Expert meeting on the development of the vegetable production sector in Tanzania

Arusha March 18, 2014

A.P. Everaarts and T. Hemelings (Edts)

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Praktijkonderzoek Plant & Omgeving (Applied Plant Research), part of Wageningen UR
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Table of contents

page

Summary

On March 18, 2014, a meeting of experts on the development of the vegetable production and marketing sector in Tanzania was held in Arusha, Tanzania. The meeting was organised in the framework of the end of the 'African Vegetables' Project (2011 - 2014) and the start of the new 'Seeds of Expertise for the Vegetable Industry of Africa' project (SEVIA, 2013 - 2019). The aim of the meeting was to discuss, and formulate, recommendations for the improvement of production, marketing and consumption of vegetables in Tanzania. The discussion was broadly based on the results of the 'African vegetables' project. The results of the discussion served as input for new the SEVIA project. The recommendations formulated focus on production, marketing, consumption and enabling environment.

Recommendations

The concluding recommendations of the workshop to improve vegetable production, marketing and consumption in Tanzania were shortly formulated under the headings: Production, Marketing, Consumption and Enabling environment.

Production
- New varieties
- Counterfeit prevention
- Credit facilities

Marketing
- Reduction of the post-harvest losses
- Better information on practice and demand
- Organization of the farmers

Consumption
- Information dissemination
- Improve recipes
- Capacity development on nutrition, gender and health

Enabling environment
- Lower taxes on farmers inputs
- Implementation of land mapping and title deeds
- Create awareness at local level for environmental protection
- Standardization and accreditation of products
- Strengthening independent advice to farmers

1 Introduction

In the framework of the concluding of the 'African vegetables' project (2011-2014) and the start of the inception phase of the 'Seeds of Expertise for the Vegetable Industry of Africa' (2013-2019, SEVIA) program, a meeting of experts on vegetable production, marketing and consumption in Tanzania was held on Tuesday, March 18, 2014, in Arusha (Appendix 1).

The aim of the meeting was to discuss means and methods for the development of the vegetable production and marketing sector in Tanzania and how best to secure affordable vegetable supply to the rural and especially to the growing urban population (Appendix 2).

As a result of the meeting practical recommendations for the development of the vegetable sector in Tanzania were formulated.

Participants attending the meeting covered the whole vegetable supply chain, from production to consumption (Appendix 3).

2 Opening

Following the arrival of the workshop participants, the moderator, Ms Tine Hemelings, warmly welcomed everybody, and invited participants to be relaxed but with active participation to the workshop proceedings. She gave briefings on the logistical arrangement concerning the workshop schedule.

Mr Arij Everaarts, who welcomed all the participants on the floor from different invited organizations, officially opened the meeting. He explained the aim of the workshop as being to discuss the means and methods for the development of the vegetable production sector in Tanzania and how best to secure affordable vegetable supply to the rural and especially the growing urban population. He emphasized the expected result of the workshop as being to have practical recommendations for the development of vegetable sector in Tanzania.

3 Current vegetable production in Tanzania

Presentation by Jehovaroy S. Kaaya (farmer), Vincent Tarimo (farmer) and Arij Everaarts (research) covering all aspects of current vegetable production in Tanzania, including seed supply, transplant production, soil fertility and fertilizer use, pest and disease control, agronomy and economy of production, harvesting, packaging and transport, marketing, product safety and nutrition, research, development and knowledge transfer, role of women, environmental protection (Appendix 4).

The following questions and comments were discussed during the presentation:

3.1 Seed supply

Mr Kaaya prefers hybrid vegetable varieties because of the market and because compared to Open Pollinated (OP) varieties the quality is much better of hybrid varieties, e.g. tomato varieties *Anna* and *Nowara,* purchased from East West Seeds, Rijk Zwaan and Balton.
Responding to the questions "What is the yield of a plot in the normal climate?" Mr Kaaya replied he gets one debe (20 l tin per plot). He further said, the land scarcity in Meru areas is very big and that is the biggest challenge for their production. As a result farming should be more efficient in order to have a good production.

3.2 Soil fertility and fertilizer use

Farmers can't do soil analysis and they just apply fertilizer based on experience. Mr Kaaya said, he dissolves four kgs of DAP (Granules) of fertilisers into 200 litres of water (1drum) which is enough to fertilize 800 plants. He said that, he had 2000 seedlings in which he had to use 600 litres of the solution to sprinkle the seedlings. However, doubts amongst farmers are present about the fertilizer quality and content. Mr Kaaya further said he had only one acre of land for vegetable production. Mr Kaaya talked about fertilizers costs, in which he said that the high costs of farming inputs is a potential barrier to the production of vegetables for farmers and this should be assisted by both governmental and non-governmental institutions.

3.3 Pest and disease control

No adequate information is available on proper use of pesticides in terms of efficient use and health aspects. Pest and disease identification is essential but knowledge is lacking. Furthermore it happens that the expiry date of pesticides is exceeded when sold by agro shops. Quality assurance systems, controlling bodies and enforcement measurements are lacking.

3.4 Agronomy and economy of production

Mr Kaaya explained that farmers face financial inadequacies in their production because they do not have access to financial credit as seed capital due to the low level of their income base. He recommended that, the farmers should be provided with credit to enable them to start horticultural small-scale projects and said there is a farmers' bank currently in Meru that enables farmers to access credit.

Farmers should do calculations of costs and income but are not doing that. In order to obtain loans it is important to convince the loan provider about the possible profits of vegetable cultivation. For this a breakdown of costs and income is required.

3.5 Harvesting, packaging and transport processes

The question posed was "What should be improved"?

1. To continue harvesting into a bucket rather than just on to the soil.
2. To have special tracks for vegetable transportation like in Kenya that prohibited vegetable transportation with open tracks.
3. Improve the roads.
4. To harvest half- ripen to avoid damage during transportation.
5. To organize farmers to have collective cooling cells.
6. Quality and traceability of product should be improved.

3.6 Marketing

Vincent Tarimo gave a testimony about intermediaries, consumers and added value of the vegetables through various processes. He stated the challenges that farmers face during their cropping undertakings as follows:

1. Limited technology concerning storage and preservation.
2. No standard packing unit. Although the unit is the same the content per unit can differ greatly to the expense of the farmer.
3. Price fluctuation, which leads to limited capital and therefore replicate poverty.
4. Transport violation from the farms to the market.
5. Manure costs.
6. 'Rumbessa' (excessive product's measure): This is facilitated by the middlemen, since when the producer sells to them a tin and puts more and more without increasing the price, more buyers will prefer to buy from him/her and others see, they will all do the same in order to get buyers.
7. Existence of intermediaries: they buy at low price and sell at high price in the market.
8. Cultural related beliefs and customs.
9. Spraying on the harvesting day.
10. Access to information of market prices by telephoning relatives, friends etc. No formal system present.

3.7 Production safety and Nutrition

Some additional issues raised were:

1. Farmers' beliefs with regards to the toxicity of pesticides.
2. Limited or no governmental regulatory system for product safety for example, not very well known whether there is a national testing laboratory for products or not.
3. There should be Industrial codes of conducts.
4. There is no sufficient intake of vegetables and fruits in the daily foodstuffs taken by the society.
5. There is a need to establish vegetable projects at schools and families levels in Tanzania to curb up these deficiencies.
6. The Ministry of Cooperative has anticipated establishing such a program in the community.

3.8 Research, development and knowledge transfer

Research and development should be improved. Essential is a good extension service, either by the government or by NGO's, for the independent transfer of knowledge.

3.9 Role of women

The participants acknowledged that the majority working in the vegetable production sector are women and therefore, they should be equally involved and trained on how to market well their products in order to earn

a living.

3.10 Marketing, income, credit and promotion

Recommendations:

1. To establish the vegetable production project at schools and provide each child with one nursery for the promotion of vegetable consumption.
2. There is a need to grow several varieties of vegetables.
3. Still the beliefs aspect (i.e. insufficient intake) is a problem and awareness should be created across the society.

3.11 Environmental protection

There is terrible environmental destruction due to economic needs, for example, cutting firewood, charcoal, clearing water catchment areas for cultivation purposes.

4 Agronomy and profitability of vegetable production

Herman de Putter gave a presentation on the findings of the research project 'African vegetables', that looked at improving productivity in African vegetable production (Appendix 5). The presentation included the following:

4.1 Modern techniques for production

The presentation had in it crops, cultivars, raising methods etc. More issues were shown in the slides like potentials positive impact of production techniques on yield.

4.2 Financial returns of vegetable crops

In this part, analysis was presented of the costs related to fertilizer, pesticides, other materials and labour. This was impressive as it showed how valuable the horticulture production is for the farmers as it was given analysis of the returns, for example, the return per annum for an acre of tomatoes to the farmer is Tzs 2,831,600/= providing a daily income of Tzs 7,760/=

4.3 Issues raised by the presentation

Issues of knowledge gap for the farmers on the negative side effects of the pesticides. Involvement of the likeminded institutions such as Tropical Pesticides Research Institute (TPRI) and Tanzania Food and Drugs Authority (TFDA)

5 How to improve production and marketing to stimulate consumption

Participants were asked to write their proposals on "how to improve vegetable production and marketing to stimulate consumption" in Tanzania. Participants' recommendations were clustered under the headings 'Production' and 'Marketing'.

5.1 Production

1. Prioritize the types of vegetables to be produced.
2. Timely availability of seeds to the farmers and affordability in terms of price.
3. The quality of seeds to be more improved.
4. Value addition (processing, packaging, etc.).
5. Awareness raising on the value chain process through mass media such as TVs, Newspapers, radios etc.
6. Involves the cross cutting issues such as gender, women, youth, Environment, HIV/AIDS, health and nutrition.
7. Production infrastructure e.g. water for irrigation systems, tunnels, roads, capital (financial and non-financial) e.g. insurances, weather indexes/climate forecast such as how, what, means etc.
8. Technology related information for farmers' production.
9. Land tenure and ownership issues. Limited capacity to map, title, and use land as collateral.
10. Limited access of land for youths in urban areas.
11. Enabling environment.
12. Improvement of the recipes for preparation and cooking.

5.2 Marketing

1. Formalizing the marketing system as opposed to the current informal marketing system.
2. Campaigning for eating more vegetables (awareness raising in the society).
3. Change image of negative beliefs based on traditional values and taboos.
4. Focus on health benefits.
5. Improve the market place, storage (improve market infrastructure).
6. Promotion of standards and accreditation (improve hygiene, safety, quality,…).
7. Training the stakeholders in the value chain approaches.
8. Application of social-change behavioural communication strategies.
9. Market information inflows are critically required.
10. Education on the importance of consuming vegetables. Curriculum review (Primary and Secondary schools).
11. To improve the microcredit accessibility strategies.
12. Improving the packaging and transportation logistics.
13. The government to reduce the taxes on farm inputs.
14. Improve seeds and agriculture practices, good planning, etc.

Building further on these initial ideas, participants worked in groups to further elaborate on the recommendations on "how to improve vegetable production and marketing to stimulate consumption" in Tanzania. Results were grouped again under 'Production', 'Marketing', 'Consumption' and 'Government policies'.

5.3 Group work on Production

1. Improving farming practices

- High yielding varieties –vs. traditional OP varieties demonstration –by private sector and farmers.
- Packaging of seeds to be translated into Kiswahili – by seed producers.
- Tests of varieties in terms of performance on yield – by government, seed producers, and farmers.
- To learn on how to recognize counterfeit fertilizers, seeds and pesticides – by farmers and TPRI.

2. Production innovation

- Training on production, planning and storage (demonstration) – by private parties, extension officers and farmers.

3. Financial and non- financial services

- Group formation to obtain financial/loans support from banks.
- Create more community cooperatives (e.g. SACCOs, VICOBA) – by farmers.
- Seedling nursery for vegetable – by private sector and farmers.
- Record keeping – by farmers.
- Financial management – by farmers.
- Improve extension services such as knowledge and means to reach the farmers – by government and NGO's.

5.4 Group work on Marketing

Priority is to improve market place, package and transport.
The problems include:

1. Harvest too late.
2. Inadequate handling and storage.
3. Not suitable packaging materials.
4. Poor infrastructure such as roads, bad trucks.
5. Bad handling at market place.
6. Poor display (dirty, unattractive).

Solutions:

1. Market information system trainings - Contract farmers.
2. Better facilities, on farm training.
3. Improve and standardize the re-usable tracking materials to be provided by traders.

General: Organization of farmers to form groups as enterprises to do their own marketing.

5.5 Group work on Consumption

1. Awareness creation and sensitization programmes.

- Information dissemination tools such as charts, posters, distinct slogans, cartoons.
- Media campaigns such as jingles, radio & TV, seminar, tots, public announcement, e.g. daladala, using celebrities, newspapers, social media.
- Trade fairs such as Saba Saba or Nane Nane events (7 July and 8 August), horticultural specific events, fruits and vegetable tasting events.

2. Improving Recipes

- Booklets, e.g. brief, catchy and attractive to read.
- Tasting festivals.

3. Capacity Development

- Review national training curriculums.

- Practical training.
- Integrating gender nutrition and health in developmental issues.
- Engaging health institution, e.g. hospitals and clinics.
- Engaging traditional leaders (to break the social negative cultures).

Governmental and private sectors should implement these strategies.

5.6 Group work on Government policies

1. Promote production –Agricultural policy.
2. Lower taxes on inputs to stimulate production.
3. Hasten the implementation of MKURABITA e.g. in land mapping, title deeds.
4. Awareness creation mechanisms at local levels on environmental protection, e.g. penalties, incentives etc.
5. Standards and accreditation - promotion –development, enforcement (inputs and food).
6. Strengthen independent advisory services to farmers.

6 Introduction of the new SEVIA project

The new 'Seeds of Expertise for the Vegetable Industry of Africa (SEVIA)', project was introduced by Heleen Bos, Mathe Bastiaansen and Flip van Koesveld (Appendix 6). The project is funded by the Dutch Government and will last for seven year in Tanzania as from 2013 to 2019 and seeks to cooperate with other likeminded institutions like HORTI -Tengeru, Tanzania Horticultural Association and Soikone University of Agriculture. Location to be determined later, but must be in places suitable to grow vegetables like Arusha, Moshi, Mwanza or anywhere else which is suitable for vegetable production.

Few questions raised included:
How is their sustainability? It will depend on the market, which is sure to sustain throughout Tanzania and the whole of eastern Africa and beyond.
How is the safety of their products? Depends on the knowledge of the farmers especially how frequently they spray or the ways they spray and the type of the pesticides applied.

After the presentation of the recommendations (see below), the SEVIA team came forward again and listened to the participants for more observations and advice for the SEVIA project. The observations and advice partly overlapped with the formulated recommendations. According to the participants SEVIA should also focus on:
1. Improve production techniques, decrease costs of production and increase yield per ha.
2. Increase efficiency in water use.
3. Processing of vegetables to add value.
4. Team up with research institutes in the country (like the Tropical Pesticide Research Institute).
5. Implement a good baseline study to know the present situation.

7 Summary of recommendations

Under four headings the following summary of the group work was plenary presented and concluded.

1. Production
- New varieties
- Counterfeit prevention
- Credit facilities

2. Marketing
- Reduction of the post-harvest losses
- Better information on practice and demand
- Organization of the farmers

3. Consumption
- Information dissemination
- Improve recipes
- Capacity development on nutrition, gender and health

4. Enabling environment
- Lower taxes on farmers inputs
- Implementation of land mapping and title deeds
- Create awareness at local level for environmental protection
- Standardization and accreditation of products
- Strengthening independent advice to farmers

8 Closure of the meeting

The workshop was closed by Heleen Bos at 5: 25 pm by giving a word of thanks to the participants for their precious time they offered to attend the meeting. She further appreciated the valuable inputs that were made by the participants as they will enhance and enrich the work of SEVIA in their undertakings.

Acknowledgements

We thank Timothy Yaile for reporting.

Funding

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Appendix 1. Workshop Program March 18: Development of the vegetable production sector in Tanzania

Time	Subject
09.00 - 09.20	• Introduction • Aim of the meeting
09.20 - 10.00	Overview of current vegetable production and marketing in Tanzania • Comments by farmers and a researcher
10.00 - 10.30	Break
10.30 - 11.00	How to improve production and marketing to stimulate consumption? • Introduction • Statements • Preparation of reaction in group work Look at the elements related to your group • Is it an important one? • If yes, then analyse: what can or should be done about it? • Who should do this?
11.00 - 12.00	Discussion based on propositions and statements in three groups
12.00 - 12.30	Agronomy and profitability of current vegetable production • Presentation of 'African vegetables' project research results
12.30 - 13.30	Lunch
13.30 - 14.30	Presentation of group discussion results, plenary
14.30 - 15.00	Presentation of the new SEVIA program
15.00 - 15.15	Break
15.15 - 16.00	Formulation of recommendations for the development of the vegetable production and marketing chain in Tanzania
16.00	Closure
Evening	
18.00 – 21.00	Drinks and dinner

Appendix 2. Welcome and introduction

Welcome to the expert meeting of vegetable production, marketing and consumption in Tanzania

- Concluding of the African Vegetables Project (2011 - 2014)
- Introducing Seeds of Expertise for the Vegetable Industry of Africa (SEVIA, 2013 - 2019)

The aim of the meeting is

To discuss and prioritize practical interventions to develop the vegetable sector of Tanzania, taking in to account the role and position of the various stakeholders in the vegetable production and supply chain

The results at the end of the day are

Shared recommendations for action to enhance the vegetable sector of Tanzania. How can the vegetable production, supply and consumption be secured looking at a rapidly growing population in both urban and rural areas ? What are the opportunities ? What can be improved ?

Appendix 3. List of Participants

Name	Designation	Organisation	Contact
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Appendix 4. Presentation: Vegetable production and marketing in Tanzania

African vegetables

Vegetable production and marketing in Tanzania

Arusha meeting 2014-03-18

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Seed supply

Origin of seeds

The right advice

Locally tested varieties

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Transplant production

Field nurseries

Commercialisation

Simple nurseries

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Soil fertility and fertiliser use

Soil analysis

Fertiliser use

Fertiliser costs

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Pest and disease control

Advice on pest and disease control

Pesticide handling

Pesticide application

Agronomy and economy of production

Preparation

Credit

Optimum yields

Harvest planning

Harvesting, packaging and transport

Harvesting

Packaging

Transport

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Marketing

Middlemen

Consumer

Adding value

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Product safety and nutrition

Product handling

Product safety

Daily intake

Research, development and knowledge transfer

Research

Development

Knowledge transfer

Role of women

Marketing

Income, credit

Promotion

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Environmental protection

Highlands

Opening new land

Cooking fuel

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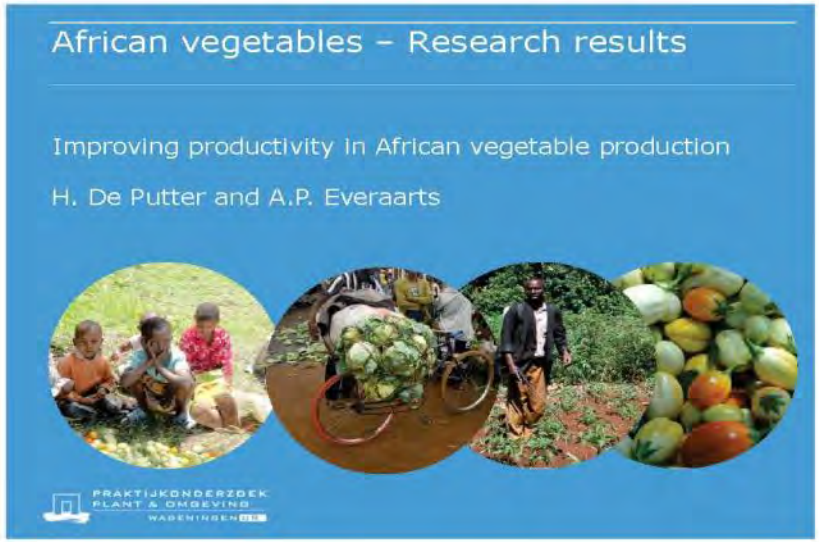
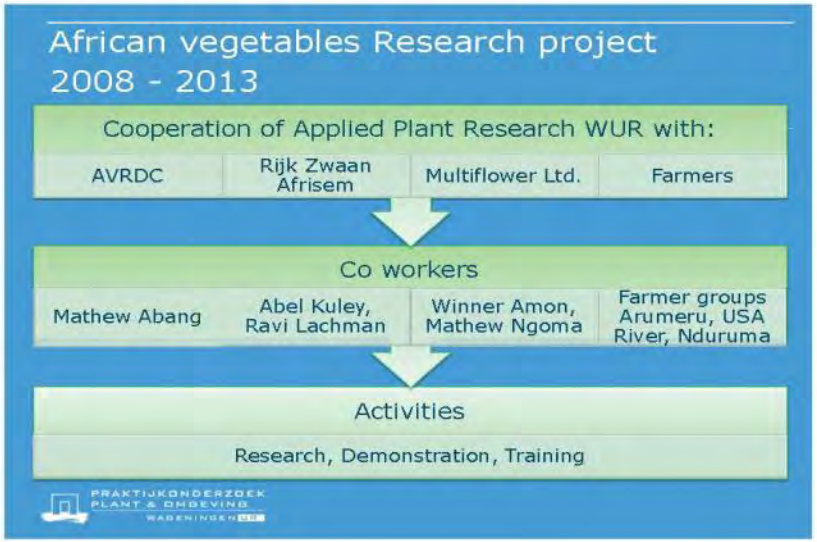
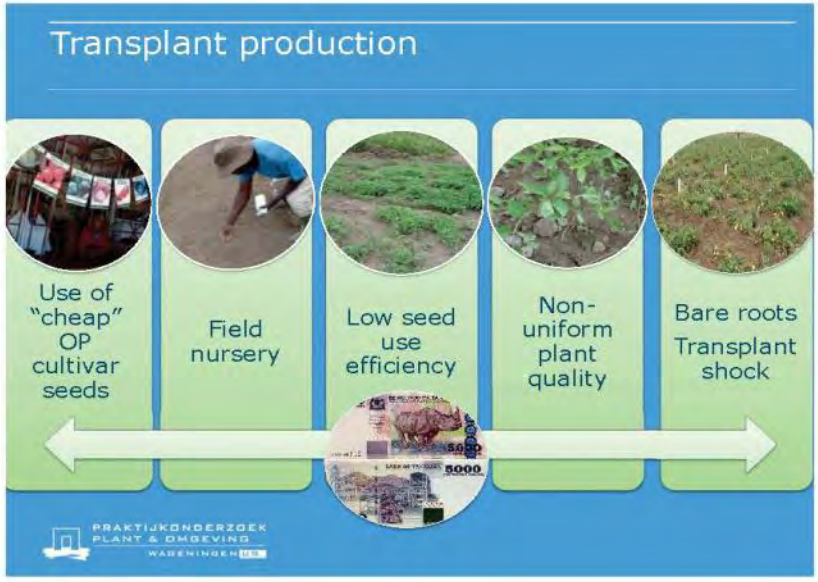
Appendix 5. African vegetables - Research results






Agronomy and Economy
How to improve production?
• Hybrid cultivars and transplant production
• Use of modern production techniques
Economics
• Analysis of costs of production and profit of vegetable crop production
PRAKTIJKONDERZOEK PLANT & OMGEVING
WAGENINGEN UR


Transplant production
Use of "cheap" OP cultivar seeds
Field nursery
Low seed use efficiency
Non-uniform plant quality
Bare roots
Transplant shock
PRAKTIJKONDERZOEK PLANT & OMGEVING
WAGENINGEN UR

Comparing of transplant production methods in two important crops

Crop	• Cabbage • Tomato
Cultivar	• Open Pollinated (OP) • Hybrid
Raising	• Farmers' practice: field nursery • Adapted Farmers' practice • Tray transplants in nursery greenhouse
Production	• Yield

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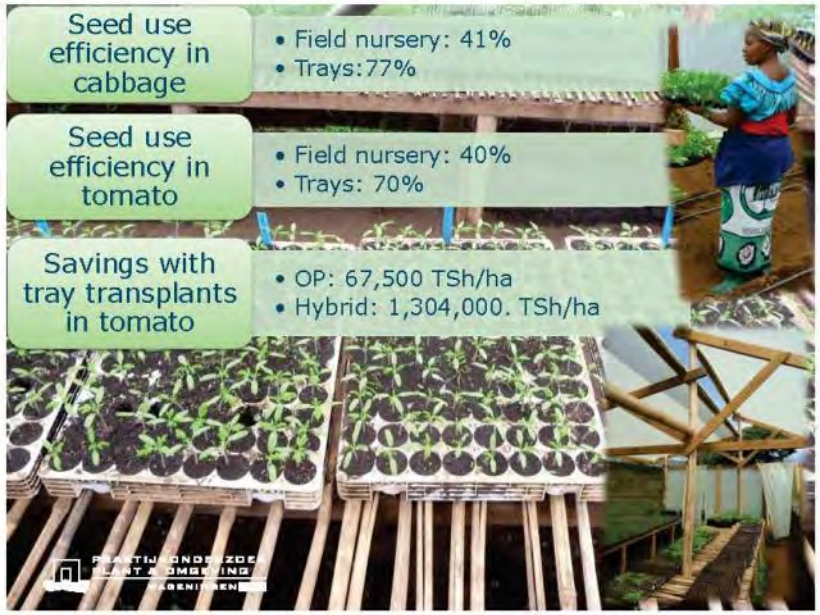
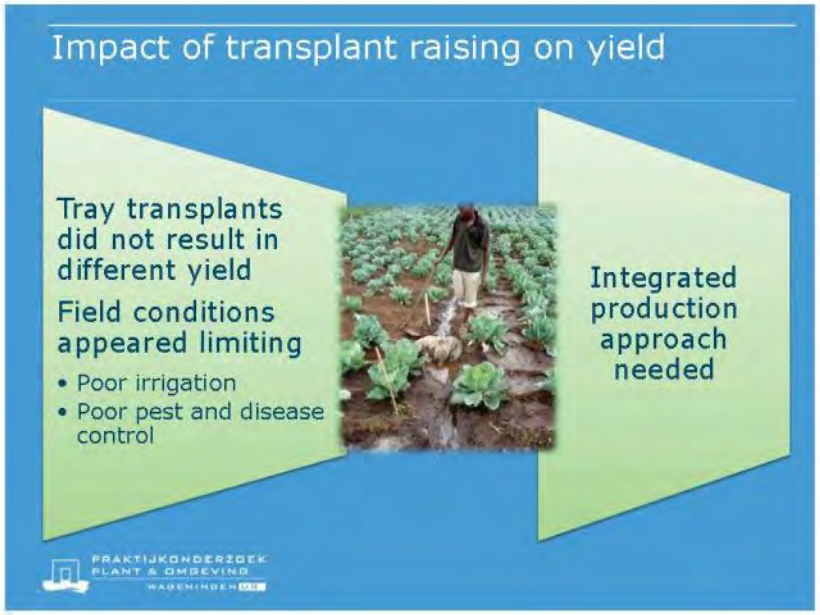
Seed use efficiency in cabbage	• Field nursery: 41% • Trays:77%
Seed use efficiency in tomato	• Field nursery: 40% • Trays: 70%
Savings with tray transplants in tomato	• OP: 67,500 TSh/ha • Hybrid: 1,304,000. TSh/ha




Impact of transplant raising on yield
Tray transplants did not result in different yield
Field conditions appeared limiting
• Poor irrigation
• Poor pest and disease control
Integrated production approach needed
PRAKTIJKONDERZOEK PLANT & OMGEVING
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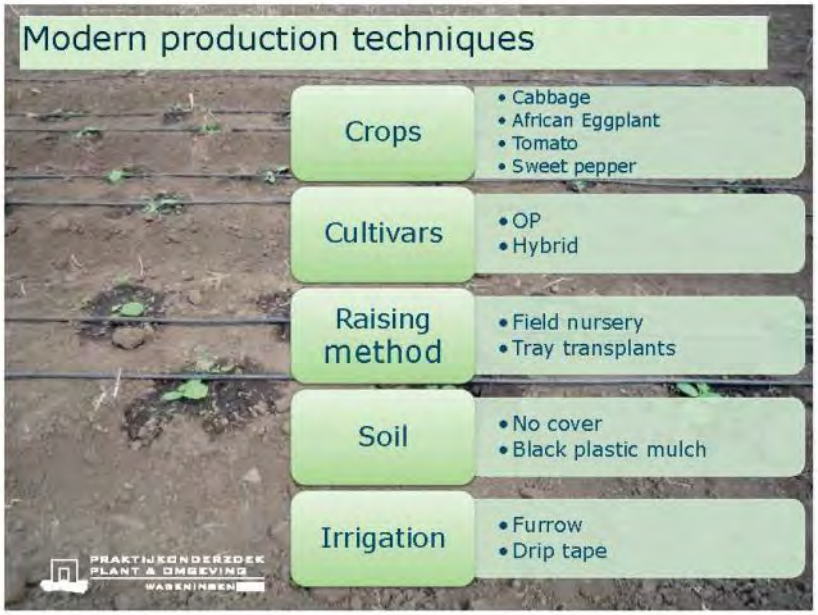
Modern production techniques
Crops
• Cabbage
• African Eggplant
• Tomato
• Sweet pepper
Cultivars
• OP
• Hybrid
Raising method
• Field nursery
• Tray transplants
Soil
• No cover
• Black plastic mulch
Irrigation
• Furrow
• Drip tape
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WAGENINGEN

Potential positive impact of production techniques on yield

Crop	Hybrid (H)	Drip Irrigation (DI)	Mulch (M)	Tray transplants (Tp)
Cabbage	38%	4%	+DI, Tp: 24%	+DI, M:14%
Afr. Eggplant	+Tp: 56%	104%	+DI: 38%	+H, DI, M: 32%
Tomato	+M, Tp: 48%	+M: 40%	+H, Tp: 19%	+H: 10%
Sweet pepper	+Tp:21%	-	-	7%

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Financial returns of vegetable crops

Calculation of:

- Profit
- Inputs
- Labour requirement

Taking records by farmers of a field with vegetables

Materials (Quantity)	Labour (Type, Hours)	Costs	Yield	Income
• Seeds • Fertilizers • Pesticides	• Own or hired • Time • Type of Activity	• Materials • Labour • Fees	• Harvest date • Kg sold	• Money received

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Use of inputs

Fertilizer

- Mostly nitrogen
- Hardly P and K
- Example Tomato: 161 N - 5 P_2O_5 - 8 K_2O kg/ha
  - Recommendation: 120/250 – 70/90 – 155/360 kg/ha

Pesticides

- Broad spectrum insecticide
- Poor control strategies

Labour

- Use of labour: 6 - 9 hr/ha/day
- Wages: 500 – 800 TSH/hr

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Average yield of vegetables

Tomato	• 12.3 t/ha • Cost price: 83 TSh/kg (2,975 TSh/crate)
Cabbage	• 26.2 t/ha • Cost price: 54 TSh/kg
Carrot	• 14.4 t/ha • Cost price: 97 TSh/kg (10,145 TSh/bag)
Sukumawiki	• 3.1 t/ha • Cost price: 313 Tsh/kg (5,900 TSh/bag)

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Crop	Total costs (TSh x 1,000/ha)	Income (TSh x 1,000/ha)	Profit (TSh x 1,000/ha	Earnings per day (TSh/day/ha)
Tomato	1,013	4,703	3,690	28,054
Cabbage	1,018	2,806	1,788	16,139
Carrot	1,116	4,071	2,954	17,102
Sukuma Wiki	642	2,243	1,601	16,228

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Current situation (an example)

- Farm with 1 acre for vegetable production
- 3 crops per year: Cabbage, Tomato and Sukumawiki
  - 320 days field period
  - 1,788,000 TSh/ha x 0.4 = 715,200 TSh/acre
  - 3,690,000 TSh/ha x 0.4 = 1,467,000 TSh/acre
  - 1,601,000 TSh/ha x 0.4 = 640,400 TSh/acre
- Annual Farm income = 2,831,600
- Daily income = 7,760 TSh/day
- Sufficient for living and investment in Modern vegetable production?

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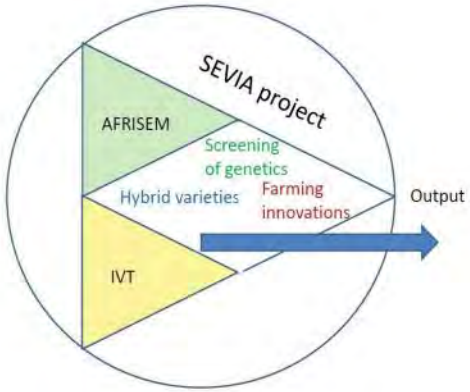
Appendix 6. Seeds of Expertise for the Vegetable Industry of Africa

Seeds of Expertise for the Vegetable Industry of Africa "SEVIA"

The purpose of the project SEVIA is to contribute to the food security strategy and vegetable industry development for Africa.

East West Seed,
Rijk Zwaan
Wageningen University and Research Center, Applied Plant Research.
Co-funded by Dutch Government
Private sector driven PPP

- The partners have an interest to develop the African vegetable sector by providing adapted varieties to the farmers and by developing and disseminating Africa adapted vegetable farming innovations and market access strategies



AFIRSEM (Breeding vegetable varieties adapted to African conditions)
IVT (Institute for Vegetable Technology Development and Innovation)

- Starting in 2014 until 2020
- Cooperation with TAHA, Soikoine University, AVRDC, Hortitengeru and others
- Location(s) yet to be decided
- Working across Tanzania
- Farmers demands are leading
- Market oriented small scale vegetable farmers
- Increasing the innovation and knowledge base of the Tanzanian vegetable farmers
- Make available tested and proven recommendations varieties and technologies

SEVIA's activities

- Breeding vegetable varieties, long term
- Screening of vegetable varieties
- Co development of farm innovations with farmers
- Practical recommendations for crop protection, spraying, crop nutrition, drainage, planning of production
- Demonstration on farmer fields

How ?

- By developing and making available accountable information and knowledge
- By engaging other organizations that are active in the farming sector
- By creating a network with sector professionals to share the knowledge with key players
- Data base, information hub on internet

Ambition

- Practical
- Demonstrations, showing, seeing is believing
- Reliable, updated information
- Small scale professionals
- Market oriented, commercial farming
- Increase productivity
- Reduce costs
- Reduce use of chemicals
- Responsible and sustainable