# HORTIN II Co Innovation Programme

## *Towards cost effective, high quality value chains*

## Sweet Pepper supply chain development
## Mission December 2009

**HORTIN-II Mission Report nr. 34**

Olga van der Valk
Witono Adiyoga
Nikardi Gunadi
Rofik Sinung Basuki
Iskandar Zulkarnain
HCC

The Hague, The Netherlands, Bandung, Indonesia, December 2009.





The purpose of the HORTIN-II programme is to contribute to the development of cost effective high quality value chains for vegetables and fruits. Among others this can be achieved when technology development takes place in close collaboration between public institutions, farmers and private companies.

On the Indonesian side the programme is carried out by the Indonesian Centre for Horticultural Research and Development **(ICHORD),** Jakarta, with the Indonesian Vegetable Research Institute **(IVEGRI)**, Lembang, and the Indonesian Centre for Agricultural Postharvest Research and Development **(ICAPRD)** in Bogor.

In the Netherlands the Agricultural Economics Research Institute **(AEI)**, Den Haag, the Agrotechnology and Food Sciences Group **(ASFG)**, Wageningen, Applied Plant Research **(APR)**, Lelystad, and WUR-Greenhouse Horticulture **(WUR-GH)**, Bleiswijk, all partners in Wageningen University and Research centre, are involved in the programme.

Addresses:

**Indonesian Centre for Horticultural Research and Development (ICHORD)**
Address : Jl. Ragunan 29A, Pasarminggu, Jakarta 12520, Indonesia
Tel. : +62 21 7890990
Fax : +62 21 7805135
E-mail : pushor@rad.net.id or pushorti@yahoo.com
Internet : www.litbanghortikultura.go.id

**Indonesian Vegetable Research Institute (IVEGRI)**
Address : Jl. Tangkuban Perahu 517, Lembang-Bandung 40391, West Java, Indonesia
Tel. : +62 22 2786 245
Fax : +62 22 2786 416
E-mail : dir_ivegri@balits.org or balitsa@balitsa.org
Internet : www.balitsa.org

**Indonesian Centre for Agricultural Postharvest Research and Development (ICAPRD)**
Address : Kampus Penelitian Pertanian, Cimanggu, Bogor 16114, West Java, Indonesia
Tel. : + 62 251 321762
Fax : + 62 251 350920
E-mail : bb_pascapanen@litbang.deptan.go.id or bb_pascapanen@yahoo.com
Internet : www.pascapanen.litbang.deptan.go.id

**Agricultural Economics Research Institute (AEI)**
Address : Alexanderveld 5, Den Haag, The Netherlands
: PO Box 29703, 2502 LS Den Haag, The Netherlands
Tel. : +31 70 335 83 30
Fax : +31 70 361 56 24
E-mail : informatie.lei@wur.nl
Internet : www.lei.wur.nl

**Agrotechnology and Food Sciences Group (ASFG)**
Address : Building 118, Bornsesteeg 59, Wageningen, The Netherlands
: PO Box 17, 6700 AA, Wageningen, The Netherlands
Tel. : +31 317 480 084
Fax : +31 317 483 011
E-mail : info.asfg@wur.nl
Internet : www.asfg.wur.nl

**Applied Plant Research (APR)**
AGV Research Unit
Address : Edelhertweg 1, Lelystad, The Netherlands
: PO Box 430, 8200 AK Lelystad, The Netherlands
Tel. : +31 320 29 11 11
Fax : +31 320 23 04 79
E-mail : infoagv.ppo@wur.nl
Internet : www.ppo.wur.nl

**WUR-Greenhouse Horticulture (WUR-GH)**
Address : Violierenweg 1, Bleiswijk, The Netherlands
: PO Box 20, 2665 ZG Bleiswijk, The Netherlands
Tel. : +31 317 48 56 06
Fax : +31 10 52 25 193
E-mail : glastuinbouw@wur.nl
Internet : www.glastuinbouw.wur.nl

The HORTIN-II programme is sponsored by the Indonesian Agency for Agricultural Research and Development of the Ministry of Agriculture, Indonesia, and by the Ministry of Agriculture, Nature and Food Quality of the Netherlands (under project nr. BO-10-006-031.02).

# Programme Team

| | Indonesia | The Netherlands |
|---|---|---|
| Programme management | Dr. Yusdar Hilman, Director ICHORD<br>Telephone +62 21 7890990<br>Fax +62 21 7805135<br>E-mail: YHILMAN@INDO.NET.ID | Dr. Arij Everaarts, APR, General management<br>Telephone +31 320 291 671<br>Fax +31 320 230 479<br>E-mail: ARIJ.EVERAARTS@WUR.NL<br><br>Mrs. Myrtille Danse, AEI, Supply Chain Management |
| Sweet pepper pilot project | Dr. Nikardi Gunadi, IVEGRI<br>Telephone +62 22 2786 245<br>Fax +62 22 2786 416<br>E-mail: NGUNADI@BDG.CENTRIN.NET.ID | Mrs. Marieke van der Staaij, Ruud Maaswinkel, WUR-Greenhouse Horticulture<br>Telephone +31 317 485 537<br>Fax +31 105 225 193<br>E-mail: MARIEKE.VANDERSTAAIJ@WUR.NL<br>RUUD.MAASWINKEL@WUR.NL |
| Shallot pilot project | Dr. Rofik Sinung Basuki, IVEGRI<br>Telephone +62 22 2786 245<br>Fax +62 22 2786 416<br>E-mail: ROFIK@HOTMAIL.COM | Lubbert van den Brink, APR<br>Telephone +31 320 291 353<br>Fax +31 320 230 479<br>E-mail: LUBBERT.VANDENBRINK@WUR.NL |
| Hot pepper pilot project | Dr. Witono Adiyoga, IVEGRI<br>Telephone +62 22 2786 245<br>Fax +62 22 2786 416<br>E-mail: VICIANTI@YAHOO.CO.ID | Herman de Putter, APR<br>Telephone +31 320 291 614<br>Fax:+31 320 230 479<br>E-mail: HERMAN.DEPUTTER@WUR.NL |
| Supply chain management | Dr. Witono Adiyoga, Dr. Nikardi Gunadi, Dr. Rofik Sinung Basuki, IVEGRI | Mrs. Myrtille Danse, Mrs. Rolien Wiersinga, Mrs. Olga van der Valk, AEI<br>Telephone +31 70 3358 341<br>Fax +31 70 3615 624<br>E-mail: MYRTILLE.DANSE@WUR.NL<br>ROLIEN.WIERSINGA@WUR.NL<br>OLGA.VANDERVALK@WUR.NL |
| Quantitative Economic Analysis | Dr. Witono Adiyoga, IVEGRI | Marcel van der Voort, APR<br>Telephone +31 320 291 312<br>Fax +31 320 230 479<br>E-mail: MARCEL.VANDERVOORT@WUR.NL |
| Fruit supply chains | Dr. Sri Yuliani, ICAPRD<br>Telephone +62 251 321762<br>Fax +62 251 350920<br>E-mail: S.YULIANI@GMAIL.COM | Dr. Jeroen Knol, ASFG<br>Telephone +31 317 480177<br>Fax +31 317 483011<br>E-mail: JEROEN.KNOL@WUR.NL |

**CONTENTS**

## Executive summary

Good Agricultural Practices (GAP) and Standard Operational Procedures (SOP) were the focus of the December mission.
In the first meeting with IVEGRI on Friday 11 December, a short presentation was given on the significance of Good Agricultural Practices / SOP and how these might be linked to the pilot supply chain project in sweet pepper.
As the request by IVEGRI was to have more knowledge on the monitoring of the pilot project, the discussion centered on the causal relations between the main outcomes sought for (continuity and increase of yield in volume and quality) and the planned interventions (setting up a new greenhouse and compliance with SOP).
An overview was made to get to control groups in stead of a baseline survey. The SOP were revised for ranking according to their monitoring value for market partners in the pilot project.

On Monday a workshop was given to the Horti Chain Center on GLOBALGAP, in view of their request to know about how to conduct pre-audits. There is one particular customer (exporter mangosteen) asking for these services. As the GLOBALGAP documentation available on the internet is very complete in this respect; in stead of working out a methodology with checklist, the objective for the workshop was to have the HCC familiarize with the different categories of GLOBALGAP documentation; different certification options and different categories of inspections. Through exercises we studied the different GLOBALGAP regulations and checklists. Good discussions took place on the differences and similarities of certification options and on the function of a quality management system (QMS). Manuals on how to establish such a system in a farmers' group in a participatory way were left with HCC. Criteria for the need for registration (documentation) were given as well as an example of a flow chart with required documentation (KenyaGAP for smallholders). Good discussions followed on the different kinds of motivations for changing at individual level; and two approaches to communication.
Conclusion of the day was that HCC resolved to internally make an analysis of relevant regulations and checklists to come up with a list of documentation; to be used as a guideline for a first check with exporters' documentation.

For Tuesday December 15; Olga chose not to limit contents of the meeting to a workshop set-up, but to make use of the fact that the Hortin / HCC team was together for making an overview of contributions by each; outputs (documents) so far; and planning of outputs (documents) for 2010. As requested by IVEGRI, an overview was given of general methodologies for monitoring and evaluation, or rather, the difference between systems of monitoring and evaluation were given. The internal management system as part of the business / work plan serves to monitor individual strategic functioning of a business of institute. The supply chain plan with agreements among market partners serves to monitor progress and compliance with agreements among market partners and whether desired targets are met. The information for monitoring the supply chain plan can come out of information management systems, if not contrary to confidentiality requirements. The research plan might require collection of additional information by means of surveys or interviews (an example is the supply chain analysis report).
Main conclusions of the day were:

- To monitor; it is necessary to involve the market actors to know their objectives for the supply chain project and to agree together on distribution of activities; responsibilities and key performance indicators.
- that HCC on the basis of earlier contributions by Marco Verloop (LEI) has elaborated a logframe for systemizing monitoring. This logframe is the basis to reach agreements with / among market partners and can be used in the sweet pepper pilot project
- researchers will want to collect as much information as possible, private market partners only the minimal required for effective decision making with least costs.
- that within supply chain projects there can be a difference between monitoring for the public good (research objectives) and for private benefits (the gain participating market actors are purchasing with the project). HCC as business provider mainly focuses on the first. Hortin, for policy considerations would be expected to also make recommendations on the conditions for scaling up of the pilot project.

Agreements:

- Target is to have a complete pilot project by the end of 2010
- No dissemination for 2010 in the sense of up-scaling among other farmers

- For the seminar (Oct. 2010); a final report with lesson learned and policy recommendations will be available;
- Other deliverables include the supply chain analysis report (according to guideline given by Rolien); feasibility report on technological innovations made; detailed description of the pilot project.

On Wednesday, in Lembang all stakeholders and market actors of the sweet pepper pilot project were present. Each (farmers, exporter, Rabobank, IVEGRI) gave their view on their objectives for the pilot project; these were made SMART; and agreements were made on how to monitor and by whom. Further filling in of the logframe will be done in a second meeting / workshop. Some of the conclusions of the meeting:

- Target of the pilot project is an increase of 25% in yield (volume);
- Farmers expressed to want a stable price;
- Exporter is interested in knowing production costs; and will pay participating farmers a stable margin of 30% on top of production costs
- IVEGRI will provide a simplified format of the developed SOP; which will be filled in by the farmers and collected / analyzed once a month by IVEGRI.

Major feat of the meeting was that market actors expressed their intentions towards each other directly instead of through written agreements. These interactions stimulate mutual trust and joint learning.

One major issue that was raised by both IVEGRI and HCC was related to commitment of partners and how to create incentives. In the case of IVEGRI this came up when discussing recording SOP by farmers; HCC mentioned it because of difficulties in collecting all information required for monitoring from market partners in the supply chain projects. Besides analyzing the effectiveness and use of information to be gathered, the methodology followed for this mission showed that (periodic) meetings for exchanging information and experiences among stakeholders contributes to mutual learning by tapping into existing knowledge and experience coming out of ongoing operations. This can be supported by direct interaction and communication which tend to create more commitment to a project strengthening the written agreements.

A more systematic learning can be set up in the sweet pepper project by giving stakeholders opportunities to apply new knowledge and information to their own benefit in their own daily practices. As HCC remarked, incentives are provided when stakeholders are shown how certain information can lead to identifying market opportunities or how it supports making current business practices more efficient.

In the sweet pepper project, joint learning can be stimulated vertically (i.e. by inviting stakeholders and interested farmers to participate in monthly analysis of information and discussion) or horizontally (i.e. “farmer field schools” based on analysis of SOP documentation).

# 1. Meeting on SOP with IVEGRI, December 11

## 1.1. Objectives for the meeting:

- Explain about the relation between Standard Operational Procedures; food safety and the (need for) information trail in a supply chain (presentation prepared by Olga)
- To know how to make farmers implement SOP: farmers register for about a month, then stop doing it (question coming from IVEGRI).
- Methodologies for monitoring, of which SOP is only one aspect. How to measure the impact of what we have done so far (question coming from IVEGRI).

**Participants**:
Dr. Witono Adiyoga; Dr. Nikardi Gunadi; Dr. Rofik Sinung Basuki; Iskandar Zulkarmain; Olga van der Valk

## 1.2. SOP and food safety (recording)

After the presentation (see Annex II) Olga explained about the difference between private sector interests and public (governmental; research) sector interest in food safety (recording) by giving the Thai example. In Thailand market access and integration is main incentive for recording Good Agricultural Practice (GAP). A similar conclusion was drawn for the Indonesian case: SOP is already implemented by farmers (so food safety has improved), but it requires additional incentives for the farmer to record the implemented procedures.
IVEGRI explained the situation in Indonesia, where Training of Trainers has been given on crop specific SOPs. These are not yet integrated into a Food Safety Program by the government.
It is mainly the supermarkets that require the SOP, but they are not so strict.

Olga linked Standard Operational Procedures to the supply chain project by making an overview of the different documents required by SOP and indicated:

- whether they could be used for monitoring by other market partners of the agreements made. This way the recording is linked to the incentives provided by the common objectives and expected results of the project (Proving other participants in the project how you are holding up your side of the agreements). In this case, it is assumed that the supply chain project has been formulated in such a way that it will bring benefits to all parties participating.
- the importance of the monitoring criteria to the objectives of supply chain project.
- the frequency of monitoring (depending on frequency of activity in SOP)

Two main overall objectives of the pilot project were taken into account: food safety and yield (quantity and quality). See Table 1.
It was also assumed that for other market partners (in this case, the exporter has a direct stake in how the farmer produces) the characteristics of the product (no exceedance of MRLs; higher volume of export quality) are more important than the monitoring the effectiveness of implemented procedures themselves, which implicates that for supply chain purposes not each SOP to be recorded will be relevant in monitoring (see highlights in table). Ranking can be specified by looking at the importance of each supply chain objective according to market partners.

Table 1: SOP in view of monitoring interventions in the sweet pepper pilot project

| No SOP and frequency of updating* | | Risk addressed by form: | Activity | Description procedures | Impact on product | |
|---|---|---|---|---|---|---|
| | | | | | food safety | yield |
| Spor | 1 | bacteria, nematodes, fungi, pests | Seed | Sterilization nursery + tools<br>Acreage | no | yes |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Product and procedure | | |
| Spor | 2 | bacteria, nematodes, fungi, pests | Greenhouse | materials used<br>fumigation / sterilization | no | yes |
| Spor | 3 | bacteria, nematodes, fungi, pests | transplanting preparation | | no | yes |
| Spor | 4 | fall-outs | planting | | no | yes |
| Reg. | 5 | | Fertigation | stock solution<br>mixing dosages<br>watering frequency | no | yes |
| Reg | 6 | Bacteria, pests (?) | Pruning + plant management | | no | yes |
| Reg | 7 | fall-outs, residue | Pest and diseases management | registration: sampling | no | no |
| | | | | Pesticides application | yes | yes |
| Reg | 8 | | Pest registration | mechanical (using traps) | no | yes |
| Reg | 9 | bacteria, residue, pests | Harvest & post-harvest | | yes | yes |

Discussion afterwards brought the following conclusions:

- the SOP have not yet been tested in practice on their efficiency to improve food safety and/or yield in quantity and quality,
- people have started to implement SOP but stopped recording after a month
- because of the many training it is assumed by IVEGRI that farmers know how to implement SOP
- IVEGRI wants to know why people are or are not implementing SOP
- Emerald in the pilot project can provide the pull (farmers' incentive) for SOP implementation. Sanctions in case of non-compliance are difficult as only two farmers participate in the pilot.

## 1.3. First design of monitoring system

To look at incentives that each intervention in the supply chain might bring, an table (not filled in afterwards) was made to look at benefits and costs of each intervention for the different market actors, which might possibly shed light on their motivation (incentive) to participate in the pilot project and results / key performance indicators they want information on (recording and monitoring incentives). The table was not filled in.
From the work plan, a total of six interventions were distinguished:
Building new plastic houses

1. Irrigation system
2. Implementing SOP
3. Improving chain governance through contracts
4. Short and practical trainings
5. Monitoring and evaluation
6. Credit
    a. greenhouse
    b. input supply

Of these the first two were deemed most important, giving a variation of 4 farming systems for potential comparison on yield and quality / food safety improvement:

| | Standard Operational Procedures (SOP) | | New technology (greenhouse / irrigation) | |
|---|---|---|---|---|
| | Without | With | Without | With |
| Farming system 1 | X | | X | |
| Farming system 2 | | X | | X |
| Farming system 3 | | X | X | |
| Farming system 4 | X | | | X |

Conclusion on choosing farming systems to set up control groups in monitoring:

- Of the four systems, number 4 was deemed not to exist (no new technology with irrigation without implementation of SOP).
- Farming system 1 is difficult to monitor, if no SOP registration exists.
- Monitoring yield will have priority in the project, i.e. a comparison between farming systems 2 and 3. The control group for the new technology will consist of the same farmers but registering key indicators for a plot with old infrastructure.

Remarks / assumptions:

- Three elements of monitoring:
  - description of what is done (innovations; activities)
  - measure whether it was done (progress; compliance with agreements)
  - measure how it was done (quality, results, cost-benefit)
- When is the pilot project a success? When yields increase; when profit is made by farmer; more transparency on chain by market information provision; traceability system in place?
- Emerald can provide an incentive by offering a higher price; farmers in return want more transparency. This was worked out for a monitoring scheme following the problem tree.
- Benchmark for increase in yield is 25% on demonstration plot at IVEGRI research station.
- What to do in case of non-compliance? For example only 80% of recording is done? => Definition of policies in case of problems (i.e. sanctions); installation of complaint procedures and a complaints / monitoring committee. IVEGRI can be the third party participating in such committee.
- SOP implementation is assumed to be taking place, as all farmers have received training; only recording does not take place.
- Changes in MRL incidence cannot be measured, as group of 2 farmers is too small
- Traceability cannot be implemented as group of 2 farmers is too small to experiment with system
- Organized collection is not part of the pilot project; the produce does not pass through the coop.
- If SOP is simplified, Emerald needs to know the consequences
- IVEGRI aims at forming a new marketing group with the 2 participating farmers; of the current coop (Cisarua) it is difficult to change the system.
- Currently Emerald is doing monitoring of field practices; IVEGRI wants to approach the company more to know whether it has complaints on SOP.

During the meeting a first set-up for a monitoring system was made, based on the problem tree. See Annex IV.

As these farming systems only monitor changes in yield because of new technology, IVEGRI commented that the pilot should be able to give an answer to the question whether non-compliance of farmers supplying to the exporter is solved by the technological innovation, or whether other factors, like commitment, play a role? With commitment being considered as opposite to defaulting on deliveries; it was decided to measure it by registering local prices, as there is a direct relation between non-compliance in (unwritten) contracts and high local prices (more default on volume occurs).

# 2. Training on GLOBALGAP certification systems, Dec 14

## 2.1. Objectives of meeting

- To know the difference between option 1 and 2 for working with groups; and what is needed in both accounts
- Registration and management requirements in GLOBALGAP
- Introduction to the Quality Management System (QMS) in GLOBALGAP

## Participants:

M. Hariyadi Setiawan (HCC); Iskandar Zulkarnain (HCC); Rara Dewayanti (HCC); Ario Sudiro (HCC)

## 2.2. Introduction

The GLOBALGAP presentation; as guideline for the day, consisted of three main blocks on Food Safety; GLOBALGAP and Interventions. For details see Annex III.

I. Modes of monitoring food safety systems
   a. Inspection & certification of best practices: 1) monitoring by sampling product and resources; 2) monitoring by reviewing documentation on GAP and product flow and 3) monitoring the inspection system (QMS)

II. What is GLOBALGAP
   b. Certification options
   c. Inspection and auditing procedures

III. Strategies of intervention
   d. Motivation
   e. Communication

## 2.3. Discussion on GLOBALGAP and actions to be taken by HCC

Minutes of the training were elaborated by Mrs. Rara Dewayanti; including main discussions, findings and action points. See table below

| TOPIC | CONSTRAINS AND PROBLEMS TO BE DISCUSSED | PLAN FOR ACTIONS TO BE TAKEN | PIC | TIME OF EXECUTION |
|---|---|---|---|---|
| 1. Food Safety | 1. Fresh product regulation requirement<br>2. Processed product regulation requirement | 1. Global G.A.P application for fresh product<br>2. HACCP application for processed product<br>3. Other regulation required by specific country destination | HCC | Onwards |
| 2. Global G.A.P applied-options | 1. Option 1 detail condition<br>2. Option 2 detail condition | 1. Draft of each option possibility details<br>2. Meeting/ discussion with exporter & producer<br>3. Meeting/ disscussion with Certifier Body (CB) | HCC AMS SAE KBUI CU | Onwards |
| 3. Global G.A.P Flow | 1. Unavailable Indonesian (language) document | 1. Will offer service to translate the document to HCC client | HCC | Based on client request |

| | | | | |
|---|---|---|---|---|
| 4. Global G.A.P Training | 1. Unavailable Global G.A.P training | 1. Will offer training to relevant HCC client | HCC | Onwards |

| | | | | |
|---|---|---|---|---|
| 5. Global G.A.P general process | 1. Option 1 (Individual Farmer)<br>2. Option 2 (Group) | 1. Option 1:<br>a. Self assessment<br>b. Internal inspection<br>c. Unannounced surveillance inspection<br>2. Option 2:<br>1a. Internal audit of QMS<br>1b. Internal producer inspection<br>2a. External audit of QMS<br>2b. External producer inspection<br>3a. External inspection<br>3b. Unannounced surveillance inspection | HCC<br>AMS<br>KBUI<br>SAE | |

# 3. Meeting for establishing monitoring system, Dec 15

## 3.1. Objectives of meeting

- Overview sweet pepper pilot and explanation of past and future activities by Hortin team and stakeholders
- Revision current SW pilot project documents plus other relevant information (HCC) and definition of deliverables for 2010
- Monitoring system: update from HCC on training by Marco Verloop (LEI)
- Monitoring system for sweet pepper pilot
- Distribution of tasks and timetable

## Participants:

Dr. Witono Adiyoga; Dr. Nikardi Gunadi; Dr. Rofik Sinung Basuki; M. Hariyadi Setiawan (HCC); Iskandar Zulkarnain (HCC); Rara Dewayanti (HCC); Ario Sudiro (HCC); Olga van der Valk

## 3.2. Overview of sweet pepper pilot

(with thanks to Ario)

Preview of Sweet pepper start Feb 2009 by Iskandar

2008

- Individual talks with
  - Amazing Farm
  - Emerald
  - Ranchmarket / Matahari
- Workshop → How to do Supply Chain Analysis

2009

- Pre workshop in Apr 2009
- Workshop in Apr 2009
- Meeting with potential partners :
  - Emerald → Inviting other farmers : Deden
  - Rabobank → Assessment & Feasibility
  - Farmers → 10 Farmers interested from Cisarua Bandung

Lessons learned :

- Guidelines → How to do interviews
- Rolien → Exporters / Supermarkets
- Supermarket difficulties to find bottlenecks

HCC sweet pepper contributions:

Not yet involved but INA through HPSP → Use pesticides
Trials of IPM / Biolog. Predators
Trials of greenhouses

Hortin actively gives intensive support

Target : Link HCC + Sweet Pepper + Hortin

HCC sees business in sweet pepper as well, has been approached by two producers. Up scaling sweet pepper production is possible.
Difference between HCC and Hortin is that HCC is not research driven, there is more emphasis on business cases. Though HCC also has ambitions to link research to business demand.

Further collaboration between HCC and Hortin in the future will be fruitful: HCC also has its pilots to monitor; has to do facilitation of technology introduction and monitor its impact.

Now there is only one exporter involved in the pilot project, but others might want to follow the example.
There are also opportunities for developing wet markets / wholesale markets.

The four pilots were not defined according to product; but according to demand. Supermarkets have a good level of organization and management of people; but have difficulties in improving business with producers. There are 31 different types of vegetables, so management of supply chains is challenge.

**IVEGRI**
The approach for the pilot project was done with limitations; and truly started in January this year. In the beginning not quite focused. When it was clear that supermarkets were not feasible for sweet pepper, the export pilot project was set up. It was meant to be used as example for the shallot export chain, but due to budget considerations the pilot in shallot has been cancelled. We now only have 2010 to finish the sweet pepper project.

## 3.3. Overview current project documentation

Overview of existing documents referring to the sweet pepper pilot project:

| | | |
|---|---|---|
| Mission Reports | | |
| No. 9 | Dec 2007 | Opportunities for value chain development projects |
| No.10 | Feb 2008 | Analysis Market parties |
| No. 11 | May 2008 | Description of retailers (visit) |
| No. 18 | Aug 2008 | Horizontal integration and marketing strategies smallholder's Cooperatives |
| | Apr 2009 | Workshop Kick Off sweet pepper pilot |

Not all reports resulted to be available to all people present, so soft copies were distributed by Olga

| | | |
|---|---|---|
| Proposals | | |
| Proposals for 2009 – 2010 | Aug 2009 | Sweet pepper and shallot export chain development |
| Activities update | Sep 2009 | Activities realized |
| Train the Chain | Nov 2009 | Activities 2010 |

| | | |
|---|---|---|
| Presentations | | |
| Poster for policy workshop | Nov 2009 | Sweet pepper / shallot / hot pepper |
| Powerpoint Training | Apr 2009 | Supply Chain Analysis (by Rolien) |
| | | Description of Sweet pepper Supply Chain (by IZ) |
| | Aug 2009 | Business Administration Development |
| HCC docs | Oct 2009 | Impact Assessment + General Info Survey |

| | |
|---|---|
| Periodical Publication | |
| Quarterly Magazines | May 2009 |
| Quarterly Hortin Prog Report | |

## 3.4. Deliverables

Target is to have a complete pilot project by the end of 2010

- No dissemination for 2010 in the sense of up-scaling among other farmers learned (Hortin Transfer Technology), for technical work, demo plots / workshop with farmers.
- Seminar

- Final report with lessons

Deliverables for 2010 with time table:

1. Supply Chain Analysis Report (WA deadline @ Feb 2010)
2. Feasibility Study (Ni deadline @ Feb 2010)
3. Description of Pilot Projects (IZ deadline @ Feb 2010)
   a. Current Project with Farmers
   b. Profilers of Market Chain Actors
   c. Selection Process
   d. Objectives of each actor → Core / Main Objectives
   e. Terms and conditions set by each market chain actors and supporting actors
4. Policy Recommend / Final Report (WA deadline @ Oct 2010)

## 3.5. Monitoring methodologies

Olga gave presentation on different categories of monitoring according to the level of the plan and proposed activities (business plan defining strategic development by each stakeholder / supply chain plan for common goals by stakeholders / research plan to learn from previous two for public good / policy recommendations. Some of the conclusions of the Friday meeting were included. See Annex V for details.

Olga asked HCC what their experiences are with the monitoring system developed by Marco Verloop. Prior to the mission she and Marco had a coordination meeting to discuss the different categories of monitoring and how information management by a business provider as HCC needs to be grounded in a database, while information is also needed to reflect on the role by HCC as facilitator. Both (knowledge broker; network facilitator) are needed to develop long term strategy for HCC.
HCC does not necessarily has to ask the "why" question, though in projects it is its strength to be above the parties and provide new insights contributing to the success of projects.

A good discussion followed on the difficulties to collect information as experienced by HCC.
The methodology is clear: to have a baseline assessment at the beginning and an impact assessment at the end. It is not easy to explain farmers that they have to fill in the questionnaire. There are two sets of data: on the characteristics of groups and farmers; and on the project itself, like productivity and transactions.
Each time HCC needs to explain how people can benefit from the information.

## 3.6. Research objectives and supply chain objectives

Difference between a pilot project and a business supply chain project is that we want to learn something from it. Objectives for learning can be different: how to develop new domestic markets with added value (either with or without participation of small scale farmers); how to address bottlenecks of farmers' horizontal integration, how to create a more evenly profit distribution along the chain etc.

Research objectives concern assumptions and hypotheses about relations between elements of production and market, for example:

- If yield per ha increases, farmers marketing behavior will change
- If a cooperative changes its bookkeeping system, this will improve variation in supply to coop by members and farmers' commitment
- If the local marketing system changes, prices will fluctuate less, which will increase farmers' loyalty to the group
- etc.

Research objectives are of a more abstract level than the supply chain plan objectives, which may have a more practical and less explanatory character. Nevertheless, it can be possible to link both objectives, by looking at impact of supply chain objectives on the different market actor behavior. One of the ways to link the supply chain project with research and policy objectives is by considering the up-scaling of the pilot project. Reviewing what

will contribute to the success of up-scaling, and by anticipating bottlenecks; will give clarity whether the supply chain project as agreed upon among market actors is addressing the right bottlenecks for supply chain improvement of development of horticulture. If not, the supply chain project cannot really be considered a pilot.

Nevertheless, research can be made more demand driven by attuning to private sector objectives. Research can also support and direct private sector initiatives by providing relevant information on the agricultural sector; market potentials (results of supply chain reports) and information on market parties (function of matchmaking) .

Monitoring: the researcher will always want to know every detail, the industry will want to make decisions with only the minimal necessary information, as gathering it costs money.
The challenge is to find a balance between the two. It also gives indications on the monitoring system itself: what information is useful to the market partners to include in their own internal information management system (or maybe is already there) and what information needs to be collected by surveys / interviews by researchers. Sometimes market partners need to be shown how the collection of data can be of use to them. For example by showing how the data to be collected for monitoring can be integrated into an internal learning system. (farmers exchanging results on key performance indicators to learn from each other, not only in order to satisfy the need for control by a third party).

For research in a pilot project and analyzing the potential of up-scaling, it is important to have a clear description of all the details and conditions of the supply chain project itself (selection criteria, perform) as well as a detailed description of the specific participants' profile (of important market actors, a profile will already have been provided in the supply chain report; for individual farmers this is less likely).

- conditions of access to land, and possibilities to invest
- current trade relations and conditions of trade (volumes to which buyer)

The difference between a research project and a supply chain project was further discussed between IVEGRI and HCC, with additional explanations by Olga.
The meeting ended with a presentation of the logframe that is managed by HCC to monitor its projects, which can be used in the pilot project. It was important to note that the whole logframe, including the objectives, is result of workshops and discussions with the market partners participating in the project.

| Objective | Activities | Responsible | Key indicator | Timeframe / freq of monitoring |
|---|---|---|---|---|
| | | | | |

# 4. Sweet pepper stakeholders' meeting Dec 17

## 4.1. Objectives of meeting

- Have market partners in sweet pepper pilot formulate SMART objectives
- Have market partners mutually confirm agreements and commitments made.
- Discuss key performance indicators and how to monitor these.

## Participants:

Dr. Witono Adiyoga; Dr. Nikardi Gunadi; Dr. Rofik Sinung Basuki; Mr. Komar (Emerald); Farmers of Dewa Family and Eman; Mrs. Kwik Sri Kinarsih (Rabobank); Iskandar Zulkarnain (HCC); Olga van der Valk

## 4.1. Meeting's results

- Target of the pilot project is an increase of 25% in yield (volume);
- Farmers expressed to want a stable price;
- Exporter is interested in knowing production costs; and will pay participating farmers a stable margin of 30% on top of production costs
- IVEGRI will provide a simplified format of the developed SOP; which will be filled in by the farmers and collected / analyzed once a month by IVEGRI.

It was clear that the thorough preparations of the pilot project and existence of MoUs facilitated the success of the meeting; and enabled open communication without any tensions.

# 4. Conclusions

It is  important to create learning platforms within and around the sweet pepper pilot project between stakeholders in the sweet pepper pilot project. This can be done both horizontally (IVEGRI) among farmers with the SOP registration as basis for analysis and comparison; as well as vertically (Iskandar) among pilot project stakeholders, for example by joint periodical analysis of pilot project results.

Direct interaction is important for creating mutual trust and commitment to the objectives of the pilot project.

It is recommended that IVEGRI formulates some research questions as a guideline to describe the lessons learned for policy makers (seminar 2010). The suggestion is to look at potential for up-scaling and how bottlenecks are (are not) addressed. Upscaling will need to include traceability and management systems.

Agreements made within the pilot project between exporter and participating farmers on selling price and margins are not necessarily binding for other farmers or after the pilot project has ended.

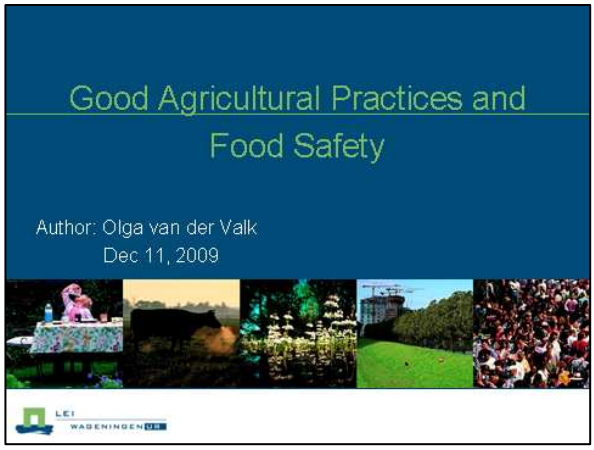
Support by the Dutch Hortin team member (Olga) was different than expected by Indonesian counterpart; as it concentrated less on providing checklists (GLOBALGAP pre-audits / monitoring system for sweet pepper) and more on learning by doing and understanding the underlying reasons; but proved to be generally effective.

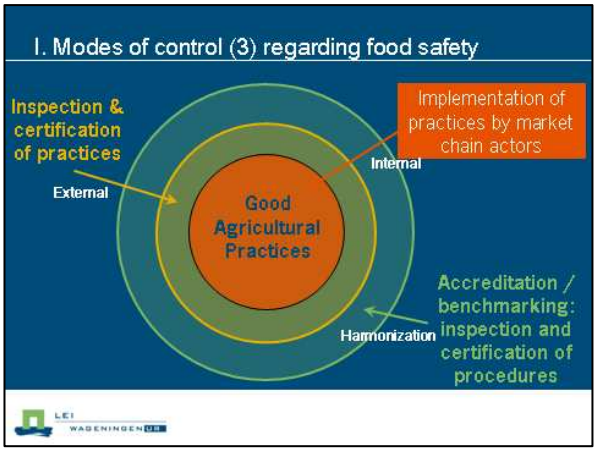
## Annex I. Mission itinerary.

Itinerary

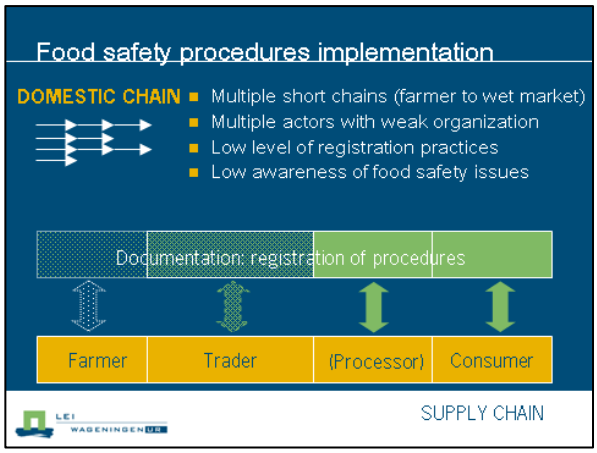
| Day/date/time | Activities plan | Remark |
|---|---|---|
| Thursday, Dec 10<br>06:10 pm<br>00:00 hrs | <br>Arrival Olga at airport KL 809<br>Transport Olga to Htl SanGria Lembang | <br>By. Cipaganti Tour and Travel |
| Friday, Dec. 11<br>09:00-11:30<br><br>13:00-17:00 | Meeting to discus:<br>• Use of SOP in view of the progress on sweet pepper pilot (by team)<br>• Revision of SOP guidelines in view of organizational and administrative requirements in GLOBALGAP. | Participants:<br>Olga, IZ, NG, WA, RSB<br>Venue: IVEGRI |
| Saturday, Dec. 12<br>09:00-12:00 | • Final preparations for workshops Monday and Tuesday | Olga |
| **Sunday, Dec. 13** | | |
| Monday, Dec. 14 | • *( WA, NG, RSB, TM and LP are not available due to general medical check up of all IVGRI staff and researchers)*<br>Training of Trainers GlobalGAP<br>• Introduction to GLOBALGAP<br>• Management requirements for implementing GLOBALGAP<br>• Registration requirements for implementing GLOBALGAP<br>• Introduction to Small holders Quality Management System (QMS) training manual as developed by GLOBALGAP<br>• Introduction of pre-audit GlobalGAP certification for Producer Organization (Option 2 GlobalGAP certification scheme) | Participants<br>HCC (MHS, RD, AS, )<br>HORTIN (IZ, OV)<br><br>Venue: INAH, Jakarta |
| Tuesday, Dec. 15 | • Update on outputs so far in sweet pepper pilot and contributions by team members and HCC<br>• Agreements on deliverables for 2010<br>• Adaptation of procedures and formats to the sweet pepper project and SOP for monitoring purposes | |
| Wednesday, Dec 16 | • Transportation Jakarta to Bandung (Olga) | |
| Thursday, Dec. 17<br>9:00 – 12:00h<br><br><br>19:25 hrs | • Formulation and confirmation of SMART supply chain plan by market partners<br>• Agreements on monitoring of sweet pepper pilot project<br><br>Departure Olga KL-810 | WA, NG, RSB, IZ, Olga Farmers of Dewa Family and Eman + Emerald (Mr. Komar); Rabobank (Mrs. Kwik Sri Kinarsih)<br>Venue: Dewa Facilities, Lembang |

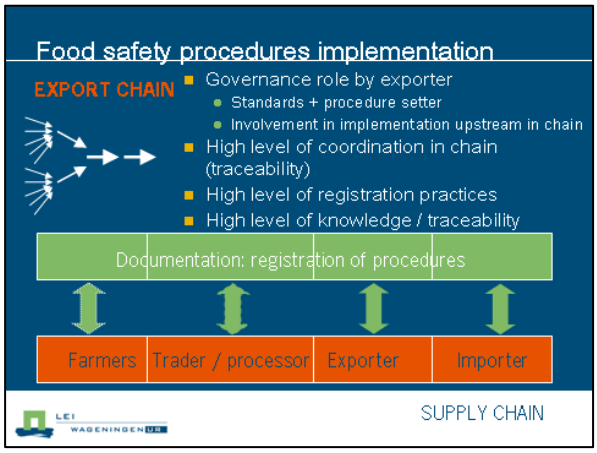
## Annex II. Presentation December 11 on GAP (SOP) and Food Safety

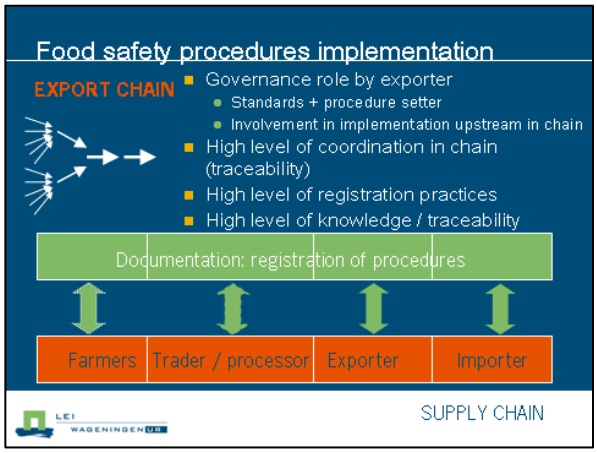






## Information needed by farmer

- Financial (payments, margins, investments)
- Administrative
  - Product flow: quantity, quality
  - Portfolio customers
  - Titles on investments / assets
- Shared risks and ownership: policies
- Field practices

Business plan

## Information needed by exporter?

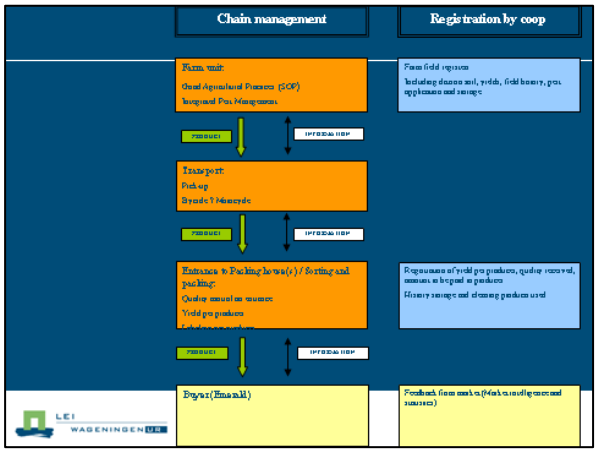
- At field level
- On product flow (traceability)
- Checks and balances?
- Etc.

## Information needed by Rabobank

- Farmer level
- Coop level
- …

## Main components (GLOBAL)GAP

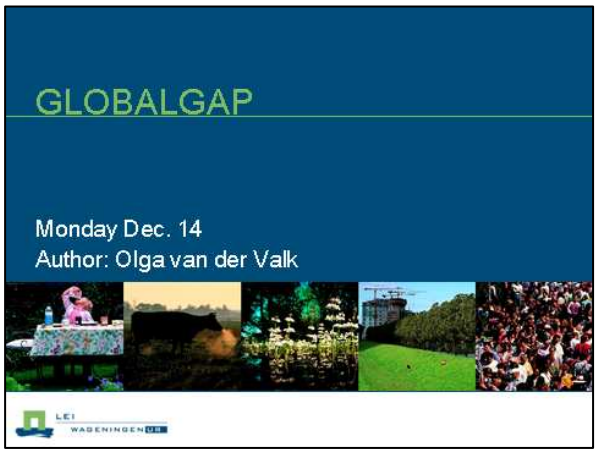
- Management structure and responsibilities assigned
- Risk assessments
- Policies for procedures
- Records / documentation (farm level / group level)
- Internal audits / certification

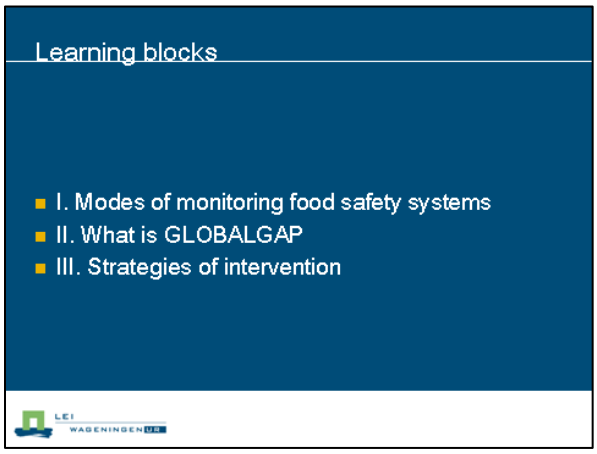



- Exercise: Design an information trail based on product flow within farmers' group

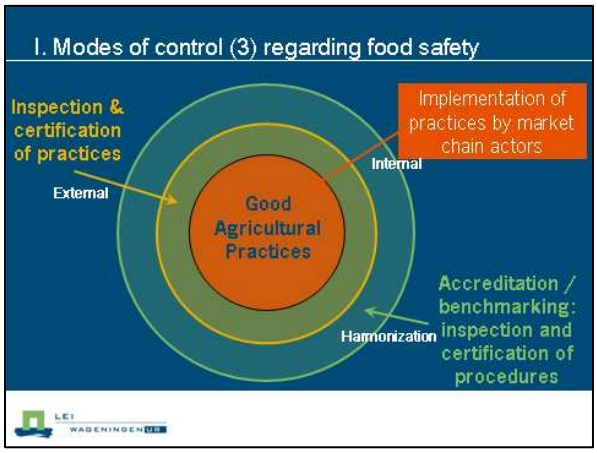
| Input | Land / soil | GAP | Transport | Storage | Sorting | Etc. |
|---|---|---|---|---|---|---|
| List authorized seeds + chemicals | Farm mapping | Farm record<br>Farm record<br>Farm record | Freight history | Allocation product | Origen per bag | |

## Annex III: Presentation December 14 on GLOBALGAP certification systems for smallholders.

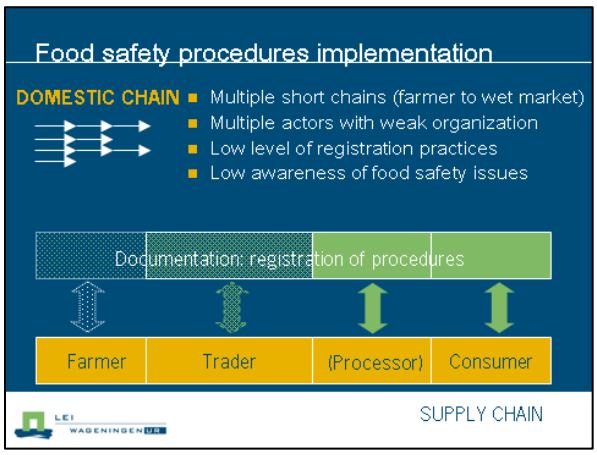










## Food safety procedures implementation

EXPORT CHAIN

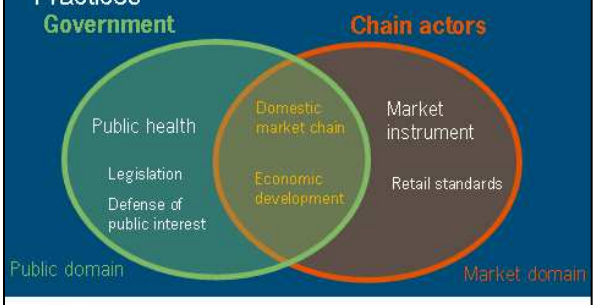
- Governance role by exporter
  - Standards + procedure setter
  - Involvement in implementation upstream in chain
- High level of coordination in chain (traceability)
- High level of registration practices
- High level of knowledge / traceability

Documentation: registration of procedures

Farmers | Trader / processor | Exporter | Importer

SUPPLY CHAIN

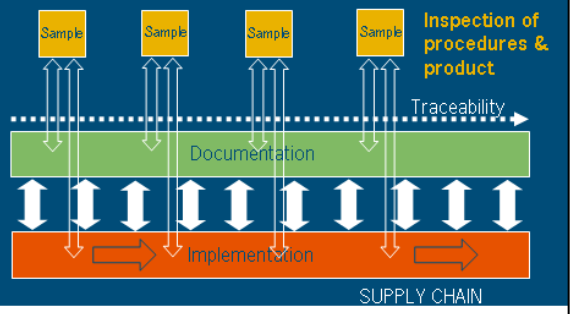
## Purpose of aiming at Good Agricultural Practices




## Inspection & certification of best practices

I. Modes of monitoring

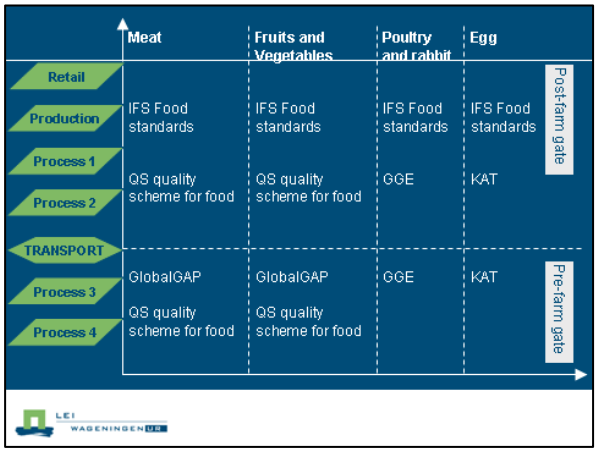
## Food safety (third party) certification




## Food safety: external inspection

- Inspection and certification of best practices
  - Physical verification of product and resources by means of sampling throughout the supply chain (water, soil, etc; phytosanitary certificate)
  - Verification of criteria as measurement of compliance with basic principles (standards)
  - Verification of documentation proving that correct procedures have been followed
- Not part of business management
- 3rd party inspection and certification as required by end market

## II. What is GLOBALGAP?




## GLOBALGAP philosophy

- GLOBALGAP is not about Good Agricultural Practices, but about reducing food safety RISKS
- GLOBALGAP is about creating a paper trail that can be checked by outsiders (3rd party inspection and certification)
- For the paper trail, a management system needs to be in place:
  - Administration and communication
  - Organization chart and job descriptions
  - Definition of policies (criteria) and processes

## Main documents in GLOBALGAP

- General regulations Integrated Farm Assurance = GLOBALGAP policies
- Control Points and Compliance Criteria (CPCC) per scope (i.e. crops base) and sub-scope (i.e. fruits and vegetables) = risk assessment
- Checklists

For scopes and subscopes; see General Regulations IFA 4.9 page 17 and Annex I.2 Product list

## SOP in GLOBALGAP

- Training procedures
- Document and Record Control Procedure
- Complaints Handling Procedure

## Main components GLOBALGAP for producer

- Risk assessments
- Records / documentation
- Policies for procedures (SOP)

For Internal Control System (ICS) / Quality management system (QMS):

- Management structure and responsibilities assigned
- Records / documentation (farm level / group level)
- Internal audits / certification

## Documentation needed:

- At Critical Control points:
  - Whenever a food safety risk occurs: see Control Points and Compliance Criteria (CPCC)
- For the chain of custody:
  - Whenever produce changes hands (trading, storing, collecting, transport, and processing) and its legal ownership over the product is taken over by a different party
  - Management system in place with an appropriate combination of segregation and identification to ensure that certified and uncertified materials are not mixed (traceability)

## Production process flow chart

| Process | Activity | Document | Control |
|---|---|---|---|
| Planting | Seed issue and dressing | | |
| | Planting | Planting schedule | Planting quantity vs. acreage planted |
| Treatments chemical / nutrients | chemical / nutrients issue | Related documents | Spray nozzles; frequency, quantity |
| | chemical / nutrients appliance | Spray application details | Spray application program |
| Irrigation | Irrigation | Irrigation application details | Irrigation application program |
| | Farm block data | Crop history record | Farm block data update |

## Production process flow chart cont.

| Process | Activity | Document | Control |
|---|---|---|---|
| Harvesting | Collection at shed | Produce receipt note | Quality check and grading |
| | | Crate label | Block data vs. crate details |
| | Delivery to packing house | Produce collection note (PCN) | Block data vs PCN |

## II. Certification options

II. What is GLOBALGAP?

## Options for GLOBALGAP certification 1

| Inspection and certification by GLOBALGAP directly | Inspection and certification by national inspection and certification system accredited by GLOBALGAP |
|---|---|
| Option 1: Single producer<br>product and procedure certification | Option 3: Single producer<br>product and procedure certification |
| Option 2: Producer group<br>product, procedure; internal certification system (ICS) | Option 4: Producer group<br>product, procedure; internal certification system (ICS) |

## Options for GLOBALGAP certification 2

| Option 1: Individual certification GLOBALGAP | Option 2: Group certification GLOBALGAP |
|---|---|
| The individual farmer<br>▪Is checked for compliance with standard<br>▪holds the certificate<br>▪pays all related costs; which is more expensive for small plots and volumes | ▪Quality Management System (QMS) needs to be in place<br>▪Only a random sample of farmers are checked for compliance with standard<br>▪Owner of the QMS holds the certificate<br>▪Costs and risks are shared |

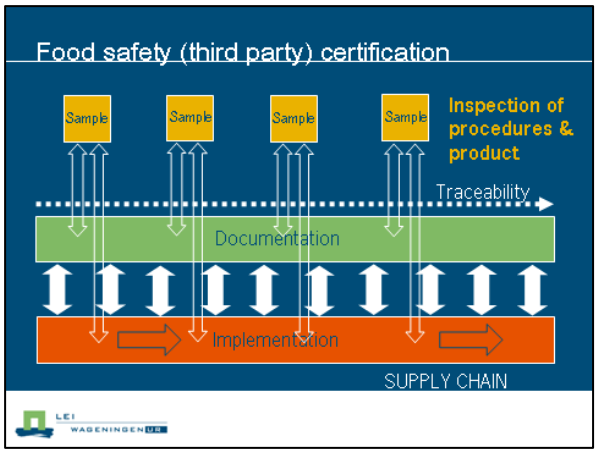
## Multi-site option 1 and 2 certification

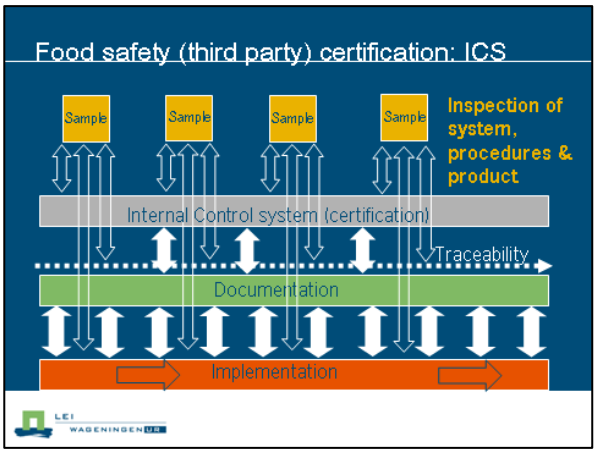
**Option 1: Single producer**

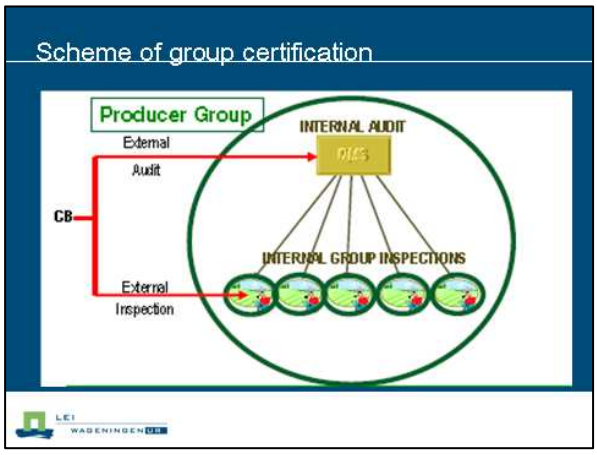
- Several production sites are owned or centrally managed by one individual or company
- Company is certification holder
- Quality Management System is required in case of certification by sampling ! !
- All suppliers must be GLOBALGAP certified

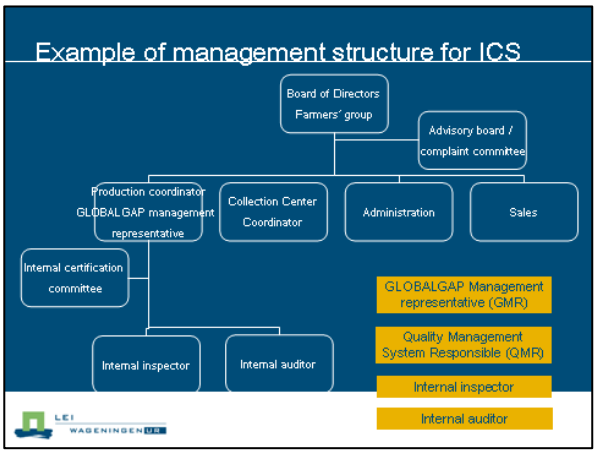
**Option 2: Producer group**

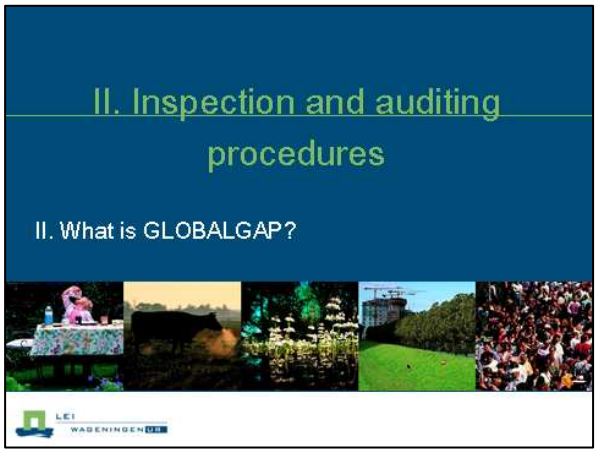
- Legal status: group is certification holder
- Not all producers of group need to be GLOBALGAP certified

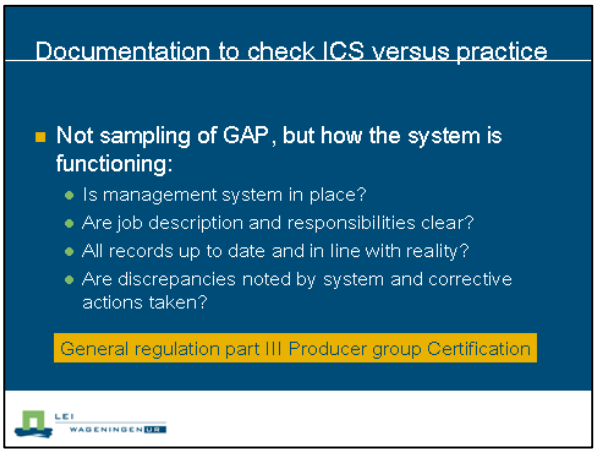

Food safety (third party) certification
Sample
Sample
Sample
Sample
Inspection of procedures & product
Traceability
Documentation
Implementation
SUPPLY CHAIN


Food safety (third party) certification: ICS
Sample
Sample
Sample
Sample
Inspection of system, procedures & product
Internal Control system (certification)
Traceability
Documentation
Implementation


Scheme of group certification
Producer Group
External Audit
INTERNAL AUDIT
CB
INTERNAL GROUP INSPECTIONS
External Inspection


Example of management structure for ICS
Board of Directors Farmers' group
Advisory board / complaint committee
Production coordinator GLOBALGAP management representative
Collection Center Coordinator
Administration
Sales
Internal certification committee
Internal inspector
Internal auditor
GLOBALGAP Management representative (GMR)
Quality Management System Responsible (QMR)
Internal inspector
Internal auditor


II. Inspection and auditing procedures
II. What is GLOBALGAP?


Documentation to check ICS versus practice
Not sampling of GAP, but how the system is functioning:
Is management system in place?
Are job description and responsibilities clear?
All records up to date and in line with reality?
Are discrepancies noted by system and corrective actions taken?
General regulation part III Producer group Certification

## Producer Registration

- Before first inspection, producer(s) needs to be registered and accepted (General Regulations 4.8 page 16)
- Registration data requirements: General Regulations IFA Annex I.3
- Inspection during harvest, recording since three months before harvest

## Certification

- What different kinds of inspection (not certification) can be distinguished?
  - See General Regulations I-5; page 26 to 29

## Certification procedures

- Internal self-assessment by producer (once a year)
- External inspection by GLOBALGAP approved Certification Body
- Unannounced Surveillance Inspections (option 1)
- Internal Quality Management System Audit
- Producer Group Internal Producer Inspections
- External Quality Management System audit by GLOBALGAP approved Certification Body
- External Producer Inspection by GLOBALGAP approved Certification Body
- Unannounced Surveillance Audits

## Pre-audit

- Producer Group Quality Management System Audit
- Inspection of Registered Producers and Production Locations
- Inspection of Produce handling sites (when applicable)

General regulation Part II Certification Body rules

Appendix II.3 Rules for evaluating option 2 producer groups

Part III General Regulations IFA Producer Group certification

QMS Checklist

## Pre-audits

- What are requirements for being an internal auditor?
- And for being an internal inspector
- What is difference between the two?

See Part III General Regulations IFA Producer Group certification

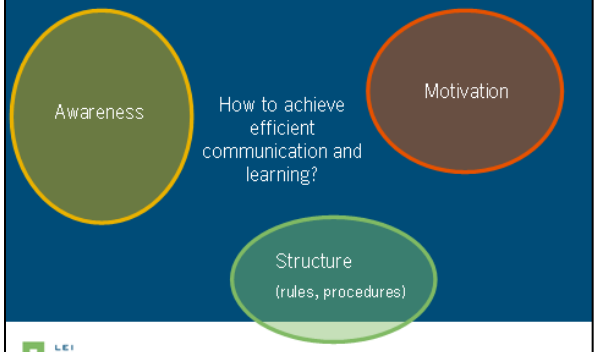
Appendix II.1 and II.2 General Regulations IFA

## Measuring compliance

- How is compliance measured?
  - Compliance levels: General Regulations IFA Part I, 4.9.3 page 20
  - Non-conformances and Sanctions: General Regulations IFA Part I, 6 page 30

## III. Strategies of intervention

## Instruments to promote food safety



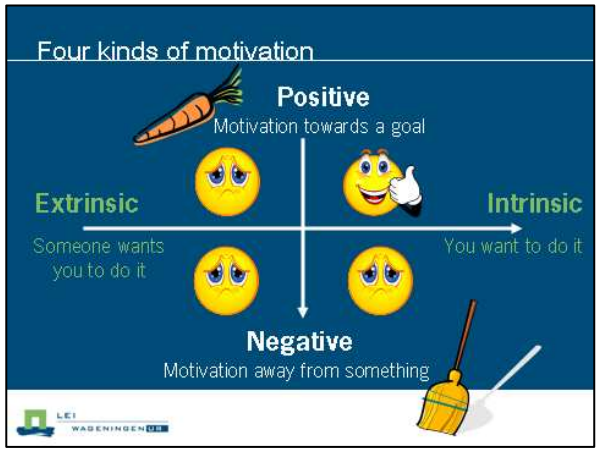

## Motivation

II. Strategies of intervention

## Motivation

- Motivation comes from the word "motive" which comes from the Latin word "to move." Motivation is
  Anything that moves people to try to perform
- If people are trying, they are motivated. However, wanting is not synonymous with trying and is therefore not motivation.
  Motivation = Motive + Action


## Four kinds of motivation



## Strategies will be more successful when they:

- Give a reason or incentive to achieve something. Stimulate motivation: the interest in or enthusiasm to make the effort to achieve something. The biological, emotional, cognitive, or social forces that move and direct behaviour.

## Exercise

- Describe the motivation of the actors in the case of sweet pepper
- Did the actions / strategies as described in the case studies influence motivation of actors involved? How?
- Which actor is main motor of change? Why?

## Communication

II. Strategies of intervention

## Two visions on communication

**Action-vision**

- Transmission
- Communication directed at people
- Communication as product
- People are a "target group" (them versus us thinking)
- Message sending (one-way traffic), transfer of information

**Interaction-vision**

- Give meaning, interpretation
- Communication between people
- Communication as process
- People are actors (thinking together)
- People encounter, curious about reality of the other

## Two visions on communication

**Action-vision**

- Assumption: frequent informing will lead to convincing people, which will lead to different thinking / feeling / acting
  - Planned, through campaigns, intranet, written press, radio
  - Telling, explaining, clarifying, convincing

**Interaction-vision**

- Assumption: the (un)structured interaction with each other will lead to shared perspective on action and commitment to change
  - Conferences, meetings, workshops
  - Dialoguing, advising, facilating, coaching, supporting

Error! Objects cannot be created from editing field codes.

## Annex IV. First draft of monitoring scheme (meeting December 11 at IVEGRI)

| Problem tree | | Supply chain plan | | | | | | Monitoring | |
|---|---|---|---|---|---|---|---|---|---|
| **Bottleneck** | **Elements contributing** | **Objective** | **Intervention:** | | **activities** | **responsible** | **who** | **On basis of what information? (Key Performance Indicators)** | |
| | | | | | | | | Compliance? | Corrective actions in case of non compliance? |
| stability of supply | high production capacity | Yield | capital | finance of inputs finance of infrastructure | | | | | |
| | | | SOP | | | | | | |
| | | | new technology | greenhouse & irrigation | | | | | |
| | | | Production & business plans | | | | | | |
| | | no exceedence of MRLs | SOP | | | | | | |
| | commitment | dispute resolving system | written contracts: what agreements? | | | | | | |
| | upscaling | | monitoring and evaluation | | | | | | |
| | | group support + transparency | strengthened communication | regular meetings learning & exchange | convene each month | Hortin | | minutes of meetings | |
| | | | | | be present | Names | | | |
| | | | monitoring and evaluation | | information to be distributed | Names | | | |
| | | | | | - farm records | Farmers | | | |
| | | | | | - marketing info by Emerald | | | | |

## Annex V. Presentation December 15 on monitoring systems

### Agenda December 15

| | |
|---|---|
| 2008-2009 | |
| 9-10h | Overview sweet pepper pilot and explanation of past and future activities by Hortin team and stakeholders |
| 10-10:30h | Revision current SW pilot project documents plus other relevant information (HCC) |
| 2010 | |
| 10:30-12h | Revision of targets for 2010 in view of planning documents |
| 13-14h | Definition of deliverables |
| 14-14:30 | Monitoring system: update from HCC |
| 14:30-16h | Monitoring system for sweet pepper pilot |
| 16-16:30h | Distribution of tasks and timetable |

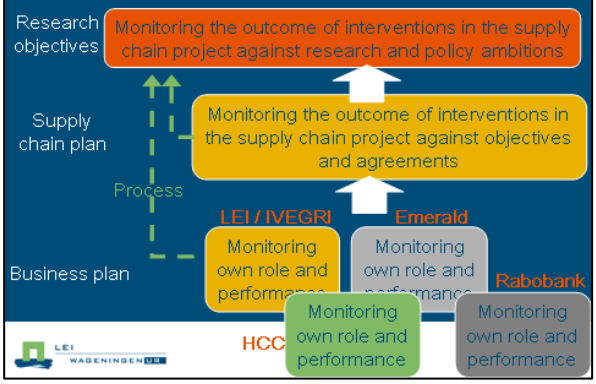
### Monitoring sweet pepper pilot

Tuesday Dec. 15

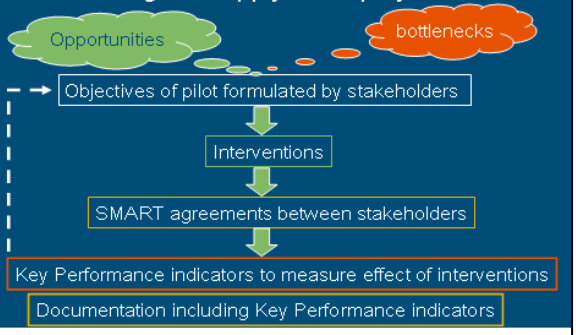
### Methodology for monitoring

I. Monitoring the supply chain project
II. Monitoring for lessons learned from project
III. Monitoring compliance of own role in project

### Monitoring methodology




### I. Monitoring the supply chain project




### Record keeping

- Recording that is useful to stakeholders for business will be more sustainable:
  - Integration into internal management system (farm / farmer / group / company / service provider etc.)
  - If the supply chain project really addresses bottlenecks or opportunities, stakeholder will want the recording also after project ends.
- All recording requires time and organization, thus money: the less recording, the better.

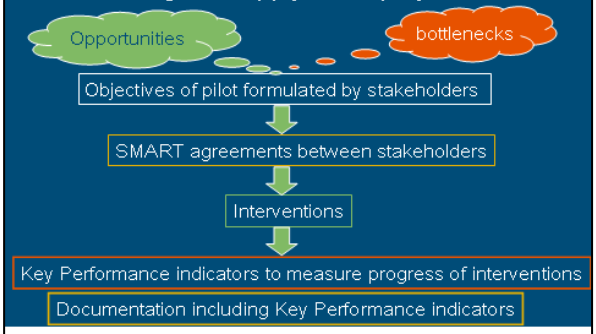
## II. Monitoring for lessons learned from project

- Main role by research
- Comparison with research leading to pilot project:
  - Were the main bottlenecks / opportunities addressed with the pilot?
  - What are the assumptions for the desired impact of the pilot project?
  - Are executed interventions congruent with the desired impact?
  - How can the pilot project be up-scaled? What are minimal conditions to make similar projects a success?

## III. Monitoring compliance of own role in project

- How do the tasks I perform in the project relate to:
  - My market position (competitors)
  - My portfolio
  - Profitability of my operations
  - Sustainability of the project

## I. Monitoring the supply chain project




## Objectives of pilot formulated by stakeholders

- Stability of supply
  - Quantity
  - Quality
- No incidents of exceeding Maximum Residue Levels (MRLs)
- Strengthen commitment of suppliers (?)

## Interventions

- Infrastructure and inputs:
  1. Building new plastic greenhouses
  2. New irrigation systems
  3. Availability of credit
- Implementation of Good Agricultural Practices
  4. Standard Operation Procedures (SOPs)
- Commitment and transparency
  5. Introduction of contracts

## Agreements among stakeholders

- What are SMART objectives to obtain with the interventions? (increase yield; volume; quality, etc.) => how much, when
- What are activities to be realized? How is task distribution among project partners?
- What are policies in case of non-compliance with targets / agreements?
- Is there an arbitration committee / complaint procedure? If so, how will it function?
- Who will write down the agreements and policies?

## Monitor effect of interventions on objective

| | Standard Operational Procedures (SOP) | | New technology (greenhouse / irrigation) | |
|---|---|---|---|---|
| | Without | With | Without | With |
| Farming system 1 | X | | X | |
| Farming system 2 | | X | | X |
| Farming system 3 | | X | X | |
| Farming system 4 | X | | | X |

## Thus monitoring for comparison of three groups:

- The 2 farmers participating in pilot project with implementation of SOP on site of new technology; — Farming system 3
- The 2 farmers participating in pilot project with implementation of SOP on site without new technology; — Farming system 2
- Control group of farmers *with the same profile* but without SOP or new technology — Farming system 1

## What information to gather on the three groups?

- Changes in yield
  - because of new technology
  - because of SOP
- Changes in costs of production
  - because of new technology
  - because of SOP
- Profiles

| To be gathered by | |
|---|---|
| Market partner | Research / facilitator |
| | |
| | |
| | |
| | |

## Remarks / assumptions

- SOP implementation is assumed to be taking place, as all farmers have received training; only recording does not take place.
- Changes in MRL incidence cannot be measured, as group of 2 farmers is too small
- Traceability cannot be implemented as group of 2 farmers is too small to experiment with system

## Other option:

- Baseline study:
  - Measure the key indicators before and after interventions
  - In this case not possible, as key indicators are not known for previous crops (no registration has taken place)

## Monitoring a project: sweet pepper pilot case

- What do the stakeholders want to achieve with the project?
- What are main interventions?
- How to measure these interventions