ACCELERATING AGRICULTURAL INTENSIFICATION IN THE RISKIER ENVIRONMENTS OF SUB-SAHARAN AFRICA:

A Case Study of the Sasakawa Global 2000 Program in Mali

by

Kako Nubukpo
Valerie Kelly
Mbaye Yade
Marcel Galiba

The context:

A UN study released on World Food Day in October 1999 predicted that....

Continuing soil degradation in Sub-Saharan Africa will bring about starvation and poverty on an unprecedented level with up to 60% of Africans going hungry by 2025.
Organization of the presentation

- Description of SG 2000
- Malian context
- Program results and impacts
- Lessons

SG 2000 approach

- Exclusive attention to food crops
- Searching for Green Revolution magnitude of changes in productivity
- Direct farmer participation in technology transfer using test and control plots
Critiques of SG approach

- Too much attention to yield and not enough to profitability
- Adoption frequently not sustainable
- Too much dependence on external inputs vs. alternatives

Mali:
A conducive environment for agricultural intensification and transformation:

- Market reforms began in early 1980s
- Democratization movement began in early 1990s
- Devaluation of CFA franc in 1994
- Agricultural value added grew at 4%/yr 1985-99
- Growth even faster since 1994.
**Characteristics of SG2000 Segou Zone**

- Sudanian climate
- Rain 700-800 mm
- Soils moderately productive
- 120-150 day season
- Millet, sorghum + pulses
- Animal traction used

**Characteristics of SG 2000 participants**

- Among better endowed farmers
- Heavy reliance on millet self-sufficiency
  - Millet production for home consumption is principal source of income for 88% of farmers
  - Market considerations (prices) have little influence on millet production decisions for about 55% of participants
- Few farmers have diversified incomes
SG 2000 Mali approach

- Incremental introduction of technologies from low to high costs, risks, and productivity
- Research on farmers’ risk perceptions and profitability
- Promotion of savings and loan associations to ensure input purchasing power after SG program ends

SG 2000 – Profitability

Packages recommended:

- Level A - improved seed and fungicide
- Level B – Level A + light fertilization
- Level C – Level A + heavy fertilization
### Crop budget results

(Per ¼ hectare)

<table>
<thead>
<tr>
<th></th>
<th>Level A</th>
<th>Level C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td>40</td>
<td>47</td>
</tr>
<tr>
<td>Yield change (kg)</td>
<td>133</td>
<td>122</td>
</tr>
<tr>
<td>Value change (FCFA)</td>
<td>10640</td>
<td>9760</td>
</tr>
<tr>
<td>Pkg cost</td>
<td>2050</td>
<td>16500</td>
</tr>
<tr>
<td>Benefit A</td>
<td>8590</td>
<td>-6740</td>
</tr>
<tr>
<td>Benefit B</td>
<td>n.a.</td>
<td>-1931</td>
</tr>
</tbody>
</table>

45% of Level C farmers realized positive returns; others suffered losses (750-16500 CFA).

Many Farmers suggested elimination of phosphate rock from Level C package.

### Perceptions of profitability

- **Level A** – all farmers unanimous that it was highly profitable
- **Level C** –
  - only 11 of 47 farmers (23%) thought the package was **NOT** profitable
  - Most with losses <5000 CFA thought package was profitable

- **Why?**
  - Maximizing cereal production rather than income??
  - Doing a whole farm analysis rather than a partial budget??
SG farmers’ risk perceptions
(determinants of production risk)

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>poor access to inputs</td>
<td>132</td>
</tr>
<tr>
<td>poor rains</td>
<td>116</td>
</tr>
<tr>
<td>bird damage</td>
<td>92</td>
</tr>
<tr>
<td>declining soil fertility</td>
<td>64</td>
</tr>
</tbody>
</table>

Impact of SG technology on risks

- 96% claimed SG technologies reduced the risk of crop loss associated with the above mentioned problems
  - Combination of all inputs worked together to keep yields above normal levels (62%)
  - Fungicide reduced pest attacks (16%)
  - Reduced risk of land access because yields could be increased on existing land (8%)
  - Reduced risk of poor rains (5%)

- 3% claimed risk increased
  (All were Level C farmers)
What do we conclude?

- Farmers are much happier than the rest of us....
  - Concern about declining effect of fungicide and low absolute yield increase
  - Concern about credit reimbursement capacity if Level C is not profitable but farmers think it is
  - Can greater attention to NRM provide better results?

Agroeconomic lessons

- The challenge of identifying profitable technologies for low-productivity, high-risk areas remains.
  - **Level A** technologies profitable but inadequate in terms of production and marketable surplus
  - **Level C** technologies not profitable
- More agronomic research is needed to identify productive combinations of inputs (NPK, TPR, OM, NRM)
- More financial analysis is needed to evaluate profitability and ways of reducing input costs
Socio-economic lessons

- Need to move from production strategies based on food self-sufficiency to ones based on increasing farm and household incomes (nonfarm activities, commercial crops)
- Requires attention to developing farmers knowledge and skills in areas other than technology use:
  - marketing
  - financial analysis
  - evaluation of debt carrying capacity

The end

Thanks for your attention.....