Seed system security assessment: new methods for understanding farming system resilience

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IMPROVED BEANS FOR THE DEVELOPING WORLD

Why seed system security assessment

Emergency seed aid interventions are steeply on the rise. For instance, the FAO alone managed 400 such projects between 2003 and 2005, and in response to the current food crisis has seed aid plans for 48 countries. As such, humanitarian actions unfold among vulnerable populations and often in more marginal contexts, they include arenas in which public sector research particularly has the mandate to serve.

Intervening in seed systems is serious business. Seed is an input at the heart of agricultural production and determines what farmers grow and if they will harvest. Also, as seed is often replenished, even short-term seed-related interventions can have effects over many seasons. Further, designing emergency aid is very challenging as such programs are context-specific and, following a disaster, time may be short for assessing needs of the next season.

Despite the need for well-conceived technical advice, seed security assessments, to guide precise responses, are rarely, if ever, effected. Determinations of seed security are simply based on food security assessments. Evaluators assess food needs and then extrapolate seed requirements as part of the aid package. So, standard seed assessment practice is simply wrong and standard practice can do harm—as when blanket solutions (“give emergency seed”) start to undermine local and formal seed markets, create dependencies and change basic crop profiles.

In 2008, CIAT published the first ever Seed System Security Assessment Guide. The Guide helps researchers, development and relief agencies decide if seed-related interventions are warranted and, if so, to tailor a strategy toward strengthening vulnerable farming systems.

Exploding basic (and dangerous) myths

A production shortfall does not necessarily equal a seed shortfall

The most common justification given for seed aid is a decline in crop harvests due to drought, floods, low-level conflict, or other shock. The logic is that a drop in crop production translates directly into less (or no) seed for the following season. The assumed linkage between crop production and seed availability is so embedded that funding proposals, particularly in Southern Africa, often cite ‘drought’ as the reason seed aid is needed. This simple and apparently innocent error can lead to unnecessary expenditure of millions of dollars, and can result in more harm than good.

However, simple calculations show that a production shortfall is not necessarily equal to a seed shortfall. Take a case from eastern Ethiopia, [table below]. Even in very poor seasons, when production is more than 80% below that of good seasons, farmers would need only 5% of that low harvest to re-seed their fields.

For many crops analyzed in African contexts e.g., common bean, fava bean, maize, sorghum, wheat, teff, harvests can drop as much as 80-90%, and enough seed is potentially available. We add the qualifier ‘potentially’ as the quality of seed harvested has to be adequate.

Sowing needs in relations to harvests (by household): example from Ethiopia

<table>
<thead>
<tr>
<th>Crop</th>
<th>Seed use (kg household)</th>
<th>Seed use (kg)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>harvested area(s) (ha)</td>
<td>2008, 2009, 2010, 2011</td>
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Fitting technically-smart practical tools

Calculating seed needs from harvests

For a given crop (and variety) and area to be planted, it’s easy to calculate the amount of seed a farmer will need for sowing, as well as the size of harvest to be expected.

Let PA be the area to be planted by a farmer, in hectares. Let SR be the seed rate, that is the amount of seed, in kilograms, that needs to be sown for each hectare of the crop and variety in question. Let MR be the multiplication rate of this crop or variety, namely the ratio of harvestable grain to seed sown. Using these three variables, we can determine sowing needs (SN) and the expected harvest (H) with a few simple formulas:

SN = PA × SR
H = PA × SR × MR
H = SN × MR

A note of caution: The formula for SN assumes a crop is sown only once. However, sometimes, especially in marginal areas, seeds of an initial sowing may fail to germinate. So farmers may end up planting a crop two or even three times, thus doubling or tripling their sowing needs.

A simple calculator, in Microsoft Excel format, can be downloaded from www.ciat.cgiar.org/Africa/seed_manual.htm

Decision-making trees for linking targeted assessment to targeted action

Decision trees help stimulate thinking about which specific options for action are most appropriate for which types of problems.

For example, a problem of access arises when the desired seed is available locally but farmers lack the means to buy it, barter for it, or otherwise obtain it. Access problems due to constraints on market functioning, such as a lack of security that restricts human movement, occur much less frequently.

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