

QUALITY CONTROL IN AGRICULTURAL INDUSTRY

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WHAT IS QUALITY CONTROL

Quality control is a procedure aligned in any agricultural production establishments to either monitor the correct implementation of the quality assurance system, provide an early warning of product deviations or departures from quality assurance system; detects errors or faults in processing equipments, facilities and procedures; and to ensure that the total quality system is working as intended. Therefore quality control in any agricultural production involves all operational techniques and activities from production of produce such as cash crops, fruits and vegetables, harvesting, processing, packaging, storage and transportation chain, and at each operational stages quality control functions are undertaken to ensure that the quality system within the establishment is working as intended and the end product fulfils the requirement for quality.

In any given agricultural production establishment, quality control systems would rely very heavily on end product inspection and testing, the aim being to reduce the number of defective products reaching the market place. The quality of end product is inspected against known consumer or importer's specification and the end product, is either released for sale in markets, reprocessed or discarded.

A quality control program does very little, if any, to prevent production of defective products. The major faults with this approach are firstly, that defective products are still produced and reach the market. Secondly, value is added to the product at each step in the process and it is the valuable finished product that is being rejected or reprocessed. This is costly for the industry. For instance, harvest of immature or over ripen (rot-

ten), germinated nuts, insect infested and diseased produce when processed into finished goods may never get to land in the market places. Therefore harvesting of fresh produces should be timely, harvest only mature, clean, wholesome (hygiene and purity), and pests and diseased free, for processing and the processor must have an efficient processing facilities to produce the desired finished product. Harvest of defective produces must be eliminated as much as possible. Defective produce undergoing through the processing line gains value added to product at each phase of product development and the valuable end product may not satisfy the market requirements. Harvest of perishable for marketing must be conducted timely and proper storage is vital to determine the shelf-life, the keeping qualities. It is therefore very essential, to decide on what desirable qualities a produce should have prior to undergoing a manufacturing process.

Agricultural establishments processing a single product with high performance rating may present a low risk to product quality, would therefore anticipate low priority. Conversely, an establishment processing many products with poor performance rating may pose for a high risk to product quality therefore stringent quality control measures must be aligned to detect faults in any steps in the manufacturing process. Management practices, product design, consumer requirements and plant health requirements for overseas marketing will influence the quality control programs that are aligned into each phase of production from harvesting of produce to finished product line.

NAQIA'S POLICY ON QUALITY CONTROL

Quality control is an issue, which has been left to

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various industries to absorb and police by undertaking all necessary actions to safeguard their interest and to ensure that quality of their product for export purposes, is achieved. NAQIA being a facilitator to international trade will ensure that all goods for exports comply with World Trade Organisation (WTO) trade guideline, and will provide confidence building, quality assurances and acceptance of goods for exports. The Authority under *NAQIA Act 1997* has the following mandated regulatory functions and responsibilities on quality assurance and certification system, and they are:

1. Conduct product assessment for export quality and issue product certification for export;
2. Issue Phytosanitary Certificate for export consignment;
3. NAQIA Inspectors ensure that export consignment comply with legislated quality standards as set out under commodity Acts (coffee, copra, cocoa etc.);
4. Monitor, inspect and control the export of agricultural produce and related products to ensure that they are free from pests, diseases, weeds and any other symptoms;
5. To undertake all necessary actions to ensure that the export of agricultural produce and related products are free from pests, diseases, weeds and any other symptoms so as to provide quality assurance to meet the import requirements of importing countries;
6. To issue permits, certificates and endorsements pertaining to imports and exports of agricultural produce and related products that they are free from pests, diseases, weeds and any other symptoms, and
7. To inspect and treat vessels, aircraft, vehicles, equipment and machinery, that are used for importing and exporting agricultural produce and related products to ensure that they are free from pests, diseases, weeds

and any other symptoms.

NAQIA 'S ROLE ON EXPORTS

The National Agriculture Quarantine and Inspection Authority is the sole agency mandated with regulatory function to perform product quality assurance and certification for export. The Authority will monitor, inspect, control and undertake all necessary actions to ensure that our agricultural produce and related products for marketing are free from pests, diseases, and weeds and any other symptoms so as to provide quality assurance to meet the consumer's requirements and plant health authorities of importing countries.

The Authority through regulatory (quarantine and inspection) roles promotes and is committed to quality assurance as it facilitates international trade, ensures importing country requirements are met, and strives to fulfill public health requirements. The Authority will ensure specific criteria of export quality on our agricultural produces for exports such as cocoa, coffee, copra, palm oil, rubber or other plant products are achieved through sound inspection and quality standards and certification procedures. Achieving quality standards on our agricultural produces would ensure that our exports conforms to World Trade Organization trade principles and guidelines, and thus attract a better market opportunities for our export goods. NAQIA will continue to provide certified assurances that the country's product complies with the country's legislated quality standards that consumer's requirements are satisfied and the consumer's quarantine entry conditions, which include compliance with overseas standards are met.

Taking on export of cocoa, coffee and copra for an example, on every presentation of these products for export, a Quarantine Officer under the supervision of a Senior Quarantine Officer will conduct product inspections, assessment for quality of product and make recommendation for acceptance for market (exports). The quarantine inspection procedure involves examina-

tion on arrival for conditions of containers (bags) used, carriage hold; presence of dirt (mud/soil); insect pests adhering to the exterior of the bags, appropriate markings and labeling (product name and grade) on the bags/containers. A representative samples are drawn and the drawn samples are further examined for presences of foreign matters, insect pests and state of product. The samples are then assessed for quality either visually or aided by employing machinery or equipment to determine product quality against established standards as prescribed under the relevant commodity act. Once the quality assessment conforms to standard and all requirements are satisfied, the consignment is accepted for exports. A Phytosanitary certificate is issued to declare the goods freedom from all injurious pests and diseases and is now ready for export shipment.

ROLES OF OTHER SERVICE REGULATORY BODIES

Functions like Consumers Affairs Council (CAC), National Capital District Commission (CDC), National Institute of Standards and Industrial Technology (NISIT) and Department of Health (Role of Food and Sanitary Act) have a part to contribute in maintaining national quality standards and quality assurances on the services or movement of goods into or within the country. CAC can join forces with NCDC to ensure service industries are complying to minimum national standards on Food and Sanitary. While NAQIA is maintaining quality control on imported goods to ensure freedom from exotic pest and diseases, it is Department of Health, NCDC and CAC through their combined efforts can monitor quality assurances on the entry of all consumable goods and that servicing agents are operating within national Food and Sanitary Act. The Department of Health must continue to ensure that all entries of consumer goods satisfy legislated health quarantine requirements. The Health Department together with NCDC must ensure that all food processors either for markets in the country or overseas must operate within the principles and guidelines as set out under the

Food and Sanitary Act. Establishment of critical hazard control points system at each food, processing unit will necessitate for product conformances and safety.

It is vital that NISIT must resource from their standards library and consult NCDC, CAC and others on the development of standards on quality controls and quality assurances management systems as well as educating servicing agent on in-house quality control programs appropriate to activities performed at each establishment. These Service Regulators in-turn do require appropriate resources and therefore must be supported to enable them to continue to function properly.

QUALITY CONTROL ON EXPORT CROPS

Quality standards for agricultural export commodities are established to comply with legislated grade standards within Papua New Guinea and with overseas plant health quarantine and market requirements. The quality standards are specified under relevant commodity acts like the *PNG Coffee Act 1980*, *Copra Act 1984*, *Cocoa Act 1982* etc. These standards regulate the minimum acceptable physical and Phytosanitary (plant health) conditions, which the producer/exporter must meet, for market acceptance.

The management practices within the industries, provide the protocols one must adhere to when conducting production for marketing. And, at the end of the process, finished products must meet prescribed national standards. For instance, in the production of copra, let us take a single step for consideration like the copra drying process.

During drying of crops, the dryers has to be well ventilated to ensure smooth transfer and distribution of heat and if otherwise the product will result in either being burnt or "un-cure" and that will have a deleterious effect on the marketing quality of copra. Or cocoa and coffee beans not agitated during the drying process would lead to development of cold and hot spots and on mixing

of beans that would promote mouldy growth, which would deter the quality of beans. Given these examples, the appropriate act specifies what exact control measures are to be taken in each case to ensure that at each developmental stages product gains added value in quality and tries to as much as possible to eliminate factors that would deter quality of the finished products.

As in the case, of perishable goods, the product quality aspects of it rests very much on the importer's requirement and by arrangements, the exporters are to comply. With the perishables, timely harvests and due post harvest care and attention with regard to proper packaging and storage would warrant a prolong shelf-life.

PRODUCT QUALITY

Achieving quality on product is an end result of a concentrated effort and is achieved when features and characteristics inspected and tested on end products for marketing that bear on its ability to conform to stated requirements for quality. The features and characteristics vary between products however, the generalised product quality attributes are flavour, odour, wholesome, colour, purity, consistency, weight, shape and size, and moisture contents of products, and product's freedom from presence of foreign matters and product derived debris. These attributes are achievable targets and can be checked against known standards of the same product. In addition to product quality, packaging must meet legislated standard for quality and marking.

QUALITY STANDARDS ON EXPORTS

Quality of products for export will be examined/assessed by NAQIA and product assessed conforms to minimum national quality standards and plant health requirements of the importing country would be passed. NAQIA will also ensure that the products are produced in accordance to prescribed quality standards under relevant commodity Regulations within the

Act. NAQIA will advice industry on overseas Phytosanitary (plant health) requirement that may vary between importing countries and may be subject to change depending on the pest and disease status of plant produce and related products within PNG.

MARKET REQUIREMENTS

As the volume of marketable agricultural products and related products increases, there is a continued need for market access. To maintain market demands and attractions, the growers must be encouraged to continuously cultivate crops to produce yields of acceptable standards of quality, purity and hygiene. The processor must have an effective and efficient product manufacturing process. Produce for processing must meet processor's specification (maturity, wholesome, cleanliness) and must be free from pests and diseases, and other defects.

Industry must establish an effective quality control procedure and placed in each process steps from growing, harvesting, processing, packaging, storage and transportation to achieve quality assurance and certification on product intended for export. At the same time, set up an effective up to date and maintain communication with buyers on their requirements and regulations governing entry of export product into importing countries.

There is an increasing demand on the markets for products, which are organically grown and processed compared to products where a lot of chemical fertilizers, weedicides and pesticides are applied. Consumers all over the world are nowadays conscious of chemical residues in product and they are preferred to pay for goods or products that are organically, processed and tested. A lot of the Papua New Guinean produce comes from many smaller holders or individuals where there is no usage of chemicals of any kind. Large plantations may have had the use of chemical substances at some stage of the production. Policy issues on the organically, grown produce must be developed by

National Agriculture Research Institute (NARI) and the affected industries. Within the policy developed, the industry will be better able to regulate and set up quality control procedures to ensure product conformance to market requirement and take advantage of the market opportunity for the organically grown product.

PLAYERS IN QUALITY CONTROL

The major players in maintaining and promoting quality control systems within industry are the growers, processor, exporters, provincial Department of Agriculture, commodity boards and NAQIA. Each player has a defined role to perform to enhance sustainability in production of quality products, which will meet market requirements.

The **growers or farmers** must know and be able to produce healthy, wholesome and pest and disease free agricultural produce, which are suitable to processor or manufacturer's specification or the consumer.

Processor has to make sure that produce received for processing is of the desired quality. The processor must ensure that correct manufacturing technique is applied to enable production of end product, which will meet quality specifications. The processor must appoint a competent quality control officer whose vital task is to ensure all incoming produce meets specifications for processing and regularly monitors the various processing stages to ensure product development conforms to required specification before presenting the finished product for inspection an assessment for sale in markets.

Exporter must ensure that the product for which requires certification complies with legislated quality standards and overseas plant health and market requirements; provide products specification to buyers or supply produce specification to growers.

The **commodity board** under the respective acts is to administer registration of processors

and exporters and thereby regulate the produce brought in for processing, processing methods, product quality, storage, marketing access, transportation chain and marketing of end product; has the power to regulate the sale of produce (product) that fails to comply with prescribed minimum quality standards; and offer technical advice to the industry to sustain production and product quality.

Provincial Agriculture Department through extension must offer sound extension advice to farmers and producers on efficient procedures on growing and processing of produce to achieve export quality standards. National Institutions like Cocoa and Coconut Research Institute (CCRI), Coffee Research (CRI), National Agriculture Research Institute (NARI) and others involved in the industry through their extension programs must disseminate research findings and offer sound technical advice to growers on how best the growers could improve and sustain production of quality yields.

NAQIA will ensure that all end products are inspected and assessed to determine fitness for market or export complies with national legislated product quality standards and packaging requirements by consumers or importers overseas. That all products passed for export markets comply with plant health requirements of the importing countries and to provide necessary certification an assurances that the product is of export quality standard.

ECONOMIC IMPORTANCE OF QUALITY CONTROL

Product Quality

Competition on worldwide markets is ever increasing especially with the same export crops being produced in other tropical countries and in far larger volumes than Papua New Guinea. However, production of larger volumes usually involves mass production for quantity but not for quality. Papua New Guinean produce being produced on small

scale involving smaller volumes and in instances, where personal touches are applied, the product should excel in quality. If quality of agricultural product is poor then this would not attract markets and the industry as a whole and the country suffers economic gains. Therefore if our produce (products) is to attract a better price then quality of our export goods is of paramount importance and this cannot be over-emphasized nor denied.

Trade Facilitation

In the past, goods were quarantined for zero or no risks of pest and diseases associated with imports goods and thus, this has been phased out by WTO. Under the WTO agreement all quarantine services of the member countries are obliged to accept movement of goods with some risks. This, then places even greater risks on our imports and would cause us to draw as much as possible of our limited resources to monitor and control entries of pests and diseases. This Authority being a facilitator to international trade will ensure that no risks are exported or imported through our exports and imported goods, respectively. NAQIA has in the past, and will continue to maintain that PNG is free from exotic pest and diseases but there is no guarantee that a hundred percent of the risks involved would be controlled.

Quarantine Lessons

Illustrating on some past incidents of economic importance, like the outbreak of coffee leaf blight (rusts) in the Highlands Provinces that cost the Government nearly two million kina to eradicate. The cattle tick problem in Markham Valley, Morobe Province, which required a lot of funding for the eradication and much needed financial support came from the industry. And, more recently in Manus where there is a reported case on outbreak of an unknown disease on poultry. NAQIA moved swiftly to establish the causes and has, thus confirmed the outbreak and is now considering ways to control the disease.

The new castle disease outbreak in NSW, NAQIA in collaboration with Australian Quarantine Services acted fast to ban imports of poultry products from NSW.

Failing to take effective and timely control measures would simply mean that our country would face a major disaster that would harm and cause our agricultural industries to suffer with even greater losses. It would cost our country millions of kina just to address whatever the disaster may be before the industry or the smaller sectors are able to recover. Without quality control and monitoring of movement of all goods, the detection and identification of the threat to industry such as the coffee leaf blight (leaf rust), cattle tick or the discovering of the new castle diseases on poultry would almost be impossible. Therefore ongoing quality control services provided by NAQIA and other regulatory bodies must be recognized, appreciated and appropriate resource inputs given to assist its continuance and further support the improvement and developmental program plans.

Industrial Support

In the country, industries have a lot to contribute to maintaining quality control over their own activities and equally supported by relevant regulatory bodies to ensure productivities continue to maintain quality and maintain our status in the open markets. All regulatory bodies within the industry must perform their mandated functions to ensure that participants especially the small holders are given the freedom to go about conducting their businesses normally.

RECOMMENDATIONS

Implication of Global Trade

The phasing out of zero risks exerts even more pressure on our quarantining roles. This simply means that we have to accept even greater risks on our imported goods.

This Authority can monitor, inspect, control and undertake all necessary actions to ensure minimizing the risks of pest and diseases on imported goods but cannot do it alone. Government must provide needed resources to the Authority to enable her to continue to perform a very vital role in the prevention of exotic pest and disease from entering our shores.

Collaborative Efforts

It is seen that each National Institute like CRI, CCRI, NARI and NAQIA, has a specific or vital role to play in the Agricultural Industrial Services. Should there be a major outbreak of pests and diseases in the country, it will mean that our small holders will be the ones to be affected most. It would be even difficult to contain the outbreak due to the country's rugged pockets and isolated terrains and would cost the government millions of kina to just control the outbreak. At the same time, the Government may have the capacity to feed her populace for just one day but not for 364 days. It is therefore critical that Government must ensure that each Institution is capable of performing its mandated functions by providing and resourcing needy inputs.

Resourcing Departments

Provincial Government Departments of Primary Industries needs to have sufficient budget for extension and marketing, Commodity Boards and Agricultural Institutions alike should be given the budget each requires to perform their regulatory functions. Also, the establishment of Spices and Rubber industries must be on sound footing to enable regulation, monitoring and control activities within the industry. The horticultural (fruit and vegetable) industry, Fresh Produce Development Corporation requires realistic support from the government to enable the industry in her attempts to achieve a trade balance on the imports of fruit and vegetables.

Impediments

Achieving quality on our products are further constrained by lack of transportation facilities, rural infrastructure, rural communication and extension services and these would require government support through the normal public service mechanisms or through the organisation developmental budgets.

Conclusion

NAQIA has Corporate Plans and is charging for the services the Authority renders to the public. The raising of this revenue enables the Authority to stop waiting for Government handouts and continues to conduct normal business in undertaking all necessary actions in the prevention of exotic pest and disease from entering or going out of the country. The Authority, however requires developmental budget support from the Government to assist develop her plans to facilitate for improvement of delivery of services to customers, business houses and maintain linkages with institutions, alike and the industry.

For more information, you can contact:

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