Development of the EHPEA Code of Practice

Results of fieldwork conducted
During September- December 2006

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Executive summary

For the Ethiopian flower sector, the European Union is currently its most important market. By improving quality of production, logistics and marketing strategies, the sector aims to enter the European retail sector, and some other specific niche markets. However, these market segments also demand more corporate social responsible behavior regarding social and environmental issues. Besides that, there is growing pressure from local civil society organizations, demanding fair social conditions and good environmental management practices. This is not just the case for the Ethiopian flower farmers, but is a growing concern for the sector at a worldwide level. Finally, both at market level as within Ethiopian, the flower sector has to comply with the existing legislation. Partly due to external pressures, these legal framework change in time and define restrictions and conditions regarding environmental and social issues. For the sector, it is important that this legal and institutional framework enables the sustainable development of the sector. Active cooperation between public and private actors, helps to understand each others mandates and agendas, and to define together reasonable requirements that help the sector to improve its sustainability gradually.

Altogether, these are important reasons that have led EHPEAs to decide to identify the design of an Ethiopian specific Code of Practice for Sustainable flower cultivation. This is one of the strategic issues to be developed within the framework of the Dutch- Ethiopian Horticulture partnership. In order to be able to design this Code of Practice, EHPEA requested the support of the Dutch LEI (Agricultural Economics Research Institute) to facilitate the process. This support consists of a combination of desk research, expert interviews, workshops and data collection in the field. This report presents the results of the data collected through fieldwork in Ethiopia in the period September-December 2006.

This fieldwork should not be considered as an alternative ***to replace an initial audit*** *for*. These audits are normally conducted by an external expert in order to analyze the exact level of compliance and gaps of the current practices applied in the farms in comparison to these standards, and take a considerable amount of time for each farm. To do such audits there was no time, nor budget available.

This fieldwork has been a quick scan to identify the most pressing environmental and social issues the farm managers must improve their management system. Also, the fieldwork has been useful for the identification of the most urgent gaps between the requirements of the most important international standards on sustainable flower cultivation to be considered by the Ethiopian sector, and the current practices applied. This information is used to create awareness of the representatives being active in the sector. And, the information is used in workshops organized by EHPEA to define the content of the EHPEA Code of Practice.

1 Introduction

1.1 General background

Horticulture exports from Ethiopia are growing very rapidly and are considered to be an important element in the country's efforts to diversify exports and to contribute directly to poverty reduction. All stakeholders (among others Growers, Ethiopian Horticulture Producers and Exporters Association (EHPEA), Ministry of Trade and Industry) agree that joint efforts on a wide range of issues are needed to secure a further well balanced growth of the sector and increase the societal benefits in terms of employment en foreign exchange earnings and to minimize the possible negative impact on natural resource base.

In line with the objectives established at the World Summit on Sustainable Development (WSSD)[1] in 2002, a public-private partnership between Ethiopia and the Netherlands is developed in order to improve and sustain a balanced growth of the horticulture sector in Ethiopia.

The mission of this partnership is to contribute to:

- A competitive, demand driven, self sustaining and innovative horticulture cluster well connected in international networks.
- Environmentally and socially friendly production.
- Human resource development and enlarging the positive spin-off on local, regional and national social development
- Enlarging the positive spin-off on the local, regional and national economic development.
- A strong international reputation of the Ethiopian Horticulture Cluster
- An institutional framework which enables the sector to meet (future) market demands and opportunities and to operate in a socially and environmentally friendly and broadly accepted manner.
- Strengthening the cooperation between Ethiopia and the Netherlands

The Royal Netherlands Embassy (RNE) financially supports the Ethiopian Horticulture Producers and Exporters Organisation (EHPEA) in order to develop the Ethiopian Horticulture Development Strategy (Ethio HDS). Coordination and support to the EHPEA is given by the International Agricultural Centre (IAC) of Wageningen UR. In 2006 a plan of activities for this partnership was formulated together with the sector's stakeholders. This plan consists of the following topics:

[1] WSSD, Johannesburg South Africa August/September 2002

- Capacity building in the floriculture sector in Ethiopia
- Code of Conduct for the floriculture sector
- Capacity building phytosanitary unit
- Market Information Service
- Integrated Pest Management
- Decision support model for location of flower production
- Identification of competitive product-market combinations for fruits and vegetables
- Implementation of EUREPGAP

The Dutch Agricultural Economics Research Institute (LEI) was assigned by the program coordinators to facilitate the EHPEA and its members in the process towards the design of an Ethiopian oriented Code of Conduct for responsible flower cultivation.

2 Code of conduct for the floriculture sector

2.1 Introduction

For the Ethiopian flower sector, the European Union is currently its most important market. The majority of the exporting companies sell their flowers at the auction in The Netherlands. Other export markets are via the German wholesale company Florimex, other European markets and the Middle East (Dubai). However, by improving quality of production, logistics and marketing strategies, the sector aims to enter the European retail sector, and some other specific niche markets. The reason for this is that these market segments provide attractive sales and growth opportunities, since they improve the negotiation position of Ethiopian flower companies regarding sales prices, increase the insights they obtain about market trends, and provide in some cases more sustainable trade relations. However, these market segments also demand more corporate social responsible behavior regarding social and environmental issues.

Additionally, there is growing pressure from local civil society organizations, demanding fair social conditions and good environmental management practices. This is not just the case for the Ethiopian flower farmers, but is a growing concern for the sector at a worldwide level.

Thirdly, both at market level as within Ethiopian, the flower sector has to comply with the existing legislation. Partly due to external pressures, these legal framework change in time and define restrictions and conditions regarding environmental and social issues. For the sector, it is important that this legal and institutional framework enables the sustainable development of the sector. Active cooperation between public and private actors, helps to

understand each other' s mandates and agendas, and to define together reasonable requirements that help the sector to improve its sustainability gradually.

Altogether these are important reasons that have led to EHPEAs decision to identify the design of an Ethiopian specific Code of Practice for Sustainable flower cultivation as one of the strategic issues to develop within the framework of the Dutch- Ethiopian Horticulture partnership.

In order to be able to design this Code of Practice, EHPEA requested the support of the Dutch LEI (Agricultural Economics Research Institute) to facilitate the process. This support consists of a combination of desk research, expert interviews, workshops and data collection in the field. This report presents the results the data collection through fieldwork in Ethiopia.

After this introductory chapter, chapter 3 presents the findings of the field work. These results are presented based on the structure of the questionnaire. Chapter 4 presents the conclusions and recommendations. Additionally to this report, Suzanne Valkman has written a report on Environmental Impact of Pesticides used in Ethiopian Floriculture. For this report, the data on environmental topics have been used. To avoid duplication of reporting, this report will just briefly introduce these issues and then refer for further details to Valkmans' report.

2.2 Objectives

The general objective of this project is:

- To facilitate EHPEA members in the floriculture sector with an effective strategic planning, monitoring and evaluation tool to stimulate the sustainable development of the sector.

The specific objectives for LEI in this project are:

- To facilitate the design of a Code of Practice for the EHPEA members
- To facilitate the stakeholder consensus on the content of this Code of Practice and the design and common consensus on a 1 year and 3 year implementation plan required to assure the effective introduction of the Code into the sector.

2.3 Research questions

2.3.1 Standard setting at market level

Concerns of European consumers regarding environmental and social issues in the floriculture sector have created pressure on flower farms in production countries. This pressure is not just related to a proper response to the immediate customer

requirements, but also to safe-guard the sustainable development of the sector, regarding (inter)national acceptable labor conditions and environmental issues regarding pesticide use, water consumption, among others. As a response to this trend, initiatives and agreements at chain level are made. Part of these is formalized by standard setting.

Standard setting for sustainable flower cultivation is still a domain under development. In several countries, standards for flowers have been developed but these are mostly for business-to-business use. More recently, also consumer oriented standards have been launched which are also accompanied by labels. The aim of these standards is to create common understanding and formalized agreements on the issues to be taken into account when it concerns sustainable cultivation and trade. Besides that, it helps the sector to differentiate its product, and to enter new market segments.

In 2006, the following international voluntary standards are used within the floriculture sector when exporting to the European Union:

1. Fair Flowers and Plants (FFP).
2. International Code of Conduct for Cut Flowers (ICC)
3. EUREP GAP Control points and compliance criteria for flowers
4. Milieu Programma Sierteelt (MPS), which is divided in classification A, B and C.

Besides that, some specific labels exist for some individual European countries, such as; the Flower Label Program in Germany, Milieukeur and Florimark production in the Netherlands, Fair Trade Switzerland in Switzerland. It depends on the existing and expected destination of the Ethiopian flower export within the European market, which standards and labels have to be taken into account for this project.

Research questions:

- Which sustainability standards and labels apply to the present Ethiopian floriculture sector?
- Which are the mayor issues of these standards, and how is the current performance of the sector related to these issues?

2.3.2 Other local Codes of Conduct

Codes of conducts are used to guarantee the buyer and/or the consumer certain characteristics that are related to the production of the product. These codes can be developed by a particular company or a horticultural sector, issued by independent (inter)national organizations and national codes designated by the government.

In response to the development of labels in the market of destination, flower export associations in Colombia, Kenya, Uganda, Zambia and Zimbabwe have taken initiatives to develop codes of conduct that do not only address the market concerns but also relate more specifically to the specific production circumstances in their countries. Since the Ethiopian flower sector is interested in developing a comparable initiative, the experiences of three countries (Kenya, Colombia and Zambia) have been subject of analysis for this project.

Research questions:

- What lessons can be learned from the development of a locally adapted Code of Conduct by Colombia, Zambia and Kenya?
- What have been their mayor sustainability issues and how well is the Ethiopian floriculture sector performing as with regard to these issues?

2.4 Methodology

To be able to define the content of the Ethiopian specific Code of Practice, data had to be collected on existing standards, but also on the current practices applied by the floriculture sector in Ethiopia. First, LEI made an inventory of the most important market requirements on sustainability standards. Since the vast majority of the Ethiopian flowers are exported to Europe, only the standards for this region have been analyzed.

After collecting the general information on the existing sustainability standards for the European Union, the trend on export behavior of the sector was analyzed. Table 1 presents the export trends for the period 1998-2004.

Table 1: Export trend Ethiopian flower sector, 1998-2004

	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**% total**
Belgium			35	25		6	10	0,7
Germany	**138**	**152**	**156**	**191**	**176**	**530**	**844**	**61,2**
France							1	0,1
Italy				1	1	10	8	0,6
Netherlands	**33**	**42**	**28**	**8**	**37**	**81**	**453**	**32,8**
United Kingdom	11		3			1	18	1,3
Sweden			1	9	13	39	46	3,3
Total	182	194	223	234	227	667	1380	100

Source: Eurostat (2005)

As can be observed in table 1, the majority of the Ethiopian flowers are currently exported to the Dutch auction and the German market. So these are the most important markets to

take into account for considering standard setting. Besides that, the Ethiopian flower sector works towards an increased access to the retail sector, since this is the fastest growing market segment, providing interesting benefits for flower producers. Finally, there are some new initiatives taking place that stimulate consumer awareness on sustainability issues in the flower sector. An important initiative is the Fair Flower and Plant Label. On the long term, this label can have important implications for the "license to operate" of Ethiopian flower farmers in the European market. Based on this information, the standards that were analyzed in more detail, were: MPS A,B,C, MPS GAP, MPS SQ, EUREP GAP, FFP.

After revising the standards indicated, a selection was made of key requirements for sustainable floriculture. These requirements are related to: general farm management, water management, pest control mechanisms, fertilizer use, occupational health, waste management, and general labor wealth issues. Based on this classification, a questionnaire was designed including questions on:

- General farm characteristics (type, size, greenhouse-type, soil-type or substrate, climate management, farm plan infrastructure, storage facilities, availability of agro chemicals, overall quality of the natural environment etc.)
- Planning, monitoring and evaluation (risk assessment, certification, waste, water, pesticide and nature management)
- Water Management (irrigation, source, quality and quantity, responsibilities)
- Weed, pest and disease management (agro-chemicals used, quantities, timing and frequency, training; provides the list of chemicals used for this study)
- Fertilizer and crop protection products storage (storage characteristics, treatment and disposal of waste)
- Worker health, safety and welfare (training, use of protective equipment and clothing, safe application procedures etc.)

The complete questionnaire can be found in Annex A.

In the period September-December 2006, Edwin van der Maden, a student of the plant science department of Wageningen University, applied the questionnaire by visiting 35 farms. The floriculture farms investigated in this study are in various stages of development. Currently only 35 of the 65 registered EHPEA farms are in production and are exporting cut flowers. With the support of the EHPEA staff, the managers of these farms were requested to cooperate in collecting data. Only two decided not to cooperate. Table 2 presents the general data on the farms that were visited and their main activity. From the two non cooperating farms only general sector wide available data were

available. In some tables these data were added to the once collected by ourselves, for which reason some tables present the data of 35 instead of 33 respondents.

Table 2: Farms Visited

Farm	Location	Date	Crops
A-Flowers	Holetta	04 Oct 2006	Roses
Abyssinia Flowers	Sendafa	19 Oct 2006	Hypericum & Eryngium
Arsi Flower	Holetta	10 Oct 2006	Roses
Avon Flowers	Debre Zeit	29 Sep 2006	Roses
Dire Highland	Holetta	06 Oct 2006	Roses
Dugda Floriculture Development	Debre Zeit	26 Sep 2006	Roses
DYR	Teji	22 Sep 2006	Carnations
ENYI Ethio Rose	Kara Kore	19 Sep 2006	Roses & Rose cuttings
ET-Highland Flora	Sebeta	21 Sep 2006	Roses
Ethio Agri CEFT	Holetta	05 Oct 2006	Roses
Ethiopian Cuttings	Koka	26 Oct 2006	Various cuttings
Ethio Dream	Holetta	11 Oct 2006	Roses
Ethiopian Magical Farm	Sendafa	19 Oct 2006	Hypericum & Carnations
Florensis	Koka	28 Sep 2006	Pot plant cuttings
Garad Highland Flowers	Holetta	06 Oct 2006	Roses & Rose cuttings
Golden Rose	Tefki	22 Sep 2006	Roses/cuttings & Hypericum
Holetta Roses	Holetta	09 Oct 2006	Roses
Jericho Flowers	Menagesha	04 Oct 2006	Roses & Gypsophylla
Joe Flowers	Holetta	05 Oct 2006	Roses
Joy Tech	Debre Zeit	26 Oct 2006	Roses/cuttings&Gypsophylla
JJ Kothari	Sululta	13 Oct 2006	Roses
Linssen Roses	Addis Alem	27 Oct 2006	Roses
MAM Trading	Sendafa	13 Oct 2006	Roses & Rose cuttings
Menagesha Flowers	Menagesha	29 Sep 2006	Roses
Minaye Flowers	Debre Zeit	26 Sep 2006	Roses
Metrolux Flowers	Holetta	09 Oct 2006	Roses & Ranuncula
ODA Flowers	Sebeta	20 Sep 2006	Roses
Rose Ethiopia	Holetta	10 Oct 2006	Roses
Siet Agro	Holetta	11 Oct 2006	Roses & Delphinium
Spirit Flower Farm	Debre Zeit	25 Sep 2006	Gypsophylla
Super Arcity	Nazaret	25 Sep 2006	Roses
Supra Floritech	Addis Alem	27 Oct 2006	Roses
TAL Flowers	Sebeta	21 Sep 2006	Gypsophylla
TOP Flowers	Holetta	04 Oct 2006	Roses
Ziway Roses	Ziway	27 Sep 2006	Roses

The farm managers were interviewed based on the survey. Additionally, the farm was visited together with representatives of the staff in order to do some on-site observations and collect some additional information.

Research limitations and constraints

1. This project is part of the overall program to support the Ethiopian horticulture sector. For each sub project of this program, the researchers involved require data. For this reason, the researchers related to this sub project decided to provide the opportunity to the other researchers to include a number of specific questions in the questionnaire. This caused some delay in designing the final version of the questionnaire, caused an extended list of questions, and complicated the application of the questionnaire while visiting the farms. On the other hand, it has created a unique opportunity to collect in a short time, useful data for a great variety of current and future projects to help the Ethiopian floriculture sector to improve its sustainable development.
2. Before the start of the fieldwork, there was some scepticism about the success of the data collection by means of farm surveys. Data collection through farm surveys fully depends on the level of cooperation of the floriculture farms. Especially in this case, with targeting the just recently developing, young floriculture sector. The researchers assumed that farmers could be reluctant to provide information they were not sure of what it would and could be used for. Additionally, the questionnaire could be too specific, enquiring data that was not (yet) available to the farms themselves. Furthermore, new farms do not keep detailed records on farm processes yet and are still in the process of applying to all required regulations. Therefore, Myrtille Danse accompanied Edwin van der Maden in the first farm visits to try the questionnaire in practice and to explain the managers the aim of the data collection. According to the results of these first 6 visits, the questionnaire was slightly adjusted.
3. To avoid rejection of the managers, the researchers agreed with the EHPEA staff and the Embassy that the data collected were going to be confidential. The farm specific data have become property only of Wageningen University. The report of the results will only present aggregated data and generalized information. Due to this, but also the interest of the sector to develop the Code, made that a large majority of the interviewed floriculture farms were well-willing and able to provide proper information, which benefited this research greatly.
4. The farm visits were facilitated with the support of the EHPEA. All visited floriculture farms are member of this association. The EHPEA announced the research project to its member by letter, emphasizing the importance of the development of a Code of Practice for Ethiopia. At a later stage, the individual farms at that moment in production (35) were contacted by EHPEA by phone to arrange an appointment for a

visit. The questionnaire was sent beforehand by e-mail, so the farmers could prepare for the meeting. However, this good preparation did not avoid that many of the farm managers visited by the student were not well informed about the visit. This could be explained due to the fact that the appointment in most cases was made with personnel at the farm' s administrative office in Addis Ababa. The message was not always passed on to the farm manager. Therefore it was often a time consuming process to get permission to access the farm, although the appointment was confirmed beforehand. Furthermore, the majority of the respondents never received the questionnaire sent in advance by e-mail, because it was send to the head office and never reached the farm manager. Detailed information was difficult to get hold on (e.g. chemical and fertilizer use), since most farms do not yet govern an advanced record keeping systems.

5. The detailed and sizeable questionnaire and the additional tour around the farm implied mostly a 2 – 3 hour farm visit. Therefore only 2 farms per day were visited. Because an internship student from Wageningen University was stationed in Ethiopia for the period of 4 months, it was possible to visit all the farms planned.
6. The quality and completeness of the collected data was subject to the willingness to participate and level of knowledge on farming aspects of the respondent. Therefore, in some cases the answers to the questionnaire data is not complete. In most cases the farm manager or production manager was interviewed at the farm site. Two of the 35 farms decided not to participate (no permission from the owner). In some cases, additional data could be collected through observations and photos made of the farm processes at the location, during a tour around the farm with the respondent.
7. To stimulate farm managers to provide honest answers and not desired answers, the researchers explained the respondents that the data would be treated in a confidential way and that the applicability of the Code of Practice would depend on the quality of the information provided by them. It was decided to collect only data through farm staff, to create a atmosphere of trust. Due to the interest of the farm owners to create a Code of Practice useful to the sector, this argument helped the data collection process.
8. It was agreed with the EHPEA that questions related to labor issues would only be asked to farm managers, to avoid uncomfortable situations for them by talking to the workers. However, this might have caused biased information collection
9. Unfortunately, almost finalizing the cycle of farm visits, the laptop of the internship student was stolen from his room. Therefore a part of the already collected data was lost. During the visit of Myrtille Danse (LEI) and Suzanne Valkman (Alterra) (6 – 17 November) to Ethiopia, it was decided to conduct 4 additional farm visits to collect

lacking and incomplete data especially on crop protection and fertilizers use. This information is important for the Rapid Environmental Impact Assessment but also for the development of the Code of Practice and the research project on integrated pest management. The four farms were selected based on their good record keeping systems. Suzanne Valkman prepared a specific sheet for the additional farm surveys, which were carried out by Edwin van der Maden. The results of these farm surveys are presented in the Rapid Environmental Impact Assessment report by Suzanne Valkman (2007).

3 Findings fieldwork September-December 2006

3.1 Introduction

The database containing the information collected through the application of the questionnaire provides very useful data to draw a general picture on the current sustainable management practices that are applied within the Ethiopia' s floriculture sector. This section will present information on the general farm characteristics, the environmental characteristics of the regions the farms are located, and transport & trade issues of importance for the design and performance of the farms and its management system in use.

3.1.1 Sample size

Floriculture exports from Ethiopia are growing very rapidly. Since 1999 65 farms have registered with either the Ethiopia Investment Agency or the Oromia Investment Office. Land under floriculture is currently 771.7 ha of which 254.1 ha is covered with greenhouses. However, this number is increasing rapidly as many owners are in the process of building new greenhouses or expanding existing ones. For the fieldwork, only EHPEA member farms were considered. This is a very representative sample, since the EHPEA members represent 90% of the total production capacity available in the Ethiopian floriculture sector. Of the 65 EHPEA associated farms 35 were visited. These 35 farms were the only ones that were in full production at the time this field work was conducted. The remaining farms were either still in the preparatory phase, or were temporarily out of production due to flooding problems caused by the heavy rains of the 2006 rainy season. Of these 35 EHPEA associated farms in production, 33 were willing to cooperate with the field work.

Table 3: Farm area EHPEA members in production, 2006

Characteristic	Farms (#)	Total (ha)	Average (ha)	Highest (ha)	Lowest (ha)
Total Farm size	33	771.7	23.4	40.0	10.0
Greenhouse					
Roses	27	227.9	8.4	27.0	2.3
Rose propagation	6	3.5	0.6	2.0	0.2
Other	4	22.7	5.7	8.5	0.5
Open field					
Cut flowers	7	45.3	6.5	12.0	0.6

As can be observed in table 3, the total potential production area of these 33 farms is almost 772 ha. As an average the farms have 23.4 ha available for production, of which an average of 8.4 ha was in production during the period the field research was conducted.

3.1.2 Farm location

The majority of the farms are located in the near surroundings of Addis Ababa, 32 of the total number of farms registered at the Ministry of Trade and Industry are situated in the West Showa Region. The altitudes range from 1600 to 2700 m above sea level The distribution of farms in the different regions is presented in figure 1.

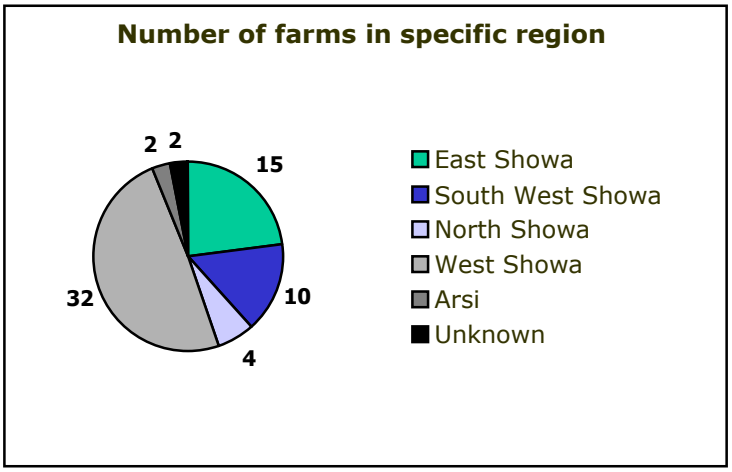


Figure 1: Number of flower farms in specific region

The ownership of the farms is quite evenly distributed among foreign and Ethiopian investors, as can be observed in figure 2.

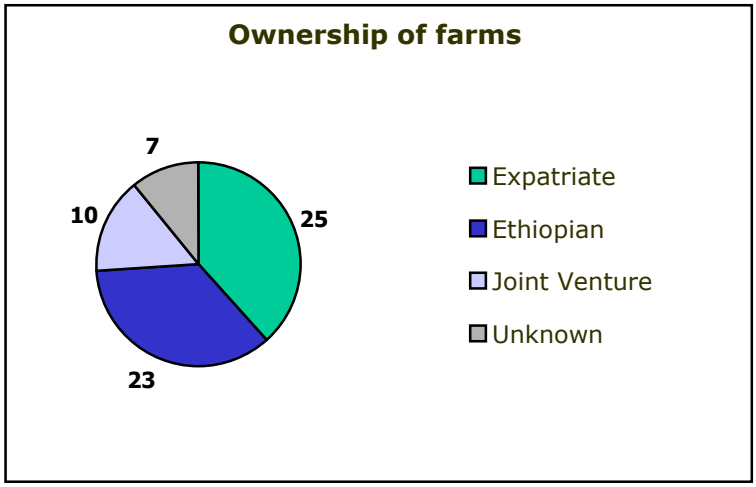


Figure 2: Distribution of ownership of Ethiopian flower farms

Most of the land used for floriculture activities is acquired from the government. The distribution of the source through which the land is acquired is presented in figure 3.

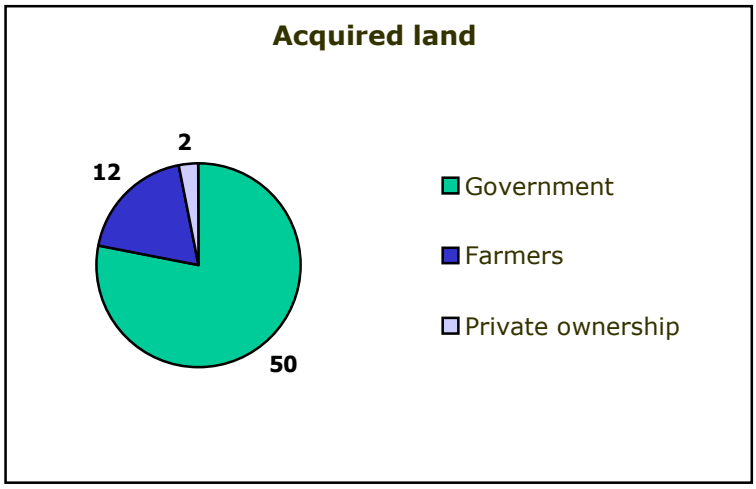


Figure 3: Floriculture land acquired from various sources

3.1.3 Central Rift Valley Environment

3.1.3.1 Geography

The Central Rift Valley is created by volcanic and faulting activity and is part of the Great East African Rift Valley, which extends from Jordan to Mozambique. The Ethiopian Rift valley divides the highlands into a northern and a southern part from the Kenyan border up to the Red Sea. Ethiopia is situated within the latitude of the tropics but since 43% of the country' s cover consists of highlands, the climate here is temperate. The hottest

month in Addis Ababa is April-May (10-30) and the coldest is December (5-23). The inter-tropical convergence zone (ITCZ) the northern trade winds and southern monsoon are major factors influencing rainfall in the Central Rift Valley. The dry season starts in October and ends in May and there is a short wet season in June-September.

The country has abundant natural resources but much of the forests especially around Addis Ababa have been exploited for mainly firewood and building material. Deforestation and overstocking has caused soil erosion and agricultural land is deteriorated by excessive pressure on the land from overpopulation and a natural shortage of water in some areas. Studies indicate that annual soil erosion in Ethiopia varies from 17 to 300 tonnes/ha.

45% of the Gross Domestic Product (GDP) is derived from the agricultural sector whilst reliance on agriculture is 80% since many people survive on subsistence farming. Rain fed crop cultivation is the principal activity in most of the area where adequate rainfall is available. In semi-arid to arid conditions, pastoral livelihoods are predominant. Sorghum and cotton are grown in the warmer areas and barley in the cooler. A few large state farms produce cereals, milk, meat, fruits and vegetables. The building of greenhouses for horticultural products is rapidly expanding in the area surrounding Addis Ababa.

Ethiopia also has abundant water resources. There are twelve major river basins, which form four major drainage systems:

- The Nile basin covers 33 % of the country and drains the northern and central parts westwards; (including Abbay or Blue Nile, Baro-Akobo, Setit-Tekeze/Atbara and Mereb)
- The Rift Valley covers 28 % of the country; (including Awash, Denakil, Omo-Gibe and Central Lakes)
- The Shebelli/Juba basin covers 33 % of the country and drains the southeastern mountains towards Somalia and the Indian Ocean; (including Wabi-Shebelle and Genale-Dawa)
- The North-East Coast covers 6 % of the country. (including the Ogaden and Gulf of Aden basins)

The Rift Valley drainage system, from the North-East to the South-West consists of three major water basins: (Alimayehu et al., 2004)

- Awash basin with the Koka, Beseka, Gemari, and Abe as most important lakes.
- Central Ethiopian Rift (CER) valley with the Ziway, Langano, Abyata and Shala lakes as most important lakes.

- Southern basin with Awassa, Abaya, Chamo and Chew-Bahir as most important lakes.

These three basins are not connected by surface water, but it is suggested that they may be connected by underground faults running in NE-SW direction (Ayenew, 2004).

All the lakes, except Lake Tana which is the source of Abbay River in the Nile Basin, are found in the Rift Valley. They cover an area of about 7000 km2 including a number of saline and crater lakes as well as several wetland areas. All the lakes are saline except lake Zway. Rising water levels, especially in Lake Tana and Lake Awassa, have been creating concern for salinisation after intense rainfall. Flooding due to intense rainfall can cause damage to agricultural crops and infrastructure. Flooding occurs mainly on the Awash River and in the lower Wabe/Shebelle and Baro/Akobo and river basins. Most of the rivers in Ethiopia are seasonal and about 70 percent of the total runoff is obtained during that period. The aggregate annual runoff from nine of the twelve major Ethiopian river basins is about 122 km3.

3.1.3.2 Wetlands

Large wetlands serve as a retention zone for river water. Besides this, wetlands are of enormous ecological importance since they hold the highest biodiversity rates of the country. Wetlands are often vital to the livelihoods of local communities especially during the 'hungry' periods just before the rainy season. One of the initiatives on wetland issues has been undertaken by the Ethiopian Wetlands Research Programme (EWRP) in Southwest Ethiopia. The research has shown that many wetlands have been severely degraded and destroyed as a result of mismanagement. The Ethio-Wetlands and Natural Resources Association (EWNRA) was formed in 2000 at the termination of the EWRP in order to provide technical guidance, support to institutional capacity and to raise awareness. They have initiated several projects under which the SIDA funded *"Integrated wetland and Watershed Management – a Landscape Approach Towards Improved Food Security, Poverty Reduction and Livelihood Enhancement"* and, in association with the Amhara Regional State's Bureau of Agriculture and Wetland Action: *"Community based partnership to reverse wetland degradation"* funded by the Embassy of Finland.

According to the Basin Development Studies Department (BDSD) of the Ministry of Water Resources (MoWR) wetlands are still degrading. Due to a lack of properly defined regulations much development takes place without permission, especially around Lake Ziway. The government has started to develop 3000 ha of land in the catchments of the Meki River. Pumps had already been installed, but the system was demolished by the

disowned farmers who were not previously consulted. A Master Plan of the Rift Valley basin has been proposed by the BDSD and contract awarding is expected soon (Hengsdijk en Jansen, 2006).

3.1.3.3 Irrigation

About 62 percent of the area equipped for irrigation is located in the Rift Valley. Ethiopia plans to develop an additional 274.612 ha of irrigated land (127.138 ha small-scale and 147.474 ha medium- and large-scale) up to 2016. Most of the irrigated land is supplied with surface water, while groundwater use is almost exclusively used in greenhouses for floriculture. The groundwater potential of the country is not known with any certainty. Salinity problems are being observed in irrigated lands along the Awash River and water pollution in the Awash River is becoming a concern. Neither desalinization nor treatment of wastewater is practiced in Ethiopia. Industrial effluents are being emptied directly into the river system and its tributaries in an uncontrolled manner. A major problem in the country is soil erosion and land degradation, resulting in the sedimentation of reservoirs and the high cost of allowing for silt accumulation in the reservoirs.

3.1.3.4 Groundwater

The groundwater flow in the Central Rift Valley area is largely controlled by the rift faults and flows to the lowest point of the Ziway/Abyata catchments. Groundwater is in quite some cases slightly brackish which is, most probably, the result of the dissolution of minerals that are present in the sub soils. The sediments covering the volcanic rocks in the Rift are composed of sandstone, limestone, silts and evaporate minerals. Also unconsolidated alluvial and lake sediments are present which generally have, generally, good hydraulic properties and allow for high groundwater abstraction rates.

Two main aquifers can be distinguished within the unconsolidated alluvial and lake sediments. The main groundwater resource for the water supply of the villages and farms is the shallower one of the two. This aquifer consists mainly of alluvial deposits and is in direct contact with the lakes. In addition, a number of springs are present, which are associated with the faulting of the rift system (tectonics) and the successive volcanic deposits in the highlands.

3.1.3.5 Energy consumption

89% of the electricity in Ethiopia is generated by hydroelectric sources. There is enormous potential to further increase hydroelectric power from the rivers draining the central highlands (EIU, 2006). In total, there are nine medium and large dams with a total capacity of almost 3.5 km3. The height of the medium and large dams in Ethiopia is 15−50 m and their capacity ranges from 4 to 1 900 million m3. Two large dams are used for

hydropower generation only, while other are used for hydropower generation, irrigation supply and water supply to the city of Addis Ababa and the town of Gondar. The council has already accepted four hydropower and four irrigation development projects proposed by Ethiopia. Sudan, Ethiopia and Egypt have also adopted a strategy of cooperation in which all projects to be launched concerning the river should seek the common benefit of all member states and this aspect should be included in the accompanying feasibility studies.

3.1.3.6 Soil conditions

Concerning the environmental conditions, soil type is the poorest valued environmental factor (see Table 4). Especially in areas with 'black cotton soil', e.g. the Debre Zeit area, substrate is desirable. Rainfall is not really an issue as all farms use irrigation/fertigation based on surface or ground water. However, during the rainy season (Jun – Aug) rainfall may create problems of flooding, high infections with fungal diseases and sub optimal temperature and radiation levels. The choice of location is foremost linked to the choice of altitude as this determines the type of crop and production goal. In case of roses a relatively high altitude will lead to higher quality (bigger flower bud), but lower production (less stems m^{-2}). The altitude of the 35 visited farms varies between 1600 m and 2650m.

Table 4: Managers perceptions on environmental conditions for the development of the floriculture sector

Element	Good	Acceptable	Poor
Soil type	12 (36%)	11 (33%)	10 (30%)
Annual rainfall	15 (45%)	16 (48%)	2 (6%)
Temperature	24 (72%)	9 (27%)	0 (0%)
Radiation	25 (76%)	7 (21%)	1 (3%)
Altitude	25 (76%)	8 (24%)	0 (0%)

3.2 General farm characteristics

3.2.1 Varieties

The majority of the farms analyzed produce roses in green houses (82%). Some rose farms have an additional propagation area. This is partially done for in farm use, but in some cases also for trade purposes. The rose farms produce various rose varieties. In

Appendix A the rose varieties of the 35 visited farms are listed. The three most popular rose varieties according to production area are:

1. Duet (13.8 ha)
2. Circus (6.1 ha)
3. Red Calypso (5.9 ha)

From the list of rose varieties it is shown that a large number of rose varieties are under production. There is no clear preference for specific varieties. However, the choice for a variety is mainly based on the market preference and demand according to the respondents.

Besides rose production, also carnation (tunnel greenhouse), ghypsophillia (open field), Hypericum (open field) and some minor open field flowers are grown. Also mixed systems were observed. Some farms have plans for future expansion of their farm area, but these numbers are not taken into account here. In figure 4 the varieties grown by the farms are presented. In this case all 35 farms are included. Some farms grow combinations of for instance roses, rose cuttings and hypericum.

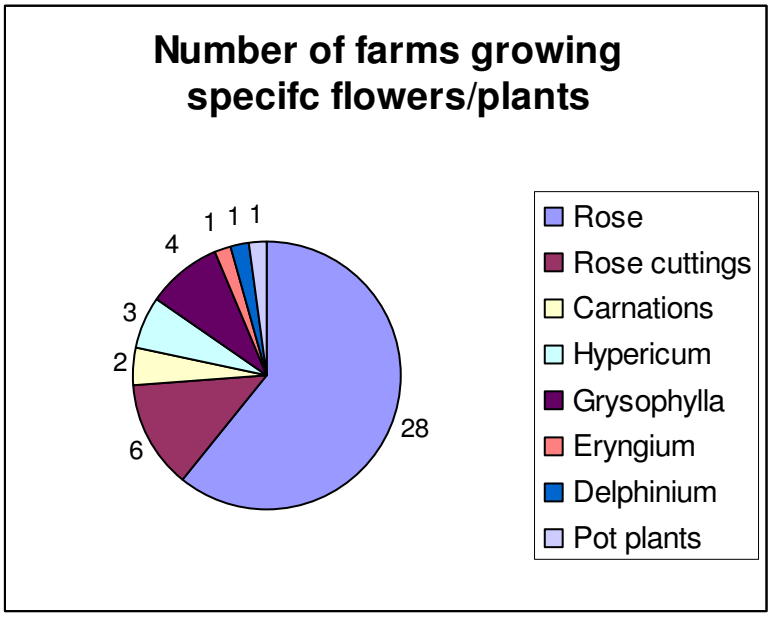


Figure 4: Number of farms with specific activities

3.2.2 Farm implements

All farms with greenhouses have plastic foil as a cover material. From the total of 28 greenhouse farms 22 have adjustable top cover windows. These farms have the possibility

to control the climate in the greenhouse to a certain extent by a computerized climate management system that is linked to the top covers. The other 6 farms have fixed open top cover windows and most don' t use a climate management system. The majority of the farms have flexible side screens for ventilation, which sometimes are connected to the computerized climate management system.

All farms use a computerized irrigation system for water and nutrient (fertigation) application. Most ghypsophillia farms make use of lamps to provide extra light. In some open field flower farms shade/protection nets were used.

Two general types of growing systems are applied: soil based and substrate based. 27 % of the farms use substrate as a growing medium, mostly red ash, sometimes coco peat, or a mixture of both with coarse particles at the basis and fine at the top. Most of the red ash comes from the Debre Zeit mountain area, coco peat is imported from Sri Lanka or India.

3.2.3 Inputs

To cultivate flowers for export in an adequate way, a variety of inputs need to be purchased. Part of these inputs can be bought within the country, others need to be acquired from abroad. Since the Ethiopian floriculture sector is very young, most of the more specialized materials required specially for floriculture are imported. Table 6 presents the results on the opinion of farm managers regarding the availability and source used to obtain the most important inputs.

Plant propagation is in its very early stage of development. For this reason, propagation material is mostly imported from abroad, and just occasionally purchased locally from the few farms with propagation areas.

Fertilizers and crop protection chemicals are both purchased locally from importing companies (Axum, Azrom, Golden Rose) or are directly imported from abroad. Availability of these inputs is not always satisfactory, since both the amount and choice of available fertilizers and chemicals is limited. Therefore several farms have problems with getting timely the proper fertilizers and chemicals in sufficient quantities. For this reason, in most of the farms stocks of 3 to 6 months, is common practice. This implies a considerable investment, and also an additional risk for accidents causing damage or loss of input. Most managers would like to see this situation change.

All farms import the construction materials for building greenhouses. The two companies with the highest market share in Ethiopia are Azrom from Israel and Richel from France. These companies have also local representatives whom provide advice and technical assistance by visiting the farms. However, in some of the farms material was also observed from Orgil (Israel), Green Span (India), Sita (Italy), Filclaire (France), Whete (Spain) and Aztor (Spain).

Regarding equipment, small tools can be easily purchased locally, but are also sometimes imported, since some managers consider the imported materials of better quality. Some respondents remarked that it sometimes is difficult to find the right person protection devices for chemical spraying. Furthermore, spare parts for large equipment is hardly available locally and therefore has to be imported. In some cases this may lead to long repair times for damaged equipment.

Table 5: Inputs availability

	Availability			Source		
Input	Good	Medium	Bad	Local	Foreign	Both
Basic plant material	12 (36%)	13 (39%)	8 (24%)	3 (9%)	17 (52%)	13 (39%)
Fertilizers	5 (15%)	18 (55%)	10 (30%)	7 (21%)	15 (45%)	11 (33%)
Crop Protection Chemicals	6 (18%)	16 (48%)	11 (33%)	10 30%)	12 (36%)	11 (33%)
Greenhouse	17 (55%)	9 (29%)	5 (16%)	0 (0%)	31 (100)	0 (0%)
Equipments	16 (48%)	12 (36%)	5 (15%)	2 (6%)	21 (64%)	10 (30%)

3.2.4 Availability work force

For most of the farms, low skilled labor force availability is not a problem. Field and post-harvest workers are sourced locally from nearby villages. Based on the total number of laborers of (10016 persons; n=33) and the total production area (299.35 ha; n=33), it can be estimated that 1 ha of flowers provides labor to 33 persons.

However, quality is an issue since skilled employees specialized in floriculture are hardly available. Due to this, all the farms provide on the job training programs. In most farms, the farm manager is a foreigner, since this position requires special knowledge about this sector for the farm to be able to comply with the international market requirements. The

managers contracted obtained their knowledge and experience in other African countries, such as Kenya and South Africa, or in The Netherlands, Israel or India.
In most farms, the field supervisor is Ethiopian. Most of them have with a degree in agricultural education (e.g. horticulture). However, the majority did not have specific knowledge nor experience with floriculture before entering the company. This is also caused by the fact that there is no academic program available in Ethiopian agricultural schools. These managers receive on the job training by the experienced foreign farm managers.

Switching of jobs between farms and a short time span of workers remaining in the same farm are problems related to labor market constraints that are often mentioned by respondents.

3.3 Relevant institutional framework

Since 1991 Ethiopia has a federal administrative structure constituting the federal and regional government. There is a number of Ministries and research institute that provide services and create an institutional framework to the floriculture sector that enables the development of the sector. The most important institutes and their relation to the sector are presented briefly in Annex C. However, in some issues, further development of rules, regulations and applied research and development is required, to support the sector to develop towards a more sustainable business model. However, this issue has not been analyzed with this research. Further analyses on the opportunities and constraints of the current institutional framework for the sustainable development of the sector is recommended.

3.3.1 Availability of public services and institutional support

3.3.1.1 Agricultural extension service

Since the Ethiopia' s floriculture sector is relatively young, an agricultural extension service for the floriculture is not present currently. At the time of the field research, there were governmental services for the horticulture fruit and vegetable branches in operation, but these services were not yet focused specifically on the floriculture sector. The respondents do not encounter this as a big problem yet.

However, considering the rapid growth of the sector more specialized governmental services for the floriculture sector would be preferable in the future. At a governmental level, useful services would be; qualified technical assistance to conduct Environmental

Impact Studies, capacity building programs on occupational health, public waste collection, and appropriate registration and labeling of agro-chemicals.

Government legislation and regulation is flexible as the government supports and stimulates the development of Floriculture in Ethiopia. Some respondents warn the Government to be avoid the risk of too concentrated cluster development in specific areas, since this could cause unnecessary pressure on local available natural resources in the future.

3.3.1.2 Availability of capital

The government provides the possibility of capital loans to new investors, which covers part of the total investment costs, and a tax-advantage. It is mentioned by respondents though that paper work for applications can often be time-consuming due to bureaucratic procedures.

3.3.1.3 Transport and trade relations

Ethiopia' s international export of flowers can still be considered modest if you would compare it to other African flower exporting countries, such as Kenya, Zimbabwe and Zambia (see table 6). In 2004 the total export value of flowers was €5.2 Million. However, this was an increase of almost 60% compared to 2003! In 2005 Ethiopia ranked the 19th position of exporters to the EU. With the ongoing floriculture investments, Ethiopia is expected to increase its export figures extensively in the near future (see also Joosten and De Jager, 2007).

Table 6: EU Imports of cut flowers and foliage (in € Million)

Country	2002	2003	2004	Increase 2002-2003	Increase 2003-2004
Ethiopia	**1,2**	**3,3**	**5,2**	175%	58%
Kenya	194,1	208,4	234,9	7%	13%
South Africa	10,1	12,9	15,8	28%	22%
Tanzania	8,3	6,2	5,0	-25%	-19%
Uganda	15,5	17,6	20,9	14%	19%
Zambia	22,1	17,5	14,2	-21%	-19%
Zimbabwe	64,6	57,2	40,7	-11%	-29%
Other	9,2	9,3	8,8	1%	-5%
Total Africa	**325,1**	**332,4**	**345,5**	167%	39%
Total Other	2718,0	2559,0	2486,0		
Total Import EU	3043,1	3222,0	3142,0		
% Africa of total	11%	10%	11%		

Source: Eurostat (2006)

In 2004 the number of stems exported from Ethiopia was 30 million. Still minor compared to Uganda (194 million stems), Zambia (63 million stems) and almost equivalent to Tanzania (31 million stems) but already a 370% increase compared to the preceding year. An exponential growth is expected to prevail in the 2005-2006 season. These data were not available at the moment this report was elaborated.

All farms have cold storage facilities at the production site and the products are transported to the airport by trucks with a cold storage. At the airport the products are stored in a cold storage and are further handled by the airport personnel due to airport regulations regarding safety issues. The quality of handling at the airport seems to be less than desired. Several of the respondents had remarks on probable quality loss at the airport due to cool-chain interruption or careless handling.

As table 7 shows the Ethiopian flowers are mainly sold to the two Dutch import auctions (i.e. Flora Holland and Aalsmeer Flower Auction VBA). Both auctions have a representative in Ethiopia. Other destinations are the German wholesale company Florimex. Of minor importance yet, are other European markets and the Middle East (Dubai).

Table 7: Export destinations Ethiopian flower sector

Trade	Farms (#)	Total Area	Percentage of total production (%)
Auction	12	161.6	54%
Direct sale	9	137.7	46%
Both	11	-	-

The respondents were asked if they had to comply to certain specific client or customer requirements. All of them indicated that product quality, product quantity, product price, fast response time, reliability and transparency are all requested in case of direct sales. A contract is often issued. In case of auction sale only product quality, reliability and transparency are major issues. Both in the case of direct sale and auction, corporate social responsibility is not an issue reflected in trade requirements yet or at least the current buyers do not request for it specifically.

3.4 Planning, monitoring and evaluation

The international voluntary standard schemes presently applicable to the floriculture sector are based on a process rather than a product focus. Conformity to these standards

certifies that a farm has put in place a documented management system that considers economic, social and environmental performance issues. The adequate use and compliance of the system is demonstrated through periodically repeated internal and external audits. This system can provide buyers (both business to business and final consumers) with greater confidence on the relation between the flower and its origin, since the certification implies that a system is in place that at least observes environmental and labor regulations and requires the discipline of farm management to implement and maintain such a system.

In practice, the implementation of the standards can be very flexible and adapted to the companies' special circumstances. It is this flexibility that allows the certification of a wide range of enterprises, regardless of size or type of business. The key requirements of implementing are captured in the expression "write down what you do, and do what you write down". In essence, a documented management system, either in the field of quality, environment or social issues, must be in place, and its implementation and application must be verified by means of external audits. Nevertheless, the norms will make a substantive contribution to the greening of industry only if and in so far as companies are committed to continuous improvement. Without such a commitment the norm will eventually become static ends in the form of improved visibility and a "seal of approval" for market access. Therefore, the implementation of a system according to these voluntary standards should be directly linked with the execution of a substantive and verifiable program of continuous improvement.

For the development of the EHPEA Code of Practice, the current practices on planning, monitoring and evaluation in place in the farms are thus important, since an important part of the requirements of the Code are focused on having a management system in place.

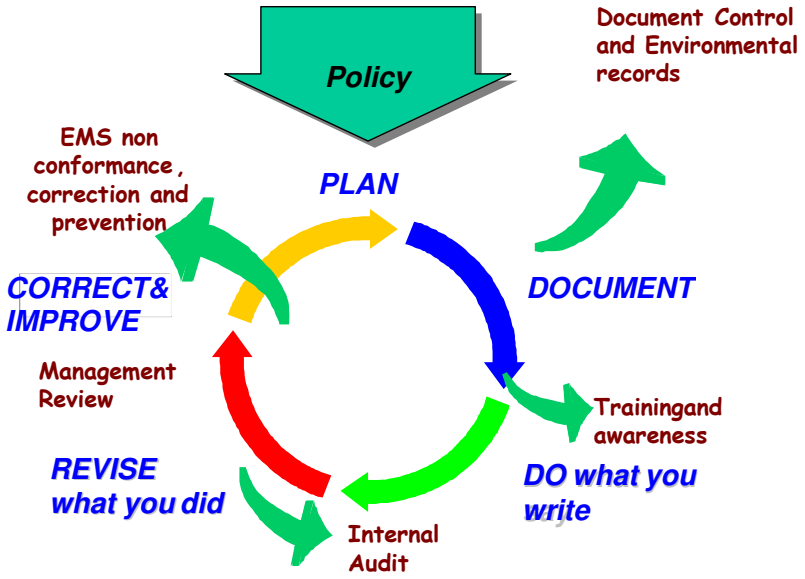


Figure 5: The planning, monitoring and evaluation cycle of voluntary standards

In the case of the Ethiopian flower farms, most respondents acknowledge conducting monitoring surveys at a regular basis. Nevertheless, during the farm visits one can observe that the monitoring systems in place, are mainly focused on controlling the cultivation process and the quality of the flower. And even though there are working procedures and instructions in place, the majority of the farms have not formalized them in a documented system, which might result in a lower than optimal working environment than desired by management, The absence of records for most of the farmers activities, limits the capacity of management to define and implement process adjustments. The majority of the procedures are focused on the efficient application of nutrients and chemicals. Nevertheless, in the majority of the farms these procedures do not include clear and correct instructions regarding the occupational health of the workers.

Data collection helps the planning, monitoring and evaluation process. For this, record keeping is important. In the farms under analysis, records are kept on; pest and disease monitoring, pesticide use and application, water use and irrigation, soil quality and nutrients application and production and harvesting. According to the respondents, soil analysis is carried out approximately every 1 to 3 months. Some farms send their samples abroad, but not all the farms have the capacity to do so. The quantity of ground water withdrawn from boreholes is monitored continuously mainly through the automatic irrigation system that is in place in most farms. The quality of the water is believed to be 'good' and apart from the initial test, by the company digging the borehole, no quality-testing is being. The evidence of these tests is kept at the farm. The most precise records kept by the farms are related to chemical stock and applications. The reason for

registering on this topic is mainly an economic one, since the inputs have to be bought (partially) abroad, for which long term purchase planning is required. Besides that, the chemical use imply one of the most important costs of the total production costs involved, for which precise bookkeeping is of its use is important. Sometimes records are kept for each greenhouse separately, but most of the farms manage them for the farm as one integrated system.

Especially when farms are MPS or otherwise certified with international voluntary standards, their recording and monitoring system is better and more easily accessible. As table 8 demonstrates, 5 growers have a certified management system in place and 6 are in process of getting certified. Four of the certified farms have more than one certification. Most common is MPS (MPS A - 3x; MPS B – 2x; MPS D – 4x; MPS unspecified – 2x). However, some farms are also in progress to implement other standards, sometimes even in a combined system; EUREP GAP, Max Havelaar together (1x), VLAG Florensis quality system (1x), and FFP (1x). There is just one farm that is certified with EUREP GAP, ISO, HCCAP and BRC together (1x) at the time the fieldwork was conducted.

Table 8: Certified management system

	Farms (#)	Percentage (%)
Yes	5	23
In progress	6	13
No	20	64

Additionally, 12 additional growers have indicated their intention to get a certified management system in place in the near future. Only, one grower noted explicitly that it was too early for Ethiopia to engage in such an integrative certifying system since the sector is still identifying its path.

Finally, the compliance to certain governmental procedures, create an internal system that obliges monitoring and evaluation. This is for instance the case for the Environmental Impact Assessment procedure. Of the 32 respondents, 24 (69%) have not carried out an Environmental Impact Assessment prior to commencing production. This is partially due to the fact that some farms initiated their business before 2002, when the EIA became a compulsory legal requirement. Partially, respondents also indicate that the procedure is difficult to understand and it is difficult to find experts to advise them on applying the procedure. Farms that receive Dutch funds through the so called PSOM program are required to conduct an EIA however this is not always equal to the EPA EIA.

3.5 Water Management

3.5.1 Irrigation and Water Quantity

Ground water is in general the main source of irrigation water for flower production. Only 3 of the 33 farms with data on water sources were not using ground water as a main source, but were using surface water from a nearby river. Boreholes are drilled at the farm site to pump the groundwater. Ground water availability may differ per area. The bore holes are used as a primary water source, while rainfall collection or surface water may serve as additional sources.

Table 9: Water sources

	Farms (#)	Percentage (%)
Ground water	29	91
Rainfall harvest	7	22
Surface water	10	31

At least 29 farms derive their irrigation water from boreholes of 20 to 120 m deep depending on the geology. 7 farms use rainwater supplementary to borehole water and 8 farms use surface water (rivers) supplementary to one of the above. Only 2 farms use exclusively water from the nearby river.

Based on the data collected it can be estimated that an average farm uses about 16750 m^3 of irrigation water ha^{-1} $year^{-1}$, taking into account different irrigation levels during dry season (8 months) and rainy season (4 months)[2]. The amount of water used per day varies from 24 to 83 M3/ha. Only 3 farms recycle drained water with an average of 30% return. Water uses for other purposes than irrigation are not included in this estimation, as the clear data on these levels were not available. It should be remarked that the estimation is a coarse calculation based on the answers of the respondents and needs a cross-check from other sources. All farms apply a computerized irrigation/fertigation system with drip

[2] The collected data on water management is used by dr. Huib Hengsdijk from the International Plant Science Institute of the Wageningen University in the Netherlands. This information was used for an initial presentation on his project "Ecosystems for Water, Food and Economic Development in the Ethiopian Central Rift Valley" during the 1st Horn of Africa Regional Environment Meeting (4 – 8 December). The presentation can be found in Appendix D.

irrigation, which enables full control over water and nutrient application. In case of certain crops and for propagation areas, overhead sprinklers are used as well. Only 3 farms combined their substrate growing system with water recycling.

The groundwater potential is believed to be sufficient and according to EPA a 200% growth is believed to be possible within the existing levels. However this has not been verified and no research has been done on the exact groundwater potential as of yet. Farms do sometimes experience a downfall of the groundwater level and gift from the boreholes especially towards the end of the dry season. One farm even indicated that his bore hole was waterless at the end of the dry season. The reason for this shortage, could be the strong increase of the number of farms preparing for production and using water from the only source available in the region.

Rainfall collection is an opportunity that could be beneficial in floriculture, as the large roof areas of the greenhouses enable easy collection of water with good quality. However, it is not common use presently as the majority of the farms are not yet confronted with problems regarding water shortage nor water quality. Nevertheless, the sector has been feeling already pressure due to this issue since some environmental NGO' s are emphasizing through the media on the potential negative effects of the water use by the floriculture sector. They fear water shortage and pollution due the fast growing sector in the future. This fear is partially based on earlier experiences with the floriculture sector in Kenya. In this case Lake Naivasha (Kenya) has been over exploited, for which pollution and declining lake water level were the result.

3.5.2 Water Quality

The rivers/surface waters that are used for the extraction of water are: Awash River, Dwegi; Belbela; Holetta; Gegel; Dobi River and Lake Ziway. Some of the respondents indicated that the quality of the river water is sometimes not good enough for direct use on the farm. Mainly the high concentration of organic material and particles are the reason for this. Due to this, growers using surface water always employ a sink basin and/or filters to separate out the particles. Besides filtering surface water for particles, 6 farms treat or cover their basins with a shade cloth against algae. Copper sulphate, nitric acid and phosphoric acid are used for this purpose. One farm uses reverse osmosis and UV to treat water for water born diseases.

Ground water seems to be of good quality, which does not need chemical treatment, and enables farmers to manage individually their water source (without interference with other water stakeholders). Before farms initiate production, ground water derived from a

borehole is toxicologically tested by the construction company as part of their responsibility. After initiating the use of the bore hole the water is not tested again for toxic substances. In general there is no reason to suspect the water would have toxic qualities. However since the water is in most cases also used by workers for drinking water purposes, it should be guaranteed that toxic elements are below the maximum tolerable level for drinking water (WHO). For instance, it is already observed that the groundwater has in some regions high concentration of some elements such as Se, Na and F (Valkman 2007). It is recommended to do further research on this.

The quantity and basic quality (not toxicology) of irrigation water used in the farm is monitored continuously. This is mainly done through the automatic irrigation system that is in place in most farms. Of the total number of respondents, 29 growers use the fertigation system to measure water and manage pH, EC and nutrient composition of the water, but the main purpose of these measurements is adjusting the amount of water to the performance of the flowers, and not the measurement of water to assure the sustainable use of this natural resource.

3.6 Weed, pest and disease management

In this chapter the general data on weed, pest and disease management collected by applying the questionnaire will be presented. More detailed information on this topic, is presented in the report on the environmental impact of pesticide use in Ethiopian floriculture that was conducted by S. Valkman in November 2006.

3.6.1 Pest and diseases

All respondents (32) were requested to indicate the main pests and diseases they have to cope with at their farm. The ones that were mentioned are shown in Table 10. It should be mentioned that not all farms have rose as a main crop, but also some other crops are cultivated. These farms are also taken into account in the Table 11. As can be observed in the table, the major problems encountered presently are Botrytis (88%), Downy mildew (88%), Red spider mite (88%) and Powdery mildew (72%).

Table 10: Main pests and diseases encountered in the Ethiopian floriculture sector

Pest / Disease	Season*	Farms
Agro bacteria (Crown Gall)	All year round	4 (13%)
Aphids	All year round	12 (38%)
Black spot	Rainy season	3 (9%)
Botrytis	Rainy season	28 (88%)
Caterpillars	All year round	8 (25%)
Downy mildew	Rainy season	28 (88%)
Powdery mildew	Dry season	23 (72%)
Red spider mites	Dry season	28 (88%)
Rust	Rainy season	3 (9%)
Trips	Dry season	18 (56%)

*) Rainy season: June – September

During the dry season crop production loss due to pests and diseases is relatively low (varying between 0-5%; according to estimation respondents). This in the contrary to the rainy season when crop production loss due to pests and diseases can be as high as 15-40%. This is mainly due to fungal diseases.

3.6.2 Crop protection management

All farms use chemical crop protection products to control pests and diseases in the greenhouse. Main target is Red Spider Mite (RSM); the average frequency of applying chemicals for RSM only is 3 times a week (see also Valkman 2007). Some farms apply additional cultural practices (e.g. removing dead or infected plant parts, cleaning paths between flowerbeds, ventilation).

Table 11: Types of weed, pest and disease control

Type of Control	Pest	Disease	Weed
Chemical	21 (66%)	20 (63%)	2 (6%)
Biological	0 (0%)	0 (0%)	0 (0%)
Chemical & Cultural Practice	11 (34%)	12 (37%)	4 (12%)
Cultural Practice	0 (0%)	0 (0%)	21 (66%)
None	0 (0%)	0 (0%)	5 (16%)

Detailed information on the chemical substances used for flower cultivation, as well as their potential impact on health and environment are presented in Valkman (2007).

For post harvest activities most of the farms also use chemicals. In most cases it concerns; aluminium sulphate, sodiumhypochloride, chloride, silverthiosulphate, calciumhypochloride. Sometimes other treatments like fumigation (post-harvest or pre-cool; mainly to prevent Botrytis) are also used. The products used are in accordance with the requirements of the markets the flowers are exported to.

The reasons for the use of chemical crop protection products the majority of the respondents mentioned are:

- The best option available at the local market
- Easy and effective
- Absence of alternative options (i.e. biological control methods)
- Lack of information / trainings on alternative methods

Preventive spraying is mostly applied for several main pests and diseases, for which spray plans are made in advance (on weekly or monthly basis). Based on the scouting for pests and diseases the plan can be adjusted per week/day accordingly. All farms scout for pests and diseases, of which 69% (22) farms scout every day (sometimes with exception of Sunday) and 31% (10) farms scout only a few times a week. In general the scouting is done by visual observation by special trained field workers. According to Leigh Morris, who undertook a previous research on cultural control methods a.o. on 32 flower farms: "…one farm visited offered a financial reward (1 Brirr) to any staff that found rust on the *Hypericum* crop" (Morris, 2006)

Other cultural control methods seen at farms are:

- Avoiding plant stress through correct and timely irrigation, feeding, pruning and maintenance, ventilation to reduce excess moisture mainly in the wet season and moisten the floor in greenhouses to reduce dust and Red Spider Mite in the dry season.
- Maintaining good hygiene: imported plant material is mostly certified with an officially recognised health certificate; every 3-4 days dead leaves, flowers and weeds are removed by hand; paths are swept regularly and sterile mats are placed before the entrance clean cold storage areas.

Probably more farms apply some kind of cultural practices to control pests and diseases than the 34% and 37% shown in Table 12, but it could be that most farm managers consider this so obvious that they did not consider to mention it during the interview. Weed control is in general done manually, and mostly only outside the greenhouse. Some respondents mentioned that they only use chemicals against weeds when the weeds are growing in the side screens of the greenhouses.

Regulations concerning crop protection products seem still to be unclear, at least to the farm managers interviewed. Government regulations are under development, this is mainly due to the fact that the sector is very new, and the development of new legislation takes time. Farms with MPS are using MPS guidelines, some farms that are a subsidiary of a company abroad, use the same guidelines as in their home country. Most farms use only the chemicals that are available at the distributors in Ethiopia. Nevertheless, at the moment the government is working on regulation and awareness building[3].

Constrains that farmers face regarding crop protection management are mostly related to the availability of chemicals, counting with the proper chemicals at the right time and in the right amount. Especially the chemicals to deal with Red Spider Mite are poor and not effective enough. Respondents mention that in this case biological methods already available in other countries, could be an interesting solution. However, the absence of clear regulation regarding the import of crop protection systems, has caused an import barrier for alternative crop protection materials, such as biological ones. Due to this, and the absence of information and knowledge on the topic, the use of Integrated Pest Management practices and biological crop protection methods is still very incipient[4].

3.6.3 Record keeping regarding crop protection

Respondents mention that chemicals are one of the highest fixed production costs. Therefore the majority of the farms has good record keeping on chemical use. This helps to simulate the efficient usage of the input, to keep control on the expenses and to monitor effectively the stock.

The majority of the farms also use records to register scouting activities. In this way the person in charge of the chemical application can easily decide to apply spot spraying or

[3] On request a copy of the material of Pesticide workshops for farmers on the inventory and registration of chemicals is available

[4] As part of the Netherlands Ethiopian horticulture partnership program, specialists from the international plant science department of Wageningen University facilitate the sector in developing integrated pest management practices.

full spray. In case of spot spraying sometimes coloured flags are used to indicate the area for the spray team against which pest or disease to spray. Most growers keep a log to register application method (spot, central, etc), date, time, amount, name of chemical and target.

3.6.4 Qualification personnel directly related to crop protection management

The farm manager, production manager or a specially assigned chemical expert is in charge of defining the application of the chemical crop protection products. Most of these managers have an educational back ground in agricultural sciences and chemistry. However, presently the local agricultural science programme lack specific courses for the floriculture sector. Due to this, most of the pest control experts whom are hired in the flower farms have obtained earlier experience in the sector in neighbouring countries. Of all farms, 56% obtain additional advice on crop protection management through a consultant, which is mostly from abroad (e.g. Israel, The Netherlands). Sometimes also information on crop protection is inquired from neighbouring farmers, from the chemical supplier, and through internet and literature.

Application of crop protection chemicals is done by special spray teams. The spray teams consist of men only. The level of personnel training is low and basic. Mostly trainings are given in field by supervisors and in general merely basic instructions on chemical application are given.

3.6.5 Protection measures

Protection measures for the sprayers (e.g. hand gloves, mask, long sleeved shirts, long trousers, apron, boots) are available at all farms. However, according to several respondents, not all sprayers use them. Supervisors really have to stress upon usage of the protection equipment by sprayers. Sometimes even sanctions are used for spraying without the proper equipment. Furthermore, it was not possible to check the quality of the equipment used, and every chemical needs a different level of person protection. If the right protection is used for spraying of a certain chemical could not be checked. In Picture 1 one example is shown of sprayers in action.

Picture 1: Example of spraying activities

In the majority of the farms washing facilities are available (at some farms temporarily ones, because they are still in construction), so sprayers can clean themselves by taking a shower after spraying.

3.6.6 Re-entry time

Some schemes of re-entry times (the time between spraying of the chemical and continuation of the field work activities) are being used in more than 50% of the farms, but most farms don' t have clear registers for it (i.e. specific re-entry time for each chemical). Sometimes door signs are used to inform the field workers that they should not enter the greenhouse. For certain cultivation systems (e.g. open field), re-entry times are not applicable.

In most farms, only one re-entry time is used for all chemicals or the rule of thumb is used that the greenhouse can be entered after the chemical sprayed is dried. This is mostly done for the chemical applications done in the night. However, there are cases in which chemical applications take place while worker are inside of the greenhouse. The related farm managers, explained that in these cases the chemicals applied were not harmful for human health. Nevertheless, there is no written evidence in place to show results of the analysis made and the critrerias used in order to take the appropriate decision.

3.6.7 Mixtures

Of all farms 75% (24) use chemical crop protection mixtures, because it saves time, it is more efficient and it saves resources. The respondents indicate that only chemical

mixtures are used when the chemicals are compatible. For this some farms do tests to check if certain chemicals are compatible, however not all of them apply this method.

Especially in case of Red Spider Mite mixtures are being used, to control spider mite eggs and spider mite adults. The respondents that do not apply mixtures, explained that they tried to avoid an increased resistance on pesticides in the green house. During the period of the field work, biological crop protection methods were not available yet in Ethiopia. However, almost all farmers are interested in using or trying biological products.

3.7 Nutrient management

In the farms regular soil quality checks are being carried out. In some cases this is done by laboratories abroad, testing pH, EC and Nutrient composition. Nutrient application systems are adjusted according to the outcome of the tests. Mostly this is an integrated practice incorporated through the irrigation application system (see Picture 2, integrated irrigation and fertigation technology).

Picture 2: Integrated Irrigation and fertigation system

Some farms, especially those located in areas with 'black cotton soils' or those who have been infected with *Agrobacterium tumefaciens* use hydroponic systems with 'red ash' as a medium. The Red Ash granules are clean and water efficient for rose production. Sometimes Res Ash is used in combination with Coco Peat.

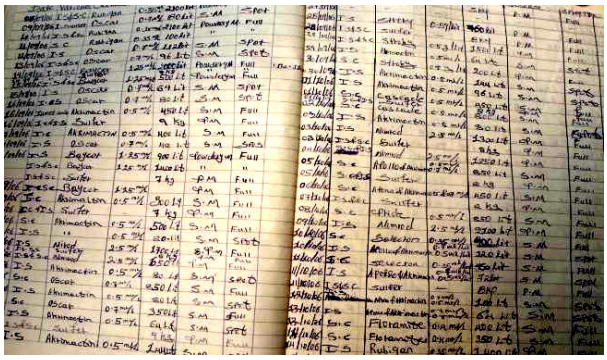
All farms apply a computerized irrigation/fertigation system with drip irrigation, which enables control over water and nutrient application.

3.8 Fertilizer and crop protection products storage and waste disposal

3.8.1 Storage of crop protection inputs and nutrients

The storage of crop protection inputs and nutrients is in general organized by storage in warehouses. Most farms have storage facilities that are locked so not authorized personnel cannot access. These warehouses are covered with a roof, inside the space has a solid (cement) floor and most of the warehouses are designed in such a way that ventilation is fairly well. Because some farms are still under construction, temporarily storages are also used, mostly containers.

In the majority of the farms crop protection products and nutrients are stored in separate spaces. In most cases, a manager with training and experience in agro-chemicals manages the stock control of the warehouse. This control is recorded in a bookkeeping system, with the main objective to control expenses and stock management (see picture 3).



Picture 3: example of agro chemical stock book keeping system

Though in many farms the warehouses appear to be organized, more detailed analysis shows a lack of practice in correct storage of products to prevent accidents. Also, in most cases the personnel does not count with protective equipment such as masks and gloves to prevent health problems when handling the chemicals. In Picture 4 a few examples of storage facilities are presented.

Picture 4: Examples of chemical and nutrients warehouses

In most of the farms general written accident and emergency procedures are not in place. There are no clear guidelines for accidents or emergencies regarding chemical storage and proper first aid equipments are hardly available (e.g. eye-shower).

3.8.2 Solid waste disposal

One of the major problems the Ethiopian floriculture sector faces presently is the currently ineffective and environmentally unfriendly disposal of waste in the country. The improvement of this public service is of utmost importance for the farms due to the large numbers of pesticide containers and other waste from pesticide use flower cultivation generates on a weekly basis.

Due to this situation, the most common waste treatment practices for solid waste are currently:

1) Perforating the package material (to prevent reuse),
2) Temporary storage and
3) Burning and/or burrying in a pit on a desolate part of the farm.

However, this is not a sustainable and hygienic way of treating waste on the long term, since chemical residues can easily enter the environment. Some respondents indicated they don't feel comfortable with this way of waste disposal and therefore store all their waste for the moment in a part of the warehouse, hoping that in the near future some kind of centralized public or private pick up and processing service comes available.

The polythene coverage is of variable quality and generally last from 2 up to 6 years. Since most farms have only recently started, the excessive amount of waste from removing and replacing polythene coverage has not been an issue so far. Some growers paint the strip above the metal framework white in order to reflect sunlight and reduce the heat of the metal frame. This way the polythene lasts longer (Leigh, 2006). In other countries, the polythene used to cover the greenhouses is usually returned to the distributor once they are ready for replacement. The distributor takes care of the recycling. However, there might be a possibility that the distributors in Ethiopia will put restrictions on the amount of film taken back. This is something that needs to be addressed before it becomes a problem.

The same can be said for other equipment and materials used in the industry. At present most equipment; machines, installations, computers, cooling instruments and isolation materials etc are relatively new and not ready to be disposed yet but this is a matter of concern for the future. Especially since for some growers, mainly those who are new to the industry and purchased their machinery without previous knowledge, it seems to be difficult getting spare parts.

No records are kept of the waste collected and its final disposal.

3.8.3 Liquid waste

Liquid waste concerns mainly water flushing or rinsing pesticides and nutrients used for the pest control applications. In most of the farms this water is disposed in ditches or areas surrounding the farms. This is an environmentally unfriendly practice, since it might affect the surrounding flora and fauna and pollute ground water and rivers. With

unchanged practice, this can cause severe pollution and/ or eutrophication effects in the future (Valkman, 2007)
Besides this run off, the majority of the farms indicate not to have surpluses of chemicals (i.e. chemicals that passed the expiration dates) because the inputs are just for a few months in stock at the farm, and farm management tries to apply as precise as possible the required amount of chemicals to prevent unnecessary production costs.

Seven farms collect waste water into a basin where it sits for a while before it is released into a ditch next to the road, this way the deactivation of chemicals can take place, however in the rainy season the basin is often overloaded and waste water spills into the environment or into the neighboring basin from where the water is used for irrigation

Several farms use waste pits filled with charcoal to deactivate some of the active ingredients from chemicals otherwise water is not treated or filtered. Most growers are painfully aware of this and try to reduce run off of chemicals by applying the rinsed solution and calculating this into their application schedule. Some others spread the run off over a large area where it can be filtered and cleaned naturally before entering the groundwater or river. However this will only have limited effect especially when highly persistent pesticides are continued to be applied (Valkman 2007).

3.9 Worker health, safety and welfare

As table 12 shows, 87% of the workforce in the floriculture sector works in the field or in post harvest activities. Farms count with considerable number of field workers and post harvest workers. These workers are hired depending on the availability of work. They are paid based on the load of work done during a fixed period of time. It is common use to hire these workers without any written contract.

Besides production activities, almost 15% of the workforce works in administrative or other related activities. In a considerable number of farms, these workers have a written contract for a fixed period.

Table 12: Composition of the work force

Work	Number of Workers (#)	Percentage of total work force (%)
Field	5333	73%
Post harvest	1042	14%
Management & Office	531	7%
Others	430	6%
Sub Total	7336	100%
Undefined*	2680	
Total	10016	

*) 5 respondents did not provide the information

Social issues related to occupational health and the wellbeing and welfare of the workforce, is of growing importance in the discussion on corporate social responsibility. Also the international voluntary standards applicable to the sector started to include requirements related to this topic. EUREP GAP focuses still mainly on occupational health issues, while MPS developed separate standards called MPS Socially Qualified. Besides occupational health, this standard also includes mandatory requirements on a number of issues related to well being and welfare. And incipient but obtaining growing interest within and outside the sector are the requirements of the Fair Flower and Plant label.

Both MPS SQ and FFP, base their requirements on the existing legal framework of the country under analyses. Nevertheless, in case of unclear local legislation they refer to the International Conventions of the ILO. These conventions include mandatory requirements regarding child labor, gender, forced labor, discrimination, among others.

Due to this growing interest, the researchers decided to include questions on this topic in the questionnaire, referring to legal and ILO requirements. However, in most of the farms, the respondents were not always well informed about the official legal requirements, or were not the officials working in these issues. For this, the majority of the results can be considered not more then perceptions and guesses. Were possible, we have tried to include information regarding the legal framework, to compare the answers to the official requirements they should comply with.

3.9.1 Working conditions

3.9.1.1 Minimum wage

The actual wages that are paid vary between 6-8 birr day^{-1} according to the interviewed respondents. Some farms apply a bonus system and mostly overtime is paid. According to the majority of the respondents it is unclear what the legal minimum wage is. Some respondents think it is 6 birr day^{-1}, others think it is 200 birr month^{-1}. The confusion is understandable, since the Ethiopian Labour Proclamation Act (legal Ethiopian document concerning labor issues) does not mention a precise minimum wage.

3.9.1.2 Minimum age

The legal minimum age of workers is 18 year. All of the farmers are aware of this fact and indicate not to have under aged workers in the farm. However, at the same time they explain that it is most of the time difficult to formally check the age of persons as birth certificates or identification papers are not available. Due to the need for work, some workers lie about their real age.

3.9.1.3 Working hours

All the respondents are aware of the fact that a worker should not work more than 8 hours a day and more than 48 hours a week. In general the respondents mentioned that these conditions are respected and that overtime is paid.

3.9.1.4 Safe working conditions

Most of the farms focus their efforts on creating safe working conditions especially on the protection of employees that are directly related to chemical handling. The utilization of Personal Protective Equipment (PPE) for employees working with agro-chemicals varies considerable between the farms visited. Respondents often mention that they instruct employees but that some employees continue to disregard safety guidelines. In some cases, special penalty systems are introduced to create awareness on the importance of following the safety instructions. This is mostly the case for farms that are already certified or in the process of obtaining a certification of one of the voluntary international standards such as MPS or EUREP GAP.

At the same time, Valkman observed that in some instances old and worn (PPE) is used which undermines its protective function. Especially for masks the impression exists that employees are using the same masks for spraying and mixing a variety of chemicals without replacing the filters or changing cartridges. A specific cartridge for powders for instance does not give protection for liquid sprays. This gives a false sense of security and can give serious health problems (Valkman 2007)

Post harvest fertigation is in some instances applied at night through fixed fertigation dispensers in cold storage room. However it is observed to be applied in the open air, without protection, next to the workers handling flowers. A common reply is that the concentration of the chemical is so low that this will not do any harm. This would indeed be true if it was not applied 5 times per minute on each bucket coming in from harvesting. The frequency here is more important that the concentration.

80% of the growers do not keep a register for after spraying entering time. It is not clear to some growers how long after spraying workers can enter the glasshouse safely again. Other growers do know but do not really employ a strict regulation so it happens that a few hours after spraying workers are allowed to enter the greenhouse again. In some instances it was also observed that pesticides were applied while people were still at work wearing no protective clothes or equipment at all (Valkman 2007)

Besides safety issues regarding chemical application, another safety issue concerns areas under construction. One of the respondents explained that the present design of greenhouses obliges to work elevated of the ground to be able to finish the structure and place the polyethylene cover. This sometimes causes severe accidents for the workers. Farms do not guide with clear, written instructions on this issue. They provide the workers with verbal information and basic protective gear.

3.9.1.5 Freedom of organization

There is no labor union for the floriculture sector present. At a few farms the laborers have organized themselves with one or two representatives. The majority of the respondents says that if the laborers want to join a labor union or want to push forward one or two representatives, that will not be a problem to them.

3.9.1.6 Security of employment

In general, field and post harvest workers are employed without a written contract and thus without formal security of employment. In contrast, in most of the farms the farm managers, production managers and sometimes office workers and supervisors are under contract. Only 5% of the farms have contracts for all workers.

Some respondents reply that they treat the workers without a contract like contract workers. Furthermore, respondents remark that workers can come to work at their farm everyday if they want, but they just do not. They tell this is probably due to cultural or mentality factors (short-term vision). Switching of jobs between farms and a short time

span of workers remaining in the same job are problems that are often mentioned by respondents.

3.9.1.7 Gender

The majority of the laborers is female. They are taking care of field and post-harvest activities. The minority of male laborers carry out chemical spraying and some maintenance activities. Office employees, managers and supervisors have mostly higher education degrees, with no clear gender differences.

The legislation regarding pregnancy leave is unclear. Applied is 1 month before pregnancy and 2 month after paid leave (mostly only for contract workers). Most farms are afraid that if they introduce pregnancy leave to all workers, that misuse will be made of this arrangement.

3.9.1.8 Pension provisions

None of the farms provide pension provision.

3.9.1.9 Medical service

Some farms have a periodical medical check-up for the spray team. For other workers medical care is provided when needed, for instance if something happens during working time. In most cases this concerns public health services in the near surroundings of the farm. However, in some cases farms are located in remote areas were these public services are not present. These farms have created their own medical services to avoid severe problems in the case of an urgent situation.
A few farms indicated that they provide a special insurance for all labourers working on the farm.

3.9.1.10 Forced labor

In none of the farms forced labor is used. Workers are free to leave in the moment they want.

3.9.1.11 Community support

Support to the community is something the majority of the farms consider important (69%). This support consists of:

- Providing clean drinking water
- Funding/contributing to the development/construction of a school, church, kindergarten, clinic, etc.
- Construction of a road

In many cases this support has been partially the result of the development of services for the farm not present at the moment construction initiated. The services developed were shared with the community. Besides these services, also providing employment is one of the important extras the farms have contributed to the community.

4 Observation and recommendations

Based on the fieldwork, it is possible to derive a number of observations and recommendations regarding the current sustainable management practices applied in the Ethiopian flower sector. Since the objective of the fieldwork was to collect data to be used in the development of the EHPEA Code of Practice (CoP), the observations will be mainly focused on issues that will be taken into account in this Code.

For the presentation of the discussion the structure of the general design of the EHPEA code is used. This structure was developed by representatives of EHPEA in a workshop in November 2006.

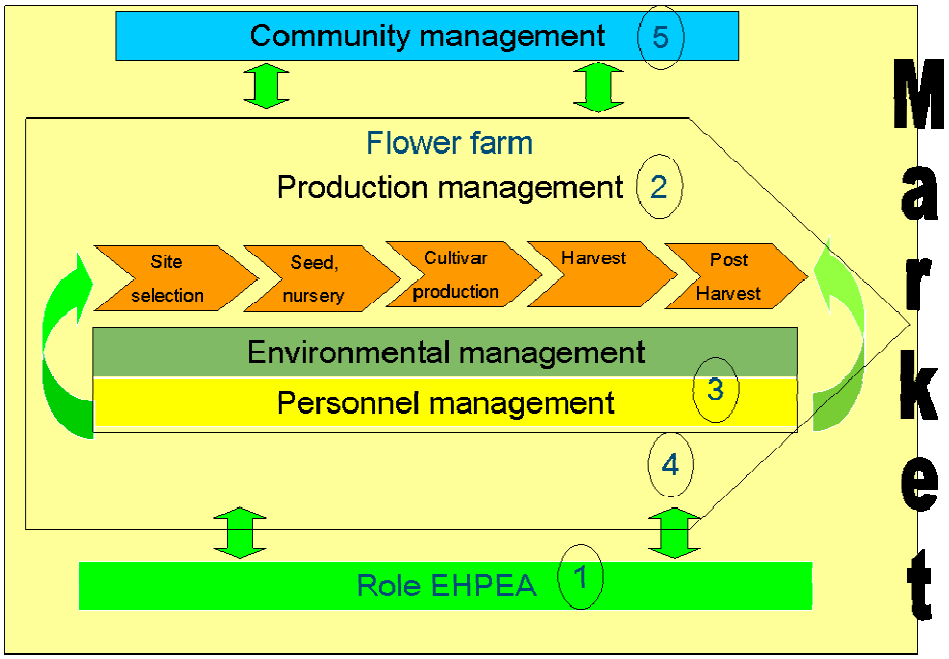


Figure 6: Structure EHPEA Code of Practice

The content of the CoP will consist of five main chapters, being the role of EHPEA, production management, environmental management, personnel management and community management. The objective of the fieldwork was to collect data regarding the current sustainable management practices used in Ethiopian flower farms. Since the role of EHPEA in the development of the CoP was not an issue for analysis within this assignment, this report will not present conclusions on this. However, some general recommendations are included, focused on certain specific support EHPEA could provide to its members, in order for them to improve their sustainable management system.

4.1. General comments

As stated in the introduction of this report, for the design of the Code of Practice the most important international standards on sustainable flower cultivation for the Ethiopian flower sector were considered for the content of the questionnaire. These standards are mainly used in business to business relations between flower producers and European buyers. The standards considered, were EUREP GAP, MPS GAP, MPS A,B,C, MPS SQ. Additionally, the International Code of Conduct, being the basis of the Fair Flower and Plant label, were analyzed. The environmental, production and occupational health issues this ICC raises, are also considered in the other standards. However, the ICC includes also some more elaborated lists of requirements regarding welfare issues and general well being of the workers. For this, general questions on these topics were also included in the questionnaire.

It is important to recall that the fieldwork was ***never meant to replace an initial audit*** *for* all or either one of the international standards mentioned. These audits are normally conducted by an external expert in order to analyze the exact level of compliance and gaps of the current practices applied in the farms in comparison to these standards, and take a considerable amount of time for each farm. Due to time and budget limitations, it was not feasible to conduct such audits.

Nevertheless, the fieldwork has been a type of quick scan, to obtain a first insight on most pressing environmental and social issues at farm level. The application of the questionnaire has made it possible to identify the most urgent gaps between the requirements of the international standards mentioned and the current practices applied at farm level. This information is used for different purposes:

1. To create awareness of representatives active in the sector on the issues improvements and adjustments are required in order to have a state of the art sustainable management system in place.
2. To feed the discussions in the workshops in order to define the content of the CoP.
3. To feed the discussions between EHPEA and other stakeholders, to define common actions to enable the sector to comply with the requirements of the EHPEA CoP.

4.2. Production management

Internal audits

- Regarding internal audit procedures, most farms have a professional bookkeeping system in place, that by law needs to be audited periodically. However, there are just two farms that have an integrated management system in place that includes an internal audit procedure, being the farms certified with EUREP-GAP, ISO, Max Havelaar and/or HACCP. The procedures of these standards require an internal audit procedure, in order to stimulate the continuous improvement process. The MPS A/B/C system does not include such a procedure. The development of an internal audit procedure will help management to obtain a better insight in the companies' processes, flows and performance.
- Since it concerns a general procedure, it could be developed at a sector level and put in place by each individual firm.

Traceability

- Most farms have procedures in place to monitor the flower production from harvest till the delivery at the airport. This allows the farms to trace the origin of flowers rejected by the market. However, most of the farms do not have a formal procedure in place, nor registers of the different activities taking place between harvest and delivery, which allows to identify the precise origin of the problem.

Record keeping

- Regarding record keeping of production activities, the farms register the origin and choice of the varieties used.
- Since, the majority of the farms buys the varieties from foreign breeders, a procedure regarding the requirements on rootstock does not apply to these farms. However, the CoP should indicate the requirements for the farms developing breeders activities, indicating that these requirements only apply to them.
- All farms have a bookkeeping in place that is used to register data on the type of chemical applied in the greenhouse, amount requested to be applied, chemicals and fertilizers in stock, use per plot, name employee, date. The main purpose of this record is stock management and monitoring the efficient use of crop protection products. In most cases, the data collected are not used to analyze the opportunities to reduce use nor to consider alternative, less harmful crop protection products.

Varieties and rootstock

- For the initial production, all farms have used imported varieties. These varieties origin from official breeders and are accompanied by an official certificate.
- The Ethiopian government has not signed UPOV. For this reason, foreign breeders have not yet entered the market, and initiating local breeders will have difficulties to export through the official channels.
- A small number of farms have initiated their own breeding activities. For these farms it will be important to comply with the requirements of the reference standards regarding seedlings quality certification, prove the varieties degree of resistance to pest and diseases, evidence the seedling is free of pests and diseases, records of possible treatment with chemicals.
- In case of in house production of parental material and young plants, the farms should be able to demonstrate the health of the plant, records on crop protection methods applied and prove of plant health.

Site history and site management

- Ethiopian law limits the possibilities of private ownership of land. The sites used at present for flower cultivation, are owned by the government. At least 18 respondents confirmed they had conducted a risk assessment before initiating construction. This assessment is normally done as part of the formulation of the business plan. The most pressuring issues that were considered in this assessment were; available infrastructure, available potential work force, available water resources, distance to the airport. Site history are not considered as an important risk, since the terrains used to be farm areas.
- Of the information collected through the fieldwork, it is not clear if growers have conducted soil analysis before initiating production to analyze the possible presence of harmful agro-chemicals. This is an issue to be considered in the CoP.
- In the majority of the farms the greenhouses are physically identified, as well as in most cases the plots. However, the fieldwork did not include a check on the use of this identification throughout the whole process.

Harvesting

- Regarding this issue, especially EUREP GAP provides specific requirements that are especially related to personnel hygiene and packaging. These requirements will be considered in the EHPEA CoP.
- The farms do not have a risk assessment procedure in place that covers the harvesting operations.
- The farms do not have a formal hygiene protocol in place.

- Were applicable there should be a cleaning procedure in place to ensure no remaining foreign materials are present in the buckets used for temporary storage of harvested flowers.
- The farms do not have a formal control measures in place to guarantee the storage of consumer packaging free of pests, rodents, birds, physical and chemical hazards.
- In most of the farms, employees can use toilet facilities that include washing facilities. In some they are still temporary solutions due to the construction phase they are in.

Post harvesting

- Especially EUREP GAP provides specific requirements on this issues. These are specifically related to personnel hygiene and packaging. These requirements will be considered for the EHPEA code.
- The farms do not have a procedure in place to revise and clean entering and leaving barrels. This might create risks related to remaining residues that could harm employees or other people handling the flowers.
- For post harvest activities most of the farms use chemicals. In most cases it concerns; aluminium sulphate, sodiumhypochloride, chloride, silverthiosulphate, calciumhypochloride. Sometimes other treatments like fumigation (post-harvest or pre-cool; mainly to prevent Botrytis) are also used. In the farms there should be a procedure in place to monitor if the chemicals used might be harmful for personnel, other external people whom treat the flowers and end users.
- The respondents seem to apply the chemical fertigation treatment in a preventive way. None of the respondents indicated to consider possible alternatives to substitute chemical fertigation. Since the focus of the majority of the international standards is based on the continuous improvement cycle, a procedure should be developed to stimulate the search for reducing the use of chemical substances.
- From the fieldwork it has not become clear if the farms count with written agreements on the use of post harvest chemicals.
- There should be up to date information in the farms that confirms the official registration of the chemical substances used for post harvest treatment.
- The farms do not have records in place to register the appropriate training employees have received whom apply chemical substances during post harvest activities.

4.3. Environmental management

Soil and substrate management

- In the farms regular soil quality checks are being used. The nutrient applications are adjusted to the results of these tests.
- The farms should have a procedure in place to search for non chemical substitutes to treat the soil. Currently this procedure is not in place in the farms, with exception of the farm that is EUREP Gap certified.
- The use of methyl bromide is not allowed.
- In some farms substrates are used. The fieldwork did not include an in detail analysis on the place of origin of these substrates nor on the way these substrates are treated before use. Nevertheless, these farms should take into account that they require written evidence that these substrates do not come from natural reserves. If these substrates are inert, the farms should participate in a recycle program.
- In case the substrates are sterilized in the farm, this has to be recorded , including information on application date, trade name, active ingredient, type of equipment, application method and name of person applying.

Water/ Irrigation and fertigation

- The majority of the farms use groundwater for irrigation. The groundwater potential is believed to be sufficient and according to EPA a 200% growth is believed to be possible within the existing levels. However this has not been verified and no research has been done on the exact groundwater potential as of yet. Farms do sometimes experience a downfall of the groundwater level and gift from the boreholes especially towards the end of the dry season. One farm even indicated that his bore hole was waterless at the end of the dry season.
- Currently farms measure their water use as an indicator for efficient and suitable pesticide and fertilizer application. The farms do not have a formal sustainable water management system in place that helps to guarantee the efficient use of the available water resources.
- All farms have a drip irrigation system installed. Managers should register the water use and analyze periodically the consumption patterns.
- In most farms the water at the farm is also used by workers for drinking water purposes. For this, it should be guaranteed that toxic elements are below the maximum tolerable level for drinking water (WHO). For instance, it is already observed that the groundwater has in some regions high concentration of some

elements such as Se, Na and F (Valkman 2007). It is recommended to do further research on this.

- The farms do not use untreated sewage water for irrigation.

Fertilizer use

- All farms visited have a record in place to register periodically the use of fertilizers and crop protection products. Some farms have automated registers, including data related to the plots the products were applied, other farms have a more traditional manual system, that includes in most cases limited data mainly focused on stock management, and not on relating product use with efficient and effective flower cultivation.
- Most farms conduct periodically soil analysis. Some farms send the samples abroad, to obtain more precise results. These results are mainly used to monitor fertilizer use. The results of the fieldwork do not provide an answer if farms conduct periodically risk analysis, and use these besides the soil analysis to plan fertilizer and crop protection use. Farms should conduct both analysis frequently and use them as a planning instrument. This helps to reduce costs due to unnecessary loss of crop protection products and fertilizers, and the risk of potential weakening of the natural resistance of the flower to pests and diseases.
- Most of the respondents confirmed the competence and periodical training of employees applying fertilizers. However, most of the farms do not have formal procedures nor records in place.

Crop protection

- All farms apply chemical crop protection products to combat a number of pests and diseases. Additionally, some farms apply mechanical weed activities, but none of them applies biological crop protection methods.
- None of the farms apply integrated pest management methods. The main reasons indicated for this, is the legal difficulties encountered to import biological pest control methods and a lack of knowledge and experience with these methods (see Valkman, 2007 and Den Belder and Eerlings (2007), for more details)
- In some farms, residue of crop protection products can be observed on the leaves and the bud. These should be removed during the post harvest activities.
- Spray plans are made in advance (on weekly or monthly basis). Based on the scouting for pests and diseases the plan can be adjusted per week/day accordingly.

- All farms scout for pests and diseases, of which 69% (22) farms scout every day (sometimes with exception of Sunday) and 31% (10) farms scout only a few times a week.
- Farm managers do not have specific knowledge on the local legal indications regarding legally approved crop protection products. It was indicated that this specification is under development by the Ministry of Agriculture. As an alternative for this lack of a clear local legal framework on the procedures of crop protection products registration, growers could consider buyer or consumer indications, and the WHO listings on the classification of crop protection products in relation to environmental risks. The farms certified with MPS A/B/C or are in process to become certified use the MPS specifications on allowed product use. It is recommended to distribute the WHO listings to all the EHPEA farmers, and organize training activities to create awareness on the product characteristics of the products in use at the moment.
- Most of the respondents confirmed the competence and periodical training of employees applying crop protection products. However, most of the farms do not have formal procedures nor records in place.
- More than 50% of the farms contract external consultants to receive periodical advice on the application of crop protection products and mixtures. It is important that these advices are documented and that related employees receive the appropriate training for them to understand the reasons behind the advices.

Fertilizer and crop protection product storage

- All farms store their fertilizer and crop protection products in locked warehouses. These warehouses comply with basic requirements regarding ventilation, roof, limited access. However, most of the farms do not comply yet with specific rules regarding accident prevention plans. No formal procedures are in place. And in some farms there are no emergency facilities in place.
- Most of the warehouses are not fire resistant.
- Some warehouses are also used for the temporary storage of waste such as obsolete products and empty packaging without its clear identification. Clear signs should be put in place to identify the different products stored.
- In most farms the crop protection products are stored in a more organized way, than the fertilizers. In some farms, fertilizer spoilage on the floor was observed, as well as water. There were no procedures in place to prevent or correct this situation in the appropriate way.

Waste disposal and pollution management

- In Ethiopia there is no well functioning public waste collection service in place in the regions the flower farms are located. Due to this, farms have to define an internal solution for the disposal of waste generated. Most common practices used are burying, burning or on the surface disposal in assigned areas inside or in the direct surrounding of the farm. Burning and on the surface disposal are not accepted by the voluntary standards used for verification.
- Farms certified with MPS A/B/C or in process to obtain certification, destroy the crop protection product packaging and deposit the remaining parts in a specially assigned and identified hole. This practice is accepted by MPS. However, this practice will cause unacceptable harm to the environment and a risk for pollution of people in the direct surroundings of the farms at the long term. EHPEA together with the responsible governmental entities should start developing solutions for this pressing problem.
- None of the farms has documented procedures in place that enable the appropriate identification of waste and pollutants flows, and the way to proceed to store and treat these pollutants in an appropriate way.

Local flora and fauna protection/ Environmental enhancement

- None of the farms has a specific policy plan on conservation of flora and fauna inside the farm and in its direct surroundings. However, some farms have initiated activities to replant trees and protect forest areas within their farm as part of a nature conservation plan.
- None of the farms has a energy consumption management plan, nor have procedures in place to reduce energy use to minimize consumption.

4.4. Personnel management

Health and safety

- Employees handling crop protection products have received at least the required basic training at the farm. In some farms, the assigned employees also have enjoyed training and education out side of the farm. However, most of the farms do not have a formal procedure in place to document the training of personnel nor their former experience.
- In most farms, employees handling crop protection products receive basic protective equipment. However, most farm managers complain about the problems they face to oblige their employees to protect themselves in the appropriate way.

- In some farms employees handling crop protection products receive a periodical medical check. There is no formal procedure in place, and records are not kept of these activities.
- In some farms, a rotation system is in place for employees to work for not more than one year in a row in the application of crop protection products.
- In some farms, the personnel protective equipment used, seem to be too much used, which could cause a risky situation since the protection capacity could not be appropriate anymore. Employees responsible for the management of this equipment, seem not always have the appropriate knowledge to monitor the quality of the equipment.
- Most of the farms do not have clear re-entry procedures in place. There is a lack of knowledge on the relation between the characteristics of the crop protections products used and its related re entry times to be considered. This information can be obtained through the WHO. It is advised EHPEA request this information and distributes it among its members.
- In some farms it was observed crop protection products were applied while other farm activities were taking place. These practices should be abandoned as soon as possible.
- Most farms have a washing facility in place for the workers handling crop protection products. In most of the farms, these facilities are not to be used by all field workers.
- In most farms there is not a formal accident prevention and emergency procedure in place, nor is there emergency equipment available in different areas of the green house.
- In most of the farms only employees handling crop protection products receive training on the risks of using these products. The other employees do not receive such training.

Employment conditions

MPS GAP and EUREP Gap requirements are more focused still on occupational health issues, and only specify in a general way, some requirements regarding employees welfare. However, since the end of the 1990s a clear trend can be observed regarding market pressure on social issues such as employee labor conditions. MPS SQ provides more specific requirements on this issue, as well as the Fair Flower and Plant Label. Both standards base they requirements on the Universal Declaration of Human Rights, The Convenant on economic, social and cultural rights of the United Nations and the core conventions of the International Labor Organization (ILO).

- In most farms there is not a formal procedure in place to document the experience and qualifications of each employee, nor are records kept of the training provided to each of them.
- Most farm managers are well informed about the basic labor laws that apply to their workforce. Respondents indicate they respect the maximum daily and weekly work hours allowed, and pay over hours. The fieldwork did not investigate if this applies also during peak moments of production.
- In most farms there are no formal procedures in place on the labor conditions applicable. Most farms do not have specific training programs in place to inform their employees specifically on rights related to association, discrimination, annual leave, etc.
- Ethiopian legislation does not indicate specifically the legal minimum wage to be paid in this sector. Due to this, most respondents have the impression they pay minimum wage or a little bit more. The average wage per day paid is around 7 birr. It is recommended to negotiate a common agreement among the sector and the related public entities to define more specific legal indications on this, for the sector to be able to defend themselves against criticism from other stakeholders in society.
- Most respondents indicated that field workers are contracted based on verbal agreement. There are no formal contracts in place for these workers. In most farms administrative and management related employees have contracts. In most cases these are temporary contract.
- The majority of the respondents indicated that the employees are free to associate to labor unions or to organize a workers association. However, in none of the farms such association is created. One farm informed about an occasional situation in which employees organized themselves to bargain collectively better wages.
- During the visits, no children were observed within the farms. Most farm managers indicate that they try to avoid contracting under age employees. However, this can not be verified easily, since many rural people are not registered in the birth control register.
- There were no signs observed of people working at the farms against there own will.
- In most farms, there were no signs observed of gender discrimination. However, the majority of the harvest and post harvest activities are done by women and the pest control activities by men.
- None of the farms provide pension plans to its personnel. This is against the existing legal requirements in place.

- Just in some farms medical services are provided to the employees. This should be in place in every farm.
- Most of the respondents indicated to respect the legal indications regarding maternity leave. However, there are no records in place were these periods are registered.

4.5. Community management

- Occasionally, most of the farms provide support to the community. In most cases this concerns, drinking water facilities, road infrastructure, and the construction of schools. There are no formal procedures in place to include these type of activities in the regular management plan. Such a procedure could help management, to proactively plan support to the community, reserve budget, but also use this information for internal and external communication purposes. This might stimulate employees' dedication to the farm and improve the relation with the community and community related external stakeholders.
- None of the farms has a written procedure in place to guarantee the safety of visitors inside of the farm. During the field work, it was observed that some farms provide visitors personnel protective equipment before entering the crop protection products warehouse.
- With the exception of the farm being EUREP GAP and ISO certified, none of the farms have a formal complaint procedure in place. This procedure should put in place to enable employees and external stakeholders to share their concerns and observations for improvement with management.

4.6. Final conclusion

The EHPEA CoP will be a guideline for new and existing Ethiopian flower and ornamental plant growers. The structure and content of the CoP allows these growers to enter a cycle of continuous improvement towards more sustainable cultivation practices. For this, it is recommended that EHPEA will develop a gradual scheme that enable growers to comply step by step and in an effective way to state of the art voluntary standards (see figure 7). This could be done by defining requirements for three different levels of compliance: the bronze, silver and gold level. This gradual system prevents the sector to jeopardize its competitive position in the international market.

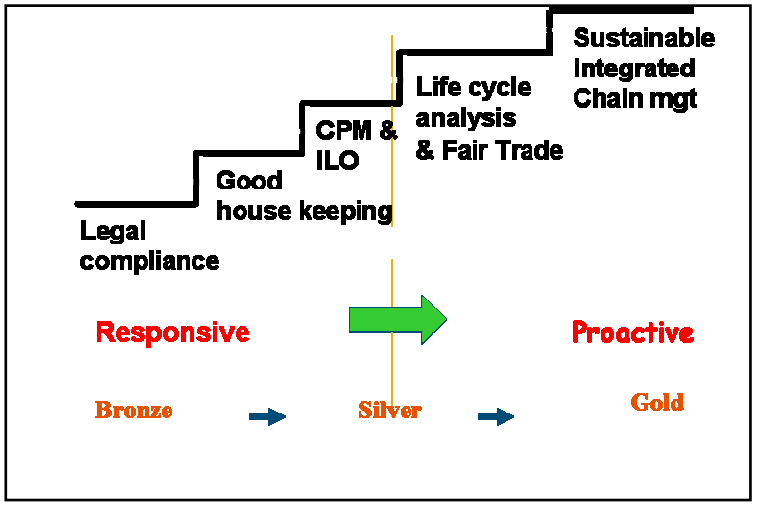


Figure 7: EHPEA gradual scheme to stimulate social responsible farm management

Each level could be rewarded by EHPEA through a certificate. Farm managers can use this certificate for internal and external communication purposes. Next, some suggestions will be done on the specific topics and requirements that could be considered for each level.

4.6.1. Bronze level

The Bronze level is the minimum level Ethiopian flower and ornamental plant farms should meet to be able to export their produce.

Objective:

Compliance with the requirements of the bronze level enables Ethiopian farmers to put a basic management system in place that ensures the planning, monitoring and evaluations of key sustainability issues at cultivation, post harvest and distribution level.

Results:

Compliance at bronze level ensures that the farm:

- Has put a monitoring and evaluation system in place that complies with the MPS A/B/C requirements.
- The farm measures, documents and evaluates every month its performance on water consumption, pesticides use, fertilizers use, waste management and energy consumption.
- The farm uses the information of the monthly performance evaluation to take the required corrective actions in order to remain between the sector wide defined range.
- Complies with the basic good occupational health practices that ensure the safe use and storage of pesticides and its related equipment.

- Has its personnel enrolled in a general training and awareness building programme on sustainability issues at the workplace.
- Has put a personnel management system in place that ensures safe working conditions and job security.

4.6.2. Silver level

Objective:

The Silver level enables the Ethiopian flower and ornamental plant farms to meet national and internal legal compliance, and basic flower cultivation practices demanded by the European retail sector.

Results:

Compliance at silver level ensures that the management system put in place at farm level complies additional to the requirements at bronze level with the following requirements:

- The farms has put a professional auditing system in place that allows the periodical evaluation of the sustainable management practices put in place.
- Ensures farm compliance with Ethiopian laws and regulations regarding:
    - Sustainable site management: an Environmental Impact Assessment has been carried out and adjustments have been taken into account in to ensure sustainable site management; sustainable soil and substrate management practices have been put in place.
    - Sustainable water use: farm water use is measured and practices are put in place to ensure the sustainable consumption of available water sources
    - Safe pesticides use and storage: a pest control planning and monitoring system is put in place, the pesticides and fertilizers storage complies to internationally recognized safety and health conditions.
    - Safe waste management: a sustainable waste management system is put in place that complies with national legislation and MPS A/B/C requirements,
    - Occupational health: Personnel related to pest control activities is trained on the risks of its job position and the correct use of personnel protective devices, internationally recognized re-entry times are put in place, a general emergency and risk procedure is put in place at farm level, all personnel is trained for the general accident and emergency procedures.
    - Labour conditions: a personnel management is put in place that guarantees its compliance with Ethiopian laws on: job security, discrimination, minimum wage, minimum labour conditions, gender,

forced labour, child labour, and the right to organize and collective bargaining.

- Ensures market compliance with requirements related to:
  - Sustainable post harvest practices
  - Accepted pesticides residue levels.
  - Safe pesticides and fertilizers storage
- The farm has put a management system in place that allows the data collection, reporting and evaluation of its sustainable management performance, and has put a procedure in place to take its required corrective measures.
- The farm has put a complaint procedure in place for visitors and other stakeholders and has installed a procedure to take the required actions to respond.
- The farm plans, monitors and evaluates activities that improve nature conservation and support community development in the direction surroundings of the farm.
- The farm will be able to obtain MPS GAP/ EUREP GAP certification.

4.6.3. Gold level

Objective:

The Gold level enables the Ethiopian flower and ornamental plant farms to meet good flower cultivation practices demanded by the European retail sector.

Results:

Compliance at gold level ensures that management system put in place at the farm complies additional to the requirements at bronze level also with the following requirements:

- The farm has put a system in place that enables Integrated Pest Management.
- The farm introduced biological crop management systems that enable a significant reduction of pesticides use.
- The farm has installed an international recognized sustainable waste management system.
- The farm has put a personnel management system in place, based on internationally recognized fair labour conditions, as indicated by the ILO conventions.
- The farm will be able to obtain FFP certification.

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Annex A: Rose varieties and other cut flowers

Table A.1: Rose varieties and other cut flowers

Rose Variety	Farms (#)	Total Area (ha)	Rose Variety	Farms (#)	Total Area (ha)
Aloha	3	3.3	High & Magic	2	1.6
Alyssia	2	0.7	High Society	3	3.2
Aqua Pink	1	1.0	Hypnose	1	0.6
Artic	1	1.3	Indian Sunset	6	4.6
Ashram	1	0.2	Infrared	1	0.6
Asper	1	2.2	Josie	1	0.5
Audio	1	2.0	Jupiter	2	1.5
Azafran	2	0.9	Kalahari	1	2.5
B-Happy	1	0.6	Kerio	3	2.1
Bibi	3	4.4	Kiwi	1	1.5
Black Bakarra	3	2.7	Look	1	3.0
Boeing	1	0.9	Lovely Red	1	0.3
Bolero	1	0.5	Lucida	1	0.3
Cartoon	1	0.5	Mamamia	1	1.0
Cezanne	1	0.7	Marie Claire	4	5.0
Charleston	1	0.8	Milva	2	1.8
Chelsea	2	2.7	Moonja	1	0.5
Circus	5	6.1	N-joy	3	3.6
Costa Rica	1	0.6	Olympia	2	2.0
Dance Valley	1	1.0	Only Yellow	1	1.3
Dark Lulu	1	1.0	Pascha	2	4.3
Duet	12	13.8	Passoa	1	0.3
Duo Unique	2	2.0	Pistache	1	3.0
El Toro	1	1.3	Poem	4	5.8
Esperance	1	1.3	Radio	1	3.2
Euforia	1	0.6	Red Calypso	3	5.9
Fedora	2	2.0	Red One	1	1.1
Golden Gate	1	1.3	Red Horizon	1	0.7
Habari	1	0.3	Red Sensation	1	0.2
Happy Hour	2	0.7	Respect	2	0.8

Rose Variety	Farms (#)	Total Area (ha)
Shanty	3	1.8
Sanaa	1	0.3
Scorpia	1	0.8
Shakira	1	0.3
Sorraya	4	3.3
Stereo	1	0.7
Sunlight	2	0.7
Sunny	3	2.2
Leonidas		
Sweet Akito	2	1.5
Sweet Candia	7	4.4
Terracotta	3	1.8
Trix	2	4.0
Top Sun	2	1.7
Tropical	3	4.9
Amazon		
Tucan	4	5.0
Upper	1	1.0
Charming		
Upper Class	1	0.2
Upper Gold	1	1.0
Utopia	1	0.9
Valentino	2	4.2
Versilia	1	0.9
Wild Calypso	2	3.1
Wivava	1	1.5
Yabadabadoo	2	1.1
Undefined		41.5
Sub Total		215.6

Cut flower	Farms (#)	Total Area (ha)
Carnation	2	18.5
Delphinium	1	0.6
Eryngium	1	0.7
Gypsophilia	4	22.7
Hypericum	3	24.3
Ranuncula	1	0.5
Undefined		4.2
Sub Total		71.5

TOTAL	287.1

Annex B: Farm questionnaire

Farm Questionnaire Floriculture Sector Ethiopia

A. Farm details

Farm name: …
Owner' s nationality: …
Name persons interviewed: …
Position: …
…
Position: …
Address: …
Location: Region: … Zone: … Woreda: …

B. General farm characteristics

1. Total farm size (ha): … (cultivated and non-cultivated)

Cultivation	Greenhouse (ha)	Open field (ha)
Roses		
Other cut flowers		
Ornamental plants		
Cuttings / propagation roses		
Other cuttings / propagation		

2. Greenhouse characteristics:
   a. Cover material: ❑ glass ❑ plastic foil ❑ screen
   b. Top cover: ❑ open ❑ closed ❑ flexible (i.e. can be opened / closed)
   c. Growing medium: ❑ soil; soil type: … ❑ substrate; substrate type: …

   If substrates are used:
   - Do they contain methyl bromide? ❑ Yes ❑ No ❑ Don't know
   - Are they traceable to the source? ❑ Yes ❑ No ❑ Don't know
   - Do they come from designated conservation areas? ❑ Yes ❑ No ❑ Don't know

   d. Automated climate management (e.g. climate computer): ❑ Yes ❑ No
   If yes, what type and what is controlled (temperature, humidity, etc.)?
   …
   Other climate management measures (ventilation, screens, etc)?
   …

e. Simple drawing of farm plan infrastructure:

3. How are the environmental conditions for cultivation?

a. Soil type:	❑ good	❑ acceptable	❑ poor	❑ Don't know
b. Annual rainfall:	❑ good	❑ acceptable	❑ poor	❑ Don't know
c. Temperature:	❑ good	❑ acceptable	❑ poor	❑ Don't know
d. Radiation:	❑ good	❑ acceptable	❑ poor	❑ Don't know
e. Altitude (m): …	❑ good	❑ acceptable	❑ poor	❑ Don't know

4. Variety characteristics

(Variety names, otherwise: sweethearts (=klein), intermediates (=middelmatig) or tea hybrids (=groot))

Variety	Duration (year)	Average flower production/ variety (stems m-2 year-1)	Percentage of total cultivated area (%)	Reason choice variety*

*) 1= resistance to diseases / 2 = consumer preference / 3 = location / 4 = other

5. a. How is the availability of purchased inputs?

Basic plant material:	❑ Good	❑ Medium	❑Bad	❑Local	❑Distance
Fertilizers:	❑ Good	❑ Medium	❑Bad	❑Local	❑Distance
Pesticides:	❑ Good	❑ Medium	❑Bad	❑Local	❑Distance
Greenhouses:	❑ Good	❑ Medium	❑Bad	❑Local	❑Distance
Equipment:	❑ Good	❑ Medium	❑Bad	❑Local	❑Distance

b. How is the availability of agricultural services?

Agricultural extension service:	❑ Good	❑ Medium	❑Bad
Capital loans:	❑ Good	❑ Medium	❑Bad
Skilled laborers:	❑ Good	❑ Medium	❑Bad

c. What are the main institutional barriers for cultivation? And why?

❑ Government	specify: …
❑ Legislation	specify: …
❑ Bureaucracy / Corruption	specify: …
❑ Safety issues	specify: …
❑ Others: ….	specify: …

6. Transport and trading

a. Are there cool storage facilities at the farm? ❑ Yes ❑ No

b. Is the storage capacity sufficient? ❑ Yes ❑ No

c. Are the flowers transported in a cool truck to the airport? ❑ Yes ❑ No

d. Are the flowers stored cool at the airport? ❑ Yes ❑ No

e. How is the product handled at the airport? ❑ Good ❑ Medium ❑Bad

f. How is the product traded?

❑ Auction clock: … % Which market? … (e.g. Europe, USA, etc.)

❑ Direct sale: … % Which market? …

Which one gives best price? ❑ Auction ❑ Direct sale

g. Is the likely price of the product known prior to the sale ❑ Yes ❑ No ❑ Sometimes

h. Which are important client requirements?

Requirement	Yes / No	Remark
Product quality	❑ Yes ❑ No	
Product quantity	❑ Yes ❑ No	
Price	❑ Yes ❑ No	
Fast response time	❑ Yes ❑ No	
Reliability	❑ Yes ❑ No	
Transparency	❑ Yes ❑ No	
Corporate social responsibility	❑ Yes ❑ No	

7. Is there a written agreement with the customer(s) on:

a. Product quality ❑ Yes ❑ No

b. Product health ❑ Yes ❑ No

c. Product variety ❑ Yes ❑ No

d. Product guarantees ❑ Yes ❑ No

e. Others, specify: …

8. Which portion of total production is sold under the acquired quality standards?

… %

What is done with the production with quality below quality requirements?

…

9. What is the origin of the parental material?
   ❑ Purchased; countries of origin: …
   ❑ On farm propagation

   In case it is purchased, is the material accompanied by officially recognized plant health certification? ❑ Yes ❑ No

10. Number and type of farm workers?

Type of workers	Number	Contract
Permanent workers		❑ Yes ❑ no
Temporary workers		❑ Yes ❑ No
Field workers		-
Post harvest workers		-
Office workers		-

C. Planning, monitoring and evaluation

11. a. Did the company undertake a risk assessment before initiating the development of the farm / green house? ❑ Yes ❑ No ❑ Don't know

   If yes, which topics were assessed?
   - Labour issues ❑ Yes ❑ No if yes, specify topics: …
   - Environmental issues ❑ Yes ❑ No if yes, specify topics: …
   - Economic issues ❑ Yes ❑ No if yes, specify topics: …

   b. Did the company undertake an official environmental impact assessment, as required by Ethiopian law? ❑ Yes ❑ No ❑ Don't know

12. Is there a periodical planning, monitoring and evaluation system in place?
   ❑ Yes ❑ No ❑ Don't know
13. Does the farm have any certified management system in place?
   ❑ Yes ❑ No ❑ In process ❑ Don't know

   If yes, which standard?
   ❑ MPS A / B / C ❑ FFP
   ❑ MPS GAP ❑ EUREP GAP
   ❑ MPS SQ ❑ ISO

14. Which management issues are periodically planned, monitored and evaluated?

Management issue	In place	Frequency planning cycle[1]	Formal procedures available[2]	Description
Sales and expenses	❑ Yes ❑ No			
Investment	❑ Yes ❑ No			
Quality management	❑ Yes ❑ No			
Social quality Occupational health Labour conditions	❑ Yes ❑ No ❑ Yes ❑ No ❑ Yes ❑ No			
Environmental management Environmental impact assessment Sustainable water use Energy efficiency Pesticide management Waste management Nature conservation	❑ Yes ❑ No ❑ Yes ❑ No ❑ Yes ❑ No ❑ Yes ❑ No ❑ Yes ❑ No ❑ Yes ❑ No ❑ Yes ❑ No			

[1)] 1= daily, 2= weekly, 3= monthly, 4= annually

[2)] 1= Written procedures defined and in place;
2= Procedures in place but not formally defined in written procedures

15. Does the farm register data on the following issues
(if possible , request copies of the register formats)

Issue	In place	Frequency of registration[1]	Type of data collected
Soil analysis	❑ Yes ❑ No		
Pesticide and fertilizers input use Application frequency Stock records	❑ Yes ❑ No ❑ Yes ❑ No ❑ Yes ❑ No		
Equipment maintenance	❑ Yes ❑ No		
Waste collection and disposal	❑ Yes ❑ No		
Training programs	❑ Yes ❑ No		
Working hours	❑ Yes ❑ No		
Medical status of employees	❑ Yes ❑ No		

[1)] 1= daily, 2= weekly, 3= monthly, 4= annually

D. Water Management

16. What water source is used for farm activities?

Water source	Using	When[1]	Why[2]	Quality[3]	Remarks
Ground water	❑ Yes ❑ No				
Rainfall basin	❑ Yes ❑ No				
Surface water	❑ Yes ❑ No				

[1)] 1= always; 2= rainy season; 3= dry season

[2)] 1= quality; 2= availability / location; 3= quantity

[3)] 1= good; 2= acceptable; 3= bad

If rainfall basin available, what is the size?: ... m^3

17. Is there a measurement system in place to measure the water consumption?
    ❑ Yes ❑ No

    If yes, describe system (and take pictures): ...
    What is the purpose of the measurement?
    ❑ Irrigation control
    ❑ Sustainable water consumption from the source
    ❑ Legal requirement

18. How much water is used for cultivation activities?
    a. Total amount (m^3 $year^{-1}$ $farm^{-1}$): ... real measurement / estimation
    b. Number of irrigations: ... per day / week / month
    c. Amount per irrigation event (m^3 ha^{-1}): ... real measurement / estimation
    d. Water used in processing unit (m^3 ha^{-1}): ... real measurement / estimation

19. a. Is the water availability sufficient during the rainy season? ❑ Yes ❑ No
    b. Is the water availability sufficient during the dry season? ❑ Yes ❑ No
    c. Do you expect the water availability to be sufficient during the next five years?
    ❑ Yes ❑ No, why not: ...

20. What kind of irrigation system is being used?
    ❑ Overhead sprinklers
    ❑ Drip irrigation
    ❑ Hand spray
    ❑ Others: ...

    Why this system? ...

21. Is irrigation water treated for water born diseases? ❑ Yes ❑ No
    If yes, in what way? …

22. Is drained water recycled? ❑ Yes ❑ No
    If yes:
    - How often is the water flushed? …
    - How much each time? …
    - How is the recycled water treated? …

23. Is untreated water used for post-harvest washing? ❑ Yes ❑ No

24. Has the farm faced any problems with other stakeholders in the area on water consumption? ❑ Yes ❑ No

    If yes, describe when and why: …

E. Weed, pest and disease management

25. Which are the major pests and diseases on your farm during the last 5 years?

Type	Period	Problem

26. Which methods of control are applied on the farm?

Type of control	Chemical	Biological	Others	Why these methods?
Pest control	❑ Yes ❑ No	❑ Yes ❑ No		
Disease control	❑ Yes ❑ No	❑ Yes ❑ No		
Weed control	❑ Yes ❑ No	❑ Yes ❑ No		

If biological control is used, specify: …

27. Who recommends you on the applied pest control methods?
    - ❑ Trained supervisor
    - ❑ Shop
    - ❑ Extension officer
    - ❑ Other farmers
    - ❑ Consultants, from: …
    - ❑ Other information sources, specify: …

28. What is the level of training of the person in the farm responsible for the pesticide management?
    - ❑ Appropriate university degree
    - ❑ Required training certificates
    - ❑ Trained at the farm
    - ❑ Practical experience

29. If no other methods than chemical control is used, why are they not used?
    - ❑ Lack of knowledge
    - ❑ Lack of time
    - ❑ Lack of information
    - ❑ Lack of alternative products (e.g. beneficial insects)
    - ❑ Price
    - ❑ Others: ….

30. How are pesticides applied?
    - ❑ Knapsack
    - ❑ Other method, specify: …
    - ❑

31. a. Are cocktails / mixtures used? ❑ Yes ❑ No
    Why? …

    b. Who recommends you to use a cocktail / mixtures?
    - ❑ Trained supervisor
    - ❑ Shop
    - ❑ Extension officer
    - ❑ Other farmers
    - ❑ Consultants; from: …
    - ❑ Other information sources, specify: …

32. a. Do you scout the field for pest / diseases / weed presence? ❑ Yes ❑ No

If yes, how often do you observe/scout your field to check pest/disease presence?
… times per week

b. Which method is used?
- ❑ Sticky traps
- ❑ Visual observation
- ❑ Other, specify: …

33. Are you known with local biological control agents? ❑ Yes ❑ No

Do you consider imported biological control agents as possible solution? ❑ Yes ❑ No

34. What is the average % of traded product that is rejected by the market due to pests and/or diseases? … %

How big are in your opinion crop losses per cropping season due to pests and diseases? … %

35. Are you satisfied about your current pest management?
- ❑ Yes
- ❑ No, why not? …

Would you like to / are you planning to change the current pest management?
- ❑ No
- ❑ Yes; in what way? …

36. Which are the three major ristrictions according to you in the development of integrated pest management? …

37. Pesticide applications:

(if possible , request copies of the register formats)

Pesticide name (product or common name)	Applied to crop (variety)	Purpose of application (pest / disease name	System of application1	Method of application2	Number of applications (#/month)	Amount per application (l/ha)	Timing of application (day / night

1) Calendar spraying / action threshold based / observation based / other: …

2) Hand spraying / drip / overhead sprinklers / other: …

38. Are you known with the national legal requirements on pesticide use? ❑ Yes ❑ No
    Does the farm comply with these requirements? ❑ Yes ❑ No

    In case of absence of clear national legal directives on pesticide use, does the farm know and comply with the specific legislation of other regulation of the country of destination?
    ❑ Yes ❑ No
    If yes, which one: ...

39. Is any post harvest pesticide or fungicide treatment applied? ❑ Yes ❑ No
    If yes, specify the treatment applied: ...

40. Has the farm faced any problems with stakeholders inside and outside the farm on pesticide use?
    ❑ Yes ❑ No

    If yes, describe when and why: ...

F. Nutrient Management

41. Nutrient application:

(if possible , request copies of the register formats)

Nutrient name (product or common name)	Applied to crop (variety)	System of application1	Method of application2	Number of applications (#/month)	Amount per application (kg/ha)

[1)] Calendar application / other: …

[2)] Hand application / fertilization / other: …

G. Fertilizer and crop protection products storage

42. Were do you keep the stock of the fertilizer and crop protection products?
    - ❑ Open air
    - ❑ In a farm warehouse / barn
    - ❑ In a locked chemical store
    - ❑ No answer

    If the products are stored in a closed area, are the following requirements taken into account:

a.	Solid space	❑ Yes ❑ No
b.	Covered, clean dry area	❑ Yes ❑ No
c.	Well ventilated	❑ Yes ❑ No
d.	No contact with water sources	❑ Yes ❑ No
e.	Kept separate from parental material	❑ Yes ❑ No
f.	Only accessible for authorized personnel (locked)	❑ Yes ❑ No
g.	Products stored in original packaging	❑ Yes ❑ No
h.	Packaging present handling and storage instruction	❑ Yes ❑ No
i.	Evident accident and emergency procedure	❑ Yes ❑ No
j.	Emergency facilities	❑ Yes ❑ No

43. What does the farmer do with surplus of pesticide?
    - ❑ Spray extra on crop
    - ❑ Store in fertilizer / pesticide storage
    - ❑ Deposit on untreated plots
    - ❑ Throw away in trash can
    - ❑ Burn
    - ❑ Bury
    - ❑ Use disposal contractor
    - ❑ Other, specify: …

44. What does the farmer do with packaging material?
    - ❑ Store in fertilizer / pesticide storage
    - ❑ Throw away in trash can
    - ❑ Wash and re-use
    - ❑ Wash / cut and sell as scrap
    - ❑ Burn
    - ❑ Bury
    - ❑Use disposal contractor

❑ Other, specify: …

45. Has the farm faced any problems with stakeholders in the area on waste disposal?
❑ Yes ❑ No

If so, describe when and why: …

H. Worker health, safety and welfare

46. Has formal training or safety instructions been given to all workers (fixed and temporary) operating dangerous or complex materials and/ or equipment?
❑ Yes ❑ No if yes, describe method used: …

47. Has general training or instructions on safety and emergency instructions been given to all workers (fixed and temporary)?
❑ Yes ❑ No if yes, describe method used: …

48. Are the re-entry times been observed after the application of crop protection products? ❑ Yes ❑ No if yes, are there registers: ❑ Yes ❑ No

49. When mixing agrochemicals how does the worker usually stir the mixture?
❑ Using a stick
❑ Using a sprayer lance
❑ Just filling the tank up and shaking it
❑ Filling the tank with water and concentrate alternatively
❑ Others
❑ Don’ t know
❑ No answer

50. When spraying agrochemicals which protection measures are taken?
❑ Hand gloves
❑ Protective eye glasses/goggles
❑ Face visor/shield/mask
❑ Long sleeved shirt
❑ Long trousers
❑ Apron
❑ Boots
❑ Spray backward walking
❑ Other personnel not allowed in greenhouse
❑ Others: …

51. What clothing is used when handling/mixing concentrated agrochemicals?
    - ❑ Hand gloves
    - ❑ Protective eye glasses/goggles
    - ❑ Face visor/shield/mask
    - ❑ Long sleeved shirt
    - ❑ Long trousers
    - ❑ Apron
    - ❑ Boots
    - ❑ Do not wear any protective clothing
    - ❑ Don' t know
    - ❑ No answer

52. Are there toilet and washing facilities near the workplace? ❑ Yes ❑ No

53. Are there separate toilets for men and women? ❑ Yes ❑ No

54. And dressing and washing facilities? ❑ Yes ❑ No

55. Does the farm comply with the local and national requirements regarding working conditions?

a.	Minimum wage	❑ Yes	❑ No	remark: …
b.	Minimum age	❑ Yes	❑ No	remark: …
c.	Working hours	❑ Yes	❑ No	remark: …
d.	Safe working conditions	❑ Yes	❑ No	remark: …
e.	Freedom of organization	❑ Yes	❑ No	remark: …
f.	Security of employment	❑ Yes	❑ No	remark: …
g.	Legislation on pregnancy leave	❑ Yes	❑ No	remark: …
h.	Pension provisions	❑ Yes	❑ No	remark: …
i.	Medical provisions	❑ Yes	❑ No	remark: …

56. Are on site living quarters habitable? ❑ Yes ❑ No
    Which are the facilities provided? …

57. Does the farm provide any support to the community?
    ❑ Yes ❑ No if yes, which type of support? …

58. Has the farm faced any problems with stakeholders (inside and outside the farm) in the area on occupational health and labor condition issues?
❑ Yes ❑ No

If so, describe when and why: …

Annex C: Stakeholder analyses.

Source: Joosten, F and A. de Jager (2007), Development strategy for the export oriented horticulture in Ethiopia

This annex introduces the main public and private stakeholders with regard to the horticulture sector Ethiopia.

Public stakeholders

The main Governmental stakeholders that are active in or have influence over the horticulture sector are the Ministry of Agriculture & Rural Development (MoARD), Ministry of Trade & Industry (MoTI) and its Export Promotion Department and Ethiopian Investment Authority, Ministry of Finance (MoF) and its Customs Office, Development Bank of Ethiopia (DBE), Ethiopian Airlines (EA) and the national research system.

Ministry of Agriculture and Rural Development (MoARD)

Promotion of agricultural development and issues of plant protection and regulation on the use of agrochemicals are under this Ministry. The Crop Protection Department has the mandate to deliver phytosanitary services of regulation and control of the import and export of planting material and produce. The Phytosanitairy Service carries out inspections of seeds, seedlings and other imported plant materials and pre-shipment inspections of fresh produce.

Ministry of Trade and Industry (MoTI)

This Ministry has the mandate on trade development. Promotion of foreign investment and exports has become a priority area of the Government, which implies close consultation with the Prime Minister' s Office on this. The Ethiopian Export Promotion Agency (EEPA) has become a department under MoTI (Export Promotion DepartmentEPD). The EPD services include training to exporters, enabling conducive export procedures, information sharing and networking, market studies, and facilitating participation in international trade fairs. UNCTAD established a Trade Point at the then EEPA in order to upgrade the quality and to improve the efficiency of its trade support services and aiming to increase the participation of small and medium enterprises in the export business. The Centre for the Promotion of Imports from developing countries (CBI) of The Netherlands Ministry of Foreign Affairs has also been collaborating closely with the EEPA and now EPD on an Integrated Institutional and Export Development Programme

(IIEDP). Floriculture and vegetable exports are amongst the selected products to be supported under this IIEDP. The Ethiopian Investment Authority (EIA) is a parastatal company under the responsibility and coordination of the MoTI. It serves a one-stop window for investors and has played a role in facilitating foreign investment in the horticulture sector. Aiming to promote investment, the main services to be provided by the EIA are provision of information, screening and approval of investment plans, and issuing of investment permits.

Ministry of Health (MoH)

The Ministry of Health - together with the Environmental Protection Agency (EPA) – is responsible for the development and implementation of Environmental Impact Assessments and safeguarding occupational health in the floriculture industry.

Ministry of Water Resources (MoWR)

The responsibilities of the Ministry of Water Resources include the planning and allocation of water resources, preparation of water legislation, permits for water infrastructure, water budgeting and management of international rivers. The Basin Development Studies and Hydrology Department are the main departments dealing with data collection on basins resources potential, development plans and hydrological data.

Environmental Protection Authority (EPA)

The Federal Democratic Republic of Ethiopia has established the Environmental Protection Agency, as a response to the requirements of the Constitutions' Proclamation No 9/1995[5]. Her task is to protect the human welfare and protect, develop and utilise natural resources, of which humans depend for survival, in a sustainable manner. In 1997 EPA together with MoTi developed the Environmental policy of Ethiopia (EPE). The EPE provides: guiding principles, sectoral environmental policies and cross-sectoral environmental policies. Environmental Impact Assessment policies are included in the cross-sectoral environmental policies (for more detailed information see Valkman, 2007).

Ethiopian and Oromo Investment Authorities

The Ethiopian and Oromo (for the Oromo region) Investment Authorities stimulate investments in the floriculture sector and facilitate and guide new investors in obtaining permits.

The Ethiopian Investment Authority also has the responsibility to comply with environmental protection laws. Proclamation No 37/1996 states that *"...the intended*

[5] Proclamations captured in the Federal Negarit Gazeta of the Federal Democratic Republic of Ethiopia.

investment activity would not be convening the operational laws of the country and that, in particular, it complies with conditions stipulated in the environmental protection laws…"

The Ethiopian Investment Commission especially calls for potential (foreign) investors to participate in the supply of different kinds of plant protection chemicals and equipment.

Quality and Standards Authority (QSAE)

The Quality and Standards Authority of Ethiopia is the National Standards Body of Ethiopia established in 1970 and became fully operational in 1972. The Authority is a non profit governmental organ directly accountable to the Ministry of Trade and Industry. The Authority promotes effective quality management practices in addition to Standards development, certification, testing and metrology. Clients are the Federal Government and private local and foreign investors.

Currently the laboratories of the QSAE undergo extensive physical expansion. An increase testing facilities will be the first step towards a more comprehensive and inclusive service. Chemical testing is now possible using a HPLC (High Pressure Liquid Chromatography) and Mass Spectrometry device and toxicity testing can be performed using cytotoxicity tests on various cells. The QSAE is in the process of obtaining ISO 17025/21 certification and testing of agro-chemicals and plant residues is going to be possible in the near future.

Pesticide Research Committee (PRC)

The Pesticide Research Committee (PRC) consists of researchers from both the MRC and the Ethiopian Institute for Agricultural Research (EIAR) in Addis Ababa. PRC is responsible for the national pesticides registration for agricultural use. In 2006 the Centre recommended MOARD the list of legally allowed pesticides for the floriculture sector. The list of pesticides is composed through cooperation with several floriculture farmers and pesticide shops

Development Bank of Ethiopia (DBE)

Ethiopia counts with a Government Bank for economic development. EDB manages a public fund (international loan), which is allocated particularly for the development of horticultural exports. The financial package is relatively attractive and the fund is substantial. However, its implementation is weak due to bureaucracy being a typical Government institution and due to lack of expertise in reviewing horticulture investment

proposals. Furthermore, the package favours foreign growers and local investors have barely access to it.

Ethiopian Agricultural Research Organisation (EARO)

Recently EARO developed a plan for research into horticultural production and for extension activities. However, the implementation of this plan has not yet come off the ground. The two main research institutes (Melkasa near Nazreth for the lowland crops and Holeta for highland crops) lack experience and expertise on export oriented horticulture and floriculture.

Jimma University (JU)

The College of Agriculture of Jimma University offers the only formal horticulture education in the country. The College launched a B.Sc degree and a diploma programme in horticulture recently. Relationships with horticulture training and/or education institutes in other countries as well as collaboration with existing growers are yet to be established.

Private stakeholders

The main stakeholders of the private sector that are active in or have an influence over the export oriented horticultural sector are the Ethiopian Horticulture Producers & Exporters Association (EHPEA), the Ethiopian Horti Share Company (EHSC), airlines, handling agents in Ethiopia and Europe, importers and the (Dutch) flower auctions.

Ethiopian Horticulture Producers and Exporters Association (EHPEA)

The EHPEA was established at the end of 2003 as a not-for-profit organisation based on the voluntary membership of horticultural growers cum exporters. EHPEA is the only association related to the horticulture sector in Ethiopia and aims to promote the sustainable growth of the sector in general and the private sector participation in particular. EHPEA is recognized by the Government, international organisations and other agencies as the representing body of the horticulture sector. It has facilitated constructive dialogue and coordination (see EHSC below) amongst stakeholders in and around the sector. The association has difficulties to keep up with the rapid growth of horticulture industry and requires strengthening of its organisational and institutional capacity urgently.

Ethio Horti-Share Company (EHSC)

Mid 2004 the EHSC was established by a number of horticulture producers and exporters with the objective to collectively arrange for airfreight and handle administrative issues

with the airlines. In its few years of existence, EHSC has contributed to the launch of into collective purchase of supplies like agro-chemicals and small equipment.

Airlines

All exports of flowers, cuttings and vegetables are by air. The B-757 of EA takes the majority of all cargo, but fresh produce is exported and loaded onto different passenger planes operated by KLM and Lufthansa. EA also leases DC-10 cargo planes for freight services during peak seasons. Other airlines do not operate dedicated cargo planes out of Ethiopia to Europe as yet. The number of cargo flights varies between 2 and 7 flights weekly.

Handling agents

Bole airport has a number of handling agents who expand to be able to handle large volumes of fresh produce. EA recently opened new facilities and a Dutch/Ethiopian consortium is preparing a complete cool chain service (Ethiopian Perishable Logistics). With these new facilities Bole airport will be as good as or better than airports in Nairobi and Entebbe.

Flower Auctions & importers

A substantial part of the cut flowers is sold through the Dutch flower auctions FloraHolland and VBA (Aalsmeer). Both auctions have their own representatives in Ethiopia. Upon arrival on the auctions, flowers are handled and prepared for auctioning by an importer (like Global Flower Service, Van Beek Bloemen and Decofresh).

Suppliers to the industry

The horticultural industry requires inputs like greenhouses, irrigation equipment, cold stores, young plants and varieties/cultivars. The suppliers of these inputs and equipment play a very important role, since they do not only provide the hardware, but also valuable information and expertise as an embedded service to the client. At the moment, growers import most of their inputs and equipment.

Civil society organisations

Apart from public and private stakeholders, there are a number of civil society organisations that are active in the horticulture sector. Civil society organisations monitor the use of natural resources such as land and water as well as the use of agro-chemicals and its impact on the natural environment. Moreover, primary as well as secondary labour conditions are monitored and discussed with relevant authorities and EHPEA. Recently six

civil society organisations have organized themselves into the National Flower Alliance (NFA).

National Flower Alliance (NFA)

The National Flower Alliance (NFA) is a group of six civil society organizations (i.e. Forum for Environment, Organization for Social Justice in Ethiopia, Panos Ethiopia, Confederation of Ethiopian Trade Unions, Ethiopian Wildlife & Natural History Society, Ethiopian Women Lawyers Association) chaired by the Forum for Environment (FfE). The NFA aims to work constructively together with floriculture stakeholders and aspires to contribute to the sustainability, corporate social and ecological responsibility of the flower industry. The NFA and EHPEA have entered into discussion on a number of issues focusing particularly on the development and implementation of a sector wide code of conduct. NFA has formulated a positive proposal of its envisaged contribution.