

# Tool

## Determining Training Requirements for Upgrading Production Chains

**Area of Application** Development of GAP/GPP-training programmes in commercial agricultural production chains (primary production and processing)

**Objective** Systematic, quick and efficient determination of necessary skills/ knowledge for farmers, processors and their advisers in the improvement of production chains, as a basis for training modules in Good Agricultural Practices (GAP) and Good Processing Practices (GPP)

### 1 Context

Agricultural commodities of developing countries face strong competition from produce or products of industrialised or semi-industrialised countries. Traceability requirements (certification) by retailers in industrialised countries force producers and processors for export to reach and maintain standards of production and food safety similar to those in developed countries. Market orientation therefore requires local farmers and processors to produce crops, livestock or products that match the requirements of uniform and high quality, food safety, sufficient quantities, right in time and at a competitive price.

The production chain approach used by development projects is characterised by a clear market orientation for the different elements of a chain (production, processing, marketing). In order to improve the local value addition in production chains and to face the challenges of competition, farmers and processors have to upgrade their production processes and to introduce elements of quality management. Compared to traditional production, high value market orientation demands new skills/knowledge and systematic training in the required qualities and in cost effective production. There is a need for systematic, practice-oriented training of producers and processors in the standards of GAPs/GPPs that are required for higher value markets.

## 2 Description of the tool

The tool consist of 4 steps, as outlined below:

STEP	OUTCOME
<b>1. KAP SURVEY</b> Detailed structured KAP (knowledge, attitude, practices) survey of the production or processing system: conditions , all practices (practical and managerial) and knowledge needs	<ul style="list-style-type: none"> <li>▪ Overview on range of all production/ processing practices and conditions in a certain commodity</li> <li>▪ Overview on priority information needs</li> </ul>
<b>2. OFFICE DIAGNOSIS</b> Technical assessment of practices, prioritisation of skill/information requirements and benchmark setting.	<ul style="list-style-type: none"> <li>▪ Analysis of technical bottlenecks and priority skill requirements</li> <li>▪ Priorities in information needs</li> <li>▪ First benchmarks of good local practices</li> </ul>
<b>3. ROUND TABLE WORKSHOP</b> Moderated workshop with expert farmers/processors, commodity experts and trainers on peer basis (storyboard approach)	<ul style="list-style-type: none"> <li>▪ Definition of codes of practice for good agricultural or processing practices (benchmarks and agreed research/expert practices)</li> <li>▪ Identification of training needs and knowledge gaps for research</li> </ul>
<b>4. CURRICULUM WORKSHOP</b> Moderated workshop for definition of technical and managerial skill requirements for a syllabus. The final design of training modules is done with adult education experts.	<ul style="list-style-type: none"> <li>▪ Definition of necessary skills and techniques for training in the sequence of production and processing</li> <li>▪ Priorities for structure and content for a syllabus and modules</li> <li>▪ Syllabus and lesson plans for training (include training methods, time, trainers, material required etc.).</li> <li>▪ Training modules</li> </ul>
<b>TRAINING PROGRAMME</b>	

### Step 1 KAP Survey

The first step is a survey for a complete and detailed inventory of all steps practiced as well as of the human resources, inputs and skills available for the production or processing of a certain produce. This gives an overview on the range of all current production/ processing practices and conditions for a certain produce. The survey should include a range of farms or processing plants from subaverage to top level. About 10 selected enterprises usually cover the range.

The surveyor interviews farm or plant managers on all the production/processing steps along a chronologically sequenced checklist. General questions cover farm/plant structure and management. The outcomes are a classification of farms/plants, standard sequences of steps in the production/ processing of a crop and an overview of priority information/ skill needs.

For primary production the checklist includes questions on:

- Farm type: size, crops grown, natural conditions, degree of mechanisation, inputs used, market outlets, etc.
- Management and workers: level of skills by different groups, documentation, etc.
- Production of a certain crop: rotation, planting material, planting, maintenance, pest management, fertilisers, harvest and post harvest procedures, etc.

Managers of processing plants/units are asked similar questions. A detailed checklist is in the annex.

## Step 2 Office diagnosis

As first step, the information on practices from of the survey data is sequenced. Ranges of technical practices are determined between poor and good. Good local practices of best farms/enterprises are formulated in more detail as provisional benchmarks. The obvious technical bottlenecks and skill requirements are analysed and prioritised vis-a-vis the felt training needs by the management. Levels of farmers/processors are defined for the various levels found in the survey. This is a preparation for the next step, where the standards of good practices are defined.

Step	Options	Decisions
Inventory of all practices	Technically wrong practice →	Training need
	Technically best practice →	Benchmark practice
Inventory of felt needs	Mentioned frequently →	Priority training need
	Mentioned occasionally →	Low priority
Classification of farms	Average performers →	Major target group for training
	Top performers →	Resource persons
	Poor performers →	Need special training courses

## Step 3 Round table workshop: standard setting

On the basis of the analysed survey results, the participants of a moderated round table workshop define standards for each step in the production chain (primary production and processing). Participants are the surveyors, top performing farmers and processors (practitioners!), commodity and technical experts, extension specialists and a moderator (who may be one of the surveyors). The participants discuss/ exchange experience and agree on standards as peers on consensus basis. A moderator must make sure that researchers do not dominate the exercise. It is also useful to separate production from processing by two workshops...

The participants define step by step codes of practice for good agricultural and processing practices (benchmarks, agreed research/expert practices as well as possibly certification requirements). The steps/standards are best visualised on cards. This procedure follows the storyboard approach (similar to the DACUM method used for developing curricula in adult education, Ohio State University). The steps have to be described in sufficient detail and be precise enough to be used as standard codes for practice and as basis for topics and subobjectives for training. The formulation of codes of practice i.e. in pineapple production is described in the annex:

Chapters in agricultural production cover the processes from planting material selection to post-harvest. Chapters in processing cover the processes from delivery of produce to post-processing storage. More detailed lists are in the annex.

After the definition of codes of practice, the participants mark areas with training needs on the basis of the survey (frequent substandard practices and training priorities) and on their own felt needs. Knowledge gaps for further research can also be defined. Certification requirements may be an additional area to be marked for further training or research.

Step	Options	Decisions
Sequence of good practices	Best local practice →	Benchmark practice
	No good local practice available →	Research topic or expert advice
	New practice for certification or quality management →	Expert advice
Areas for training needs	Usually good practices →	Low training priority
	Usually poor practices →	High training priority
	New practices →	High training priority

#### Step 4 Training curriculum workshop

The training curriculum is worked out in another moderated workshop with the surveyors and adult education training specialists. Basis are the defined, sequenced codes of practice and the identified areas for training needs. The defined standard practices can be used for sub-objectives and contents of the curriculum, as well as for reference material of trainers.

A standard lesson plan contains an overall objective and for each step sub objective, contents, training method, trainers and trainees activities, time required, location and materials needed. An example for a lesson plan with field practice and classroom activities is in the annex:

Modules for workshops on the basis of GAPs/GPPs may include as overall topics:

- Priority GAP or GPP Sequences
- Principles for IPM, ICM, IFM, CA in Commodities
- Chemicals Management
- HACCP and Certification Requirements (documentation)
- Training for Workers and Training of Trainers
- Quality Management Systems

It good practice to sequence the training steps in the same order as they are done in the field/ processing plant. General questions like hygiene or pesticide management can be dealt with in separate modules. Adult education experts should define the methods used for training, but the modules should include practicals in farms/plants alongside classroom lecturettes and exercises. Trainings should be done in modules of 2 –3 days each, not to take staff too long from their work.

Training Modules	Specific production practices →	GAP/GPP module in sequence of process
	Generic issues →	Topical modules, e.g. pesticide management, hygiene
Training Methodology	Skills training →	Practice
	Knowledge training →	Lecturette and exercises
	Training of Trainer methods →	Integrate in training modules

## **Annex:**

### **1. KAP Survey, Categories of Checklist Questions**

#### **a. Farms**

##### General farm data

- Farm structure (size, labour, crops, soils)
- Input store (pesticides, fertiliser, seeds, store keeper, warning signs and accident procedures, store procedures and management, measuring equipment, training of staff)
- Protective clothing (types, status, storage)
- Mechanisation (machinery, calibration, training of staff)
- Input supply and market

##### General management information

- Management level (professional background, experience, training)
- Workers (permanent, casual, trainings received)
- Outgrowers (numbers, training, contracts)
- Decision making (seeds, fertiliser, pesticides, harvest, post harvest for routine and exceptional measures, quality management)
- Priority training needs perception for topics (production, protection, certification requirements, market requirements, farm economy, labour management etc.)

##### Production information for a certain crop

- Seeds/planting material (characteristics and choice of variety, selection of material, treatments, nursery practices, spacing, sowing rate, pests, fertilisation, transplanting, depth, intercrop, mulch, shade etc.)
- Planting (land preparation, soils, spacing, patterns, intercrop, erosion measures, sowing/planting depth, irrigation, fertilisation, pests, pesticide use etc.)
- Maintenance (weeding, cultivation, irrigation, fertilisers and fertilisation, pests and pesticides, mulching, etc.)
- Harvesting (date to maturity, hours of harvest, ripening parameters, harvest procedures, quality standards, etc.)
- Post harvest (equipment, location, hours, procedures, pesticides, storage, quality separation, use of rejects, packing, transport, quality management, etc.)

#### **b. Processing Plants**

##### Plant data

- Structure (size, labour, products, output, markets)
- Inputs (chemicals, energy)
- Equipment (machinery, age, status, measuring devices, quality management devices, laboratory equipment)

##### General management information

- Management level (professional background, experience, training)
- Labour level (specialists, skilled/permanent, casual, trainings received)
- Decision making (selection of material, chemicals used, quality management, marketing)
- Priority training needs perceptions for topics (processing, preservation, packing, marketing, economy, certification requirements, labour management, quality management)

##### Production information

- Raw materials (quality, quantity, time, suppliers)
- Processing steps (storage of raw material, preparation, treatments, processing proper, quality management)
- Packing steps (machinery, material, label)
- Storage
- Marketing and Transport

## 2. Chapters for Good Practices:

### a. Good Agricultural Practices

- Variety Selection,
- Site Selection and Land Preparation
- Planting Material
- Nursery Practices
- Nutrition and Fertilisation
- Weed Control
- Irrigation
- Pest Management
- Maintenance
- Harvest
- Post Harvest
- Storage

Further general production standards refer to pesticide management (pesticide selection, application, storage, disposal), machinery maintenance and environmental management, workers hygiene and welfare.

### b. Good Processing Practices:

- Transport to the Plant
- Storage, Pre-Processing
- Selection and Pre-Processing Quality Control
- Treatments
- Processing Process
- Packaging
- Post Processing Quality Control
- Storage, Post- Processing
- Transport from the Plant

Further general processing standards are plant hygiene, machinery maintenance, environmental management, workers hygiene and welfare.

### c. Example for Formulation of GAPs in Pineapple Production

STAGE	RECOMMENDED PRACTICE	REASONS	REMARKS
Site Selection and Land Preparation	<ul style="list-style-type: none"> <li>▪ Soil: well drained, do not plant in waterlogged patches.</li> <li>▪ Slopes: below 30<sup>0</sup> inclination preferred.</li> <li>▪ If inclination is higher, erosion control measures <u>must</u> be applied: contouring, absorption bunds, drainage channels protected with cover grass. Refer to site plan. Combine several measures.</li> <li>▪ On slopes: plant in contours, plant absorption bunds along contours (e.g. <i>Vetiveria</i> spp. and other grasses) in accordance with site plan.</li> <li>▪ Rotation: one pineapple cycle only every three years or more. Rotate with cereals and/or pulses/cover crops (e.g. <i>Mucuna</i>, <i>Pueraria</i>) preferably, or leave land fallow. Do not rotate with vegetables, plantains, bananas or root and tubers. Remove all old pineapple plants/debris</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prevent phytophthora root rot, stunted plants, poor nutrient uptake</li> <li>▪ Erosion control</li> <li>▪ Erosion control,</li> <li>▪ Erosion control</li> <li>▪ IPM strategy: reduce nematode, wilt, phytophthora, mealy-bug incidence,</li> </ul>	<ul style="list-style-type: none"> <li>▪ Routine practice</li> <li>▪ Management decision</li> <li>▪ Routine practice for steeper slopes</li> <li>▪ Management decision</li> <li>▪ Management decision</li> </ul>

	<p>from field.</p> <ul style="list-style-type: none"> <li>Land preparation: ploughing, harrowing, ridging or zero tillage.</li> </ul>	<p>weed infestation</p> <ul style="list-style-type: none"> <li>Enhances root development, weed control; erosion control (zero tillage)</li> </ul>	<ul style="list-style-type: none"> <li>Management decision</li> </ul>
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NB:

- Routine practice refers to standard GAPs that are to be followed as described.
- Management decision refers to choices between options to be made by the farm manager; the choice usually requires a specific justification for the certification process.

### 3. Sample Lesson Plan for GAPs

**Overall objective:** After completing this module, managers of papaya farms will be able to properly select, handle use, store and dispose of pesticides in papaya production on the basis of national legislation and requirements for export

SUBOBJECTIVE	CONTENTS	TRAINING METHOD	TIME/LOC	MATERIAL
To be able to identify major pests and diseases in papayas and to know their control measures.	IPM IN PAPAYA: Phytophthora, anthracnose, virus, mildew, white fly, aphids, mites, fruit flies and others	Field practice Form groups, explain task. Groups collect pest specimen from trees Identify samples in groups and present findings. Check identification at presentation Discuss possible control strategies within GAPs.	8:00 – 12:00	Car, papaya grove, plastic bags for samples. Reference handouts.
To know the required protective clothing for the resp. pesticide used and to know how to wear it	PROTECTIVE CLOTHING Workers safety requirements for pesticides, general classes Types of protective gear. Washing and storage of protective clothing Exercise: wear protective gears.	Classroom lecturettes and practice Brainstorming: what protective gears are used on your farms? What are the standard workers safety requirements? Presentation and exercise: put on standard protective clothing	12:15 – 01:00	Blackboard/Flipchart Protective clothing: overall, Wellington boots, apron, hat, face shield, rubber gloves, respirators. Handout: protective clothing
To be able to select appropriate pesticides for papaya production following approved procedures	CHOICE OF CHEMICALS Pesticides used in papaya production Technically appropriate pesticides Legal basis for	Classroom lecturettes and task Brainstorming: Which pesticides are used in papaya production? Lecturette: legal conditions national	14:00 – 15:30	Flipchart PowerPoint presentation : Pesticide selection Pesticide lists national,

	pesticide selections Pesticides approved in Ghana Pesticides registered in EU	and EU concerning pesticide registration Compare lists Exercise: select your own farm pesticides		Pesticide list EU, Worksheet: pesticide selection
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