

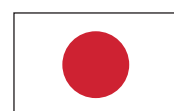


Enhancing food safety by strengthening food inspection systems in ASEAN countries

(GCP/RAS/222/JPN)

Case studies on inspection and certification

Case study 2: SALM inspection and certification scheme of Malaysia



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**Case study 2:
SALM inspection and certification scheme of Malaysia**

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Foreword

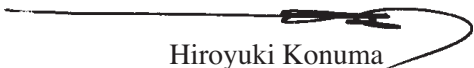
Food safety is of considerable significance from both the health and economic perspectives. Safe food is of importance in protecting the health of consumers by preventing both acute and chronic food borne diseases. With globalization and a greater movement of food across borders, quality and safety have become even more critical. Consumers are showing a preference for high quality and safe food while at the same time governments are laying down stringent requirements relating to pesticide residues, contaminants, microbiological parameters, pests and disease, as well as various aspects of hygiene controls so as to protect the health and safety of their populations.

The problems of quality and safety are complex and systemic, often extending from the production environment to the end consumer involving the entire food chain. There is also a shift from end product inspection and testing to a preventative systems approach based on risk. This necessitates not only implementing standards for the end product but also standards on good practices to include Good Agricultural Practices (GAP), Good Manufacturing Practices (GMP) and Hazard Analysis and Critical Control Point (HACCP) systems at various stages of the food chain consisting of the primary production sector, the processing sector, the distribution, retail and food service (including street foods) and the consumer sector. The role of food control, which is of paramount importance to assure food safety and quality, has also shifted from end product inspection and testing with corrective actions towards food safety concerns to preventive checks on the controls put in place in operations to address food borne risk factors all across the food chain. This approach necessitates not only a change in the mindset of inspectors – from regulators to food safety professionals – but also a need for additional and varied skills for the purpose.

ASEAN countries have made remarkable progress in improving food safety standards and increasing the competitiveness of their food and agricultural products to increase food exports. These achievements need to be strengthened and expanded to further improve food safety not only to protect the health of their own domestic consumers but also to promote regional trade opportunities, earn more foreign exchange and expand tourism by providing safe food to travellers. For this purpose, regional cooperation and exchange of information at all levels must be strengthened.

In order to address the various issues connected with this important activity of food control, under the regional project “Enhancing Food Safety by Strengthening Food Inspection Systems in ASEAN Countries”, funded by the Government of Japan, four case studies have been published on different dimensions of inspection and certification. The case studies were selected so as to provide an opportunity for the most successful practices developed in one country to be used as a model for other countries in the region. They were prepared by specialists within the country with expertise in the subject matter. These were subsequently discussed in a regional workshop attended by participants from ASEAN countries and based on the feedback, edited into a uniform format. I take this opportunity to convey FAO’s appreciation and gratitude to the Government of Japan for its liberal contribution towards this project.

This case study is on Malaysian farm certification scheme for Good Agricultural Practice also known as (SALM inspection and certification scheme). It is hoped that the results of these efforts will be of immediate relevance to the countries of the ASEAN region in particular, and to developing countries in general, especially at this present juncture of increasing complexities of worldwide food production systems, and the growing potential for new hazards associated with changes in food production and consumption patterns.


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Abbreviations and acronyms

| | |
|---------|--|
| As | arsenic |
| ASEAN | Association of Southeast Asian Nations |
| Cd | Cadmium |
| DOA | Department of Agriculture |
| FOA/LPP | Farmers Organization Authority |
| FAMA | Federal Agricultural Marketing Authority |
| GAP | Good Agricultural Practice(s) |
| GMO | genetically modified organisms |
| Pb | lead |
| PHI | pre-harvest interval |
| MARDI | Malaysian Agricultural Research and Development Institute |
| Hg | mercury |
| M-FIT | Malaysia Food Information and Traceability |
| MAAI | Ministry of Agriculture and Agro-Based Industries |
| MOH | Ministry of Health |
| MRL | maximum residue limits |
| SALM | <i>Skim Amalan Ladang Baik Malaysia</i> (Malaysian farm certification scheme for Good Agricultural Practice) |

Preamble

Maintaining a safe and nutritious food supply is an essential prerequisite to achieving food security, good nutrition and safeguarding the general health of populations. Food inspection plays an important role in this by making sure that the food meets the required standard and by preventing the adulteration of food and commercial fraud with respect to the sale of food, especially in terms of mislabelling of food products.

The project “Enhancing food safety by strengthening food inspection systems in ASEAN countries” (GCP/RAS/222/JPN) was funded by the Japanese government and was started in 2007. The objective of this project was to enhance food safety by strengthening food inspection systems in ASEAN countries covering domestically produced food, food import control and food export control. As part of the project a number of capacity-building activities such as regional workshops and training courses and national training courses in various aspects of food inspection were organized. In addition, case studies and guidance documents related to food inspection were prepared.

The project has contributed primarily to strengthening food inspection systems, including risk-based inspection and to facilitating recognition of and compliance with international food safety standards and guidelines with special reference to food inspection and certification. This should lead to improved food safety conditions in ASEAN countries, enhanced public health protection from food-borne diseases and facilitation of food trade by increasing competitiveness in the international market.

A series of four case studies to assess the various aspects of the food inspection systems in Indonesia, Malaysia, Thailand and Viet Nam were prepared. The needs for capacity building in food inspection systems and the factors associated with implementing successful inspection systems in the countries concerned have been identified.

The case studies have examined the existing capacity and performance of the food inspection systems according to circumstances and needs in the selected ASEAN countries where they were prepared. The assessments have covered systems of inspection and certification for selected aspects of either product-wise (processed foods, fruits/vegetables) or process-wise (food service) inspection systems for foods domestically produced, imported and exported. Because of the fact that the ASEAN countries are very different from one another, the following two approaches were used as a framework: 1) A ‘needs assessment approach’ with the purpose of identifying capacity building needs; and 2) A ‘lessons learned approach’ with the purpose of identifying successful factors in implementing food inspection system or certification schemes.

The case studies conducted were:

1. Indonesia: The inspection and certification system for GMP for processed foods.
2. Malaysia: The SALM inspection and certification scheme.
3. Thailand: The group inspection and certification system for small farmers.
4. Viet Nam: The inspection system for the food service sector, including street food, restaurants and canteens.

The following general outline was followed for each of the case studies with appropriate modifications to suit the requirements of the subject of each individual case study:

- i) Mission and strategy: mandates, functions, responsibilities of the various agencies involved in food inspection and enforcement.
- ii) Laws or regulations that provide rules and procedures for food inspection and enforcement, organizational charts of the agencies involved in food inspection and enforcement.
- iii) Operational principles and processes for food inspection and certification, consistency of inspection and certification activities by different agencies, planning, implementation and monitoring of inspection activities, compliance policies and certification.
- iv) Human resources: availability of human resources for food inspection and certification, technical and managerial skills training.
- v) Financial resources such as budget for food inspection activities.
- vi) Information resources such as systems for the collection, reporting and analysis of information related to food inspection. These may include a national database of food premises categorizing premises according to risk and including food inspection records.
- vii) External linkages and interdependencies, including linkages and cooperation between food inspectorates and other concerned stakeholders.
- viii) SWOT analysis of the food inspection system and recommendations for capacity building activities in the national food inspection systems.

The case studies were presented and discussed in the first regional workshop “Modern principles for food inspection and certification” held in Jakarta, Indonesia from 1 to 3 April 2008 in order to identify capacity building needs and priorities for follow-up assistance such as training courses and guidance in food inspection. Some of the case studies were revised to bring them up-to-date taking into account the latest developments in countries of the region. The case studies could be used by other ASEAN countries with appropriate modifications for setting up similar food safety inspection and certification systems or as training material.

Executive summary

SALM is the Malaysian farm scheme for Good Agriculture Practice (GAP), which was developed specially for fruits, vegetables and other crops. It is a national voluntary scheme to encourage farms to adopt good production practices that meet the requirements of food safety and productivity and are carried out in an environment- and worker-friendly way and thus ensure safe and sustainable agriculture. An account of the Malaysian laws relevant and applicable to agriculture production, the environment, the use of pesticides, food safety and occupational safety and health of agricultural workers pertaining to the concept of Good Agriculture Practices is provided. SALM is a document that sets out performance levels or rules of agriculture production that must be achieved (105 rules) and that are encouraged (57 rules) among the producers.

”Must” rules are critical and mandatory whereas “encouraged” rules are recommended for adoption by the producers. The various operational principles and processes, including the production plant audit and the certification process and criteria are described in this document. Crop producers meeting all requirements of all major “Must” rules of the SALM standard and showing pesticide residue levels below permitted levels (Level 1) are given a letter acknowledging the adoption of GAP and crop producers meeting all requirements of major “Musts”, 95 percent of minor “Musts” and showing pesticide residue levels below the permitted levels are given the SALM certificate of GAP and the right to use the SALM logo.

The human resource requirements of SALM include farm advisers (agricultural extension agents and farm consultants), SALM auditors, both internal and external, who have all undergone a SALM audit course and technical staff with sufficient knowledge and skills in soil surveys, chemistry and analysis. A multiagency certification committee under the chairmanship of the Director General of Agriculture is responsible for all decisions relating to the granting, maintaining, extending, suspending and withdrawing of certification.

The commitment and support of the government, the human resource capability and the infrastructure and facilities, including those for contaminants analysis, are considered as the strengths of SALM. The inspection and auditing procedure for SALM certification which is located within the purview of the Department of Agriculture, and thus not done by an independent third party certification body accredited by an appropriate authority, and the low rate of participation of small farmers are considered as the weaknesses. Growing consumer strength with increased market demand, a favourable international market, and traceability systems are considered opportunities. Not receiving favourable prices despite the increased cost of production because of adopting SALM is the biggest threat to SALM. The main recommendations that have emerged from the case study is that the GAP should be based on a basic set of rules of a national standard that is designed to meet national needs for safe and sustainable agriculture that can be later upgraded to meet regional or global requirements. Also the implementation of farm inspection and certification should be done in phases, with priority given to business enterprises and later to contract farmers, group farms and finally to individual farmers, in that order.

Case study 2: SALM inspection and certification scheme of Malaysia

1. Introduction

The importance of agriculture in the overall national development of Malaysia is clearly stated in the National Outline Perspective Plan where the sector is now identified as the third engine of growth, after manufacturing and services. The new agricultural policy formulated to achieve this objective identifies several types of crops that are strategically and commercially important to the agricultural economy of the country. The crop in which the country has a major strategic interest, for reasons of food security, is paddy since rice forms the staple diet of the majority in the country. The production is however insufficient to meet the needs of the country and at present a self-sufficiency level of about 70 percent is achieved and maintained, with the rest imported from neighbouring countries.

Apart from paddy, the new agricultural policy also specifies the types of fruit and vegetable crops that are to be developed and promoted in the country. Although the country is endowed with a wide range of indigenous tropical fruits, some of which are exotic in nature, the emphasis of fresh fruit crop development (e.g. research, extension, marketing, etc.) is however confined to a few selected types of fruit crops only. The emphasis in this case is to develop the fruit industry for which the country has a comparative advantage in marketing the produce on the world market. The reason for this direction of development is to ensure that the development of the crop commodities is in line with the agricultural vision of making Malaysia a net exporter of food by the year 2010.

To realize this vision, several strategies have been identified to define and boost this competitive advantage in the development of the fresh fruit and vegetable subsectors in Malaysia. These are:

- 1) Selecting crops (current as well as potential) that are agroclimatically suitable for cultivation in the country and with potential for continuous planting throughout the year. This is to take advantage of the seasonal loss of production (e.g. of watermelon) in competing countries because of unfavourable weather conditions.
- 2) Confining development to the cultivation of fruit crops for which the country already has a competitive advantage in world trade, especially crops that are at present widely planted in the country and promoted and marketed in different parts of the world, such as starfruits, papaya, watermelon, pineapple.
- 3) Increased productivity and efficiency so as to make the produce more competitive on the world market – a strategy which is achieved through aggregation of farms into economically viable production entities (group farms), allocation of suitable land resources for the development of permanent food parks, mechanization of the production processes, injection of new technologies, quality assurance and commercialization of agricultural operations.

A number of programmes have been initiated and put into action to realize the objectives of making Malaysia a net exporter of food. One of these is the farm certification scheme for Good Agricultural Practice (GAP) of Malaysia or SALM. This is a government initiated agricultural certification scheme which was developed by the Department of Agriculture Malaysia. The

scheme, implemented in 2002, is designed specifically for agricultural crop producers and is aimed at the adoption of GAP among producers and the provision of a platform to achieve national and international recognition in agricultural production.

2. Objectives, scope and methodology of the case study

2.1 Objectives

The objectives of the case study are:

- i) to provide a situational analysis of the inspection and certification scheme associated with the national farm certification scheme for Good Agricultural Practice (SALM); and
- ii) to identify the success factors as well as lessons learned that can be used by other ASEAN countries in setting up similar farm certification schemes for fruits and vegetables.

2.2 Scope of study

The concept of GAP, its adoption, inspection and certification covers many different aspects of agricultural production. To meet the requirements of this case study, the scope has been defined to cover:

- i) objective, purpose and mandate of the scheme, namely why the scheme is developed and implemented in Malaysia;
- ii) the product categories and production processes covered in the scheme;
- iii) the institutional arrangement and organizational set up to implement the scheme and its geography in terms of coverage; and
- iv) auditing for quality assurance and certification of GAP.

In addition: i) the factors contributing to the success of the scheme as well as the weaknesses of the scheme in its implementation; ii) the lessons learned from the implementation of the scheme; and iii) recommendations to enhance food safety in the ASEAN region are also discussed.

2.3 Methodology of study

A two-part approach was adopted and followed to realize the objectives of this case study. The components covered by the study are described in the following paragraphs.

Part 1: Review of SALM

The collection, review and presentation of information on the inspection and certification scheme (SALM) of Malaysia are based mainly on desk research and interviews with relevant stakeholders. The main stakeholder consulted is the Department of Agriculture Malaysia who, as a custodian and implementer of the scheme, provided valuable inputs related to the details of the scheme and the latest developments taking place in the scheme. This covered not only the progress and status of the scheme but also clarifications on some of the changes that have been implemented since 2003.

The topics that were given emphasis during the review include: i) methodology and implementation of the scheme; ii) organization and structure; iii) availability of human resources and their capacities to carry out a risk-based inspection service; iv) information systems and databases; v) availability of infrastructure and equipment; and vi) cost of implementing the scheme.

Part 2: Analysis of SALM

Based on the review, an analysis of SALM aimed at developing appropriate recommendations that can be used by other ASEAN countries in setting up similar schemes was also undertaken. The analysis covered not only the strengths and weaknesses of the Department of Agriculture Malaysia in implementing the scheme but also external factors, namely opportunities and threats that are likely to influence the success or failure of implementing such a scheme.

3. Farm certification scheme of Malaysia

3.1 Objective and purpose of SALM

SALM, the acronym for *Skim Amalan Ladang Baik Malaysia*, is the Malaysian farm certification scheme for GAP which was developed specially for fruits, vegetables and other cash crops. The main objective of this national voluntary scheme is to encourage and acknowledge farms that adopt good production practices that meet the requirements of food safety and productivity and are also operated in an environment- and worker-friendly way, consistent with the concept of safe and sustainable agriculture.

3.2 Agricultural production and legislation

Specific legislation on adoption of GAP by agricultural crop producers has at the moment not as yet been enacted by the government. Nevertheless, Malaysia, as a country committed to sustainable development, has formulated and enacted several laws that are relevant and applicable to the concept of GAP. These, to identify a few that have a direct and strong bearing on the management of the identified hazards of agricultural production, include: the Pesticides Act 1974, Environmental Quality Act 1974, Food Act 1983, Occupational Safety and Health Act 1994 and their associated Regulations such as Food Regulations, Use and Standard of Exposure of Chemicals Hazardous to Health Regulations, Disposal of Scheduled Wastes, Storage of Highly Toxic Pesticides, etc. The general legal provisions of these different acts are discussed in relation to the hazards and impacts of agricultural production, i.e. environment, food safety and workers health and safety, and are presented below.

3.2.1 Environment

The concern of Malaysia for the hazards that agricultural production poses to the environment was recognized as early as 1974, when the Environmental Quality Act was legislated by Parliament. The scope of the Act is wide ranging, covering the execution of environmental impact assessment studies before project implementation, prohibition of open burning, proper disposal of solid and scheduled wastes (e.g. empty pesticide containers), discharges of effluent – all of which need to be regulated properly to prevent adverse impacts on the environment.

3.2.2 Pesticides

The legal requirements for the use of pesticides for agricultural crop production and other pest control uses are governed by the Pesticides Act 1974 and its regulations. The scope of the law covers the manufacture and importation of pesticides, the registration of pesticides, the storage of pesticides, their uses and adherence to pre-harvest interval (PHI), etc. The main thrust of the law in this case is to ensure use of approved pesticides and that precautionary measures are taken to protect workers and food safety.

3.2.3 Food safety

As in the case of the environment, specific laws to manage hazards which affect food safety have also been formulated in Malaysia. The main legislation in force in Malaysia is the Food Act 1983, the Food Act 1985, and the Food Regulations 1985. Among the legal provisions included in the Act to ensure food safety are: a) adherence to defined maximum residue limits (MRL) for different crops and active pesticide ingredients, heavy metals and biological contaminants; b) prohibition on use of harmful packages for food use; c) prohibition on use of packages of non-food product for food. All of these have been formulated with the main intention of ensuring national food safety.

3.2.4 Occupational safety and health

The legal provisions to protect the safety and health of employees arising from occupational hazards are provided for under the Occupational Safety and Health Act 1994 and its Regulations. The Act, formulated to cover the main industries of the economy (manufacturing, mining and quarrying, construction, agriculture, forestry and fishing, utilities, transport etc.), is also wide ranging in scope, covering elements such as general duties of employers, safety policies, manpower requirements (safety and health officer), training, enforcement, penalties, etc. The legal requirements on the use of chemicals hazardous to health, which under the law also include pesticides, are provided for in the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations 2000. The elements which are defined in the said Regulations, applicable to agriculture, are: 1) identification of chemicals hazardous to health; 2) permissible exposure limits; 3) assessment of risk to health; 4) actions to control exposure; 5) labelling and re-labelling; 6) health surveillance; 7) medical removal protection; and 8) warning signs.

3.3 SALM standard

Agricultural production is not without risks and depending on the production site can generate several types of hazards that impart various adverse impacts on the environment, food safety, workers health and sustainability unless controlled, mitigated or eliminated. To overcome these negative consequences, adoption of GAP with specific practices to address the more important control points of production is necessary if Malaysia is to achieve agricultural sustainability. GAP is an integrated system to manage the hazards associated with the elements of land, input, processes and output of agricultural production, within an agricultural spatial entity, in a good way to achieve productivity, sustainability, quality and safe produce in a socially-acceptable, worker-friendly and environment-friendly way. GAP, in essence, is about the management of all hazards of agricultural production in a way that eliminates or minimizes the negative impact of agriculture. The emphasis on the management is that all activities and processes of agricultural production must be done in a good way.

The concept of adopting agricultural practices that are executed or implemented in a good way is, if not defined properly, a subject that is open to many interpretations by the agricultural producers. Some producers are of the opinion that good practices are already sufficiently realized if they adopt crop technological packages that result in high yields of their produce, whereas others are content if their management practices help to control or mitigate some of the identified hazards mentioned earlier. GAP, on the other hand, is a comprehensive concept or product which is characterized by increased productivity, sustainability, environment-friendly and worker-safe operations and yielding produce that are safe and of quality. In other words, the GAPs are “practices that need to be adopted on farms to ensure food safety during pre-production, production, harvest and post-harvest. In many cases such practices also help protect the environment and safety of workers”.

In view of this, a definition of what constitutes a good way or how the good way is measured is therefore necessary and required, if the implementation of GAP is to be realized in Malaysia. In this case study, the good way is defined as the management of all hazards of agricultural production that are guided by a) conformance with standards (national) and b) adherence to national laws and regulations currently enforced in the country. In the former case, common rules or criteria for GAP have to be established and adhered to so as to control or eliminate the different hazards identified at the all critical control points of agricultural production.

The Standard on Good Agricultural Practice of SALM is a document that sets out performance levels (or rules) of agricultural production that must be achieved and that are encouraged among the producers (see annex 1). However, they do not specify how the management of agricultural practices should be done. Instead it is designed to encourage producers to go through the following process: (1) understand the current situation on the ground relative to the performance levels they are required to meet; (2) planning how to get from the current to the future situation; (3) implementing the plans to conform to the requirements of the standard; and (4) monitoring whether the plans are being implemented and whether they are working. The rules of the standard are not prescriptive approaches to manage agricultural production but rather an approach that combines defined performance targets with the freedom for users to decide themselves how to achieve the target.

The identified rules of the different elements in the SALM standard are, based on the analysis of the hazard types and risks, classified into two basic categories. These are:

- a) **MUST** rules are rules that are critical and mandatory if the objective of the optimum degree of order in agricultural production is to be realized, i.e. sustainability, environmental protection, products that are safe for consumers and protect workers health and safety. All users of the standard must comply with these critical and mandatory rules and in no way should they compromise them during the crop production process. The **MUST** rules of GAP are also further subdivided into two types – **MAJOR MUST** and **MINOR MUST**. **MAJOR MUST** rules (boxed in red in annex 1) are rules that producers must comply with. If not strictly followed by producers, hazards and impacts that are very severe for the environment, food safety, workers safety and sustainability will be the result. **MINOR MUST** rules (boxed in yellow in annex 1), on the other hand, are also rules that producers must comply with but the impacts in this case will not be very severe.

- b) ENCOURAGED rules (boxed in green in annex 1) are rules that are not mandatory in the crop production process. They are essentially rules of GAP that are recommended for adoption by the producers. The hazards and impacts are, in this case, minor and not severe enough to affect the environment, food safety or workers health and safety.

3.4 Operational principles and processes

Several work processes have been developed and defined by the Department of Agriculture Malaysia for the implementation of SALM. Agricultural crop producers seeking certification in GAP, are required to undergo the following processes/steps.

- a) Step 1: Submit application and registration form to the Department of Agriculture Malaysia for SALM certification.

Agricultural crop producers wishing to participate in SALM must first register themselves with the implementing agency, i.e. the Department of Agriculture Malaysia. Application forms for this purpose are readily available at all federal, state and district offices of the Department of Agriculture. In the application, the following types of information are required from the applicant: 1) name of applicant (individual or corporate and their official identification number); 2) name of contact person and numbers; 3) location and basic information of farm such as acreage, production system and number of farm workers; 4) types of crops grown; 5) marketing channels and destination of the farm produce; and 6) types of assistance required from the implementing agency to implement GAP.

A registration number to uniquely identify the farm will be assigned by the implementing agency to the approved applicant. This number (e.g. SALM 02.01) shall represent the farm's identification number to facilitate future references such as for correspondence, location and product traceability.

- b) Step 2: Select and appoint farm advisers to assist in the implementation of GAP.

To adopt GAP for SALM certification, agricultural crop producers are also advised to appoint their farm advisers. In SALM, three options of appointment are provided. These options are mainly dependent on the technological and financial capabilities of the agricultural crop producers and advisers could be from the government, private sector or in-house; with the latter two being confined to large-scale farming enterprises only. Full details on the appointment of these farm advisers are given in Section 3.7.1.

- c) Step 3: With the assistance of the adviser, implement the SALM standard and, once implemented, apply for SALM certification.

Irrespective of the option of crop adviser selected, a number of work stages for the implementation of GAP are identified in SALM. Agricultural producers and their advisers implementing the SALM standard are encouraged to follow these steps: 1) understand the SALM requirements; 2) conduct baseline study; 3) establish an action plan; 4) prepare the necessary documents; 5) implement the action plan; and 6) maintain the action plan and documents.

3.4.1 Understand the SALM requirements

One of the basic prerequisites for SALM implementation is the need for agricultural crop producers or their advisers to understand the expectations of the performances required in SALM. Farmers and their advisers are encouraged to get a copy of the SALM standard and the checklist and conformance criteria for SALM certification, from the nearest offices of the Department of Agriculture. The performance levels (practices), which must be achieved and which are encouraged, are clearly indicated in these documents.

3.4.2 Conduct baseline study of existing practices

The SALM standard on GAP is a document that is designed to encourage growers to go through a number of work processes. These include, amongst others, an understanding of the current situation on the ground relative to the performance levels they are required to meet. Towards this end, crop producers intending to participate and implement SALM are encouraged to undertake a baseline study of their current farm practices and evaluate them as to their conformances to the requirements of the SALM Standard. Any short-coming or non-conformance must be objectively identified so that it is given emphasis in the preparation of the farm Action Plan.

3.4.3 Establish action plan

The SALM standard, with its rules, is not a prescriptive approach to managing agricultural production, but rather an approach that combines defined performance targets with the freedom for users to decide themselves how to achieve the targets. Agricultural farm managers as well as their advisers, i.e. the implementers of SALM, are thus recommended to be sufficiently trained. In addition, they must have sufficient knowledge and expertise of the different facets of agricultural production so as to define the best and viable actions to achieve the expected performance level. Each rule of the standard must be evaluated and translated into practices. This requires understanding of present practices on the ground and developing the necessary action plans on how to get from there to a level that is expected in the standard. The action plans are in most cases different for different crops and farms; a development process that is dependent on a number of variables such as crop types, available financial resources, technology and expertise of the personnel managing the farms involved.

Action plans are therefore documents prepared by users or their advisers that list all necessary work or actions that are proposed for implementation in the farm to satisfy and conform to all the rules of the SALM standard. The types of work or action proposed for compliance with the rules in the action plan may manifest in two forms: 1) preparation of principal and supporting documents to explain or demonstrate the farm's commitments and adherence to GAP; and 2) a listing of all physical works to be implemented by the farm on the ground to conform with the rules of GAP. A sample copy of the said action plan, developed for translating into practice for the some of the rules relating to GAP, is given in annex 2.

3.4.4 Document action plan and its details

Agricultural producers are also encouraged to document the action plans with details of how each of the rules is to be translated into practice and implemented by the user. Depending on the user and performance levels that are expected, the content and details of the action plan may manifest in many forms, such as documentation of: a) farm policy statements; b) reports; c) standard operating procedures and guidelines; d) farm records of activities; e) analytical results; and f) other documents.

The documentation is encouraged since the action plans and their supporting documents represent tangible and credible documentary evidence that will be helpful when the farm is audited later for conformance with the standard of GAP, either by internal or external auditors. In addition, the action plan and the supporting documents are also useful documents which will help to explain to all farm workers the scope of the rules and how the rules are to be implemented by the farm.

a) Policy statements

Several policy documents to support and demonstrate intent and adherence to GAP are expected in SALM from the crop growers. These are policies relating to: a) soil care; b) water management; c) crop protection; d) food safety; e) waste management; and f) workers health and safety. The scope of each of these policies is given in annex 3.

b) Reports

The need to undertake and report specific studies, particularly for risk assessment, is also spelt out in the SALM standard. These, together with other reports, which are required (must or mandatory) and encouraged from agricultural producers are listed and described in annex 3.

c) Standard operating procedures

The manuals or methods of how the different activities of agricultural production are undertaken in the farm are also expected from implementers of SALM and should be adequately described for the purposes of documentation. The activities and processes that are recommended for documentation in the forms of manuals or guidelines are elements that relate to: 1) land preparation for planting; 2) soil management measures to control soil erosion; 3) choice of planting materials; 4) application of fertilizers; 5) spraying of pesticides; 6) harvesting of produce; 7) post-harvest treatments; 8) grading and packaging of the produce; and 9) other operations which will enhance the adoption of GAP.

Where crop technological packages (e.g. from the Department of Agriculture or Malaysian Agricultural Research and Development Institute MARDI) are referred to by the grower, copies of the said packages should be made and documented.

d) Farm records

A good and well maintained record keeping system for the different activities of agricultural production is essential in the adoption and implementation of GAP and its eventual certification. All records should be maintained and retained by the growers for at least six months, unless stipulated by specific legislation. The types of farm records that are required, together with their expected attributes to be registered, are given in annex 3.

e) Other farm records

In addition to the above listed records, growers are also encouraged to keep other relevant records that are useful to demonstrate the farms' commitments and adherence to the rules of GAP. Among the farm records that are recommended for documentation are: 1) types of cultural and field activities undertaken (e.g. pruning of trees, cleaning of field, collection of organic debris such as rotten fruits); 2) observation of nutrient deficiencies in leaves; and 3) moisture stress conditions of the crop and other parameters that are identified in the action plan.

f) Analytical results

Analytical results, particularly with regards to the presence and content of food contaminants, must also be documented by crop growers to demonstrate their conformance with food safety requirements. The test results must be undertaken by a laboratory accredited by a competent accreditation authority or a laboratory approved by the government, with results traceable to the production sites of the crop producer. The analytical test results for the produce that must be documented are listed and described in annex 3.

Besides pesticide residues and heavy metals analyses, crop producers are also encouraged to undertake and document other analyses that are identified in the SALM standard. The analytical results that should be documented are given in annex 3.

g) Other documents

In addition to policy statements, reports, standard operating procedures, farm records and results of analysis, implementers of SALM are also required to prepare and document other supporting documents such as: a) list of registered pesticides; b) maximum residue limits; and c) permitted heavy metal contents. The mandatory and recommended supporting documents required in SALM are summarized in annex 3.

3.4.5 Implement the action plan

The action plan together with documentation in the form of policy statements, reports, standard operating procedures and design of the farm records are only written guidelines and procedures that have been developed to manage the hazards associated with agricultural production. The actual controls and elimination of the hazards, however, are only realized if all specific recommendations and actions identified in the documentation are fully translated and implemented on the ground. The state of GAP is only achieved and recognized if the crop producer is able to physically demonstrate (where applicable) that the developed and recommended specific line of actions are really put into practice in the farm. The common saying “*practice what you plan*” is seriously taken into consideration when the farm is later audited for compliance with the SALM standard.

Depending on the rules of the SALM standard and the recommendations, the translated practical actions on the ground can, depending on the capabilities of the producer, manifest in a number of ways. These are:

- a) investing in and building the necessary physical infrastructure to meet the requirements of the standard, e.g. the building of a proper store to cater for the storage of farm inputs such as pesticides, fertilizers and other farm equipment;
- b) constructing or installing recommended control measures to mitigate or eliminate hazards, e.g. to minimize the hazard of soil erosion, the following soil conservation control measures will need to be in place: i) terracing of slopes; ii) construction of contour drains; iii) establishment of leguminous cover crops; iv) construction of silt traps and slope stabilization structures; and v) contour planting of the crops;
- c) placing suitable signage in the farms to warn farm workers and visitors of the potential dangers and hazards, e.g. warnings for field entry by visitors and workers after the application of pesticides, hazards associated with use and storage of inputs like pesticides and the emergency procedures to be followed in cases of accidents.

The farm manager or person overseeing the farm operations must take the responsibility and ensure that all identified works and requirements are fully implemented as described in the action plan and the supporting documents.

3.4.6 Maintain the action plan and supporting documents

The established action plan together with the supporting documents are not one-off exercises in documentation but are put in place and executed on a continuous and operational basis to mitigate the associated hazards of agricultural production.

Changes to these documents are often required by the grower and must be up-dated constantly (at least once a year) to adapt to changing production scenarios such as improved physical and financial capabilities, introduction of new technologies and changes in national legislation. These changes may also be necessary as a result of feedback and non-conformances arising from internal audits, undertaken by parties that are not involved in the implementation of the GAP. The documents whose content are likely to change on a short-term basis and which require updating are summarized in annex 3. Apart from these documents, farm records of the identified activities must also be kept up-to-date and reviewed on a regular basis so that these records truly capture the adoption of GAP on the farms.

3.4.7 Conduct internal audit

Agricultural crop producers participating in SALM are also required to undertake periodic evaluation of their farm activities to see whether the defined plans are being implemented on the ground and whether the actions are working. This requirement (MAJOR MUST) is clearly stipulated in the SALM standard. The internal audit and its report (annex 6) serve many useful purposes for the crop producer participating in SALM. These are:

- a) it provides the crop producer with information on the farm's state of compliance and progress on the implementation of GAP;
- b) it identifies problems relating to implementation that a crop producer can then use to define follow-up corrective actions that must or should be taken to overcome the non-conformances, as identified in the internal audit report;
- c) it provides the crop producer with reference materials that are useful for a periodic review of the farm's implementation of GAP; and
- d) the report serves as documentary evidence that will help the crop producer to demonstrate its commitment and implementation of the requirement to undertake the internal audit.

3.5 Auditing for quality assurance

3.5.1 Certification process

The SALM programme also incorporates a certification system that has its own rules of procedure and management. Certification is an essential and integral component of the SALM, where in the scheme the evaluation activity is introduced as a means to provide assurance that the GAP in Malaysia and its produce comply with specific standards and other normative documents. Certification is introduced since it provides tangible and credible evidence of adherence to GAP. The competitive advantage gained from certification is also envisaged in SALM, since agricultural products from certified farms enhance the reputation of the producer; thus extending and facilitating global acceptance of agricultural produce.

Several stages of the SALM certification process are recognized by the Department of Agriculture Malaysia. These stages are briefly described in the following paragraphs.

a) Application for certification

Crop producers intending to seek certification must complete the official application form prepared by the certification committee. The form, duly signed by authorized representative of the applicant, must include or attach the following information: i) the scope of the desired certification; ii) a statement that the applicant agrees to comply with the requirements for certification and to supply any information needed for evaluation; and iii) name, address of farm or corporate entity and its legal status.

b) Preparation for evaluation

On receipt of the application, the certification panel will then prepare an audit plan for its evaluation activities to allow for the necessary arrangements to be managed. The certification panel will at the same time assign personnel appropriately qualified to perform the tasks for the specific evaluation (audit). The audit team shall consist of at least two personnel, with one acting as the lead auditor. In this case, personnel will not be assigned if they have been involved in or been employed by a body involved in implementation of its GAP, in a manner and within a time period which could conflict with impartiality.

To ensure that a comprehensive and consistent evaluation is carried out, the appointed auditors shall be provided with the appropriate working documents. Among the working documents which shall be made available to the auditors are: i) format for audit plan; ii) format for opening meeting; iii) document and field checklists (and their conformance criteria) for evaluating the rules or practices; iv) format for audit reporting; v) format for non-conformance reporting; and vi) other supporting documents to assist the auditors in the evaluation exercise.

c) Evaluation

The selected auditors shall evaluate the practices of the crop producer against the standard covered by the scope defined in its application and against all conformance criteria specified in the rules of the certification scheme. Two types of evaluation will be carried out by the auditors, namely document audit, which is carried out to cover standard and legal requirements of information submitted by the applicant, and field audit, which is undertaken for the purposes of verification when the audit team visits the site or farm of the crop producer.

d) Audit report

The audit team, after the document and field audit, will make a full report all of its findings as to the conformance with all the certification requirements. The report on the outcome of the evaluation will also be brought to the applicant's notice, identifying any non-conformance that has to be discharged in order to comply with all of the certification requirements. In the event of any non-conformance, the crop producer (the applicant) will also be given a specific time limit to take remedial action to meet the requirements, after which the certification body shall repeat the audit for the necessary parts of the initial procedure only.

3.5.2 Certification criteria

The decision as to whether the applicant or a crop producer should be certified as meeting the SALM standard is undertaken by the certification panel. In this case, the certification panel will evaluate the audit report and the information gathered during the evaluation process. The audit report and gathered information should be sufficiently objective: i) for the certification panel to be able to take an informed decision on certification; ii) for traceability to be available in the event of an appeal or planning for the next activity, possibly by different persons or body; and iii) to ensure continued conformance with certification requirements.

The certification criteria against which the products of a crop producer are evaluated are based on those requirements that are outlined in the SALM standard. Farms seeking SALM certification must satisfy all major MUST rules and part of the minor MUST rules which are identified in the SALM standard, before general conformance with the standard is acknowledged. A brief explanation of the certification criteria adopted is given below.

a) Classification of rules of SALM standard

Altogether 162 rules of GAP, which a crop producer must or is encouraged to fulfill, are specified in the SALM standard. Out of these, 105 rules are classified as MUSTS and the remaining 57 are rules that are ENCOURAGED or recommended for adoption by crop producers. For the former, 29 of the rules are classified as MAJOR MUSTS and 76 are MINOR MUSTS.

b) Additional requirement for certification

The SALM rule on pesticide residue analysis of agricultural produce is also given prominence in the certification of GAP. Besides providing evidence of residue testing, a crop producer must also demonstrate that the pesticide residues of agricultural produce are, for three consecutive analyses, below the permitted MRL as defined in the Food Act 1983 and the Food Regulations 1985.

c) Levels and criteria for certification

Two levels of certification are currently recognized in SALM by the Department of Agriculture. These levels and their certification criteria are designed to encourage wider adoption of GAP among agricultural crop producers and to enhance the marketability of Malaysia's agricultural produce in overseas markets. They are summarized in annex 4.

Certification will not be granted until all non-conformances have been corrected and the corrections verified by the certification committee, by a site visit or other appropriate forms of verification. The non-conformances and their resolution will be documented by the certification committee.

d) Mark of conformity

Certified crop producers (Level 2) will also be entitled to use the certification mark issued by the certification committee. This usage will however be restricted to crop producers that meet the certification criteria of level 2 only, i.e. meet all MAJOR MUSTS AND 95 percent of MINOR MUSTS. A draft sample copy of this mark of conformity, for level 2, is given in figure 1. The ownership, use and display of the certificates and mark of conformity will be under the control of the certification panel.



Figure 1. SALM mark of conformity

3.5.3 Surveillance of products

The SALM certification system also requires annual surveillance by the certification committee to ensure and determine the continued conformity of the certified product with requirements specified by the standard and certification scheme. The surveillance procedures that have been identified in SALM are: 1) surveillance inspection or audit of farm practices conducted by the crop producer; and 2) collection and testing of certified agricultural produce at the location of the farm or from the market. For this purpose, documented procedures to enable the surveillance to be carried out to detect non-conformances will be prepared by the certification panel. In the event that non-conformances are detected, the certificate or mark of conformity to GAP given to a producer can be withdrawn or suspended by the certification panel.

3.6 Human resources requirements

Three general groups of personnel, derived mainly from the Department of Agriculture Malaysia, are currently involved in the implementation of SALM. These are farm advisers, auditors (internal and external) and technical staff to support the analytical laboratory requirements of SALM. A brief description of each of these groups is given below.

3.6.1 Farm advisers

One of the prerequisites for participation in SALM is the appointment of farm advisers to assist and guide agricultural crop producers in the implementation of SALM. These, which are mainly dependent on the technological and financial capabilities of the agricultural crop producers, are categorized into the following groups:

a) *Agricultural extension agents*

These advisers normally work with agricultural producers who, because of their comparatively lower level of knowledge and lack of technological expertise and financial resources, require the assistance from the Department of Agriculture to provide them with necessary advice and assistance on GAP and eventual certification. Assistance to the farmers in this case will be provided by the State Department of Agriculture, who will assign agricultural extension officers (mainly agricultural graduates or holders of the diploma in agriculture who are stationed in all

the administrative districts of Malaysia) trained in SALM to assist in the implementation. A total of about 150 extension agents have to-date been trained.

b) Farm consultants

Farm consultants from the private sector are also an integral part of the SALM scheme. Agricultural crop producers, because of their large-scale operations and financial capabilities, often hire and contract these advisers to advise and guide them on the implementation of GAP. These are normally producers who are involved in the commercial production of food crops destined mainly for international markets. Advisory services from government-funded institutions in this case are minimal and any assistance, if required, is mainly in the form of specific technical support services such as soil inspection, analytical services for soils, leaves and agricultural produce.

3.6.2 SALM auditors

Another component of the human resource requirements that is critical to SALM is the auditors, which are required for farm inspection and certification. In this case, only technically competent personnel, selected from the technical divisions of the Federal Department of Agriculture and/or approved private sector (i.e. independent from the State Department of Agriculture Advisory Services), will be appointed to undertake SALM certification. The personnel selected to do the job must be competent with respect to the functions they perform, including making required technical judgments, framing policies and implementing them. In order to ensure that evaluation and certification are carried out effectively and uniformly, the personnel must have the minimum relevant criteria of competency as described below.

a) Qualification

The auditors must have the appropriate post-secondary education, i.e. tertiary qualification (degree level) in the field of agricultural sciences or closely related disciplines such as environmental sciences, fisheries, animal sciences and a total work experience of at least three years.

b) Knowledge and skill

The personnel must also undergo a SALM audit course organized and conducted by the Department of Agriculture. The course is designed to impart the necessary information and knowledge to the auditors and covers the following subject items: i) agricultural production system and processes, their hazards and their impacts on food safety, the environment, workers' health and safety and sustainability; ii) current and changing technologies and facilities to overcome and eliminate the hazards and impacts of agricultural production; iii) the SALM standard for GAP; iv) national legislation and legal requirements, relevant to GAP, that are enacted and put in place to control and eliminate the hazards; and v) audit procedures, rules, techniques, ethics, checklists, conformance criteria and reports which are to be used in the execution of the SALM audit.

A register of all auditors selected to undertake the SALM audit is maintained by the Department of Agriculture. To-date, about 80 technical officers from soils, agronomy and crop protection have been trained to undertake the audit. Among the information recorded and kept up to date for each auditor are: i) name and address; ii) name of position held and organization affiliation;

iii) educational qualification and professional status; iv) experience and training in the different fields of certification; and v) performance appraisal. All contracted personnel necessarily have to commit themselves to comply with the rules defined by the certification committee, including those relating to confidentiality and independence from commercial and other interests.

3.6.3 Technical personnel

Technical personnel from the Department of Agriculture, which cover mainly soil surveyors, chemists and laboratory assistants, are also an important component of the human resource requirement of SALM. The services they provided include soil survey, analysis of pesticide residues in crop produce, determination of heavy metal contents and analysis of water quality for either irrigation or for use in post-harvest treatment. Except for soil survey where a nominal charge is imposed on the applicant, all of these services are provided free by the implementing agency.

3.7 Organization and structure of SALM

3.7.1 Organization set-up

The organization set-up to establish and implement SALM, in terms of providing the advisory services, farm inspection and auditing and technical support services, is still at the moment under the responsibility of the Department of Agriculture. Nevertheless, strict separations of functions are recognized and enforced for the implementation of the scheme. The State Departments of Agriculture (13 in total) are currently charged with providing the advisory services for adoption of GAP whereas inspection and auditing as well as technical support services are within the purview of the different divisions of the Federal Department of Agriculture.

3.7.2 Certification committee

Besides these two inter-related departments, i.e. State and Federal, a multi-agency committee comprising of members representing the different agencies of the Ministry of Agriculture and Agro-Based Industries, has also been established to implement SALM. The committee, or the certification panel, is responsible for all decisions relating to the granting, maintaining, extending, suspending and withdrawing of certification. The members include personnel from the Federal Department of Agriculture, the Ministry of Agriculture and Agro-Based Industries, Malaysian Agricultural Research and Development Institute (MARDI), Federal Agricultural Marketing Authority (FAMA), Farmers Organization Authority (LPP) and the Food Quality and Safety Division of the Ministry of Health Malaysia (table 1).

Table 1. Organizational structure of SALM certification committee

| | | | |
|--|--|---|-----------------------------------|
| Department of Agriculture (DOA) (Chairman: Director General of Agriculture) | | | |
| Crop Quality Division (SALM Secretariat) | | | |
| Malaysian Agricultural Research and Development Institute (MARDI) | Farmers Organization Authority (FOA/LPP) | Federal Agricultural Marketing Authority (FAMA) | Ministry of Health Malaysia (MOH) |
| Other Committee Members | | | |
| Soil Management Division | Crop Protection Division | Pesticide Control Division | Crop Commodity Division |

3.8 Information resources for SALM

A good and well maintained record-keeping system for the different activities of agricultural production is an essential component in the adoption and implementation of GAP and its eventual certification in SALM. As a consequence, all certified farms have within their premises mandatory records of the important farm activities, with the first entries being more than six months old. All of these records in most farms are paper-based information (in folders), but in some, especially the commercial ones, most of the data are captured digitally on personal computers, either as text documents or in spreadsheets. A national database that captures all information kept at the farm level is still not realized at the moment, although computerized records of inspected and certified premises have been established and maintained by the SALM secretariat. Records of all audit reports are still in hard copy form.

The establishment and implementation of another project on Malaysian Food Information and Traceability (M-FIT), by the Ministry of Agriculture and Agro-Based Industries, could however in the near future change the information resources of SALM. This online farm to table information hub is a computerized information backbone which permits a full chain traceability of food products and links together everyone in the supply food chain from farms to buyers and to consumers, locally and internationally. M-FIT, developed to complement SALM, thus allows the SALM farms to provide more information on their production processes, measures taken to manage risks, types of inputs, suppliers or sources of produce, etc.; thus permitting not only buyers and consumers to make the necessary informed decisions on food safety but the implementing agency and other regulatory bodies to undertake on-line audits, perform risk assessment and to provide the capacity to trace the source of produce and its processes in the event of product withdrawal or recall. A sample copy of the type of information captured by M-FIT at the crop grower level is given in annex 5.

4. Evaluation of SALM

4.1 Introduction

The Farm Certification Scheme on Good Agricultural Practice of Malaysia (SALM), established with the objectives of encouraging and acknowledging farms that adopt good production practices that meet the requirements of food safety and productivity but done in an environment-friendly and worker-friendly way, has since its inauguration in 2002 shown positive incremental growth, which suggests it is likely to be sustainable. The indicators supporting this are clearly demonstrated in the following:

- a) increased number of farms, commercial and smallholders, certified as demonstrating GAP – the number currently is about 211 compared to the initial 17 that received their certificates in 2002 (see table 2);
- b) increased number of activities by the government to create awareness among crop growers, consumers and government about the objectives, scope and benefits of SALM; including through seminars, courses, exhibitions, road-shows, advertisements;
- c) initiatives and support from the government, through the Ministry of Agriculture and Agro-Based Industries, to raise the standard of the SALM certification scheme to a level that is equivalent to or on par with other internationally accepted quality assurance schemes;

Table 2. Summary of farms certified to SALM

| Crop Group | Main Crops | No. of Farms | Size (ha) |
|---------------------------|---|---------------------|------------------|
| Fruits | Mango, pineapple, durian, starfruit, papaya, dokong (Lansium spp.), salak, guava, jackfruit, oranges, pomelo, longan, melons, bananas, rambutan, sapodilla (ciku), pitaya, etc. | 121 | 7 301.0 |
| Tea | – | 4 | 1 051.5 |
| Vegetables and cash crops | Groundnuts, pepper, maize, leafy vegetables (cabbage, salad, spinach), fruit vegetables (tomatoes, chili, brinjal, cucumber, okra), etc. | 80 | 475.9 |
| Mushrooms | – | 6 | 11.5 |
| TOTAL | – | 211 | 8 839.9 |

- d) development of specific technological packages or templates to assist agricultural crop growers in the adoption of GAP and to seek SALM certification; covering development of generic documents on policies, action plans, record keeping and other documents for the main crops in Malaysia;
- e) increased interest from the private sector, especially companies involved in agro-based industries such as pesticide formulators, collectors and exporters, large retailers (hypermarkets) and other players in the food supply chain, to cooperate and participate in SALM; and
- f) requests from external auditors from other international crop quality assurance schemes that Malaysian farms seeking their certification should preferably be first certified to the SALM standard.

4.2 Strengths

The positive growth of SALM and the success that it has enjoyed to-date are likely to continue and to be sustainable in the future. The main reason for this projection lies in the strengths and attributes of the implementing agencies that are responsible for SALM, i.e. the Department of Agriculture Malaysia and the Ministry of Agriculture and Agro-Based Industries. These attributes, which are favourable and helpful for achieving the objectives are described in the following sections.

4.2.1 Commitment and support from top policy-makers

The active participation, interest and support of the Minister of Agriculture and Agro-Based Industries since SALM's inception are without doubt an instrumental factor for the implementation and success of SALM. This interest and commitment to achieve the objectives of the scheme is also manifested in the directives and monitoring given and undertaken by top management executives of the implementing and supporting agencies. SALM in its present form is viewed by them as an integral and important part of the National Food Safety Policy and National Agricultural Policy, which are aimed at ensuring that the agricultural food production system and food safety in the country are also in line with the concept of safe and sustainable agriculture. The commitment is further enhanced by the national action plan for food safety where all stakeholders agreed that good practices at the upstream part of the food supply chain is a prerequisite for food safety and quality.

4.2.2 Human resource capabilities

The Ministry of Agriculture and Agro-Based Industries, particularly the implementing agency, i.e. Department of Agriculture Malaysia, is also fortunately endowed with a large number of well-trained and experienced agricultural professionals who are capable of conceptualizing the scheme and translating it into reality. A wide range of agricultural disciplines is at the disposal of the implementing agency for the execution of the scheme. These range from soil scientists, crop nutritionists, agronomists, entomologists, chemists, pesticide specialists, hydrologists, etc., who through a multidisciplinary approach have developed suitable GAP technological packages for extension to and adoption by crop growers. Aside from these professionals, the Federal Department of Agriculture is also supported by a large number of agricultural extension agents of the State Department of Agriculture where at the ground level each administrative district of the State is staffed by at least an agricultural officer (degree level) and supported by other sub professionals at the diploma or certificate levels. This organization set-up facilitates the promotion and implementation of the SALM scheme.

4.2.3 Infrastructure and facilities

Technical inputs, particularly with regards to analysis of food produce for pesticide residues and heavy metal contamination, are also important considerations when establishing the credibility of the SALM inspection and certification scheme. The need for this documentary evidence to demonstrate food safety is adequately provided by the laboratory facilities established within the Department of Agriculture, both at the national level as well as at the regional level. These include laboratories for pesticide residue analysis for food crops, heavy metal (mercury, lead, arsenic and cadmium) determinations in agricultural products and water and soil analysis. The availability of these laboratories, for which the services are for a time made free to participants, helps greatly in the implementation and realization of the objectives of the scheme. Other than the laboratories, the implementing agency is also in the position to provide other technical services that are required by crop producers to meet the requirements of GAP and certification. One of these is the soil inspection service offered by the Soil Management Division of the Department of Agriculture. A nominal fee is charged for the service and the report (soil and soil-crop suitability).

4.2.4 Financial resources

The financial resources required for SALM are at the moment not a constraint on the implementation of the scheme. Except for the soil inspection fees (required by law) which are largely paid by commercial crop producers, all operational costs for the implementation of SALM inspection and certification are borne by the Department of Agriculture and the Ministry of Agriculture and Agro-Based Industries. The costs expended by the government to participants of the scheme to-date include cost of soil survey (group farms and smallholders only), cost of visits and inspections by farm advisers and auditors, laboratory analyses, transportation for inspection and maintenance of facilities, equipment and supplies. Funds for these operational expenses are sourced from annual operational and development expenditures. A breakdown of these costs is given in table 3. However, on-farm operational costs such as purchase of inputs (fertilizers, pesticides, machinery, farm structures, etc.) are borne by the crop producers, although in some instances partial physical inputs may be borne by the state departments and other supporting agencies.

**Table 3. Cost of adopting and implementing SALM
(per farm in Malaysian Ringgit)
(1 US\$ = 2.962173606 Malaysian Ringgit or 1 Malaysian Ringgit = 0.34 US\$)**

| No. | Types of services/Cost | Cost (Govt.)* | Cost (Farmer) | Details |
|---|---|-----------------|-----------------|--|
| A Farm improvement | | | | |
| 1 | Farm infrastructure | – | 1 000.00 | Improvement to storage areas, signage and others |
| B Soil management services | | | | |
| 1 | Soil inspection services (soil map and report) | 121.00 | 121.00 | Processing fee of 120 and inspection fee of RM 1.00 per hectare |
| 2 | Soil analytical services for heavy metals (produce) | 225.00 | – | 3 analyses at 75.00 per analysis |
| 3 | Soil analytical services for heavy metals (water) | 75.00 | – | 1 analysis at 75.00 per analysis |
| 4 | Soil analytical services (fertilizers) | 75.00 | – | 1 analysis at 75.00 per analysis |
| C Pesticide management services | | | | |
| 1 | Pesticide residue analysis | 300.00 | – | 3 analyses at 100.00 per analysis |
| D Advisory services and internal audit | | | | |
| 1 | Advisory services | 300.00 | – | Transport and travel (T&T) cost for 3 visits by one adviser (meal 40.00 and transport cost of 60.00 (100 km at 0.60 per km) |
| 2 | Internal audit | 200.00 | – | T&T cost for 2 visits (rates as above) |
| E Certification services | | | | |
| 1 | SALM audit | 760.00 | – | T&T for two auditors (meal allowance of 80.00, lodging 150.00 and transport cost of 150.00 (250 km at 0.60 per km) per person) |
| | TOTAL | 2 056.00 | 1 121.00 | – |

* Excluding basic salary and emoluments of government employee.

4.3 Weaknesses

Despite the operational strengths of the Department of Agriculture, the smooth implementation of the SALM scheme is also beset by a number of internalities which, if left unchecked, may jeopardize the continued credibility and sustainability of SALM. Some of these, which require corrective actions by the implementing agency, are summarized in the following paragraphs.

4.3.1 The scheme itself

One of the main weaknesses of SALM is that the current inspection and auditing procedure for SALM certification which, as shown in the previous sections, lies exclusively within the purview of the Department of Agriculture Malaysia. At the same time, the Department is also charged with the responsibility of providing advisory services on GAP; although the latter are executed by the State Departments of Agriculture. In the Malaysian context, the two entities are viewed as a single organization since staff at the federal level may and can be transferred to the states and vice versa.

Because of this administrative set-up, the credibility and impartiality of SALM are likely to be questioned since the inspection and auditing are not done by an independent third party certification body accredited to the appropriate authority. Unless steps are taken to overcome this, buyers and consumers alike may not have the confidence that the products truly meet the objectives of SALM.

4.3.2 Commitment and time

The time and commitment of agricultural extension officers required to provide advisory services to potential clients to adopt GAP is also another constraint limiting the achievement of SALM. Agricultural extension under SALM is viewed by many in the Department as a focused type of extension, where a one-to-one contact is made between the officer and the crop producer to disseminate agricultural knowledge and technological know-how. This new focus differs from the previous concept of agricultural extension where the delivery system is based on Training and Visit (T and V). As a result, the number of clients that may be assisted in a year, particularly by the agricultural officers at the district level, is limited and confined to specific clients only, since time is a constraint for them. This is further compounded by a number of other district development responsibilities that are mandated to them by the State Department of Agriculture. In view of these, many of the agricultural crop producers, particularly the commercial ones, are resorting to non-governmental sources for farm advice and guidance on certification of GAP.

4.3.3 Lack of legislation

Another factor that is unfavourable to the implementing agency and may hamper the participation of all agricultural crop producers is the voluntary nature of the scheme itself. The Department of Agriculture currently does not have the legal provisions to make SALM mandatory for all crop producers to adopt GAP, with eventual certification. The primary interest and participation to-date are mainly from growers of agricultural crops like starfruits, pineapples and papayas, destined for international markets such as Europe, USA and Singapore, and other food crop growers who supply the large retail outlets in Malaysia. The participation from smallholders and farmers is still comparatively low and any participation from them is likely to be because of the derived benefits of governmental assistance in the forms of physical inputs, channel for marketing etc.

4.4 Opportunities

Several opportunities and external conditions operate in tandem to help and favour the realization of the objectives of SALM in Malaysia. Those which have been exploited by the Department of Agriculture and the Ministry of Agriculture and Agro-Based Industries are briefly described below.

4.4.1 Consumerism and market demands

Another opportunity which SALM can exploit is the rising trend of consumerism, where consumers are now demanding, expecting and trusting the food producers and retailers to supply and demonstrate that the food they consumed are safe, of high quality and that they are produced in sustainable and environment-friendly ways. As a result of this demand and expectations, the retailers of food produce are forced to source their products from suppliers and producers that can meet the above-mentioned demands of the consumers. Failure to do so would threaten their markets.

In addition to pressures which threaten their markets, buyers of agricultural produce, i.e. the manufacturers and retailers, are also subjected to pressures that threaten their supplies. Sourcing of agricultural produce must, as a result, be made from suppliers and producers who share the consumers' expectation of the availability of agricultural food that are safe, of high quality and which are produced in an environmentally and sustainable way. This pressure, which threatens their supply, is further aggravated if the existing food farms supplying the produce to them are not managed in line with sustainable best practices; often resulting in adverse effects on environment, product safety and workers health.

4.4.2 Corporate management policies of food buyers

Another opportunity that has been exploited to promote the objectives of SALM among crop producers is the existing corporate management policies of food buyers, local as well as international. Because of consumers' concerns, there is now a demand on buyers of agricultural produce to adopt a more radical attitude towards sourcing food and other agricultural produce from their suppliers and producers. Many fresh food buyers and manufacturers of processed foods, especially those in Europe, are now committed to the principles laid down by the Rio Summit, the International Chamber of Commerce in its Business Charter for Sustainable Development and Sustainable Agriculture.

In response to this desire to be in line with safe and sustainable agriculture, many food importers and buyers of agricultural food produce have introduced various corporate management policies on buying agricultural produce, either for fresh consumption or as raw materials of processed food. In general, many manufacturers are now implementing management systems that integrate issues that relate to quality, the environment, food safety and the safety and health of workers. Some have in fact encouraged their business associates and suppliers to aim for the same high standards of environmental protection and safety as those to which they aspire. An example of this commitment is a major food manufacturer who, in sourcing for its supplies, evaluates the safety, health and environment performance of its suppliers and contractors. Some buyers are also encouraging their suppliers to strive for food safety, health and environment standards equivalent to their own whereas some buyers are committed to purchasing agricultural produce only from suppliers who meet the criteria or standards as set out by the company.

The importance placed on food safety, health and environmental protection is also, for some, an integral part of the process of selecting business alliances and of maintaining contracts. Some buyers will only work closely with suppliers who are willing, able and committed to deliver agricultural produce as per their criteria and who share their enthusiasm for quality assurance and sustainability. In view of these, many buyers have now developed guidelines for the sustainable management of key crops for products that are sourced by their buyers. These include crops such as oil palm, tomatoes and tea.

4.4.3 Compliance with sustainable management

The need for agricultural producers to comply with sustainable management standards is another external factor that has been used by Malaysia to promote SALM. Malaysian food producers, if they want to be global players in the food supply chain, have to develop and maintain systems to verify performance in food safety, health and environmental protection. The objective is to provide evidence to purchasers that specific management system is being complied with. To ensure compliance with sustainable best practices, compliance audits of the producer are often

undertaken to meet the requirements of the purchaser. These are either undertaken by staff of the company buying the products or by auditors appointed by the buyer. In some instances, some buyers are committed to independent verification of compliance by auditors appointed by the buyer or moving towards the use of independent certification against an international standard. Some of the major buyers and retailers are also in favour of developing a globally accepted agriculture certification system designed specially for food crops such as for fruits and vegetables.

As such, agricultural crop producers must now accept the reality that major food manufacturers and buyers are now demanding agricultural food products that are produced in a safe and sustainable way and with the assurance that they are truly conforming to GAP standards. The agricultural production processes that conform to standards and are certified by approved certifying bodies are now gaining momentum and will be favoured by the big buyers and food manufacturers when sourcing fresh agricultural produce and crop-based products. There is also now a rising trend for many countries and producers in the use of globally accepted and auditable systems and standards in international trade.

4.4.4 Food traceability

Traceability, defined as the ability to trace the history, application or location of that which is under consideration, is also another external condition that has been exploited by the implementing agency to encourage more growers to participate in and implement SALM; a requirement which many Malaysian crop producers have to contend with in the international as well as local markets. In this case, traceability is closely linked with product identification and recall procedures that relate to the origin of materials and parts, processing history and the distribution and location of the product after delivery. The importance of traceability for public health and consumer protection has, since the 1980s, steadily increased and grown as a mandatory requirement in the production and market access of food products. Traceability of food products is now an essential marketing requirement that is deemed necessary to meet heightened consumer expectations, particularly with respect to food safety.

The importance of the requirement of traceability is amply demonstrated in the GlobalGAP Protocol on Good Agricultural Practice for Fruits and Vegetables, SALM and other standards, where in each of these the element of traceability needs to be proven prior to certification of GAP. Traceability has now become a fundamental part of the management and audit systems that have been developed to provide assurance to the consumers.

4.4.5 Compliance with national legislation

The introduction of SALM also gives the country an opportunity for agricultural producers to be exposed to and comply with existing national legislation. Malaysia, as a country committed to consumer safety and sustainable development, has several laws that are relevant and applicable to the concept of GAP. These, to identify a few that have direct and strong bearing to the management of the identified hazards of food production, are the Pesticides Act 1974, Environmental Quality Act 1974, Food Act 1983, Occupational Safety and Health Act 1994 and their associated Regulations.

The specific legal provisions of these different Acts, discussed in relation to compliance with the SALM standard cover: (i) environmental impact assessment, open burning, disposal of solid and scheduled wastes including empty pesticide containers, discharges of effluents, etc. (for the environment); (ii) the presence of incidental constituents such as metal contaminants, micro-

organisms and their toxins, drug residues and pesticide residues (food safety); (iii) impact on workers safety and health as a result of the use of inputs such as chemicals, machinery, etc. (occupational safety and health); and (iv) use of approved and registered pesticides. The importance of compliance with national legislation is clearly spelt out in all the above Acts, where any person who violates or infringes the specific provisions of the Acts commits an offence and shall be liable, on conviction, to a fine or to imprisonment or to both.

4.5 Threats

The implementation of SALM to ensure that food products are produced in a safe and sustainable way is not without problems or constraints, which if not addressed by the implementing agency may result in the scheme losing its momentum and sustainability. Experience has shown that SALM faced several external conditions that are harmful or unfavourable to achieving the objectives. These are summarized in the following paragraphs.

4.5.1 Pricing structure of agricultural produce

The most important question in the minds of potential participants is whether participation in SALM will result in a more favourable price for their output. Experiences during the awareness campaign have shown that most agricultural crop producers expect a higher ex-farm gate price when investments in GAP and certification are made. The implementing agency is, as an extension organization, unfortunately unable to guarantee an acceptable pricing structure, since the prices of food commodities are determined by the market forces of supply and demand. In most cases, buyers often seek quality agricultural products at the lowest price possible so as to enhance their profit margins. This is evident from the retail price of a particular food crop in large supermarkets, where it can sometimes be lower than the average ex-farm price.

4.5.2 Cost of production

The capability of a crop producer to finance and implement GAP for eventual certification is another external condition that is likely to be unfavourable in achieving the objectives of SALM. The most important impact when adopting SALM is the increased cost of production: to meet the full spectrum of the SALM standard, participants have to bear additional costs of investment and operations. One of the most important investments that must be made by the farmer is in the building of a proper storage area to house chemicals such as pesticides and fertilizers: in the standard strict rules of good practices for storage of these inputs are explicitly stated and the crop producer is required to adopt these. A survey of the agricultural production units carried out recently shows that most of the farms in Malaysia do not have the proper infrastructure to store these inputs. As such, construction of such a storage facility is required before certification is given to the farm.

Besides the cost of investment, agricultural crop producers are also likely in the future to be burdened with increased costs of production because of service charges incurred for certification. Efforts are currently being made by the implementing agency to appoint a third party independent certification body to undertake the inspection and certification of GAP. This action, aimed at giving credibility to the quality assurance scheme, is envisaged to increase the cost of production of the producer further; a factor which will definitely discourage agricultural crop producers to participate in SALM unless other economic measures are put in place to absorb the additional cost.

4.5.3 Mindset of crop producers

The mindset of agricultural crop producers, particularly farmers with smallholdings, is another external challenge that can threaten the Department of Agriculture's objective of implementing the scheme in all production houses in the country. Many of these farms are small in size (less than 1 hectare), operated by farmers who are relatively older in age, satisfied with their traditional and existing practices of crop production, often unconcerned with the need for food safety and satisfied with the incomes that they obtain. Adoption of GAP, in these cases, is viewed as tedious (because of the need to keep proper documentation of their activities) and unnecessary (buyers and consumers will still buy their produce). This is aggravated further by the lack of financial incentives (e.g. better prices) offered to them by wholesale collectors and distributors of the agricultural produce.

The percentage of such food producing farms in Malaysia is relatively high, contributing significantly to the domestic production of agricultural food consumed in Malaysia. The implementation of SALM, with the objective of yielding safe and quality food but done in a good and sustainable way, will only be successful if most of these farms are brought into the fold of the scheme and certified according to GAP. Only then will the implementation of SALM be a national success.

5. Lessons learned and recommendations

The experiences from the implementation of SALM so far, in terms of its strengths, weaknesses, opportunities and threats, provide useful insights for the future development and implementation of a similar scheme for GAP in other ASEAN countries. Member economies intending to establish the inspection and certification scheme may wish to consider the following findings and recommendations.

- a) The farm certification scheme for GAP is a useful upstream programme of the food supply chain which, if successfully executed, allows for the realization of many of the objectives of a safe and sustainable agriculture. Apart from the economic benefits of safe and quality food supplied to consumers, the scheme also ensures that agricultural crop production is also done in a sustainable, environment- and worker-friendly way.
- b) Adoption of GAP and its eventual inspection and certification should be based on a basic set of rules of a national standard that is designed to meet national needs for safe and sustainable agriculture. If required or when the situation warrants, the standard can later be upgraded to a level that satisfies regional and international requirements. The choice may be different for different economies depending on the types of agricultural production involved, the participating stakeholders and the national economy. Ideally, however, member economies in the ASEAN region should ultimately strive for a common and harmonized standard for GAP.
- c) The implementation of the farm inspection and certification should be done in phases, with priority given to agricultural crop producers (mainly the business enterprises) that are in need of the service or capable of implementing the scheme. This is particularly true in member economies where a significant portion of food crop production is destined for regional and international markets, where stringent food legislation is in place to protect consumers. The scheme can be expanded later to include other players

in the food supply chain such as contract farmers, group farms and finally the individual farmers.

- d) Concomitant with the above strategy, steps should also be put in place by the implementing agency to train the necessary human resources needed for advisory, inspection (internal audit) and supporting services for the scheme. The need to differentiate the roles to be played by farm advisers and auditors is also important and necessary, if the farm certification scheme is to be successful, credible and acceptable by all stakeholders. The appointment of a third party certification body contracted to conduct third party audits is preferred and should be pursued if the resources, particularly financial, permit this.
- e) The need to create awareness and understanding of the importance and benefits of GAP and certification among crop producers, buyers and consumers should also be pursued actively by the implementing agency. This can be done through a series of seminars, exhibitions, extension materials (including videos), publication in the local media, etc. at national, regional and ground levels.
- f) The implementing agency should also consider the development of incentives to entice agricultural crop producers, particularly the smallholders, to participate in the inspection and certification scheme. The details of the incentive package, in terms of its scope, eligibility and conditions for assistance however need to be worked out by the respective member economies. These could include easier and favourable financing for those registering in the scheme, priority for assistance of inputs (physical as well as advisory) to group or contract farms, assistance in marketing the agricultural produce.

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SALM Standard of Good Agricultural Practice

(Sample extract only)

| No. | Elements |
|------------|---|
| 1 | Traceability |
| 1.1 | The produce shall be traceable to the farm where it has been originally produced |
| 2 | Record keeping and internal audit |
| 2.1 | Record keeping |
| 2.1.1 | Farms shall keep up-to-date records |
| 2.1.2 | All records shall be maintained and retained for at least six months unless stipulated by any specific legislation |
| 2.1.3 | Record keeping system shall be established in which all the essential elements are captured |
| 2.2 | Internal audit |
| 2.2.1 | Internal audit shall be carried out at least once a year based on the requirements of this standard |
| 3 | Planting materials and root stocks |
| 3.3 | The planting of genetically modified organisms (GMOs) shall be agreed between crop producers and customers before planting |
| 3.5 | Seed quality should be known before use and a record of the variety name, variety purity, batch number and seed vendor should be kept |
| 3.8 | Where protected varieties are used, the farm shall respect intellectual property rights legislation on plant variety protection |
| 4 | Site history and site management |
| 4.1 | Site history |
| 4.1.4 | A corrective action plan must be developed setting out strategies to minimize all identified risks in new agricultural sites |
| 4.1.5 | Farms shall not be located more than 1 000 metres above sea level unless the land was developed prior to 1 January 2002 |
| 4.1.6 | Farms should not be located on steep slopes that may be detrimental to the environment |
| 4.2 | Site management |
| 4.2.1 | The farm management shall demonstrate that it has legal rights to the cultivation of the land and all necessary regulatory approvals |
| 5 | Soil and substrate management |
| 5.1 | Soil type mapping |
| 5.1.1 | Soil map should be prepared for the farm, which can then be used to plan rotations, planting and growing programmes |
| 5.2 | Cultivation |
| 5.3 | Soil erosion |
| 5.3.1 | Field cultivation techniques that minimize soil erosion shall be adopted |
| 5.4 | Soil fumigation |
| 5.4.1 | Where chemical fumigation of soils is carried out, it shall be justified and recorded |
| 5.5 | Substrates |
| 5.5.1 | Preference should be given to the use of organic substrate |
| 5.5.3 | Where chemicals are used to sterilize substrates for re-use, records shall be kept and shall contain location of sterilized substrates |
| 5.5.5 | Where chemicals are used to sterilize substrates for re-use, records of date, type of chemical used, method of sterilization and name of operator shall be kept |

| No. | Elements |
|------------|--|
| 6 | Fertilizer management (organic and inorganic) |
| 6.1 | Nutrient requirement |
| 6.1.1 | Soil care plan should be developed to ensure that nutrient loss is minimized |
| 6.1.2 | Fertilizer application, using either mineral or organic fertilizers, must meet the needs of the crops as well as maintain soil fertility |
| 6.2 | Fertilizer utilization |
| 6.2.1 | Use of fertilizers should be in accordance with science-based recommendations or best developed practice |
| 6.3 | Records of application |
| 6.3.1 | All application of soil and foliar fertilizers shall be recorded |
| 6.4 | Application machinery |
| 6.4.1 | Fertilizer application machinery shall be kept in good working condition |
| 6.5 | Fertilizer source and storage |
| 6.5.2 | Fertilizers should not be stored in the same room with pesticides |
| 6.5.4 | Fertilizers shall be stored in a covered, clean, dry location where there is no risk of contamination of water sources |

Sample of SALM action plan

| No. | SALM criteria or rules | Level | Action plan | Documents to prepare |
|-----|--|------------|--|--|
| 1 | Crop producers shall only use chemicals that are officially registered under the Pesticide Act for use on the crop that is to be protected | Major Must | Liaise with Pesticides Board to obtain list of chemicals that are officially registered for use on the crop | List and labels of approved pesticides |
| 2 | All application of soil and foliar fertilizers shall be recorded | Minor Must | Prepare and maintain farm records on application of fertilizers | Farm records on application of soil and foliar fertilizers |
| 3 | Soil map should be prepared for the farm, which can then be used to plan rotations, planting and growing programmes | Encouraged | Seek assistance from Soil Management Division (DOA) to undertake soil survey and crop suitability evaluation | Soil map and crop suitability reports |

Farm records, policies, reports, analytical records and other supporting documents

A. Farm records which are mandatory

| No. | Filenames | Attributes |
|-----|--------------------------------------|--|
| 1 | Soil fumigation | Date of fumigation, basis for fumigation, chemical fumigant used, quantity used and name of operator. |
| 2 | Chemical sterilization of substrates | Date of sterilization, type of substrates, chemicals used, method, location of substrates and name of operator. |
| 3 | Application of fertilizers | Location, date of application, types of fertilizer applied, their quantities, method of application and name of applicator. |
| 4 | Application machinery | Date of purchase, types of machine, type of maintenance (service, calibration, change of parts), name of person undertaking the task. |
| 5 | Purchase of fertilizers | Date of purchase, types of fertilizer, formulations, name of vendor and cost prices. |
| 6 | Purchase of pesticides | Date of purchase, trade names of pesticides, name of active ingredient, registration number of pesticide, quantity, name of vendor and cost prices. |
| 7 | Application of pesticides | Date of application, crop name, location, reason of application, trade name of the pesticide used, method of application and name of operator. |
| 8 | List of workers | Names of workers, dates of birth, identification or passport numbers, gender and nationality. |
| 9 | Training of workers | Date of training, names of workers undergoing training, types of training (e.g. safe and proper use of pesticides, handling of produce), names of trainers and organization. |
| 10 | Post-harvest treatments | Crop name, location, date of treatment, reasons for treatment, type of post-harvest treatment, dosage, method of treatment and name of operator. |
| 11 | Yield | Date of harvest, name of crop, harvesting index, quantities by grade, total harvest and name of buyer. |
| 12 | Waste disposal | Date of disposal, types of farm waste, quantity, method of disposal and place of disposal. |
| 13 | Pest surveillance | Date of surveillance, types of trap, location, types of pest, number of pests and name of person recording the data. |
| 14 | List of equipment | Date of purchase, types of equipments, purpose, name of vendor and cost price. |

B. Farm records that are encouraged

| No. | Filenames | Attributes |
|-----|----------------------------------|---|
| 1 | Seed quality | Date of seed purchase, name of variety, the seed purity, batch number and name of vendor. |
| 2 | Grafted planting materials | Date of purchase, name of variety of root stock, origin or source and name of vendor. |
| 3 | Seed treatment | Date of treatment, basis of treatment, type of treatments, rate, name of person doing the treatment. |
| 4 | Irrigation | Date of irrigation, time started, duration, type of irrigation, types of equipment used, quantity of water used and name of operator. |
| 5 | Soil erosion control | Date of installation, types of erosion control installed, name of control and name of operator. |
| 6 | Crop protection control measures | Date of installation, location, types of measure, purpose and name of operator. |

Policies

| Policy | Scope of policy |
|----------------------------------|---|
| Soil care policy | A policy that outlines the hazards of soil management and the steps or actions that are proposed by the farm for implementation to ensure that soil resources are managed in a sustainable way with soils and nutrient losses minimized. |
| Water management policy | A policy that outlines the farm's plan to source or abstract supply of water, the types of treatment required prior to use (if any) and the steps or delivery systems put in place to optimize water resources and reduced wastage. |
| Crop protection policy | A policy that outlines the types of pest found on the farm, the user's strategies to control or eliminate these pests (including anti-resistance strategy) and the general policy on the different aspects of pesticide management (such as choice of pesticides, storage of pesticides, their applications, types of personal protective equipment used, disposal of empty containers), if chemical treatments are required for their control. |
| Food safety policy | A policy that identifies the different hazards of agricultural production to food safety and the steps or actions, including food safety standards, that are proposed by the farm to ensure that their agricultural produce destined for markets are safe for consumers. |
| Waste management policy | A policy that identifies and outlines the types of possible waste products and sources of pollution on the farm and specific action plans that are recommended to avoid or reduce their wastage and pollution. |
| Workers health and safety policy | A policy that identifies all hazards of agricultural production to workers safety and health and specific action plans that are proposed and recommended by the farm to promote safe and good working conditions. |

Reports

| Report | Scope of report |
|-----------------------------------|--|
| Environment impact assessment | Where required, as stipulated by law, the report shall include baseline audit of the studied area to understand existing animal and plant diversity on the farm, prior use of the land, potential impacts of production on activities of adjacent crops and areas and actions to avoid damage to and deterioration of the habitat and farm. |
| Pesticide residue risk assessment | A report which identifies the hazards arising from contamination of agricultural produce with pesticide residues, their risks to human health and the frequency of analysis that is required to be put in place to ensure food safety. |
| Internal audit | A report undertaken and prepared by internal auditors to check and evaluate the farm's compliance with the rules and requirements of the SALM standard on GAP. The report shall be carried out at least once a year. |
| Risk assessment on water quality | A report that identifies the hazards and risks of water used on the farm for activities such as irrigation, preparation of pesticide spray mixture, post-harvest washings and general use by the farm workers and the specific actions that are developed and deployed to ensure their safe uses. |
| Soil survey | A report that describes the location of the farm, recorded rainfall, elevation, slope, soil types, basic soil physical and chemical analytical data and the soil limitations to crop growth. The report is encouraged since it will help the farm plans crop rotations, planting, growing programmes and other soil management activities such as soil erosion control and application of fertilizers. |

| Report | Scope of report |
|-----------------|--|
| Soil fumigation | A report, if required, that identifies the soil problem, evaluation of alternatives such as use of disease resistant cultivars, crop rotation, solar sterilization and justification for resorting to the use of chemical fumigants. |

Analytical records

A. Analytical results that are mandatory

| No. | Filenames | Attributes |
|-----|--------------------------|--|
| 1 | Pesticide residue levels | Date of sampling, location of sampling, type of crop selected for residue testing, types of pesticide residue analysed, their contents in the residue and date of testing. |
| 2 | Content of heavy metals | Date of sampling, location of sampling, type of produce selected for heavy metal testing, types of heavy metals analysed, their contents in the residue and date of testing. |

B. Analytical results that are encouraged

| No. | Filenames | Attributes |
|-----|--|---|
| 1 | Routine chemical analysis of soils | Date of sampling, depth of sampling, pH in water and potassium chloride, conductivity, contents of nitrogen, phosphorus, potassium and other attributes that are required by the crop producer. |
| 2 | Nutrient levels in leaves | Date of sampling, contents of nitrogen, phosphorus, potassium, calcium, magnesium, copper, zinc, manganese, boron, iron and date of analysis. |
| 3 | Heavy metal content in organic fertilizers | Date of sampling, type, source, contents of lead, mercury, arsenic, cadmium and date of analysis. |
| 4 | Heavy metal content in irrigation water | Date of sampling, pH, contents of lead, mercury, arsenic, cadmium and date of analysis. |
| 5 | Pesticide content in irrigation water | Date of sampling, location, levels of the different pesticides detected and date of analysis. |

Other supporting documents

A. Other documents which are mandatory

| No. | Description of other documents |
|-----|---|
| 1 | List of registered pesticides approved for use on different crops grown on the farm, their trade names, their active ingredients, concentration, hazard class, registration number, post-harvest interval and re-entry interval. |
| 2 | List of maximum residue limits (MRL) for the pesticide used on the different crops grown on the farm. |
| 3 | List of maximum content of heavy metals permitted and approved for the crop produce. |
| 4 | Name of chemicals, pesticides as well as chemicals for post-harvest treatments, which are banned or disallowed in countries importing the produce. (NB: This requirement is applicable if the produce is destined for international markets). |
| 5 | List and content of local regulations regarding storage of pesticides. |
| 6 | Instructions for pesticide usage as stipulated on the labels. |
| 7 | Listing of all national legislation and the specific provisions currently enforced and applicable to agricultural production in Malaysia. |
| 8 | Records of site history and layout of the fields. |
| 9 | Legal rights to the cultivation of the land and all necessary regulatory approvals. |
| 10 | Course curriculum for training of farm workers on the safe and proper use of pesticides, basic hygiene and food safety, handling of fresh produce and disposal of wastes. |

| No. | Description of other documents |
|------------|--|
| 11 | Advice and recommendations from the relevant and competent authorities to apply fertilizers and use of pesticides. |
| 12 | Records of all complaints, received by the crop producer, on produce that are not in compliance with the standard and the remedial actions that have been taken to rectify the problems. |
| 13 | Records of corrective actions undertaken by the crop producer to overcome the non-conformances identified by the internal auditors. |

B. Other documents which are encouraged

| No. | Description of other documents |
|------------|--|
| 1 | Crop producer's protocol for sampling of agricultural produce, covering all crops grown on the farm, for the analysis of heavy metals and pesticide residues. |
| 2 | Crop producer's action plan, if any, to convert unproductive sites of the farms into conservation areas so as to enhance the habitat and increase the farm's biodiversity. |

Documents that require constant updating

| No. | Description of documents |
|------------|--|
| 1 | List of registered pesticides approved for use on different crops grown on the farm, their trade names, their active ingredients, concentration, hazard class, registration number, post-harvest interval and re-entry interval. |
| 2 | List of maximum residue limits (MRL) for the pesticides used on the different crops grown on the farm for national as well as those of importing countries. |
| 3 | Names of chemicals, pesticides as well as chemicals for post-harvest treatments, which are banned or disallowed in countries importing the produce. This requirement is applicable if the produce is destined for international markets. |
| 4 | Listing of all national legislation currently enforced in Malaysia. |

Levels and criteria for certification in SALM

| Level | Criteria for certification | Mark of conformance |
|-------|---|--|
| 1 | Crop producer meets ALL requirements of major musts of the SALM standard and shows pesticide residue levels below the permitted MRL (three consecutive analyses). | Letter acknowledging adoption of GAP |
| 2 | Crop producer meets ALL requirements of major musts, 95 percent of minor musts and shows pesticide residue levels below the permitted MRL (three consecutive analyses). | SALM certificate of GAP and right to use of SALM logo (figure 1) |

**Malaysia food information and traceability (M-FIT)
data template for crop producers**

| Stage | Data category | Files | Information (attributes) |
|---------------------|---|---|---|
| | Production processes to demonstrate food safety and quality, sustainable production and compliance to legal requirement | Irrigation | Date, crop irrigated, time of irrigation, duration, method of application, name of operator, etc. |
| | | Application of fertilizers | Date, crop fertilized, name of fertilizer, composition, rate, method of application, name of applicator, etc. |
| | | Spraying of pesticides | Date, crop sprayed, types of pesticides used, active ingredient, dosage, method of application, PHI, name of applicator, spraying approved by, etc. |
| | | Pest surveillance | Date, crop investigated, type of pests, number or count of pests, damage to crops, etc. |
| | | Cultural activities | Date, type of cultural activities undertaken, purpose, name of operator, etc. |
| | | Harvesting | Date of harvest, crop, quantity, methods of harvest, ripeness index, names of harvester, etc. |
| | | Post-harvest treatment (if any done on farm) | Date, crop treated, type of chemicals used, active ingredient, concentration, duration, name of operator. |
| | | Disposal of waste | Date, type of waste disposed, quantity, method of disposal, place of disposal, name of operator, etc. |
| | | Training of workers | Date, name of workers, types of training, name of training, place conducted, etc. |
| | | Others | To be defined by grower. |
| | Supporting data to demonstrate food safety and quality, sustainable production and compliance to legal requirement | Water quality | Date sampled, levels of contaminants (heavy metals, pesticides, name of laboratory, date analysed, etc. |
| | | Analysis of produce (pesticides) | Date of sampling, name of produce, levels of OC, OP, SP and EBDC, date analysed, name of laboratory, etc. |
| | | Analysis of produce (heavy metals) | Date of sampling, name of produce, levels of Hg, As, Pb and Cd, date analysed, name of laboratory, etc. |
| | | List of approved chemicals | Name of crop, trade name of chemicals, active ingredient, concentration, registration number, hazard class, name of manufacturer, PHI, etc. |
| | | List of approved MRL for pesticides | Name of crop, name of approved active ingredients, approved MRL, etc. |
| | | Permitted concentration of heavy metals | Name of crop, name of heavy metals (Hg, As, Pb, Cd), permitted concentration, etc. |
| | | Policy statements | Food safety, fertilizer usage, crop protection and pesticide management, workers safety, environment, waste management, water management, etc. |
| Business operations | Sales of fruits | Date of sale, invoice number, name of buyer, type of produce, quantity, grade, amount payable, etc. | |

SALM inspection and certification scheme of Malaysia
Department of Agriculture

Checklist and conformance criteria

| Part A | | Farm information | | | |
|----------------|---|-------------------------------|-------------------------------|------------|---|
| 1 | Reference number | | | | |
| 2 | Name of farm | | | | |
| 3 | Address of farm | | | | |
| 4 | Date of audit | | | | |
| Part B | | Results of field audit | | | |
| Section | Rules | Level | Compliance (Yes/No/NA) | | Conformance criteria and remark |
| | | | Doc | Fld | |
| 1 | Traceability | | | | |
| 1.1 | Is the produce traceable to the farm where it has been originally produced? | MAJOR MUST | | | There is documentary evidence, either in the form of registration number on the packed produce or other tracing system such as records (computerized or hardcopies) that permit traceability of the produce to the farm. REMARKS: |
| 2 | Record keeping and internal audit | | | | |
| 2.1 | Record keeping | | | | |
| 2.1.1 | Are farm records kept up-to-date? | MINOR MUST | | | There is documentary evidence in the form of farm records where all attributes of the different activities, as defined in this standard, are recorded and kept up to date; the last entry being less than 30 days from any inspection or audit. REMARKS: |

| | | | | | | | |
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| 2.2 | Internal audit | | | | | | |
| 2.2.1 | Are internal audits carried out at least once a year based on the requirements of this standard? | MAJOR MUST | | | | There is documentary evidence in the form of an internal audit report that has been carried out at least once a year, based on the requirements of the standard. REMARKS: | |
| 5.5 | Substrates | | | | | | |
| 5.5.3 | Where chemicals are used to sterilize substrates for re-use, are records kept that contain location of sterilized substrates? | MAJOR MUST | | | | There is documentary evidence in the form of farm records that register the chemicals used and their location. REMARKS: Not applicable if the farm does not use substrates in its crop production process. | |
| 6 | Fertilizer management (organic and inorganic) | | | | | | |
| 6.1 | Nutrient requirement | | | | | | |
| 6.1.1 | Is a soil care plan developed to ensure that nutrient loss is minimized? | ENCOURAGED | | | | There is documentary evidence, in the form of a soil management policy or other documents (such as fertilizer application procedures) formulated by the farm, that soil health will be maintained and nutrient loss minimized. REMARKS: | |
| 6.2 | Fertilizer utilization | | | | | | |
| 6.2.3 | Are the growers or their advisers able to demonstrate competence and knowledge in fertilizer application? | MINOR MUST | | | | There is documentary evidence in the form of training attended, certificates or professional qualifications that show that they are competent and qualified. REMARKS: | |
| 6.3 | Records of application | | | | | | |
| 6.3.1 | Are all applications of soil and foliar fertilizers recorded? | MINOR MUST | | | | There is documentary evidence in the form of suitable farm records, indicating that the application of soil and foliar fertilizers is duly recorded by the producer. REMARKS: | |

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| 6.4 | Application machinery | | |
| 6.4.1 | Is the fertilizer application machinery kept in good working condition? | MINOR MUST | There is documentary evidence in the form of either service records, records of testing etc. that all machinery is kept in good working condition. REMARKS: Not applicable if fertilizers are applied manually without the assistance of machinery. |
| 6.6 | Organic fertilizer | | |
| 6.6.3 | To avoid pollution by heavy metals or by nitrate leaching, are analyses of levels of nutrients, heavy metals and other potential pollutants in the organic fertilizer undertaken and completed before application? | ENCOURAGED | There is documentary evidence in the form of analytical data or other documents that the producer has collected and sent the organic fertilizer for analysis of levels of nutrients, heavy metals and other potential pollutants. REMARKS: |
| 7 | Irrigation and fertigation | | |
| 7.1 | Planning | | |
| 7.2 | Method | | |
| 7.2.1 | Is the most efficient and commercially practical water delivery system used to ensure the best utilization of nutrient and water resources? | ENCOURAGED | There is documentary evidence in the form of water management policy or other documents that support the most efficient and commercially practical water delivery system to ensure the best utilization of nutrient and water resources. REMARKS: There is field evidence that recommended water delivery systems (e.g. drip, sprinkler, etc.), as recommended by advisory services are used to irrigate the crops. REMARKS: |
| 8 | Crop protection | | |
| 8.1 | Basic elements of crop protection | | |
| 8.1.2 | Is integrated pest management (IPM) technique applied on a preventive basis by the producer? | MINOR MUST | There is documentary evidence of the use of 1) physical control methods (e.g. stickers, light traps, yellow stickers, pheromone traps, wrappers, etc.); 2) cultural methods (use of resistant varieties, pruning, collection of infected fruits, etc.); or 3) biological methods (predators) forms of pest control. REMARKS: |

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| | | | | There is field evidence, based on farm walk, that verify (or confirm) the application of IPM. These are uses of: 1) physical controls (e.g. stickers, light traps, yellow stickers, pheromone traps, wrappers, etc.); or 2) cultural controls (e.g. planting of resistant varieties, pruning of infected parts, collection of infested fruits, etc.); or 3) biological controls (planting of insect repelling plants, creation of habitats for predators, introduction of predators etc.). REMARKS: |
| 8.2 | Choice of chemicals | | | |
| 8.2.2 | Is the crop producer only using chemicals that are officially registered under the Pesticide Act, for use on the crop that is to be protected? | MAJOR MUST | | There is documentary evidence that: 1) specify that only registered pesticides shall be used in the farm; 2) all pesticides purchased and applied, as documented in the farm records, have the approved brand names, active ingredients and registration number; 3) the farm has a listing of registered and approved pesticides; and 4) only approved active ingredients are detected in the pesticide residue analysis of the produce. REMARKS: |
| | | | | There is field evidence, based on inspection of the pesticide store and storage area for empty pesticide containers, verifying that: 1) all stored pesticides and empty pesticide containers conform to the Pesticides Board official labelling requirements, i.e. registration number, hazard colour band, registered active ingredients, safety measures, contact numbers, etc.; and 2) the store and storage area for empty containers are free from unregistered pesticides (e.g. pesticides without labels or with foreign labels). REMARKS: |
| 8.4 | Records of application | | | |
| 8.4.1 | Are the records on the application of pesticides inclusive of crop name, location and date of application, reasons for application, trade name of pesticide used, dosage, method of application and name of operator? | MAJOR MUST | | There is documentary evidence that: 1) all applications of pesticides are recorded; 2) the records are kept for a minimum of six months; and 3) the records capture ALL of the required attributes on the application of pesticides, as specified in the rule. REMARKS: |

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| 8.7 | Pre-harvest interval | | | | | | |
| 8.7.1 | Are pre-harvest intervals as prescribed on pesticide labels strictly adhered to by the producer? | MAJOR MUST | | | | There is documentary evidence of: 1) the listing of all registered and approved pesticides (with their corresponding PHI) for use on the farm; 2) current farm records on application of pesticides; 3) current farm records on harvesting of the produce; and 4) the time between the last date of spraying of the pesticide and the date of subsequent harvest (days) exceeded the specified PHI of the pesticide used. REMARKS: | |
| 9 | Harvesting | | | | | | |
| 9.1 | Hygiene | | | | | | |
| 9.1.2 | Do the workers undergo training in basic hygiene and food safety before handling fresh produce? | MINOR MUST | | | | There is documentary evidence in the form of training notes and farm records on workers training to show that they have undergone training in basic hygiene and food safety. REMARKS: | |
| | | | | | | There is field evidence or confirmation from the workers handling fresh produce that they have been trained in basic hygiene and food safety. REMARKS: | |
| 9.2 | Packaging on farm | | | | | | |
| 9.2.1 | Are the packaging materials stored properly to avoid contamination by physical and chemical hazards, as well as pests? | MINOR MUST | | | | There is documentary evidence in the form of a suitable policy (e.g. food safety policy) that defines that the packaging shall be stored properly so as to avoid contamination by physical and chemical hazards, as well as pests. REMARKS: | |
| | | | | | | There is direct field evidence that the packaged products are stored properly to avoid contamination of physical and chemical hazards, as defined in the crop producer's documents. REMARKS: | |

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| 10 | Post-harvest handling | | | |
| 10.1 | Post-harvest treatment | | | |
| 10.1.1 | Is use of chemical post-harvest treatments minimized by the producer? | ENCOURAGED | | There is documentary evidence that the produce: 1) are not treated with chemicals; or 2) if treated, meet the requirements of the producer's food safety policy and action plan, which defines steps that are proposed to minimize the use of chemical post-harvest treatments. REMARKS: |
| 10.2 | Post-harvest washing | | | |
| 10.2.2 | Based on risk assessments, is the source of water for post-harvest washing analyzed at least once a year for microbial, chemical and mineral pollutants to ensure that it is potable? | ENCOURAGED | | There is documentary evidence that the farm: 1) has undertaken a risk assessment study of the water used for washing; 2) has analysed and maintained records of levels of pollution (microbial, chemical and mineral); and 3) can demonstrate that their values meet the potable water standard. REMARKS: |
| 11 | Pesticide residue analysis of produce | | | |
| 11.2 | Are the crop producer and/or supplier able to provide evidence of residue testing? | MAJOR MUST | | There is documentary evidence that the farm: 1) will or has submitted samples of the produce to the laboratory for analysis; 2) has the protocol to undertake the sampling; and 3) has copies of the original results of the analysis or endorsements from the laboratory that the produce has been analysed by the said laboratory. REMARKS: |
| 12 | Waste and pollution management, recycling and re-use | | | |
| 12.1 | Are all possible waste products and sources of pollution identified in all areas of the farm business? | ENCOURAGED | | There is documentary evidence, in the form of waste management policy or other documents that identify all possible wastes and sources of pollution on the farm. REMARKS: |
| 13 | Worker health, safety and welfare | | | |
| 13.1 | Action plan | | | |
| 13.1.1 | Is there an action plan to promote safe and good working conditions? | ENCOURAGED | | There is documentary evidence that the farm has prepared an action plan to promote safe and good working conditions. REMARKS: |

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| 13.2 | Training | | | | |
| 13.2.2 | Are records of training for each employee kept by the farm? | MINOR MUST | | | There is documentary evidence that the farm: 1) keeps and maintain records of training; and 2) records the name of workers attending the course in the said document. REMARKS: |
| 13.4 | Pesticide handling | | | | |
| 13.4.1 | Do the workers undertaking pesticide applications on the farm receive health checks in line with guidelines by local regulatory requirements? | ENCOURAGED | | | There is documentary evidence that the farm: 1) has identified all guidelines issued by regulatory bodies pertaining to this requirement; and 2) keeps and maintain records of health checks of the farm workers. REMARKS: |
| 13.5 | Hygiene | | | | |
| 13.5.2 | Do workers receive basic training in hygiene requirements for the handling of fresh produce? | ENCOURAGED | | | There is documentary evidence in the form of a policy statement, training manuals or records of training that show that the workers receive basic training in hygiene requirements for the handling of fresh produce. REMARKS: There is field evidence from interview with workers that they have received basic training in hygienic requirements for the handling of fresh produce. REMARKS: |
| 14 | Environmental issues | | | | |
| 14.1 | Impact of farming on the environment | | | | |
| 14.1.1 | Does the crop producer conform to existing environmental legislation that covers the concern for air, water, soil, biodiversity and other environmental issues? | MINOR MUST | | | There is documentary evidence in a form of a suitable text that the producer is aware of existing environmental legislation and that the producer has made a commitment that he will abide with the legislation REMARKS: There is field evidence, based on the list of environmental legislation provided by the producer that the farm conforms to the criteria. REMARKS: |

| Wildlife and biodiversity conservation | | | |
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| 14.2 | Wildlife and biodiversity conservation | | |
| 14.2.2 | Where environmental impact assessment (EIA) is required, does the report take into consideration the conservation of wildlife and biodiversity? | MINOR MUST | There is documentary evidence in the form of report (EIA report) that outlines the need for the producer to consider the conservation of wildlife and biodiversity in the farm's operation. REMARKS: Not applicable if the farm is less than 50 hectares in size. |
| 15 | Record of complaints | | |
| 15.1 | Are records of complaints on all produce not in compliance with the requirements in this standard and their remedial actions made available on site? | MAJOR MUST | There is documentary evidence in the form of records of all complaints received by the producer and the remedial actions taken by the producer. REMARKS: |

Name and signature of auditor

Date of audit:



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