,390.00
Others	R\$ 360,097.00
Total Cost	R\$ 695,487.00

P.S.: These values are the total expenses for the four training courses.

Additional information:

Total Share for the four courses:

- Training expenses: 34.4%
- Other Expenses (air transport from and to Brazil, accommodation, per Diem, health insurance) : 65.6%

## Chapter 4 Results of Evaluation

### 4-1 Analysis on Outputs

(1) **Output 1:** Acquisition of knowledge and assimilations of techniques, for 32 people from countries of Portuguese language from Africa and Asia (East Timor), in modern technologies of cultivation of cassava and tropical fruits cultivation.

#### 1) Achieved

Describe the reason of above judgment of the evaluator

**Achieved:** The infrastructure and the level of knowledge of EMBRAPA/CNPMF researchers are sufficient to make a good divulgation of the most important points for the training. The trained people have been evaluated before and after the training, and it has been possible to quantify the increase of knowledge in specific points. The number of correct answers in the evaluations made by EMBRAPA/CNPMF increased in around 50% for both cassava and fruit cultivation after the training course.

2) What are the promoting (if you chose a. or b. in 1) or impeding (if you chose c. or b. in 1) factors?

setting of outputs    requirement for application    willingness of participants  
 curriculum    targeted countries    duration    text/materials    lecturers  
 equipments    Others (similar culture, similar climatic conditions )

Describe promoting/impeding factors in detail.

**Promoting factors:** The origin of the participants helped to promote the courses, because of the importance of cassava and tropical fruits crops for their countries. Cassava is important for food security and tropical fruits for alimentation quality, both of them being important for small farmers. The quality of the texts and materials distributed to the participants allowed them to bring back to their respective countries a large quantity of information, difficult to obtain by themselves without this course.

**Impeding factors:** The selection of the participants through local indication made difficult the selection of the most qualified, or interested people, facilitating the participation of people from office, not really interested in the transference of knowledge in their own country. The qualification of participants has been very unequal.

(2) **Output 2:** Training of 32 people from countries of Portuguese language from Africa and Asia (East Timor), in modern technologies of cassava processing.

#### 1) Partly Achieved

Describe the reason of above judgment of the evaluator

**Partly Achieved:** EMBRAPA/CNPMF is not specialized in post-harvest technology of cassava. The selected products for technological transference didn't include the main African products, such as chips, chips flour and *gari*. Even if the last one is quite similar with Brazilian flour, part of its process is different and could have been approached, which has not been done. The trained people have been evaluated before and after the training, and it has been possible to quantify the increase of knowledge in specific points in an average value of 60%. Nevertheless, as the knowledge is not focused on African technologies, its value is limited, which explained the classification as partly achieved.

2) What were the promoting (if you chose a. or b. in 1) or impeding (if you chose c. or b. in 1) factors?

<input checked="" type="checkbox"/> setting of outputs	<input type="checkbox"/> requirement for application	<input type="checkbox"/> willingness of participants		
<input type="checkbox"/> curriculum	<input checked="" type="checkbox"/> targeted countries	<input type="checkbox"/> duration	<input checked="" type="checkbox"/> text/materials	<input checked="" type="checkbox"/> lecturers
<input type="checkbox"/> equipments	<input checked="" type="checkbox"/> others (products selection, use of cassava starch for bread use)			

Describe promoting/impeding factors in detail.

**Promoting factors:** The EMBRAPA/CNPMPF is located in a region similar to the one encountered in African Countries, which facilitate the technology transference. Nevertheless, the participants didn't send in advance the information about the characteristics of their countries, which would have allowed a better knowledge about each situation, with more efficiency of the training.

**Impeding factors:** The EMBRAPA/CNPMPF does not have the knowledge, or has not been worried in selecting material and texts, to approach African products processing. These information's can be found in literature and some products, such as chips and cassava flour (flour from chips), have already been produced in Brazil. Some cassava processes used in Africa can let some high level of linamarin, which is at the origin of cyanide, and the correct process must be taught.

(3) Output 3: Contribute for the development of fruit and cassava production, in the countries of origin of each participant, by the adoption of the technologies learnt in the course.

### **1) Partly Achieved**

Describe the reason of above judgment of the evaluator

#### **b. Partly achieved.**

This output is very difficult to be analyzed without visits to the countries of the participants. Nevertheless, the very general aspect of this point let us imagine that it has been very difficult to achieve.

2) What were the promoting (if you chose a. or b. in 1) or impeding (if you chose c. or b. in 1) factors?

<input type="checkbox"/> setting of outputs	<input checked="" type="checkbox"/> requirement for application	<input checked="" type="checkbox"/> willingness of participants		
<input type="checkbox"/> curriculum	<input checked="" type="checkbox"/> targeted countries	<input type="checkbox"/> duration	<input type="checkbox"/> text/materials	<input type="checkbox"/> lecturers
<input type="checkbox"/> equipments	<input checked="" type="checkbox"/> others (the selected objective make difficult the evaluation, a lot a factors can interfere impeding the achievement of the objective)			

Describe promoting/impeding factors in detail.

**Promoting factors:** indirect information's indicate than Cape Verde can have reached part of this objective for cassava crop.

**Impeding factors:** the selected objective is too imprecise and does not allow a good evaluation of the selected area (cassava and tropical fruits) without local visits. Even the analysis of the questionnaires remains at a subjective level. Even with very few questionnaires which have been returned, some of the information's are in contradiction with the one obtained in the EMBRAPA /CNPMPF, these one verified in a local visit.

A very important indication is the fact that most of the answered questionnaires or documents received are from participants of the last course (2004). This result can indicate that the time is a very important factor. The longer the time between the training course and the evaluation, the less interest of people to answer the evaluation.



(3) Overall judgment on the achievement of outputs.

From the 3 objectives established by the organizers of the 4 training courses, only the first one could be verified. The third one was missing of precision and the second one, available only for cassava, could not be reached because of the lack of competency of the technical people from the institution. There is the necessity of a better knowledge, before the course, of the reality of the countries of origin of participants.

The reduced number of people who answered the questionnaire didn't allow a good evaluation, mainly of the output 3. The time between the training course and the evaluation can play an important role on the quality of the final evaluation.

## 4-2 Relevance

### (1) Relevance of the reasons of setting the training program

*Write the evaluation teams opinion regarding the issues such as the followings, with concrete evidence the team have found through its research.*

*1) Judging from the development needs and policies of the targeted countries, has the training program been necessary?*

Yes. Even without sufficient knowledge about the targeted countries, exist international information indicating that the two selected crops are relevant and of strategic importance for these countries. Cassava is important for food security and fruit crops are important for a good alimentation. Both crops have the potential to become a relevant market for small farmers and to create a lot of labor in the countryside.

*2) Was the training program the best way to transfer appropriate technology?*

It would be better if the time of the researcher have been used working inside the reality of the countries of each participant. Nevertheless, in function of the difficulties to obtain information on each country, the training program has been realized inside the best possible conditions.

*3) Was the condition for conducting training better in the host country than in Japan? If so, why?*

Yes. Japan does not have the crops treated in the training and the climatic conditions of this country are very different to the one of the origin countries of the participants.

*4) In case of TCTP, designing of curriculum, administration and management of the training course are entrusted and under the responsibility of training institutions of the host country. /n this regard, was the entrustment of the training program reasonable in terms of improving capacity and ownership of the training institution?*

Yes

*5) Was the training program meaningful in terms of promoting networking and cooperation among developing countries?*

It was not possible to verify this item, once the answer to the questionnaire has been very low. Nevertheless, the low rate of answer can indicate a low interest of people and can demonstrate a low interest in cooperation.

In parallel, none activity to reinforce cooperation among developing countries or networking has been developed during the training.

*6) What were pros/cons of conducting the training course in the host country?*

Brazil was a good place to hold the training course, because of its climate similar to the participants' origin countries, the existence of similar culture and the cultivation of similar crops. In the case of cassava, Brazil is the country in the world with the most variation of derivative products, theoretically allowing the optimization of the training course about processing. In this country also coexist technologies for large scale industries and very small units, similar to the one encountered in Africa, which allow to have a complete vision of all the aspects.

The other possibility would have been to realize the training courses in the participants' countries, which would have been a lot more expansive solution and very difficult to realize. In conclusion, Brazil seems to be the best indicated host country for this kind of training.

## (2) Appropriateness of Output Setting and Curriculum Design

*Write the evaluation teams opinion regarding the issues such as the followings. With concrete evidence the team have found through its research.*

*1) Was the setting of output 1 and training components (lecture / practice etc...) appropriate?*

Yes

*2) Was the setting of output 2 and training components (lecture / practice etc...) appropriate?*

No. The selection of products didn't consider the reality of African Countries, minimizing the interest of this part of the training. In the other way, it has not been mention the existence of typical product (and process) of East Timor.

*3) Was the setting of output 3 and training components (lecture / practice etc...) appropriate?*

It was not possible to evaluate this objective because this one was too imprecise and difficult to analyze, even with visits in each country.

## (3) Appropriateness of Requirement for the Applicants, and selection

The selection criteria of the applicants have been well defined by EMBRAPA/CNPMF, before the selection of the applicants. Previous experience has been valorized, with a minimum of 12 months. Nevertheless, the selection criteria of the participants were not under the influence of EMBRAPA/CNPMF. For diplomatic and political reasons, the selection has been made in the applicants' countries. Most of the countries sent only 3 names for the selection, which was the number of the final participants for each training course, turning impossible any selection. At least one participant, from Cape Verde, changed of activity once backed in his country, and started bureaucratic functions, without any contact with the field. For this reason, he didn't see any reason to make the evaluation of the training course. At least in this case, it can be concluded than the training didn't have any impact. Even if difficult to verify without more information, it seems that some participants already had bureaucratic functions during the training courses, which was something EMBRAPA tried to avoid.

## (4) Overall Judgment on Relevance

The training courses has a great relevance for the participant countries and the selection criteria were well defined and of great importance. Nevertheless, the difficulty to apply these criteria and the responsibility for the interested countries to select the applicants alone, turn these criteria totally inefficient.

## 4-3 Conclusion

### 4-3-1 Factors Promoting Effects of the Training Program

The localization of the institution responsible for the training, with its climate and culture similar to African's ones, was a very positive point. The didactical material and the practical training offered to the participants for both cassava and tropical fruits, were also very positives factors, reinforced by the good knowledge of researchers in agriculture and the importance of the selected crops for the participants' countries.

### 4-3-2 Factors Inhibiting Effects of the Training Program

The establishment of an objective very difficult to verify (output 3), even with direct visits in the different countries, was not an inhibiting factor but some point which made difficult a good evaluation.

For processing of cassava, the selection of processes without experience of researchers or previous knowledge's of local reality (African reality), from EMBRAPA/CNPMPF researchers, turn less efficient the part of the training course. The participants followed a good formation for typical Brazilian products and not products from their countries, which could have been done with few modifications.

The selection of the participants by their own country is also an inhibiting factor, harming the final output of the training.

### 4-3-3 Conclusion

For other training courses, it would be good to have only quantified objective, turning them easier to be verified. Objectives such as national improvement, without any more information, lack of precision and are impossible to verify.

It could also be good to have more information about the real conditions of the country, focalizing the training about the real necessities of the participants

The good selection of the participant is important and it could be good to ask for a pre-selection of the country, with more names that the final necessity. Like that, the host country could make a final selection, based on the curriculum of each participant, avoiding people with bureaucratic functions. Finally, it would be necessary to convince the participant of the necessity of the evaluation and involve their chiefs in the evaluation. The evaluations should me made 12 months after the training course and not after this period. When contacts are made after a longer period, people seem to lose any interest in answering questionnaires and in further contacts with the host country.

# Chapter 5 Recommendations and Lessons Learned

## 5-1 Recommendations

### 5-1-1 Recommendations for Partner Country Side (Direction of Future Activities of Project)

The CNPMF/EMBRAPA should establish more realistic objectives, possible to be measurable and to be appraised without the need of traveling to the countries. The Institution should look for partners in the topics that are not of its research specialty and prepare in advance the knowledge on the countries that are involved in the training courses. That information can be found in international literature or obtained close to the specialized sections of the Brazilian Embassies.

### 5-1-2 Recommendations for ABC (Necessity for Follow-up Cooperation)

The Brazilian Agency of Cooperation (ABC), organ of the Brazilian Foreign Office has been the partner of EMBRAPA/CNPMF in the training courses. It is recommended that ABC looks for documents that can support its Brazilian Partner in the sense of providing information on the agriculture, economy and education institution, in a way to supply subsidies to turn the themes of the courses more realistic. ABC can also articulate with the local authorities of the target countries so that they help for the selection to be more technical and the selected participants may present a good technical level in the selective process.

### 5-1-3 Recommendations for JICA (Necessity for Follow-up Cooperation)

In the way the training courses were realized, it is impossible to have a good evaluation of the activities developed in each country after the trainings, turning difficult a Follow-up Cooperation. The participants don't have a good image of theirs possibilities and when they return to their countries, some of them are moved for bureaucratic works and don't use their specific and technical trainings. Among the answers from the participants of the 6 countries, one responded just to inform that he had left the technical area to assume a management function. This situation is probably not unique. Most of the answers were from people from the last training course, in 2004. For that, it is recommended to JICA not to wait 4 years to make the evaluation and to realize it in a delay of around 12 months.

## 5-2 Lessons Learned

5-2-1 Lessons Learned regarding Situations in Evaluated Country and Sectors (policy, technological level, social and cultural aspect, institution, economic and financial aspect, etc.)

Because of the difficulties found in establishing contact with the participants (just one succeeded phone call in Angola), the impossibility of doing phone contact with 2 countries (Guinea Bissau and Sao Tome and Principe), the lack of interest in answering the questionnaires, etc, we judged that it was impossible to evaluate this point with the necessary depth.

The discussion with the researchers of EMBRAPA/CNPMPF allowed establishing the following cultural profile: people from the participants' countries are not used to take initiative, the hierarchy is very strong and they wait for any initiative to be taken by their superiors. It is also possible that the participants didn't give enough value to the importance of the questionnaires and to the evaluation, which can be very abstract concepts for them. It is also possible that the chiefs of the participants were not aware of the importance of the evaluation and didn't give the due importance to it.

5-2-2 Lessons Learned regarding Project Management (Finding, Formulation, Implementation, Evaluation, etc.)

The Project Management was very well implanted by the organizers of the courses in EMBRAPA/CNPMPF. All the stages were well organized and accomplished according to the norms and specifications.

Diagnostic evaluations have been made at the beginning of the course and at the end, what allowed to measure the acquisition of knowledge of each of the participants.

## ANNEX

### Project information

The project was led by the research team of the Research Center on Cassava and Fruit from EMBRAPA, a national Brazilian Institution. The training courses focalized on developing countries of Portuguese language. Between 2001 and 2004, four training courses were given, two on Cassava Crop and Processing and 2 on Tropical Fruits, each one with maximum number of 18 participants of 6 countries: East Timor, Sao Tome and Principe, Angola, Mozambique, Cape Verde and Guinea-Bissau. The total participants of the 4 training courses has been of 67, being 32 for the training on cassava and 35 for the one on Tropical Fruits.

- Cassava Training Course of 2001: 14 participants
- Cassava Training Course of 2003: 18 participants
- Tropical Fruits Training Course of 2002: 17 participants
- Tropical Fruits Training Course of 2004: 18 participants
- **Total: 67 participants.**

The first course was on Cassava Crop and Processing in 2001. Only after 2001 participants of East Timor were included

### Summary of Input

- Total cost: R\$ 1,365,034.00
- Cost per participant: R\$ 20,373.00

Share of Japan' contribution: 49%

#### Japanese side (\*):

- Long-term Expert: 0.00
- Equipment: 0.00
- Short-term Expert 0.00
- Local cost 0.00
- Trainees received: R\$ 133,909.00
- Others: R\$ 535,638.00
- Total cost: R\$ 669,547.00

**(\*): The value is the total expenses for the four courses held.**

#### Host Country's side (\*\*):

- Counterpart as lecturers staff: R\$ 36.00 /hour per course (average)
- Equipment: 0.00 Local currency ( Yen)
- Land and Facilities R\$ 33,390.00 Local currency ( Yen)
- Others: R\$ 360,097.00 Local currency ( Yen)
- Total cost: R\$ 695,487.00

**(\*\*): The value is the total expenses for the four courses held.**

### List of Persons Interviewed

It was not possible to visit the participants in their countries. For this reason, it was not possible to make a personal interview, unless by telephone, but it has been very complicated to

find people in their office. To cover all the possibilities and in reason of the difficulties of communication with all those countries, a questionnaire has been sent by fax and E-mail, in the second week after the signature of the contract. A complete list of the all participants address was first elaborated. The lack of correct phone numbers and institutions for several of the participants difficult a lot the contacts realized. On February 21, a few questionnaires still missing have been sent, finalizing all the contacts, with the exception of Guinea-Bissau and Sao Tome and Principe, where it has been impossible to make any contact.

### **Training Interview:**

All the participants from Mozambique, Angola, Cape Verde and East Timor were contacted, first by mean of e-mail and later by fax. All the Institutions from these countries were contacted by telephone to verify if the questionnaires had been received. In the Annex 1 it is possible to found some texts received by e-mail, mainly one where a participant confirm that all the others researchers of the Center had received the questionnaire. In each country, most of the participants of the raining courses were from the same National Institution. Of the 30 electronic addresses, most were from National Institutions and we had very few return with this mean of communication.

For East Timor, Mozambique, Cape Verde and Angola it was possible to talk by phone with the participants themselves or their superiors, to confirm the receiving of the questionnaires. With Guinea-Bissau and Sao Tome and Principe, it was impossible to establish any contact. In these two countries the phone calls are made through EMBRATEL (Brazilian National Telephone Company) and the lines were always busy. Even with EMBRATEL, it has not been possible to make any contact in these countries.

In the attempt of reinforcing the importance to answer to the questionnaires, JICA established contacts through its offices and ABC through the local Embassies. EMBRAPA/CNPMF International coordination also sent messages to each participant's supervisors. No positive result was observed from these actions. At the end of the period specified to answer the questionnaires, it has been made new contacts, directly with the participants, using fix or mobile phones, to know why they didn't sent back the questionnaires.

From the 67 questionnaires, only 5 have been filled and sent back, three by private e-mail. Even a participant from Cape Verde that had confirmed the questionnaire receiving with a phone call in Brazil, didn't return his questionnaire. A participant, Toqueane Anlawe from Mozambique (Tropical Fruit Course of 2004) died, information obtained by a phone call in her former institution.

The informations obtained can indicate that there is not any doubt that the fact the participants received the questionnaire it not a guarantee that they will send it back. To try to understand the reason of the low answer rate, interviews have been made with the CNPMF/EMBRAPA. This analysis, together with the few answers to the questionnaires, can indicate the following scenery:

- a. The hierarchy is very strong in all these countries and most of the immediate supervisors of the participants were not interested in sending back the questionnaires. Some people told that they had given the filled questionnaire to their boss, for him to send it back, but these one never arrived in Brazil;
- b. People don't give value to the questionnaires and don't answer it;
- c. Some people don't have any initiative, not doing anything without being told by their superiors to do something.



### Result of Questionnaire Survey

Between the 5 questionnaires that came back, most (4) are from participants of the training course on Tropical Fruits, held in 2004 (last course) and 1 in the 2002 course on cassava. Only one of the questionnaires has been filled by telephone. In all the other contacts, people were in the field, in another city or were not known by the Institution.

Only one cassava questionnaire came back, which was from Cape Verde. This participant comes from the first course (2001).

The researchers of CNPMF/EMBRAPA indicated that the participants of the training courses in Tropical Fruits were of higher level than the ones of Cassava training, which can explain the higher degree of answers for fruits. As the answers came from different countries, and most of participants confirmed the receiving of the questionnaire, the hypothesis of local difficulties is discarded.

Participants that answered to the questionnaires:

Name	Course/ year	Country	Institution
Orlando Monteiro de Freitas	Cassava/2001	Cape Verde	Agriculture Ministry
Ambrósio de Barros Leal	Tropical Fruit/2004	Cape Verde	Agriculture Ministry
Abril Fátima Lemos Soares	Cassava/2003	East Timor	Agriculture Ministry
Bonifácio da Costa Francisco	Tropical Fruit/2004	Angola	Not reported
Fauna Ussumane R. Ibramogy	Tropical Fruit/2004	Mozambique	Agriculture Ministry
Luisa Penicela	Tropical Fruit/2004	Mozambique	INIA
Odete Elias Machai	Cassava/2003	Mozambique	INIA
Constantino E. Cuambe	Tropical Fruit/2004	Mozambique	INIA
Abdul Taioabo A. Naico	Cassava/2003	Mozambique	INIA-IITA
Paulo Lopes	Tropical Fruit/2004	Cape Verde	INIDA

### Evaluation of the questionnaires

#### Number of answers:

- Cassava: 4
- Fruit: 6

In fruit, one of people who answered, just mention he didn't work anymore with this area. The number of people who answer the questionnaire has been very low, what diminish the interest of the questionnaire evaluation.

#### Years when people participate the training:

Years	Cassava	Fruit
2001	1	
2002		0
2003	3	
2004		6

Most of the participants who answered the questionnaires were from the last years of the training course, what confirm the difficulty to maintain the interest of people after a long time. This conclusion has been mentioned in the report, where it has been concluded that it is very important to make the final evaluation around 12 months after the training course. This delay is

not long enough for people to forget and let some time for participants to implant some activities linked with the training course they received.

**Origin of the participants:**

Countries	Cassava	Fruit
Cape Verde	1	2
East Timor	1	
Angola		1
Mozambique	2	3

It has been impossible to make contacts with Guinea Bissau and Sao Tome and Principe, because of the absence of a working phone line between these two countries and Brazil. Contacts in Angola and East Timor have also been difficult. In East Timor, everybody received the questionnaires, what has been confirmed by E-mail, fax or phone call. Anyway, most of the participants from this country didn't respond the questionnaire.

**The participants didn't change of institution or working area since their training.**

	Cassava	Fruit
Yes	4	5
No	0	1

From the 6 participants of the fruit training who made the course, 1 change of working area and never applied what he saw in the course. In consequence, only 5 questionnaires can be really used in their totality.

**Number of training courses offered after training in EMBRAPA.**

Respondent	Cassava		Fruit	
	N° courses	N° participants	N° courses	N° participants
1	4	12	0	0
2	3	10	0	0
3	3	15	0	0
4	?	?	0	0
5			0	0
6			0	0

Legend: ? without answer.

Most of the participants of cassava training made some courses once back in their country, even if they only had 1 year for that. The validation of these courses is difficult. The realization of 3 or 4 courses in 12 months time seems quite a lot.

In fruit, all people who answered made the course in the end of 2004 and didn't have time to organize training in their country, which is normal.

In fruit, 2 participants are organizing courses in 2005. This situation confirms the necessity to make the evaluation 1 year after the course.

**What was missing to offer more training courses?**

Cassava	Fruit
Money - 1	Money - 2
No Answer - 3	Infrastructure - 1
	Local team - 1

Money and infrastructure seem to be the biggest problems for the organization of local training. Anyway, as seen for cassava, this doesn't seem to be a major problem.

**Did your expectation about cassava or fruits change after the training course?**

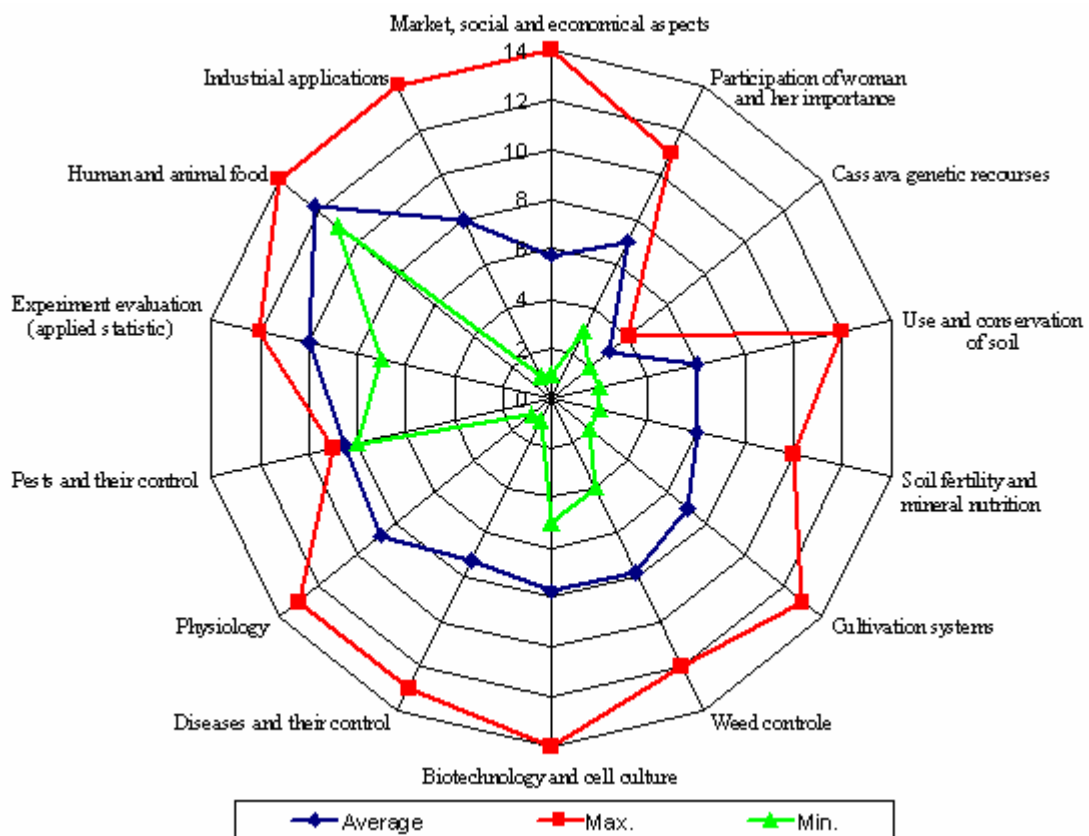
	Cassava	Fruit
Yes	4	5
No	0	0

The training course allowed some changes in all the participants. The main topics of change are described in the next table. These topics are quite diversified and it is impossible to make some conclusion.

**Which aspects have been changed during your training?**

Cassava	Fruit
Improvement of varieties	Increase of fruit cultivation
Use and conservation of planting material	Production and integral protection of tropical fruits
Better quality, especially on post-harvest	To adopt techniques and mechanisms used in Brazil
Substitution of varieties sensitive to African mosaic	Genetic improvement
Potentiality of the crop	Technical aspects

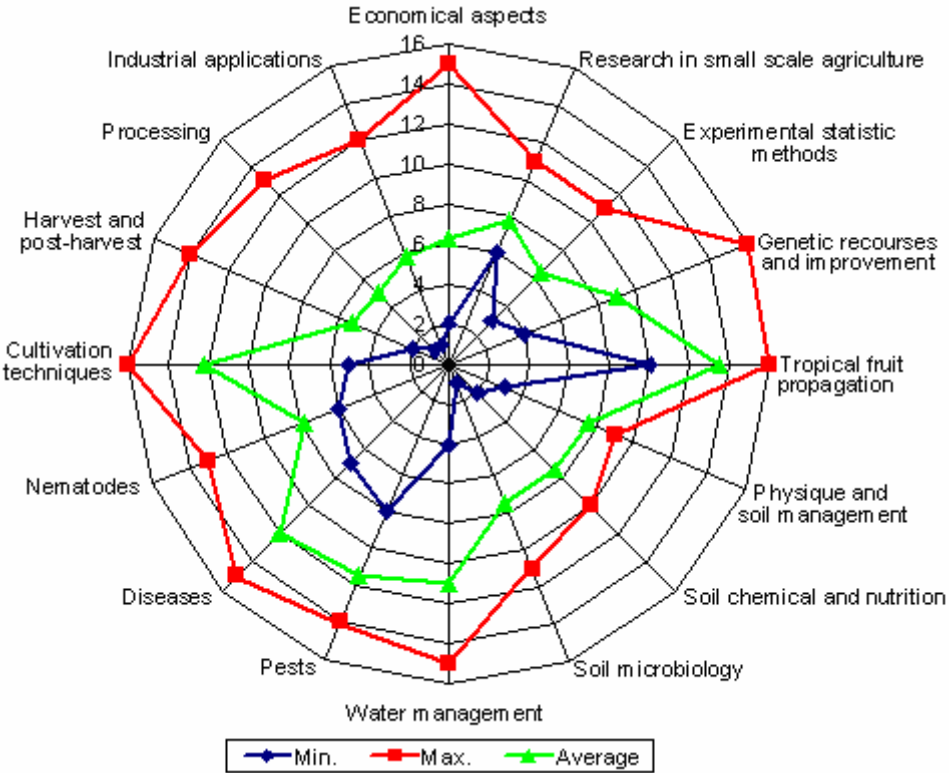
**Classify the topics taught during the training period (1= worse and 14 or 16 (fruit) = best).**



**Topic classification for cassava (4 answers)**

The analysis of the classification of the topics of the cassava training course shows that genetic resource is not an interesting topic for all the participants. In the opposite, human and animal food (including processing) is the most interesting one, in front of experiment evaluation

(statistic methods) and identification of pests and pest control. All the other topics are around the average, but with very large differences between the participants. These results are confirmed by the answer to the topics participants will eliminate if they could chose, which has been genetic recourses for 3 of them and physiology for one.



**Topic classification for fruit (5 answers)**

In the average, processing and post-harvest are the 2 topics with the lower punctuation, in front of industrial applications, economic aspects and experimental statistic methods. When compared this results with the topics participants will have eliminated in the training course, we find some difference as they decided to eliminate research in small scale agriculture and industrial applications, this last one classify as one with the smaller score in the previous Figure, but not the other one.

Tropical fruit propagation, cultivation techniques, diseases, pests and water management are the most preferred topics, topics that are all linked with cultivation aspects.

**Which topics will you develop with more profundity in another training course?**

Cassava	Fruit
Experiment evaluation (statistic methods)	Separate post-harvest, to valorize it
Biotechnology and cell culture	Production systems and integrated production
Rapid multiplication	Economical viability study of fruit plantation
Transformation and conservation	

In the cassava training course, people will like to develop with more profundity topics related to biotechnology, statistic experimentation and transformation. For the fruit training participants, they would like to develop better aspect in post-harvest and economic.

**Regarding the topics saw in the training course, which one did you applied when you came back in your country?**

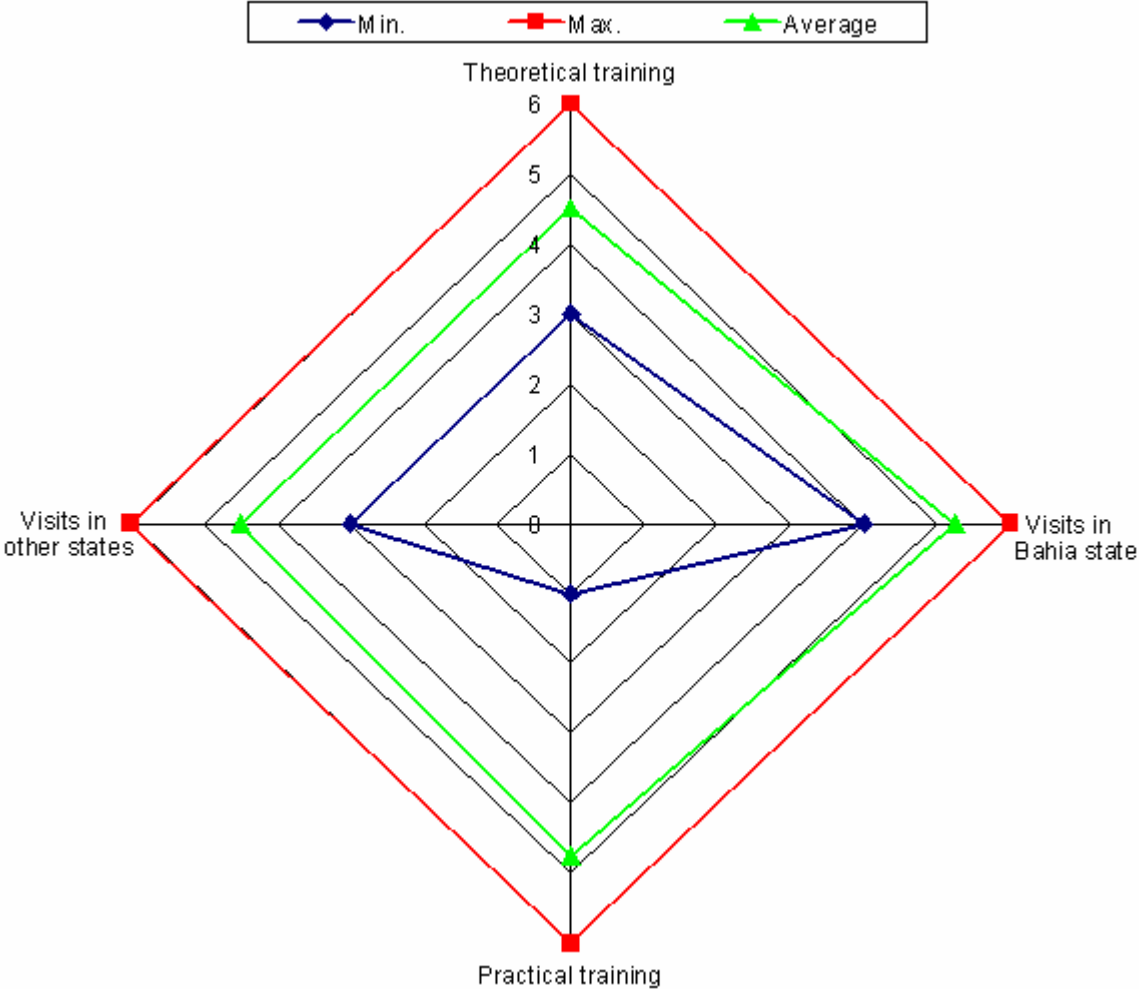
<b>Cassava</b>	<b>Fruit</b>
Genetic resources – 2	Experimental statistics methods - 2
Genetic improvement - 2	
Experiment evaluation (statistic methods) - 1	
Economic, social and market aspects – 1	
Food technology - 1	

For cassava, genetic resources and improvement are very similar and can be considered as the topic cassava genetic recourses, which was the one they discarded because they didn't like. As in this question, this topic was the most used, the answers are difficult to explain and are inconsistent between them.

The same happened for experiment statistic methods, in fruit participants. This topic was classify between the ones they less liked and it is the one they most used.

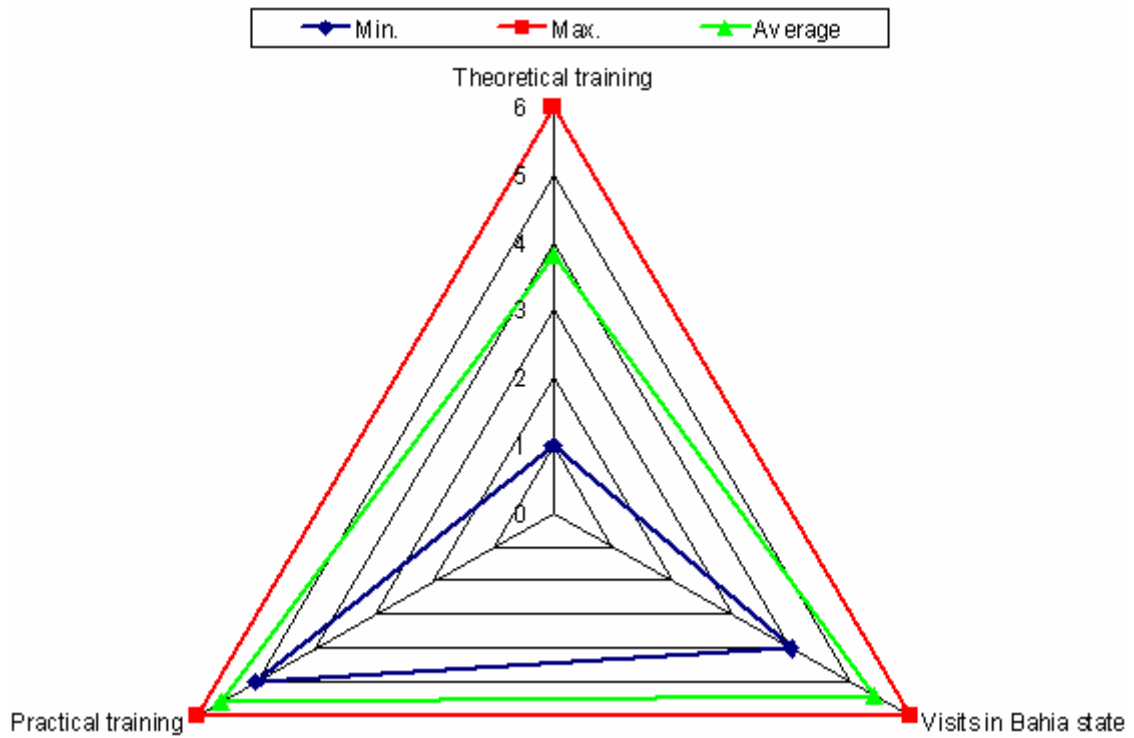
Two explanations are possible, or the answers are inconsistent or people do not make the relation between what they most need and what they prefer.

**What did you like most between visits, practical and theoretical trainings? (1=worse and 6= best)**



**Preferences of the different parts of cassava training course (4 answers).**

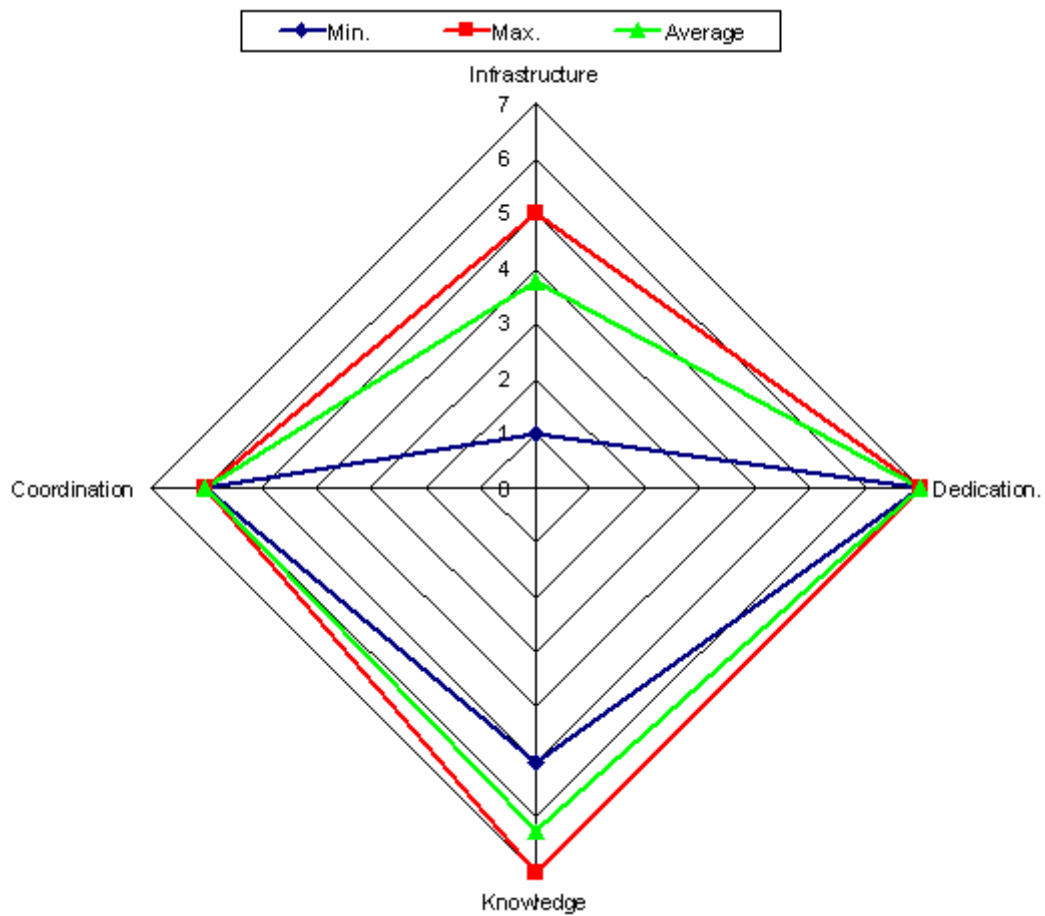
The visits of Bahia state have been preferred. The other topics are quite similar and the low rate of answer did not allow any conclusion. One of the participant who answered the questionnaire didn't like much the practical training, but it was just one participant and it can not be considered as significative.



**Preferences of the different parts of fruit training course (5 answers).**

For the training course in fruit, they didn't make any visit outside the Bahia state, which explains why they had only 3 points of evaluation. The theoretical training was the point they like less, why they prefer the practical training.

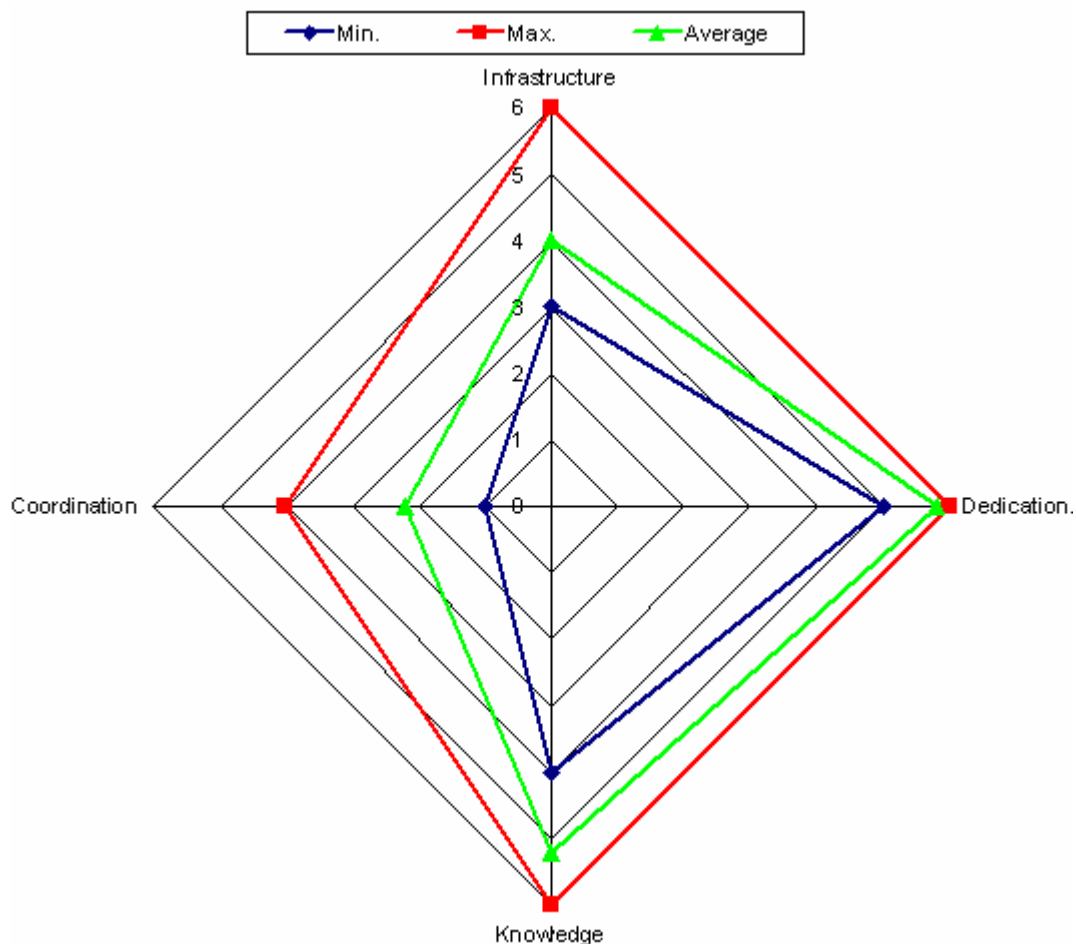
How do you evaluate the following items? (1=worse, 7=best)



**Evaluation for cassava (4 answers)**

It is difficult to make some conclusions because of the low number of answers. But, for cassava, it seems that the infrastructure was not so good. This is confirmed not only by the average score, but by all the answers, with a maximum score inferior to the other topics.





### Evaluation for fruit (5 answers)

For fruit, it seems that infrastructure was also a problem, but for the evaluation of people, coordination was worse. Dedication and knowledge were classified as good.

### How many times did you make contact with EMBRAPA after the training?

N° times	Cassava	Fruit
0	2	
1		
2	1	1
3	1	1
4		
5 or more		1

One told that she made more than 5 contacts with EMBRAPA, but without answer. It is difficult to confirm these answers, as EMBRAPA told that only 3 participants made contact, 1 in cassava post-harvest and 2 in fruit (1 in post-harvest and 1 in statistic).

As contacts are quite difficult between Africa and Brazil, it could be interesting to establish some way to facilitate communication, maybe through JICA, to allow the contacts after the training courses.

**If after coming back you felt the need for some actualization, how long after the training did this occurred?**

	<b>Cassava</b>	<b>Fruit</b>
The same year		2
After 1 year		
After 2 years	2	
Didn't need actualization		3
Do not answer	2	

Less than half of the participants felt some needs of actualization after coming back in their country.

**The training course improves your knowledge?**

	<b>Cassava</b>	<b>Fruit</b>
Yes	4	5
No	0	0

As it appears in the former table, the training courses improve the knowledge of all the participants who answered the questionnaire. As only a few number of participants answered this questionnaire, these results can not be considered as significative.

➤ What kind of knowledge did you improve?

	<b>Cassava</b>	<b>Fruit</b>
Theoretical and practical	3	5
Theoretical	1	

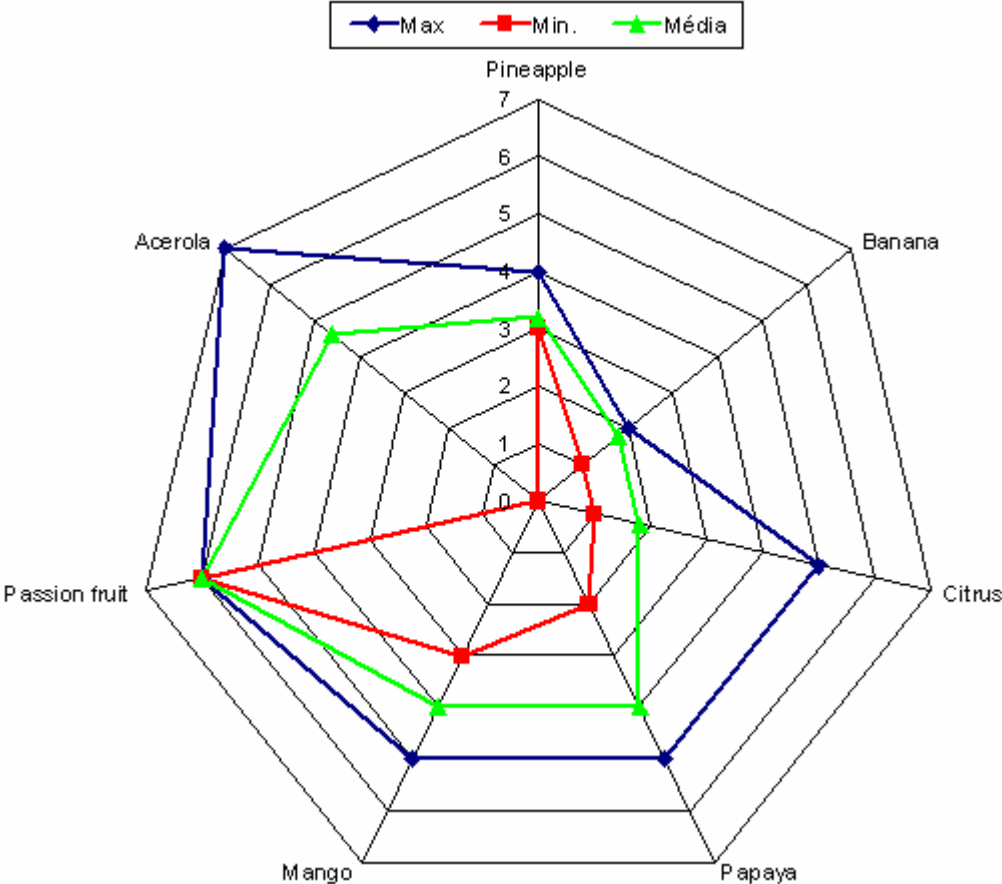
**Mentions 2 projects or activities, linked with your training, that you would like to be fund by JICA?**

<b>Respondent</b>	<b>Cassava</b>	<b>Fruit</b>
1	Socio-economical and market aspects <b>Experiment evaluation</b>	<b>Fruit processing</b>
2	Rapid multiplication <b>Processing</b> and conservation	Cultivation of mango and orange
3	<b>Processing</b> and agribusiness Genetic improvement	<b>Fruit processing</b> Production of material for divulgation (folders, etc.)
4	<b>Experiment evaluation</b>	Pineapple in-vitro cultivation with cell cultivation Characterization and conservation of fruits germplasm

For cassava, processing and evaluation of experiments are the main activities that participants would like to be financed by JICA. The results are similar with the evaluation participants gave to the topics of the training course (Topic classification for cassava), where animal and human food, which included processing, has been selected as the first one, and experiment evaluation as the second one.

For fruit, biotechnology items (in vitro cultivation and germplasm) and fruit processing were the topic more mentioned (twice each), very different that the classification of the preferred topics (Topic classification for fruit), where processing was one of the worse and biotechnology related topics had only an average score.

**Evaluation of the fruits studied in the training course.**



Passion fruit was the preferred fruit for all of the participants who answered the questionnaire (5 answers), in front of papaya and acerola. For this last one, one of the participants didn't like it and classified it as the worst one. Citrus and banana, 2 of the most cultivated crops were the one they liked less. These results have to be taken with a lot of care, because of the low rate of answers.

The other mention fruits have been strawberry, mentioned twice and coconut, cashew and guava, once each.

### **Researchers Interview:**

The CNPMF Researchers interview was made in the EMBRAPA/CNPMF. In 2 days it was possible to talk with almost all the people who participate to the training courses. The people interviewed were:

- From Cassava training course: 22 researchers
- From Tropical Fruits training course: 50 researchers

The information's obtained in the Researchers interviewees were the following, for both Cassava and Tropical Fruits:

- The participants had only little interest or just general interest in the training. The participants' level in general was low and unequal.
- Most of the participants were bureaucratic people. The indication from the countries of the participants favors that kind of recruitment.
- For a good use of courses research knowledge and didactical material, the technical knowledge of participants need to be higher.
- The practical activities woke up larger interest.
- Most of the participants were apathetic, not very enterprising.
- Many participants act in several areas (cassava and fruits).
- Contacts of participants with researchers after the courses were poor and few: only 2 in Cassava and 1 in Tropical Fruits.

### **Suggestions:**

In the meeting in EMBRAPA/CNPMF, it was possible to establish the following suggestions for the next course:

- To establish more realistic objectives, quantified and possible to evaluate;
- To request ABC or other partner to prepare previously basic documents on the target country: agriculture, climate, economy, hydro regime, etc;
- To establish a permanent and responsible contact in the countries and to sensitize the managers of the local centers on the need of follow up;
- Not to depend only of the participants' answers of the questionnaires, as they doesn't have any tradition to answer this kind of document;
- To evaluate secondary information, as proposed by dr. Wania Fukuda, such as multilateral projects, visits, invitations, observed results.

A report of CNPMF/EMBRAPA researcher's, Dr. Wania Fukuda, after a Cape Verde visit on invitation by the local Government, is attached in Annex 2. In this visit, the researcher verified most of the facts that explain the lack of answers to the questionnaires. These data have been considered as secondary information and used for recommendations. Others activities that happened during and after the courses, have also been considered as secondary information and used for the training courses evaluation.