ISSD Africa

Synthesis paper

Effective seed quality assurance

Introduction

Quality assurance is an important aspect of seed production and marketing. Seed producers or seed traders distinguish themselves from grain producers or grain sellers by offering quality seed in response to the demands of the seed client.

External quality assurance is often seen as the centre piece of the seed sector, and so when aiming to strengthen seed sector functioning, the automatic response is to improve seed certification systems. It should be noted, however, that there is little evidence of well-functioning seed certification systems in sub-Saharan Africa. The system of independent seed certification is not the only option for improved quality assurance. This paper investigates the different kinds of quality assurance mechanisms that are being used, and which circumstances they work.

To investigate alternative quality assurance, a desk study of existing alternative quality assurance mechanisms was conducted. This was followed by an in-depth study of cases of quality assurance mechanisms in Burkina Faso, Tanzania, Uganda, Burundi and South Sudan (Table 1). The results of the desk study and field studies were debated in a meeting of experts, which brought together case investigators and senior seed sector expert, and formed the basis of this discussion paper on effective mechanisms for seed quality assurance.

Discussion of lessons learned

Internal quality control

When assessing the functioning of the seed sector, both the internal quality control practices, as well as external quality assurance mechanisms, need to be considered. The cases studied did demonstrate an inadequate understanding of the distinction between internal control and external quality assurance, and the role of both in providing seed clients with access to high quality seed. Seed inspectors do, at times, see it as their role to educate seed producers on production practices and quality control in the field. Similarly, seed producers often expect advice from seed inspectors on how to manage the quality of their seed.

Internal quality control refers to the measures that seed producers take to ensure that the seed they produce meets their own minimum standards. Every seed producer, whether informal or formal, practices some form of internal quality control. External quality assurance refers to an independent or semi-independent form of inspection of the quality of the work done by a seed producer. External quality assurance has as such no influence on the quality itself; it only verifies whether a certain quality standard is met.

Table 1. Quality assurance mechanisms studied

Cases	Inspector
1 Quality declared seed of indigenous vegetables, Tanzania	Agricultural officer
2 Quality declared seed of open-pollinated varieties (OPV) of maize and rice, Tanzania	Agricultural officer
3 Internal quality assurance in potato production, Burundi	Internal committee
4 Cassava quality management protocol, Burundi	Internal committee and agricultural officer
5 Certified maize and sorghum seed, Burkina Faso	Independent central inspector
6 Self-control, cassava, South Sudan	Seed producer
7 Self-control versus certified seed potato production in Burundi	Seed producer and central inspector

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The cases studied demonstrated that hardly any seed producers in Burundi, Tanzania and South Sudan were using standard protocols for internal quality control. They could not provide much clarity about the specific moments in the growing season they assessed quality, nor did they have precise cut-off points for downgrading the quality of their seed. Also, the decision-making with regard to specific actions to maintain quality, such as rogueing off-types and diseased plants, was not clear. Although this does not mean that these measures are not taken, it does indicate that they are often not practiced in a structured and objectively verifiable manner.

In all cases, when discussing quality control, seed actors seem to refer automatically to seed certification agencies, and are quick to indicate that certification services function poorly. Few seed sector actors consider the internal opportunities, within the seed production operations, to improve quality control.

A stronger emphasis on improving internal quality control by seed producers could be made a more deliberate part of seed sector interventions. Judging from the case studies, seed producers could benefit from clear, pragmatic crop-specific quality control protocols for the management of their seed crop. Such quality management protocols should not only specify norms, but they should also assist seed producers in following specific steps in crop management and administration during the production season. As a result, seed producers would be better able to monitor the quality of their seed crop, respond with specific cultural practices in a timely manner, and downgrade their seed if necessary. Better monitoring of the seed crop will also deter seed producers from inviting inspection services to check a crop that is clearly not within the norms, thus avoiding costs to the seed producer as well as to the seed certification body.

The value of external quality assurance

It has to be acknowledged that seed is often produced and traded without external quality assurance mechanisms. So it is valid to question what the added value of external quality assurance actually is.

External quality assurance is first and foremost a service for seed clients, who can rely on it when judging the quality of the seed they intend to buy and use. As their own productivity depends on the quality of the seed they buy, an additional safeguard that the seed they purchase is of decent quality is appreciated by farmers. But when is this a necessity that clients are willing to pay a premium for, and when is it a luxury that clients appreciate, but do not wish to pay for?

In the case studies, it can be observed that the most important basis for seed clients to buy seed from specific suppliers, is the reputation of the supplier. In Burundi for example, the individual seed potato producers interviewed have a reputation for supplying farmers with good quality disease-free seed potatoes. They have a relatively fixed clientele, which lives nearby, and is even in the position to see the field of the seed producer. However, there is little choice for seed potato clients in Burundi, as there is little competition between seed producers. The seed clients are already paying a premium price for seed potatoes compared to ware potatoes, and would benefit from an additional quality assurance. It is difficult to judge which premium the producers would be willing to pay for to have additional independent quality guarantees.

In the seed expert debate, when the case studies were considered, it was agreed that it is likely that seed clients would be willing to pay a modest premium for external quality assurance, provided that this quality assurance is accurate. Smallholder farmers usually adhere to an economic strategy of risk avoidance. Investing in seed of an assured quality is greatly reduces risk. At the same time, the monetary investment required increases the risk.

It was also agreed that farmers would likely be willing to pay for external quality assurance under three important conditions:

- the additional cost of external quality assurance is modest compared to the profits they could obtain from the crop;
- they are convinced of the rigour of the external quality assurance; and
- there is a clear difference in the yield potential of quality seed produced by a seed producer, and their own seed.

The above does mean that external quality assurance for seed of crops used strictly for home consumption is a feasible option. Clients are not willing to pay a premium for quality seed of these crops, let alone an additional premium for an external quality guarantee. As such, it is prudent to focus external quality assurance efforts on marketed crops only.

In addition to the seed client, seed producers and traders also benefit from well-functioning external quality assurance. Not to assist them in producing good quality seed, which is their own responsibility, and for which they need good internal quality control, but to proof the quality of their produce to clients. Through external quality assurance, professional seed producers have an instrument to distinguish themselves based on quality from other less professional producers. Even though reputation as a producer or trader of quality seed is the main distinguishing factor, external quality assurance can assist them in proving their worth to clients.

External quality assurance becomes more important when there is no direct relationship between the seed producer or trader and the seed client. The further the distance that seed gets traded, the more difficult it is for seed clients to judge the seed based on the reputation of the individual seed producer or trader. External quality assurance can provide for a minimum quality standard that packaged seed needs to adhere to, and can protect seed clients against buying poor quality seed.

Effectiveness of current seed certification systems

It is difficult to generalize across the entire region of sub-Saharan Africa, but it has to be acknowledged that well-functioning seed certification systems, which provide seed clients and seed producers and traders with the services they require, are rare. Seed sector interventions have supported the development of seed certification systems over the last few decades, with only limited success, and a limited impact on the quality of seed used by seed clients. The two main constraints often cited are: (1) the price of the seed certification services; and (2) the effectiveness of those services.

To assess the value of the claim that it is the cost of certification services that is hampering its functioning in sub-Saharan Africa, the costs incurred by seed producers, and the total actual costs of seed inspection, have been calculated for potato, maize, beans and rice in Burundi, and for amaranth and African eggplant in Tanzania (see Table 2).

What can be seen is that the actual added costs of external quality assurance, paid by seed producers in Burundi and Tanzania, if calculated per kilogramme of seed produced, is modest, and represents only a minute fraction of the total retail costs. This is largely because the majority of costs are absorbed by the public system. The same situation can be seen in many other countries, where a high proportion of the actual costs of the seed certification system is absorbed by the public sector, and the costs to the seed producer are limited if factored into the price of the certified seed. If it is assumed that seed clients are willing to pay a modest premium for seed that has been subjected to external quality assurance, the current cost of this service per kilogramme of seed can hardly be the main problem of seed certification.

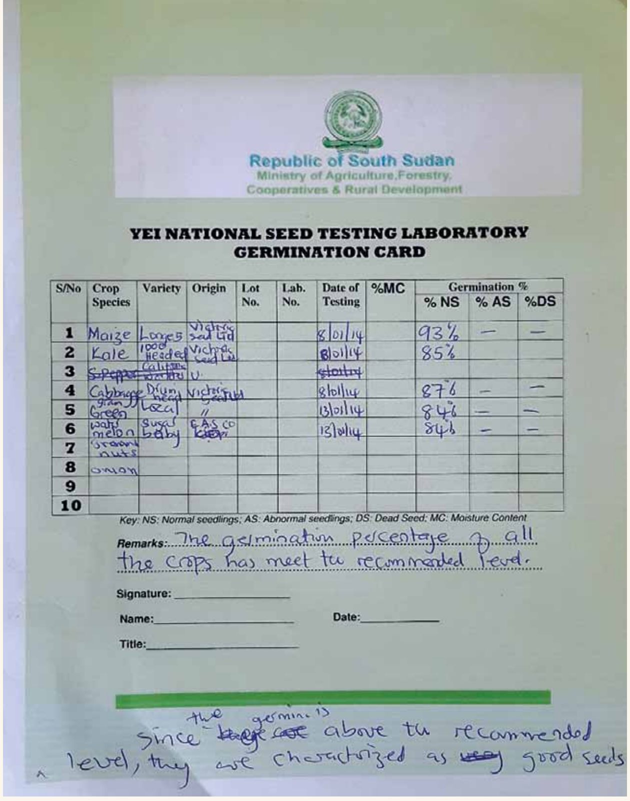

Photo: David Ndung'u, AGRA

Basic laboratory services for seed testing in South Sudan

If the real costs, including staff time, travel costs and institutional overheads are included, the added costs can amount to up to 25% of the retail costs. Once the full real costs of certification are charged to the seed producer, this will result in a substantial increase in price compared to non-certified seed. A 20% to 25% increase in the cost of seed is a high price to pay for the certification of bean seed, or amaranth or eggplant seed. It can be debated whether seed clients would be willing to pay this for the guarantee that the seed they purchase has been controlled independently.

The second important factor for the poor performance of certification services, frequently mentioned in the case studies and debated in the experts' meeting, is the inef-

Table 2. The cost to the producer and the public certification system of seed certification in Burundi and Tanzania per kilogram of seed and as a fraction of the retail price in 2015

Costs	Burundi				Tanzania	
	Potato	Maize	Beans	Rice	Amaranth	African eggplant
Cost to the seed producer (USD/kg)	0	0.002	0.001	0.001	0.02	0.16
% of retail price	0.01	0.17	0.13	0.08	1.24	1.66
Cost to the public system (USD/kg)	0.06	0.24	0.19	0.12	0	0
Total costs (USD/kg)	0.06	0.24	0.19	0.12	0.35	2.19
% of retail price	7	27	21	13	25	23

ficiency of public seed certification services. In many countries, the public seed certification service is highly administrative, understaffed, and poorly responsive to the needs of seed producers. Rather than being service oriented, the seed certification services are often more oriented towards regulation enforcement and control. Also, as shown in Table 3, the costs to the public system for the running of the certification schemes can be substantial, and are only partially covered by the fees paid by seed producers. Public services in sub-Saharan Africa are usually not very well funded, which hampers the effective delivery of services.

There are many examples of inefficiencies in the seed certification procedures. Laboratory testing can be a particular obstacle, as the process – from sampling through to communicating the results from a central laboratory – can take a considerable amount of time, which can be very detrimental to the seed business. In Tanzania, for example, it can take up to three months to receive the results of seed sampling. In Burkina Faso, seed producers are required to transport their seed to central storage facilities, run by the public seed certification body. Within these central stores, samples are taken for laboratory testing. After clearance, seed is treated in the facility and the owners can trade their seed. Such a system does little to support seed entrepreneurship, as it forces seed producers and traders to cede control of their own seed stock, and in addition concur double transport costs once they want to sell seed from their own farm. The system is only being tolerated as it is tied to the distribution of subsidized seed, and as such represents the major certified seed market in Burkina Faso.

In South Sudan and, to lesser extent, Burundi, the most obvious constraint hindering the performance of the seed certification agency is the lack of manpower. In South Sudan, only one single seed inspector is available, who is clearly not capable of satisfying the demand of different seed producers to get their seed certified, largely for the institutional market of aid organizations providing seed to disaster-struck farmers. Similarly in Burundi, there are four seed inspectors available to service the entire country, which is evidently beyond the capacity of these four professionals.

In certain cases, the insufficient number of seed inspectors and the lack of a service orientated attitude of the seed inspection, results in hidden costs. In Burkina Faso, seed producers incur unnecessary transport costs to get their seed tested. In several countries, the transport costs of seed inspectors, which should be taken care of by the public system, have in practice to be paid by seed producers, to ensure the inspectors actually turn up and provide inspection services. In situations where the demand for services in higher than the supply, there is the risk that informal mechanisms will develop to 'convince' service providers to prioritize one particular business over another.

Alternatives to classical seed certification systems

In the desk study, the African case studies and the experts' debate, a number of alternative models for certification were identified and discussed. Table 3 provides a schematic overview of different quality assurance mechanisms identified and their advantages and disadvantages as perceived

Table 3. Seed quality assurance mechanisms

System	Examples	Advantage	Disadvantage
Self-control	Case 6: South Sudan; default system for most small seed producers selling farm-gate in sub-Saharan Africa	Cheap and simple; based on reputation protection	Subjective; cannot be controlled; difficult to market off-farm; little incentive to be consistent; no check on the knowledge of the local seed producer
Truthfully labelled	Cross-state seed trade in India; vegetable seed from multi-nationals	Cheap; based on reputation protection; full private sector control over logistics	Requires ethical entrepreneurs; only works where a company wants to protect its reputation; responsibility with seed buyers to make a prudent choice
Group control	Case 3: Seed potato, Burundi; Seed potato, UNSSPA, Uganda	Internal organization of inspection; cheap	Not independent; sensitive to internal group politics
Quality Declared Seed (QDS)	Case 1: QDS African indigenous vegetables, Tanzania; Case 2: QDS OPV maize and rice, Tanzania; QDS by local seed businesses in Uganda (Otim, 2015)	Local inspection; independent; relatively cheap	often limited laboratory testing; largely field-based observations
Certification	Case 5: Burkina Faso; Formal system in most countries	Least opportunity to cheat; fully independent	quires complex logistics; centralized laboratory testing; requires full-time inspectors

by the experts involved in the discussions, based on their own experiences and the case studies.

Self-control

The most basic form of quality assurance is self-control by the individual seed producer (Case 6). This system is characterized by the complete absence of any form of external quality assurance. Some would argue that it is not a quality assurance mechanism, but here we prefer to consider it as an option, as it is the default system of quality assurance in areas where there is little seed sector organization, and it dominates seed sectors in sub-Saharan Africa. The fact that it is dominant in many countries for many crops is not only the result of a lack of effort to create other systems of quality assurance, it is also because of several notable advantages to this system.

The most obvious advantage of self-control is that it is cheap. There are no costs for external field inspections, which is a direct saving to the seed producer, normally translated into an advantage for the seed client, in the form of a lower price for seed. A second associated advantage is the simplicity of the system. There is no organization whatsoever involved in inspections, communication of results and the like. The only mechanism for external quality assurance is very clear, i.e. the reputation of the seed producer. In many cases, this is considered ample proof that the seed is of the desired quality for seed clients. The reputation based self-control system serves its purpose, especially where there is a direct relationship between the seed producer and the client, such as in the cases of seed potatoes produced by individual multipliers in Burundi, and cassava in South Sudan.

However, there are also several major disadvantages to self-control, which have been at the origin of the development of external quality assurance mechanisms. The self-control system is highly subjective; the direct beneficiary of the seed is the same person who has to subject the seed to the scrutiny of its quality, and who has to decide to downgrade the seed if the quality is deemed to be unsatisfactory. As much as a seed producer has the desire to protect his or her reputation for quality seed, making the decision that the seed is not up to standard, and refraining from selling it as such, is difficult, and a lot to ask. There is little incentive for individual seed producers to be consistent and rigid in this system. The field work did not find individual seed producers using self-control with clear objective internal procedures to decide whether the quality was satisfactory or not. Another clear disadvantage of self-control by local seed producers is that the seed is not easily recognizable as quality seed outside of its immediate production site, which makes it difficult to market off-farm. Finally, individual self-control assumes that the seed producer is aware of all quality aspects that need to

Photo: Daniel Karanja, CABI

Quality Declared Seed of Amaranthus, Tanzania

be considered. It may occur however, that in spite of the honesty and good intentions to protect his/her reputation, a seed producer is not aware of certain quality issues, such as emerging new seed-borne diseases, and is unwittingly selling poor quality seed.

We would like to suggest that self-control by individual seed producers is not an inherently bad system, as the reputation of the seed producer is the main driver to deliver quality. It is the fall-back option for quality assurance in places where there is no organized external quality assurance system in place. It may be considered a good option for crops with little yield benefit from quality seed, not much prone to seed-borne diseases, and which are traded locally, directly from the farm-gate.

Truthfully labelled

Truthfully labelled seed can be considered an improved, officially recognized version of self-control. The essence of truthfully labelled seed is that the seed producer tests the quality of his/her seed, and labels the seed accordingly, making it traceable. This quality assurance mechanism is widely used in India, USA, Japan, Korea and Thailand. In India for example, maize seed production is often deliberately conducted in a different state by seed companies, as truthfully labelled seed may be imported from another state. In the United States, the entire seed system is based on truthful labelling. International trade in vegetable seed also relies on effective truthful labelling. In some seed-producing countries, sampling is done by public quality assurance, to assess whether seed companies are indeed labelling truthfully. Similarly, in seed-importing countries post-entry sampling is carried out at times to assess whether the seed conforms to the promised standard.

Photo Patrick Oyee, ISSD Uganda

Quality Declared bean seed from Uganda

The most important advantage of the system is that the seed company has full control over the quality assurance process, which makes it more dependable in terms of timeliness. The company also has full control over the associated costs. The latter does result in quality assurance costs that are automatically priced into the traded seed, and which are kept modest as otherwise the seed company would not be able to compete. A final advantage of the system is that it builds on the natural principle of reputation protection, which also drives the simple self-control system, where the main driver for quality maintenance is an intrinsic part of the seed company, and it's continued functioning in the direct interest of the seed producer.

A disadvantage of the truthfully labelled system is that it can be only successful in an environment where clients can recognize brands, and where there is a significant amount of trust in brands. Labels can be fabricated and the quality of the seed can deteriorate easily. Seed companies can opportunistically launch seed brands in a way that seed clients are not able to distinguish between them. This will undermine the trust in packaged and labelled seed, and hurt the objective of increasing the use of professionally produced seed.

In the seed experts' discussion, the advantages of the truthfully labelled system were acknowledged, and a truthfully labelled seed quality assurance system was considered an ideal self-regulatory quality assurance system for the long-term future. For the short- to medium-term however, it was not considered to be feasible to use the truthfully labelled system as the leading quality assurance mechanism, for a number of reasons. In the first place, the capacity of seed clients to distinguish between different brands of packaged seed was considered too low. In general, trust in the quality of seed and other inputs is low, as there are counterfeit products in the market. Another, possibly even more important, argument against truthfully labelled seed is that is does rely on judicial systems for sanctions against those companies not meeting their own and the sector's minimum standards. Unfortunately, judiciary systems in many sub-Saharan African countries are not able to assume this responsibility.

Group-based quality assurance

Another approach to quality assurance compared to self-control is group-based quality assurance. When seed producers start collaborating, and especially market seed together, a need arises to ensure that the quality of seed produced by the individual seed producers adheres to an agreed minimum standard. An example of such a system can be found in Burundi, where a farmers' association initiated internal quality control for seed potatoes. Selected members were producing seed potatoes to solve the internal seed availability issue they were facing with regard to potatoes. As non-members appreciated the better quality of the seed compared to their own recycled seed, the producers also found a market outside of their association (Case 3).

Similarly, commercial seed producers, united as the Uganda National Seed Potato Producers Association (UNSSPA), have developed quality assurance protocols to assess the quality of seed produced by its members. There are concerns, however, over the sustainability of the internal quality control system if the number of association members grows (Kakuhenzire et al., 2015).

An advantage of group-based quality assurance is that it can be organized locally, which makes the logistics easy, and keeps the costs low. It constitutes a clear improvement compared to self-control, as the organization of the quality assurance ensures that a quality assurance protocol is developed and followed, with objective quality criteria being applied to all group members.

One disadvantage is that such a system is vulnerable to internal politics and power dynamics in the group. Sanctions are relatively difficult to impose as the inspectors issuing these are association members as well. In addition, quality control is relatively loosely structured and not always of high quality. The system is also not completely independent. Even though such a system usually works with a quality control committee, the members of this committee are seed producers themselves, and obviously have a direct economic stake in the outcome of the quality assurance. Finally, the quality assurance committee requires the capacity to decide what is of good quality and what is not.

Quality declared seed

Quality declared seed (QDS) refers to a form of quality assurance that was created to reduce the burden of rigorous conventional seed certification, while retaining the basic characteristics of external quality assurance, and thereby increasing access to quality seed for smallholder farmers. The generic guidelines for QDS, developed by the Food and Agriculture Organization of the United Nations (FAO), which date back to 2003 (updated in 2006), form a point of reference for QDS systems (FAO, 2006). The FAO guidelines are rather general and leave the exact interpretation of QDS to governments and regulatory bodies to be adjusted to each specific context.

The leading principle of QDS is that quality assurance is organized locally, through individual self-control or through group-based mechanisms as described above. The national seed inspection services only routinely check a random sample of seed producers to assess whether the local quality assurance mechanism is functioning properly. The standards the seed producers need to adhere to under QDS can be adapted to the local situation.

In Tanzania, QDS has been in operation since 2000 (Granquist, 2009). The main distinction from the certified seed system is that only a proportion of fields are inspected each season, and the inspection is implemented by the local agricultural officer. This reduces travel distance and thus the costs of inspection. QDS seed is marketed locally in Tanzania and is restricted to OPVs, to reduce the competition with fully certified seed. QDS was introduced more recently in Uganda, where it is restricted to crops that were not considered to be catered for by the formal seed system using official certification, which is the case for practically all crops with the exception of maize and sunflower.

An obvious advantage of QDS compared to self-control is the introduction of a truly external quality assurance mechanism that provides a clear incentive for seed producers to be rigorous and methodical about the quality control of their seed.

In addition, it provides for an independent quality label by which seed clients can recognize professional seed multipliers. If the seed is also packaged and labelled, it offers an opportunity to market the seed beyond the direct vicinity of its production site. In that regard, it seems illogical for the seed law in Tanzania to particularly forbid trading QDS seed beyond the boundaries of the ward in which it is produced. Seed producers must be registered to produce QDS seed, and a condition for registration could be that the seed producer has received training in quality seed production. Importantly, seed producers not abiding by the rules can be sanctioned, by deregistering them from the QDS system.

Since QDS generally works with locally based seed inspectors, the logistics of obtaining quality assurance for the seed is less complex.

The added cost of QDS-based quality assurance is lower than that of certified seed, which is an obvious advantage. Table 4 compares the estimated costs of full certification services with QDS inspection service for amaranth in Tanzania. Its shows that both the costs paid by the seed producer, as well as the real cost to the seed services are substantially lower for the QDS system. The costs of field inspection in particular are much reduced as a result of the decentralization of inspection services to district agricultural staff, and a reduction in the number of field visits required. In the QDS system, the costs of the inspection services as a percentage of the expected retail price can be reduced to 11%, compared to an estimated 25% for full certification. The additional cost of QDS could still be considered to be modest, whereas a 25% increase in cost for full certification may not be acceptable for clients of amaranth seed.

Table 4. Comparing the cost of QDS and full certification of amaranth seed for the seed producer and seed services, Tanzania, 2015

Cost for the seed producer (Tsha)	QDS	Certified
Registration fee	3,000	4,500
Field inspection	4,000	18,000
Seed health testing	6,010	24,020
Cost/hectare (ha)	13,010	46,520
Cost/kg seed	10	37
Cost (% of retail price)	0.30	1.20
Real costs for the seed services (Tsha)	**QDS**	**Certified**
Field inspection	345,000	835,500
Seed health testing	80,000	80,000
Overheads (50%)	212,508	457,508
Cost/ha	412,523	937,523

Basically, QDS is a form of seed certification, and as such its quality assurance mechanisms do potentially share much of the disadvantages of certification systems. Even though the costs are lower than for a full certification system, additional costs are still involved. In Uganda for example, QDS seed needs to be labelled (Otim, 2015), and the label is provided by the central seed certification body, which results in delays like those in full certification systems. The availability of inspectors can also pose a constraint similar to full certification systems. In addition, usually both sampling and laboratory testing is involved, which requires a functioning laboratory and seed sampling protocols, and therefore delays in receiving test results are to be expected, as is the case in full certification systems.

For the QDS system to contribute to improving the availability of high quality seed to seed clients, it is essential that the quality assurance system is kept simple, and as much as possible, local. Otherwise, it will not be able to solve the problems of full certification, for which purpose QDS has been developed. This means that inspectors need to be available locally, seed sample laboratory testing should be kept to a functional minimum, and preferably conducted locally as well, and labelling should not become a constraint to the functioning of the system.

Opportunities for improvement

Seed certification systems do not function well in most African countries. At best, they serve only a part of the seed clients, for a limited number of crops, particularly for maize. Therefore, it is essential to consider how quality assurance systems can be improved. There are a number of opportunities to improve seed quality assurance; Table 5 provides a summary of these opportunities.

In informal seed systems, the main opportunity lies in providing informal seed producers with clearer protocols for self-control of the quality of their seed and training on seed technology. This is especially useful for situations where clients have a direct trust relationship with the seed producer, and the seed producer is seeking to improve his/her service to these clients. Similarly, internal quality assurance within seed producer groups can also benefit from clear protocols for internal quality assurance.

The introduction and promotion of QDS production is a way to increase the availability of high quality seed, to complement the full certification system. The full certification system only addresses the seed needs of part of the seed clients, for selected crops. These services demand public investments, which cannot be made for a large range of crops, and would probably best be reserved for national priority market crops that contribute both to national and international trade and food security.

A QDS system, if designed well, can complement a system of full certification. It is essential, however, that the QDS system does not get overcomplicated, as it would suffer from the same constraints as a full certification system, which would defeat its purpose. The essential elements that distinguish QDS from certified seed systems are not the quality standards – these could even be the same in both systems. Experience from Uganda shows that QDS can meet quality standards and even be of better quality than certified seed (Otim, 2015). What should distinguish a QDS system from a full certification system is that it is basic, simple and easily accessible, which will also automatically make it cheaper. As such, it is important that inspections are not too frequent and are conducted by local inspectors, and that laboratory testing is kept simple and implemented locally. Any centralization of the quality

Table 5. Options for improving seed quality assurance

System	Opportunities for improvement
Self-control	• Training in the use of clear internal quality assurance protocols • Training on (seed-borne) pest and disease management
Truthfully labelled	• Reduction of importation restriction for seed of reputable international brands • Promotion of the development of recognizable brands by national seed companies
Group control	• Training in the use of clear internal quality assurance protocols • Training on (seed-borne) pest and disease management
Quality declared seed	• Institutionalization of QDS in the national seed regulations • Development of realistic minimum quality parameters • Development of local inspection capacity • Development of local laboratory testing capacity • Support for local labelling and marketing of QDS seed • Development of simple, local laboratory testing protocols
Certification	• Decentralization of seed inspection • Development of seed inspection by accreditation • Simplification of sampling and laboratory testing protocols

Photo: David Ndung'u, AGRA

Maize seed produced in South Sudan, largely under self-organized quality control

assurance will increase the chances that the QDS system will suffer from the same logistical constraints as the full seed certification system.

There is a tendency to invest in technologically superior centralized seed inspection services, which are neither in demand (because they are expensive), nor functioning properly (as they depend on public subsidy). However, an alternative option to improve seed quality assurance would be to simplify and decentralize the full certification system, so that it would resemble a QDS system. In certification systems, laboratory testing can also be conducted in simple local laboratories; and inspection can be delegated to accredited inspectors who are part of seed enterprises, individual service providers, or local government or agricultural field officers. It is best to strive towards simple, robust and affordable seed inspection services that can satisfy the demands of a large number of seed producers and their clients.

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Annex 1: Case descriptions

Case 1: QDS of African indigenous vegetables, Dodoma, Tanzania

By Daniel Karanja, CABI; Damas Marandu, Hortitengeru

Case description

In particular the functioning of the Quality Declared Seed (QDS) system for African indigenous vegetables (AIVs) was looked into in the Dodoma area in Central Tanzania. AIVs comprise crops such as African eggplant *(Solanum aethiopicum; S. macrocarpon)*, amaranth *(Amaranthus spp.)* and Nightshade *(Solanum nigrum complex)*, which are popular home garden and small-scale commercial crops.

Description of the quality assurance mechanism

In Tanzania, three quality assurance mechanisms are recognized: certified seed, QDS, and specialized (non-certified) seed. The QDS system was modified from the FAO proposed QDS system and adopted by Tanzania in the year 2000. It has been incorporated into the formal seed system in the national Seeds Act of 2003. This was followed by the registration of detailed rules, regulations and procedures in 2007.

A QDS producer is required to have been trained and register with the Tanzanian Official Seed Certification Institute (TOSCI). To register a recommendation is required by the local village authorities and the district authorities. In addition a QDS producer needs to proof not being solely dependent on seed production. Also, a QDS producer needs to demonstrate having access to ample land for seed production and rotation. Basic seed has to be sourced from ASA, or certified seed can be used as basic seed.

Field inspection is done at least twice, by local inspectors (90% of the inspections), who are under the supervision of TOSCI inspectors (10% of the inspections). A seed sample is taken by the local inspector and is sent to the central TOSCI laboratory for germination and purity testing. The rejection rate of seed lots is estimated to be below 20%.

QDS is meant for the production of seed of crop varieties that are not accessible as certified seed. Seed marketing guidelines require QDS to be sold within the ward in which it is produced. Farmers thus normally sell their seed at farm gate to other farmers. Two out of the five QDS producers interviewed specifically package their seed for retailing.

Key advantages of this quality assurance mechanism

QDS helps to address the gap between the formal and informal seed systems. An advantage for the seed clients is that QDS is sold at affordable price, at prices set by local market mechanisms, above the price for grain. Seed clients consider QDS to be easily accessible, of good quality and cheaper than certified seed. In addition, QDS is packed in small packs that are demanded by small scale farmers. Clients of QDS are able to choose crops and varieties of their interest for their markets. Quality seed of these varieties is not offered through the certified seed system. QDS seed is mainly sold and used in the area where it is produced. As such, chances of seed fraud and counterfeiting are minimal, and varieties are adapted to the local demand and agro-ecology.

From the point of view of seed producers the advantage of QDS is that it provides an opportunity to distinguish their seed from non-controlled seed in the open market. As such they can build a reputation and ask a small premium price for quality seed. Compared to the certified seed system, the inspections are less costly, and the requirements for registration as a seed producer less stringent.

Constraints experienced with this quality assurance mechanism

The seed inspection by local government agents is imperfect. They lack the resources to visit fields, and their number has reduced over time as a result of a lack of training of new officers replacing retiring agricultural staff. In addition, it is hard for TOSCI to cover their supervision duties from the resources allocated from the QDS system. Also the release of seed for sale may be late, due to belated official approval of TOSCI of the dossier. The reason of this can be the result of delayed sampling and transport of samples, delayed laboratory testing, and inefficient communication of the results.

A major threat to the QDS system is that the payment of local inspections and TOSCI services is not fully recovered from the seed growers, but partly covered by the local government and TOSCI. As such the system is not self-sustaining; this poses a threat in the long run.

Among the QDS producers constraints are observed in terms of their level of professionalism, and a limited capacity to invest to assure that adequate crop protection measures are taken.

Main lessons from the case

A growing awareness on the value of the use of quality seed was observed from various responses under this study, with QDS playing a key role in providing seed for various Indigenous African Vegetables. Farmers appreciated the quality of the QDS seed, and prospects for scaling up QDS in the country exist.

Based on responses, there is no inherent competition between QDS with other quality assurance systems. QDS and certified seed both address a unique niche, responding to different farmer needs.

Currently, farmers are not paying any money for seed inspection and certification. The cost has either been covered by donor funded programs promoting QDS or has been subsidized by the government. In the absence of a clear funding mechanism, the financial sustainability of QDS remains questionable.

In spite of being a decentralised quality assurance mechanism, it is not void of administrative hurdles and constraints. A further simplification of the number of actors and administrative steps can contribute to an even more efficient quality assurance mechanism.

Photo: David Ndung'u, AGRA

Maize seed shelling, South Sudan

Case 2: QDS of open-pollinated maize and rice, Morogoro and Dodoma, Tanzania

By Raphael Laizer, Ministry of Agriculture

Case description

Farmer groups in the Morogoro and Dodoma area have been trained and supported in the development of QDS production from 2003 to 2006 by the Ministry of Agriculture, with the support of DANIDA. Since then, groups of seed producers have been producing quality declared seed of maize and rice for the local market. The trend of total QDS production of different crops has been increasing gradually from 194 MT in 2009/10 to 62,712 MT in 2013/2014.

QDS seed producers mainly sell their seed farm gate. There are however also QDs producers who sell to traders who market the seed in surrounding villages, even though this is, strictly speaking, not allowed. Some cases were reported of seed traders even providing QDS producers with fertiliser and packaging material on credit. Some seed companies have contracted QDS seed producers as outgrowers of their certified seed.

Description of the quality assurance mechanism

See for a description on how the quality assurance functions Case 1.

Key advantages of this quality assurance mechanism

QDS is beneficial to seed clients as it puts another, intermediate type, of quality seed in the market, and makes quality seed better available locally. As a result of the introduction of QDs as a category of externally controlled seed, a better national coverage has been achieved of inspection services. Whereas TOSCI does not have the capacity to do inspection across Tanzania, the co-optation of Authorised Seed Inspectors at district level has made inspection services better available locally.

QDS is beneficial for clients as the seed has a good price-quality ratio. QDS is three times cheaper than certified seed and is often of similar quality. QDS is developed and sold at village level so most of the customers know the producer in person; this supports the seed quality control system. Clients trust the producer even without the usage of separate packaging material provided with official quality guarantee stamps. Most farmers are able to witness the quality themselves just by seeing the seed in the field. Production at village level is also beneficial for the accessibility of buying the seed.

Producers will be confident of producing and distributing seed according to the required standards. Through the QDs system they have access to a service which assists them in assuring that they provide a quality product to their clients.

QDS seed fetches a modest price premium, as clients have confidence in the quality of the seed. By being integrated in the QDS system, producers have had access to training, and they are also accessing the 'institutional market' of projects and farmer organisation buying seed for distribution.

Constraints experienced with this quality assurance mechanism

The timely availability remains a constraint for seed clients. Seed is only released for sale after approval by TOSCI has been granted. This approval can be late and forces clients to wait or to buy other seed. Also, the amounts of QDS available in the market are still limited compared to the total demand for seed.

A disadvantage for seed producers is that inspectors do not always indicate when they plan an inspection visit. The seed producer is therefore not always present and cannot receive the feedback in person. If the seed producer is present he or she often does not receive any kind of feedback.

Laboratory tests are carried out centrally by TOSCI. This process from sending the sample to TOSCI until receiving the feedback can take up till even three months. Seed producers are not allowed to sell their seed during that time and have to make sure to keep it in good conditions. The length of the testing phase is very unbeneficial for both seed client and seed producer.

The starter seed needed for the seed production is bought from ASA or received through the District Authorities. The District Authority is not reliable and consistent in its supply and the seed producers are awaiting the District Authority to receive starter seed. This awaiting delays the seed production activities. Another witnessed concern is that seed producers accessing ASA themselves cannot always purchase the crop variety they prefer, simply because ASA does not have it available.

Main lessons from the case

emand for QDS is increasing. All producers are able to sell their yield year after year. However, only rice, maize and sunflower seed producers have been interviewed. Scaling up seems a logic continuation of the activities, but some components of the legal regulation of QDS production do not allow this. The Ministry of Agriculture Food Security and Cooperatives is currently looking into changing the regulation regarding the restriction of sales to the ward. According to the current seed regulation which is under review process, the proposed amendment is for QDS to be marketed within the district. If they agree on expanding the sales area this means scaling up can be done by selling to agro-dealers and farmers in other wards. Another condition counteracting upon scaling up concerns the size of the QDS field. A QDS producer is only allowed to cultivate five hectares of one particular variety.

Financial sustainability of QDS system not guaranteed, as currently seed producers do not structurally pay for inspection. The inspection services are being provided by the district government agricultural officer.

Case 3: Internal quality control by a seed potato producer group in Burundi

By Cyriaque Simbashizubwoba, IFDC

Case description

The cooperative Rima Wihe in Burundi has developed its seed potato production activity particularly to solve the difficulties of poor availability of quality potato seed in their region. All if its members are producers of potatoes for the consumption market. As they recurrently faced difficulties in procuring good quality seed, they decided that collective action needed to be taken.

The cooperative consists of 15 associations of producers of 10-15 members each. They purchase basic seed together and produce seed potatoes. Seed is being stored under good conditions in four stores which are managed by the cooperative. Together they produce 30 tonnes per season. Seeds are largely sold within their own cooperative, for a friendly price. Surpluses are sold to non-members of the cooperative.

Description of the quality assurance mechanism

The cooperative has developed its own quality control mechanisms. All seed production starts with the purchase of quality basic seed as a group. In each of the 15 associations which make up the cooperative one member is chosen as the quality controller. Together these 15 controllers form the cooperative quality control committee. Each individual quality control agent is responsible for the control within his association. The larger committee assures cross-association quality control. Regular field inspections are done to assess the quality of the production of the individual members. There are, however, no clear objective quality criteria which are followed across the different associations.

Key advantages of this quality assurance mechanism

For the end users of the seed the system functions well. It has been initiated to solve the acute problem of poor availability of quality seed. Especially seed without bacterial wilt is hard to obtain, and the system provides for the demand for higher quality disease free seed. An important advantage is that the seed is available locally, and purposefully produced for the demand of the cooperative members.

In addition to satisfying the internal demand for seed, production of seed potatoes is a profitable side-business to ware potato production. The quality assurance system is convenient is it has no costs attached. The chosen seed quality inspector within their association is performing the service on a voluntary basis. Through the cooperative farmers can store their seed under more favourable conditions. The collective storage also provides for market opportunities to sell seed potatoes in larger quantities, which is of particular importance for orders from other farmer organisations and local NGOs. By collectively ordering basic seed the producers are surer of acquiring basic seed on time.

Constraints experienced with this quality assurance mechanism

Even though there is an internal quality assurance mechanism, the quality of the seed is not perfect. The main criterion used is the visible infection with bacterial wilt. This is, however, not sufficient. A control of ample crop rotation is required to further control bacterial wilt infection. In addition, a visible control of virus infection rates would be required, but is not practiced. The chosen seed inspectors within the cooperative do not have all the experience required to judge the quality of the seed, nor do they follow objective decision making criteria.

The main constraint for seed producers is their highly diverse technical capacity to produce seed. Their knowledge of quality management is rather limited, resulting in high rejection rates. Considering the high cost of basic seed, this easily results in poor economic performance of their seed activities. The internal seed inspectors do not have the skills to provide the producers with the advice they need to improve their production practices.

Main lessons from the case

Internal quality assurance can assist seed producer groups in maintaining their collective reputation. They could benefit, however, from support in the design and implementation of a quality control system which is technically sound. They would benefit from a clear internal quality control protocol to assure that the downgrading of seed is not an arbitrary decision, but based on meaningful criteria.

Both the seed producers as well as the internal seed inspectors need to develop the skills that do justice to the investments made in basic seed. The existing structure set-up by the cooperative is a very good entry point for supporting initiatives to improve the availability of high quality seed.

Case 4: Internal quality assurance of cassava cuttings using a quality management protocol, Burundi

By Ernest Niyondiko, IFDC

Case description

In cassava, cassava mosaic virus (CMD) and brown streak disease form major constraint for the re-use of cuttings by farmers. To mitigate this problem groups of farmers multiply cuttings under close monitoring of the health status of the plot. The production of cassava cuttings is done as a non-commercial activity. In the first place, this provides the group members themselves with clean planting material, and secondly, it provides the community with a clean source of material.

The system has been introduced between 2006 and 2008, by IITA and CRS, together with local partners. Some of the farmer groups trained at that time are still continuing to produce disease free cassava cuttings in multiplication plots.

Description of the quality assurance mechanism

The quality assurance is done by the group members, on the basis of sampling of plants and roots within the multiplication plot. The group has received specific training on a quality control protocol to assess if the plot does not exceed the maximum tolerance levels. At regular intervals field inspections are done by assessing 10% of the plants in a plot for CMD, cassava brown streak and cassava mealy bug. A sample is taken for root inspection. If the plot exceeds the tolerance level for the disease, it is rejected as a source plot for cuttings, and harvested for roots only. The same farmer groups have been the basis of a field multiplication system for the introduction of new resistant varieties to CMD. The same infrastructure of farmer groups with cassava multiplication capacity using the quality management protocol are currently considered to be re-activated to distribute cassava varieties with a tolerance to cassava brown streak.

Cuttings are rarely sold from the multiplication plots. They are used internally within the groups and distributed for free to the community.

Key advantages of this quality assurance mechanism

The main advantage of the self-control system is that provides the producers of cuttings with an objective protocol to monitor the quality of the planting material. Further-

Labelled bunches of cassava cuttings, Tanzania

Photo: David Eagle, MEDA

more there are no additional costs attached as there is no external quality assurance. The cuttings are distributed for free to members of the farmer association, and also to non-members, making it an effective tool for rapid variety deployment.

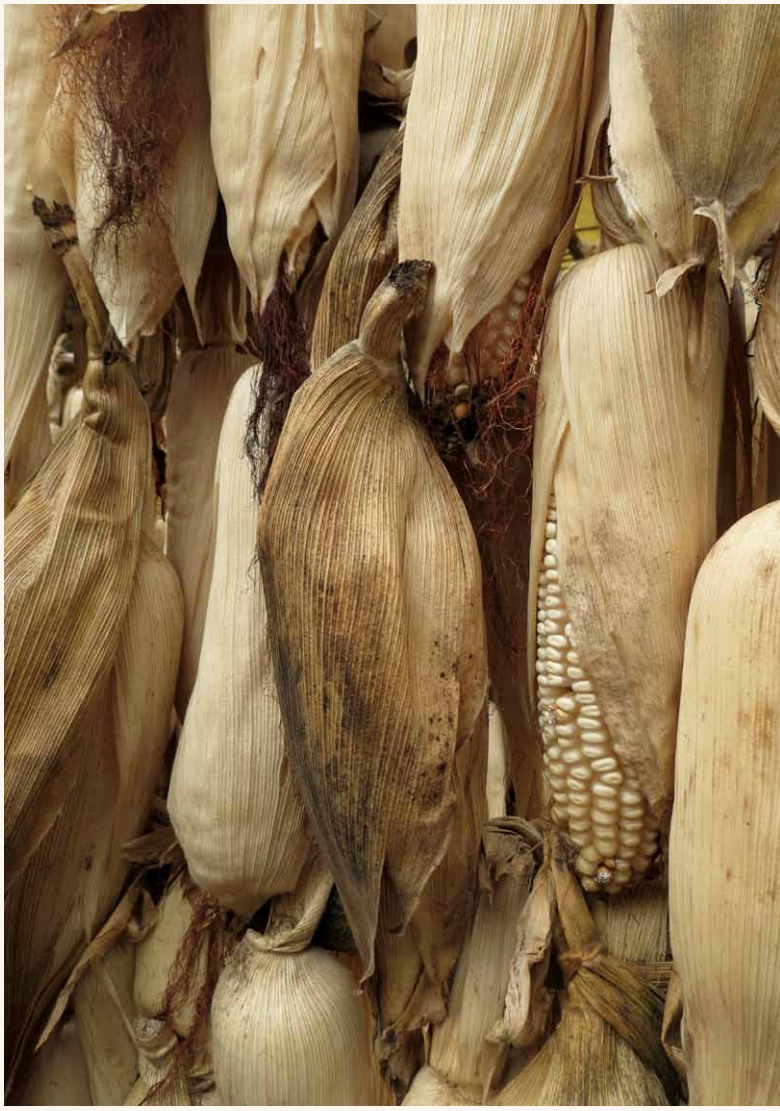
Constraints experienced with this quality assurance mechanism

The main constraint is not the quality assurance as such, but the fact that no price is paid for the cuttings. As such there is little incentive to maintain the clean garden, and continue to provide a source of clean planting material. The motivation to continue is social rather than economic, which provides a higher risk of discontinuing the activity. Still, some of the groups initiated around the year 2008 continue to produce cassava cuttings using the same system.

Main lessons from the case

The main lesson which can be derived from this case is that also in non-commercial or low-commercial seed production quality assurance can be improved. A clear and simple protocol to assess the quality of planting material can provide informal seed producers with a more objective manner to decide whether or not the quality of their material is sufficient for distribution. Furthermore, it shows that for crops such as cassava, with a demand for clean planting material, but a poor willingness to pay, collective production can be an option.

Photo: Geneviève Audet-Bélanger, KIT



Maize

Case 5: Certified maize seed production, Burkina Faso

By Adolphe Kadeoua, NAZAN Sarl

The certified seed system in Burkina Faso was studied. Currently, there are about 2502 registered seed producers in Burkina Faso. An impressive number, but insufficient to serve all the farmers. The National Seed Service has five laboratories in five regions (Ouagadougou, Bobo Dioulasso, Fada N'gourma, Dédougou, and Tenkodogo), 23 seed inspectors and 46 deputy inspectors; the inspectors are all civil servants.

The current seed law has been in place since March 2006. Its application, however, started as late as 2014 according to the director of the National Seed Service. The quality control mechanism derives from this law. Since 2015, the National Seed Service is implementing the quality assurance system according to the new seed law. At the same time the seed producers started to pay for the quality control to cover part of the costs of the service. This includes registration fees 5000 CFA (~ 8.5 USD) and field inspections fees 1000 CFA (~ 1.7 USD) per hectare up to five hectares and 1500 CFA (~ 2.6 USDS) per hectare above five hectares.

Description of the quality assurance mechanism

The government is in charge of the seed certification system. A seed producer needs to be registered. For registration a seed producer needs to show that he has received relevant training in seed production. Secondly, an information sheet needs to be filed which indicates the seed crop and the area for certification by the National Seed Service.

The seed producer is required to fulfil the technical requirements, which includes isolation distance, maintaining varietal purity and crop health by removing off-types, weeding and appropriate crop protection. After harvest, seed is dried, decorticated, and weighed before packaging. The entire yield is subsequently collected it in a common regional central warehouse for certification.

Government inspectors from the National Seed Service are in charge of the external quality assurance. They are supposed make four field inspections, but because of a lack of means (financial and material) they visit a maximum of three times. For laboratory testing, the inspectors sample from the central regional warehouses, and forward these to the regional seed laboratories for testing the moisture content, the varietal purity, the germination rate and, depending on the crop, seed-borne diseases. If the seed fulfils the minimum requirements a certificate is provided to the seed producer and he/she can sell the product. In case the minimum requirements are not attained the seed is downgraded to consumption grade. About 20% of seed lots are rejected.

Key advantages of this quality assurance mechanism

The quality control system allows seed clients to get seeds of externally assured quality and hence high potential productivity.

Seed producers have access to a rigorous external quality assurance mechanism. This allows them to provide quality seeds to distributors and end users. Of particular importance is the access to the market of subsidized seed, which is managed by the Burkina Faso government services. Furthermore, the quality assurance system has enough regional reputation for seed producers to export their seed to other countries in the region, through responding to tenders for seed from development organizations.

Constraints experienced with this quality assurance mechanism

The main constraint for seed producers is the fact that they need to transport their seed to a central seed storage facility, from where samples are taken for laboratory testing. Since currently the main market is the government seed procurement and distribution system, this is not very pronounced. It does, however, hamper the development of a functioning local market for seed.

Other constraints mentioned by producers of certified seed are:

- Difficult access to early generation seed;
- Difficult access to agricultural inputs;
- The length of the certification process;
- Lack of photographic materials to assess varietal purity;
- Lack of modern laboratory materials for seed certification;
- Difficult access to the international market; and
- The seed law doesn't allow small farmers to produce seed.

Main lessons from the case

This seed certification system provides huge opportunities for development. The number of seed producers and seed clients are increasing, and vegetable crops and additional cereal crops can be inserted into the system.

The quality assurance mechanism is highly dependent on public human and financial resources. The government provides laboratories for quality control, technicians as well as starter seed, which makes the system vulnerable. On the other hand, the government services are needed for seed producers to thrive in their business. The challenge will be to improve these services and making them more financially sustainable.

Another major threat to the seed sector is that it is currently build on government price subsidies. The subsidy system is highly government controlled. The current subsidy set-up is hampering the development of a local seed market, in which agricultural producers develop the habit to purchase quality seed from local agro-dealers or form seed producers directly. A true liberalization of the seed sector, and the stimulation of seed entrepreneurship, with the government in a supporting and facilitating rather than a leading role would further stimulate the development of a functioning seed market in the country.

Photo: Ivan Rwomushana, ICIPE

Selected seed potatoes, Uganda

Case 6: Quality management based on own-control and social pressure, South Sudan

By David Ndung'u, AGRA

Case description

In South Sudan public services are of rudimentary nature in general, which is also the case for the seed sector. As such the quality assurance mechanisms applied by seed producers are largely developed and applied by themselves. In spite of this there are individual producers who specialize in seed production, and seed companies are emerging. These are supported by the AGRA programme. The formal seed companies are selling their seed through agro-dealers, and at the farm gate to NGOs. The informal seed producers sell at village markets and at their farm gate, targeting mainly individual clients.

Description of the quality assurance mechanism

Formal seed companies indicated they had a process of internal seed quality control including rogueing of diseased plants and off types, cob and seed selection, and germination testing. Informal seed producers were also aware of the need to make selections of the best cobs or pods and to treat the seed differently from grain. Seed is stored differently and informal seed producers control storage pests by applying ashes. Most of the informal seed producers did, however, not engage in structured internal quality control procedures such as rogueing of off-types and the deliberate decision making on the acceptability of the quality of seed for commercialization based on objective criteria.

Formal seed companies have to acquire a business license, a tax registration certificate and a membership certificate of the chamber of commerce. In addition they need to develop a company profile and a memorandum and articles of association. Formal seed companies were cognizant of the need to engage seed inspectors for field and seed inspection. However, they all indicated that it was extremely hard to get the seed inspectors to their fields as there were very only few available. Seed companies did indicate to send seed samples to the Yei research station laboratory were basic seed quality testing including germination, purity and moisture content are performed. The tests determine if the seed will be accepted or rejected. In cases where the seed was rejected, the seed companies indicated they sell the rejected seed batch as grain. The cost involved for formal seed inspection includes provision of transport for the seed inspector and a lunch allowance. For seed testing, the cost is 10 SSP (~ 3 USD) for a sample and 50 SSP (16 USD) for the certificate. For informal seed producers there is no external quality assurance mechanism and as such also no additional costs involved.

Key advantages of this quality assurance mechanism

The advantage of local seed producers is that they are known by their clients, and they have a reputation for providing seed of a specific quality. The advantage of the registered seed companies is that they serve clients who distribute seed to a larger audience, and require some assurances that the seed is of reasonable quality. Through this they can compete with seed of dubious origin which is also being distributed by relief programs.

The advantage for seed companies of using a form of external quality assurance is that they can distinguish themselves, most importantly, on the institutional market. Projects and programmes distributing seed as a relief intervention are willing to pay a price premium for seed of a controlled quality.

Constraints experienced with this quality assurance mechanism

Quality seed is poorly available outside of the capital. The penetration of the countryside by agro-dealers is poor. As such local availability of seed is difficult to assure through a few larger seed companies. Local seed producers selling their seed at local markets and at their farm gate do complement larger seed producers. For local seed producers there is no access to external quality assurance mechanisms. As long as local producers have a good technical capacity and sell to local clients this works reasonably well.

The main constraint of the current system is the difficult availability of an independent inspection. Seed producers are managing the quality themselves. Getting external quality assurance is difficult as a result of the poor availability of inspectors. Also laboratory services for testing are difficult to obtain.

For local seed producers there is no option of external quality assurance, which effectively rules local seed producers out of an important part of the relief market, of organisations which are demanding some form of quality assurance. These buyers represent an important component in the seed market and not being able to serve these clients reduces the business opportunities for local producers.

Main lessons from the case

Even though local seed producers manage to sell to their clients, they would appreciate the option of external quality assurance, to serve a wider than local market, and particularly to gain access to the institutional market. A quality assurance mechanism provides serious professional local seed producers and seed companies with the opportunity to distinguish themselves form opportunists aiming for short term profit in the relief seed market.

Currently there is no inspection capacity to speak of in South Sudan. The highest priority needs to be given to the development of a rudimentary, simple and highly decentralized system of light external quality assurance, which serves both local seed multipliers and larger seed companies.

Furthermore, it has been indicated that in the relief based seed market, intervening organisations are not paying enough attention to and are not making enough effort, to purchase seed form reputable producers and traders. Parallel to the development of a simple external quality assurance mechanism, intervening organisations need to be made aware of and buy into the development of a class of professional seed multipliers at local level, and seed companies at national level. Their joint purchasing power can provide a major incentive to the emergence of seed businesses, provided that it stimulates competition amongst serious professionals in the seed sector, at local and national level.

Case 7: Potato quality control in Burundi by individual seed multipliers

By Ernest Niyondiko, IFDC

Case description

Two individual seed potato producers and a farmer group were investigated who are producing and trading seed potatoes based on reputation, without external quality assurance. In addition, the study included one single seed potato producer, who subjected his seed to official inspection.

Description of the quality assurance mechanism

The informal seed potato producers have all received training in the production of quality seed. They are sourcing pre-basic seed potatoes from ISABU or basic seed potatoes from a private or public seed producer. They do apply quality management practices, particularly to keep bacterial wilt infestation as low as possible. A lower bacterial wilt infection rate as compared to that of recycled farmers' seed is the main driver for seed potato sales. Plants showing signs of bacterial wilt or viruses are eliminated to minimize the infection level of the seed that will be sold. Furthermore, late blight is being controlled. The informal producers do have minimum quality standards for own seed inspection that they apply for the seed they sell. If they have rogued out more than 10% of plants in a field, the field gets downgraded, and the seed is sold as consumption potato.

The one seed producer subjecting his field to external quality assurance invites the ONCCS to come and inspect. They apply a single field inspection as well as an inspection once the produce is in storage. Furthermore, samples are taken for laboratory inspection, particularly focused on assessing the infection rate of bacterial wilt.

Key advantages of this quality assurance mechanism

The informal internal quality assurance is well adapted to the local system, and has little to no added cost compared to the production of ware potatoes. The advantage of the formal system is that the quality of the seed is not only confirmed through field inspection, but also verified through laboratory testing.

Constraints experienced with this quality assurance mechanism

The volumes produced and sold are by the informal producers are low per individual seed producer, because access to land is difficult in the highlands where potatoes are grown. The informal producers typically sell to a small group of recurring clients who have trust in the minimum quality of the seed produced. A disadvantage is that infection levels with bacterial wilt are only verified by visual inspection, and not by laboratory testing, which is only a proxy for the health of the seed lot. Furthermore, there is little pressure to improve the quality of the seed over time. There is limited competition between seed growers, as they are producing for a particular clientele, and farmers cannot easily go elsewhere for seed potatoes.

The constraint of seed certification is that there are few seed inspectors; as a result the inspectors are not able to implement inspections timely, and provide certificates timely. The seed producer does not pay for the field inspection, but a fee is asked for the laboratory inspection.

Main lessons from the case

External quality assurance requires the timely availability of inspectors. Currently this is not assured in Burundi. To provide inspection services to small local seed multipliers a large number of inspectors would be required. A centralized system of inspection would constitute an important cost for seed producers in the case of potatoes, and it is doubtful whether seed clients are willing to pay for such an inspection service. A local light external quality control mechanism could be an option for seed potato producers to distinguish themselves from other producers. For the time being, however, the offer of seed potatoes is limited, which puts little pressure on seed producers to distinguish themselves.

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ISSD Africa is a community of practice that unites African seed experts, seed programmes and associated organizations, and which aims to increase farmers' access to quality seed through the development of a market-oriented, pluralistic and vibrant seed sector in Africa.

The ISSD approach is a farmer-focused and demand-driven seed sector development approach, which caters for the diversity of seed demands. Through this approach interventions are designed that are tailored to specific crops, value chains and seed systems. It is a seed sector-wide and inclusive approach.

ISSD Africa is coordinated by a consortium of Wageningen Centre of Development Innovation (CDI) of Wageningen University & Research, the Royal Tropical Institute (KIT), the Future Agricultures Consortium and Tegemeo Institute of Agricultural Policy and Development in Nairobi Kenya.

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