

GlobalHort / Crops For the Future Project

Recipes for Success (RfS)

Enhancing productivity and consumption of indigenous horticultural food crops for better nutrition and health through enhanced communication of research results in community-run resource centres

Project completion and proposal writing workshop

Cotonou, Benin 11-15 April 2011



Consolidated Report

by

National Institute of Agricultural Research in Benin (INRAB)

(Facilitation: Achigan-Dako E.G., N'Danikou S., Mensah I.)

Introduction

The Recipes for Success (RfS) project entitled “***Enhancing productivity and consumption of indigenous horticultural food crops for better nutrition and health through enhanced communication of research results in community-run resource centres***” aims at increasing the nutritional status of underprivileged groups (mainly women and children) through better production of and access to traditional foods (e.g. mainly fruits and vegetables). Key activities of the project included:

- capacity strengthening of community groups through “Health Clubs” to organize themselves into business and production units (community empowerment and feedback of research results).
- evaluation of the effects of soils, climate and farmer practices on production and nutrient content of indigenous vegetables and fruits (agronomic studies).
- facilitation of seed availability for valuable indigenous vegetables and fruits (nursery and seed stores).
- understanding the effect of processing on nutrient components/palatability of indigenous vegetables and fruits (recording and developing recipes).

The objectives of this completion and proposal writing workshop consisted in sharing learnt lessons during the life span of the project, identifying gaps in knowledge, setting out elements for a follow-up project, and agreeing on a work plan up to the official end of the project which is 31 May 2011. Twenty one people participated in the workshop. They were from Benin, Kenya, Tanzania, France, Germany, and Malaysia.

Opening ceremonies

The workshop was opened on April 11, 2011 by Dr. Françoise Assogba-Komlan, head of the Vegetable Program of INRAB, Dr. Marco Wopereis, Deputy Director General, Africa-Rice, Dr. Raymond Vodouhe, Coordinator of Bioversity International West and Central Africa office, Dr. Hannah Jaenicke, Coordinator of the project, Mr. Hinde Adjiwanou Assistant Director APRETECTRA, Dr. Philippe Menozzi, CIRAD, and Dr. David Arodokoun, Director General, National Institute of Agricultural Research in Benin.

Dr. Françoise Assogba welcomed participants from Crops for the Future, CIRAD, KENRIK, ROP, Sokoine University for Agriculture, APETECTRA, University of Abomey Calavi, INRAB, and GlobalHort. She indicated that research and development organizations from four countries are participating in the project, namely Benin, Kenya, Tanzania and France. Crops for the Future, based in Malaysia ensure the overall coordination of the project.

Dr. Marco Wopereis, Deputy Director General of Africa-Rice, welcomed the participants to Africa-Rice and stressed on the importance of indigenous vegetables for local people. He indicated that Africa Rice is involved in vegetables research to serve the purpose of is to enhancing food security, income generation and the well being of the people in sub-Saharan Africa. He informed that Africa Rice is funded by the EU to carry out a research project on vegetables and wished that the meeting comes up with fruitful deliberations.

Dr. Raymond Vodouhe of Bioversity International recalled on the importance of diversity for human nutrition and particularly the importance of indigenous fruits and vegetables to solve

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hidden hunger and other malnutrition bottlenecks in sub Sahara Africa. Dr. Vodouhe also recalled a number of interventions on vegetables in which Bioversity were involved.

Dr. Hannah Jaenicke, coordinator of the project presented the genesis, the structure and briefly introduced the objectives of the project on which she will later emphasize.

Dr. David Arodokoun welcomed all participants and indicated that Benin is a major stakeholder in the area of indigenous vegetables. He raised issues about urbanisation and population growth that imply the need of reconsideration of the socio economic role play by indigenous vegetables in the African context. He was delighted that the West and the East decided to cooperate and work together in this project to enhance productivity and consumption of indigenous horticultural food crops for better nutrition and health through enhanced communication of research results in community-run resource centres. Dr. Arodokoun wished to the meeting fruitful deliberation and added that his institute will strongly support and facilitate all horticultural project activities.

The opening ceremony ended with an introductory note by Dr. Hannah Jaenicke which consisted in presenting the overview of the project in terms of aims and methodology, and the objectives of this workshop. Briefly stated, the project aims at increasing the nutritional status of underprivileged groups (mainly women and children) through better production of and access to traditional foods, mainly fruits and vegetables and through research on the production, processing and marketing of these food plants. During this completion workshop participants will 1) listen to achievements, 2) share experiences, 3) identify bottlenecks and gaps in knowledge, 4) set out elements for a follow-on project, and 5) agree on a work plan up to end of May 2011.

Overview of Recipes for Success activities

In this session eight presentations were delivered by the Vegetable Program of INRAB, Benin, the Nutrition Department of the University of Abomey Calavi (Benin), APETECTRA (Benin), CIRAD (coordinating project activities in Benin), Sokoine University for Agriculture (Tanzania), Rural Outreach Programme (Kenya) and KENRIK (Kenya) as follows:

1. **Overview of production studies in Benin** by Dr. F. Assogba-Komlan. This presentation highlighted activities carried out by INRAB. INRAB concentrates working on wild vegetables because they are endangered and INRAB thus makes a contribution to biodiversity conservation. Prior to RfS, INRAB was involved in a Darwin-Initiative funded project on indigenous African vegetables. The presentation showed the vegetative propagation results of *Talinum triangulare*, and subsequent yields when different parts of the plant are used. Also, the effects of fertilizer types on the yield of *Ocimum gratissimum* were described, the effects of various doses of urea on the production and mineral content of *Corchorus olitorius* and the effects of the application of extracts of *Ocimum gratissimum* on cabbage pests (e.g. *Plutella*).
2. **Recipes survey in Benin** by S. N'Danikou. This survey, which was carried out in 21 locations with respondents from different ethnic groups, revealed 12 groups of recipes for species such as *Moringa oleifera*, *Talinum triangulare*, *Ocimum gratissimum* and *Cleome gynandra*. *Talinum* and *Moringa* stand for important vegetables in diets in the surveyed communities, unlike *Cleome* and *Ocimum*. These recipes are usually prepared with a lot of oil. No cultural (ethnicity) influence on the

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preference for any of the four selected species was observed. Data analysis is still ongoing.

3. **Nutritional values of dishes based on traditional leafy vegetables** by Carole Sossa Vihotogbe. This presentation focussed on the processing effects on nutritional values of traditional leafy vegetables. Usually, vegetables are cooked and consumed together with a protein source, usually fish; fish was also included into the test dishes. The results of the study indicated that a) the proteins level in vegetable dishes are higher than the reference dish as proposed by previous studies; cooking introduces a large amount of fat which might be detrimental for health; the mineral content and the antioxidant activities in fresh vegetable are lost during cooking, although the use of potash in pre-cooking increased the mineral amount of the dishes to some extent. Carole suggested that housewives must reduce oil quantity when cooking vegetable dishes and also reduce the pre-cooking time of these vegetables. She also called for further investigation on the use of potash in pre-cooking.
4. **Recipes for Success activities in Benin** by Damien Ahouangassi. Many communication and outreach activities were conducted by APETECTRA and included stakeholder meetings, production of fact sheets (12 of them) training activities (cooking sessions, health and nutrition sessions, vegetable production sessions), setting up of health clubs, radio programmes, seed production. Some of the lessons presented from APRETECTRA was the need for using large (>1m) cuttings of Moringa for successful propagation and the low market value of Cleome. A positive outcome of the activities was that men in some locations now allow women to go to the Health Clubs.
5. **Recipes or Success: coordination activities in Benin** by Simon S. This presentation stressed on the communication activities, the literature review activities, the production trials with Health Clubs. CIRAD is just starting a new project, funded by HortCRSP, in Benin, with APRETECTRA and INRAB. This provides a natural link to RfS. CIRAD has also made links to other sections of CIRAD with regard to processing activities.
6. **Recipes for Success at Sokoine University for Agriculture** by Prof. John Msuya. SUA works with urban food vendors as primary producer groups. They form a key link in the rural-to-urban food supply chain. Two groups were identified in Dar es Salaam, comprising of 55 women and 5 men. The project also worked with initially 4 groups of vegetable producers (2 in Morogoro and 2 in peri-urban Dar es Salaam), but the 2 Dar groups had to be dropped because unseasonal and heavy rains destroyed their businesses and also because of internal problems of members. One of the Morogoro groups was also discontinued because they showed low commitment. The remaining group contains 21 members, or which 21 women. Stakeholder meetings/workshops were held with government officials/extension workers, vegetable growers, food vendors. The club was trained on group formation which included developing a constitution and has resulted in the group now having a bank account. Other training topics included: best practices of cooking vegetables, “healthy” ways of using (or avoiding) chemical pesticides on leafy vegetables. In addition, a literature survey on health and nutritional properties of indigenous vegetables/fruits was carried out. ROP and KENRIK collected and prepared 41 recipes from Kenya while SUA added 40

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Tanzanian recipes. Analyses for Fe, Zn and Se have been done while Beta-carotene analysis is underway. Contribution to dietary guidelines will begin once all the necessary literature has been collected and analyses are completed.

7. **Recipes for Success” Project: the Case of Rural Outreach Program (ROP)** by Sylvester Aura. Completed activities include field survey and data collection, data analysis and observations, a series of field days (e.g. recipes competition), continuous farmer-participatory training, enhancing of our existing Seed Bank, Creation of Health Clubs (comprising Women groups).
8. **Recipes for Success: Development of Health Clubs in Kitui, Kenya** by Lucy Kariuki. Of the groups KENRIK started working with, Inyuu group had to be discontinued as they became inactive and had internal disputes. However, 2 new groups: New Generation and Sarahs have formed spontaneously of women who wanted to participate in the project. There is a total of 120 members now in the 5 Health Clubs. Activities completed include: a) resource centre development, b) seed collection, vegetable growing, seed bulking and selling, c) tree nursery development and management, d) recipe documentation, e) cooking demonstration and recipe validation, f) nutritional and health education, g) food preparation for analysis in SUA, h) database of recipes, nutritional values, species. Lessons learnt include the need for a local champion and the need for demonstration activities. Gaps were identified in training, still weak links to the market (especially supermarket), the need to attach a value to the indigenous crops and the study of the best unit size for sale (e.g., big or small bunches).

Issues raised during this session included:

1. The management of seed viability in *Talinum triangulare* and *Vitex payos*. Seed of these species do not germinate well probably due to dormancy (maturity or hard seed coat) issues. Harvest of *Talinum triangulare* before full maturity leads to non viable seed but at full maturity seeds drop out of capsules and harvest is made difficult.
2. The lack of information on indigenous fruits which were not taken care of during the project pilot phase. In Benin partners focused only on vegetables and overlooked indigenous fruits. In Kenya a number of fruit species were inventoried but no in-depth analyses carried out.
3. The efficiency and sustainable use of manure in vegetable production. Only INRAB tentatively addressed this subject for *Corchorus olitorius*. In a second phase project this topic should be thoroughly investigated.
4. Respondent number for the recipes survey in Benin is on the lower side and varied from one locality to the other. The sampling effort is not comparable from one locality to the other. Consequently, results off the survey might not be comparable between localities.
5. Detailed information on which minerals/vitamins are lost during precooking is lacking in the nutrition studies conducted in Benin. It would be more conclusive to conduct in-depth studies on the types of minerals that are lost during precooking. To save part of the lost nutritive elements it was advised to communities in Benin to reuse the precooking water. However, it would be more informative to investigate on the presence of anti nutritional factors in precooking water. How to manage the loss of

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mineral during precooking? Is it appropriate to re-use the boiling water in the cooking process? How much do we know about the mineral composition of the boiling water? Is it necessary to boil the vegetable before preparation? A second phase of the project is needed to answer these questions.

6. To reduce/mask bitterness in Cleome a precooking is necessary. In Kenya additional ways to mask the bitter taste include use of milk, peanut sauce, mixture with other sweet vegetables such as *Amaranthus*. In Benin Cleome is not bitter and masking bitterness is not an issue. They are bitter and non bitter varieties of Cleome as it will later be confirmed with an article of PROTA on *Cleome gynandra*.
7. Intensification of production of traditional vegetable might lead to new paradigms. For instance, new pest and diseases might develop like in the case of conventional vegetables. It is important that while promoting indigenous vegetables we bear that in mind.
8. Planting material of *Moringa oleifera* should be at least 1 m tall to expect a good regeneration. Don't we have any better propagation techniques? Review article from PROTA (www.prota4u.org) indicated that plant materials should usually be more than 1 m tall. Propagation techniques developed by APRECTECTRA have proved efficient.
9. Dissemination of project results is essential. Project members should share methodological tools, results, communication strategies to increase efficiency. How to put in place a communication plan (e.g. making fat sheets/training materials available for the project team/public) was discussed.
10. Effects of use of chemical fertilizers on the quality of vegetables were discussed. INRAB conducted a preliminary investigation on *Corchorus olitorius*. However, no general conclusion can be made from results. Although *Corchorus olitorius* was not a target species in this project, it might be interesting to deeply investigate on the effects of fertilizers or other ecological factors on the quality/nutrient contents of indigenous vegetables.
11. In FAO statistics traditional vegetables are not listed. No statistics are available on indigenous vegetables and consumption in Africa. This issue has been constantly raised at different fora and need to be appropriately solved. However, a number of reports have indicated the frequent consumption of wild vegetables (not listed in FAO statistics) in Africa. It is important to propose a recommendation to FAO with regards to this issue.

Experiences from GlobalHort and CFF

A presentation on **From AVRDC to FAO: five years to make an idea, a reality** was made by Dr Remi Kahane. The presentation introduced the three ages of GlobalHort and its pathway from Taiwan to Rome through Africa. Remi indicated that Horticulture is a sustainable way of using natural resources (e.g. land resources). To promoting horticulture GlobalHort is dedicated to lobbying, joining and stimulating initiatives, networking, advocacy for knowledge management, coaching of research activities. From Taiwan to Africa GlobalHort learnt that *'an empty hand is an isolated one'* and lobbying is hard work. The new environment in which GlobalHort is operating from will certainly be conducive so that

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her mission be achieved. Remi suggested that the urban-peri-urban link could be of interest for RfS second phase. GlobalHort can be visited at www.globalhort.org.

A second presentation on **Contributing to sustainable agriculture and food systems through the enhanced use of underutilized species: The role of Crops For the Future (CFF)** was made by Dr Michael Hermann. CFF is a global partnership established through the merger of ICUC and GFU with the mission to improve access to knowledge on NUS through provision of information services to NUS researchers, advocating a favourable policy environment to promote the use of NUS (market access), increasing awareness, strengthen capacity in relevant sectors. In his presentation Michael took the opportunity to reflect on points to remember when developing any new project proposal. These include:

- a clear definition of the problem to be solved;
- a clear choice between science oriented or development oriented project;
- the definition of hypotheses, R&D questions;
- the target groups or beneficiaries (rural, urban poor, gender, age?)
- the strategies for impact assessment of intervention;
- the necessity to involve new partners (Development NGOs, research institutes?)
- the need to add new research components (e.g efficacy studies)
- the development of a logic framework for the intervention.

Issues that arose from the two presentations were related to:

- The limitations of GlobalHort and CFF. The initiative concerns only horticultural crops but some animals have huge potentials and are in comparison similar to underutilized resources. Also, underutilized crops could be used as animal feed, thus contribute secondarily to improved protein nutrition.
- The lack of statistics on the production and commercialization of NUS to demonstrate their importance to decision makers.
- The need to include impact measurement strategies/tools during proposal writing phase. This helps monitor and evaluate during and after implementation phase. Team agreed to develop output-based logical framework when writing the proposal.
- The need to involve private sector in research and development initiative to increase the uptake of knowledge and technologies generated through interventions.

Lessons and gaps from the implementation of the RfS project

Participants used cards to identify contributions of the pilot project to each of the five objectives set in the initial project document. At the beginning of this session participants were asked to write down on three main outputs/contributions of the project to communities or science. For each idea only one card was used. All cards were later displayed on a boards and similar ideas grouped together. A synthesis of main lessons or contributions of the project can be listed as it follows:

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- Setting up, operation, and capacity building of health clubs have been more or less effective in each project country;
- Knowledge has been generated specifically on the nutritional content of some recipes; this knowledge on nutrient contents of recipes proved to be informative. However, information still missing to make broad conclusions; detailed analyses would help make stronger conclusions;
- In Kenya, a community seed bank was enhanced and improved to help farmers store their seeds in pest-free environment; seeds were preserved traditionally by drying and mixing with ash;
- In project countries nurseries were established at pilot sites – Quantities not yet sufficient and quality checks necessary;
- Recipe documentation done and a database available with KENRIK (data to be shared with project team);
- Communication strategies revolved around radio programmes, nutritional education, cooking competitions, training sessions (fact sheets produced) on for instance ability to mix different vegetables and increase taste/flavour, additives like salt and milk in right proportions. There is a need to take a second step with clear communication tools and strategies in place;
- The project reached 441 households in Kenya, 337 households in Benin, and 160 growers and vendors in Tanzania

Major setbacks and gaps during the implementation include:

- project did not significantly strengthen business and production capacities;
- there was very little contribution to objective 2 of the project. In Benin a literature review was carried out on the topic which was followed by a preliminary study on the effect of fertilizers on the rates of nutrient contents in *Corchorus olitorius*; this study has not been conclusive yet;
- quality seed production has started, but quantities still small.
- internal communication, information sharing during the life span of the project has been less effective; consequently there were no harmonized methodologies in terms of training/capacity building, and research protocols development;
- knowledge on nutrient content of indigenous fruits not available yet.

Original information drawn from cards are presented in Annex A.

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Charting the way forward

During the proposal writing session, participants focused on the elaboration of output-based frameworks driving from lessons learnt and identified gaps during project phase I in relation with the five project objectives. As these objectives were clearly captured into three main goals in the initial project document, participants focused on those goals. Three working groups were set up to reflect on goals and to develop a logical framework based on lessons learnt and identified gaps. Group 1 discussed the Objective: “Improved knowledge on production and processing of indigenous vegetables and fruits available”; Group 2 discussed: “Targeted and relevant information about nutritious foods and the role of IFV in health diets available” and Group 3 discussed: “Increased marketing of indigenous fruits and vegetables and their products”. Annexes B to D present the results of group sessions.

The discussion following the presentation in plenary of the group work covered the following issues:

1. Baseline studies appear as important component to start with in many cases as indicated by working groups. However, when developing the new proposal we need to take also into account ongoing research activities on consumption or nutrition under the auspice of CIRAD. We can also build on existing information from the Darwin Initiative project in Benin, the Bioversity project in Benin and Kenya to avoid duplications. It might also be interesting to connect with new partners depending on how ambitious the new proposal is. Above all, innovation should be a driver of this new proposal.
2. Target groups may include pupils (e.g. school gardens), vulnerable women, in rural areas but also in periurban areas. The setting up of health clubs for food vendors could be prospected as well as health clubs in urban areas. However, it might be necessary to first make a typology of existing health clubs and study their structure, maybe based on age, their primary activities, etc. This would help to better frame the kind of topics to include in the training programmes for each category. What we have to bear in mind is better nutrition in a wealthy environment. All in all, the target groups should be appropriately defined.
3. Whether or not we will engage in nutrient efficacy (i.e. clinical) studies. We would need to identify experts and link up with experts from the medical profession. How much new information would we get as compared to information already available from other food stuffs which we could triangulate for our purposes? The issue of ethical clearance and difficulties in obtaining research permits when working with humans was mentioned.
4. Communication channels were discussed, the need to communicate using the best and most appropriate channels for each country and to harmonize amongst the countries where possible.

In addition the work plan up to August 2011 was consensually developed by participants. This plan in Annex D indicates activities and responsibilities of each partner organization before and after May 2011.

Funding and Partnerships Opportunities

Several funding opportunities were explored by Hannah J., Serge S., John M., Remi K., Michael H., and Joel H. These include:

- ICDF Taiwan, DFID-ERSC (by Hannah)

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- HortCRSP , e.g. BionetAgro (by Serge)
- SUNRAY (by John)
- FAO school gardens (by Remi)
- OPEC Fund, VW Foundation, GEF (by Michael)
- EU/IFAD grant to Africa Rice (Joel)
- Opportunities for publication project outcomes: CTA, *WrenMedia* (by Hannah).

Field trip: collecting impact stories

A field trip was organized by APRETECTRA and INRAB to visit 8 health clubs in localities such as Come, Grand Popo, and Kpomasse (Figs 1 & 2). These clubs shared with the project team their successes and progress on the production, utilisation and commercialisation of indigenous vegetables. They also mentioned constraints related to the implementation of the project. During the discussions it appeared that the health clubs were aware of the nutritional health contribution of indigenous vegetables and improved cooking practices. A lot of commitment and energy were observed from members. This situation was also observed in Kenya and Tanzania. Sometimes beneficiaries tend to accept new project without digesting very well the content. For instance producers in Kpomasse (Benin) were fishermen and have little space for production. Moreover, there lack basic production technologies. RfS project initiated activities in that village to contribute to a larger effort to re-train the fisher folk to new activities, since fishing is not sustainable any longer.

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Figure 1. Group discussion between project partners and health clubs in Come



Figure 2. Project partners visit *Ocimum gratissimum* plots in Come.

Vegetables products are sold to collectors/retailers as well as to other villagers. Major bottlenecks to the production of indigenous vegetables include the water availability and management, poor irrigation equipment, lack of financial resources, lack of adequate markets for commercialisation, lack of capacities, and land tenure. Other social issues such

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as lack of support from household chief could be a drawback for certain women involved in the production and marketing of indigenous vegetables. A number of issues discussed with communities are synthesized in Table 1.

From public awareness campaign communities were advised not to use potash during the cooking process. Also they have been advised to re-use precooking water under the hypothesis that this practices will improved the nutrient content of their sauce. Preliminary results from the Faculty of Agronomic research do not support this hypothesis and there is a need for in-depth investigation.

Table 1. Synthesis of discussion with health clubs in Come, Grand Popo and Kpomasse.

Positives aspects	Issues to consider	Suggestions
1. Impressive enthusiasm of health club members	1. Lack of support from household chief	1. Promote indigenous vegetables in the neighbourhoods of project site to increase market.
2. Good knowledge of nutritional and health benefits of members	2. Lack of land in some areas	2. Sensitize household chief in project activities to seek more support to wife
3. Commitment to further phases of the project	3. Poor irrigation equipment	
4. Visibility of the intervention of APRECTETRA in the field	4. Lack of financial resources	3. The formation of market units where needed
5. Presence of project team in localities reinforced HC members' awareness.	5. Poor market organization	4. Put more effort on conveying to health clubs the real message of the project
	6. Issue of the use of potash and	5. Further investigations on the issue of potash and the precooking water during preparation.
	7. Issue of the use of precooking water.	

Concluding remarks

The workshop revealed a potential for further collaboration between partners organization and specifically among the project members who expressed the willing to pursue a second phase of this initiative. Each project partner expressed the desire to see a second phase in place in the short term. The impact of the first phase project cannot be clearly measure by now. However, the enthusiasm and energy demonstrated by health club members is a sign of the uptake of knowledge about the nutritional and health benefits associated with indigenous vegetables. This partnership also brought in knowledge from different regions of the continent which is another added value of the project. The project also showed the benefits of networking whereby sharing knowledge on how each region perceives the consumption of vegetables and how communities organise the production and marketing were well appreciated. This networking needs to be reinforced through sharing of methodologies, protocols, communication tools, promotional materials, etc. In short,

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communication between partner organizations from East and West Africa need to be strengthened.

In her words of appreciation the project coordinator, Dr. Jaenicke, thanks all participants for the very good experience lessons learnt throughout the implementation of the project. She stated that we have developed a good collaboration during the last 24 months and this should be continued. She added that INRAB and APRETECTRA have shown a wonderful organisation and all participants are grateful for that.

On behalf of the participants Prof. John Msuya thanked GlobalHort for funding this project and giving us the opportunity to implement it. He also thanked Michael who is taking hand from Hanna. „Hanna has carried much of the load and we would like you Michael to carry out the burden and lead the second phase“ he said. He finally thanked all partners and said that the language should not be a barrier for us to communicate. He thanked Francoise and the all Benin team for nicely organising the workshop.

Finally, Mr. Dassou representing the Director General of INRAB thanked the participants and GlobalHort for the initiative and closed the meeting.

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