Assessing the Impact of Agricultural Water Use Development on Poverty in Sub-Saharan Africa

by Herbert G. Blank, Ruth Meinzen-Dick and Barbara van Koppen

• summarizes the evidence of the effects on irrigation investment in sub-Saharan Africa on poverty
• applies a sustainable livelihoods framework to identify the types of livelihood impacts from various types of irrigation investments
Linking irrigation to poverty alleviation

• evaluations have generally not addressed poverty issues
• Tanzania and Gambia case studies,
• Other cases: Office du Niger, Mwea, Gezira, etc.
• need for support systems
Linking irrigation to poverty alleviation

- high productivity from small plots
- groundwater irrigation and poverty
Irrigation’s impact on livelihoods

The Asset Base:
• Natural capital
• Physical capital
• Financial capital
• Human capital
• Social capital

Livelihood Outcomes:
• Increased income
• Improved well being
• Reduced vulnerability
• Improved food security
• Sustainable use of natural resource base
Irrigation and the Livelihoods Framework

VULNERABILITY CONTEXT
- SHOCKS
- TRENDS
- SEASONALITY

INFLUENCE & ACCESS

LIVELIHOOD ASSETS

Policies, Institutions, Processes

STRUCTURES
- Levels of government
- Private sector
- Laws
- Policies
- Culture
- Institutions

LIVELIHOOD OUTCOMES
- More income
- Increased well-being
- Reduced vulnerability
- Improved food security
- Sustainable use of NR base

LIVELIHOOD STRATEGIES

IRRIGATION

11/18/2002
SSA Irrigation Projects 1987-95
Livelihood Analysis

<table>
<thead>
<tr>
<th>Project</th>
<th>Funds ($mil)</th>
<th>Income</th>
<th>Well being</th>
<th>Vulnerability</th>
<th>Food Sec.</th>
<th>NRM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethiopia Small-scale Irrig &amp; Conser</td>
<td>7.0</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+/-</td>
<td></td>
</tr>
<tr>
<td>Madagascar Irrig Rehabilitation 2</td>
<td>21.2</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+/-</td>
<td></td>
</tr>
<tr>
<td>Madagascar Antananarivo Plain Dev</td>
<td>30.5</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+/-</td>
<td></td>
</tr>
<tr>
<td>Malawi Agricultural Services</td>
<td>45.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mali Office du Niger Consolidation</td>
<td>39.8</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+/-</td>
<td></td>
</tr>
<tr>
<td>Mauritania Ag Sector Adjustment</td>
<td>25.0</td>
<td>+/-</td>
<td></td>
<td></td>
<td>+/-</td>
<td></td>
</tr>
<tr>
<td>Mauritius Ag Management &amp; Services</td>
<td>10.0</td>
<td>+/-</td>
<td></td>
<td></td>
<td>+/-</td>
<td></td>
</tr>
<tr>
<td>Niger Pilot Private Irrig Promotion</td>
<td>6.8</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+/-</td>
<td></td>
</tr>
<tr>
<td>Nigeria National Fadama Dev</td>
<td>67.5</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+/-</td>
<td></td>
</tr>
<tr>
<td>Senegal Small Rural Operations</td>
<td>16.1</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senegal Irrigation 4</td>
<td>33.6</td>
<td>+/-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zambia Ag Sector Investment Prog</td>
<td>60.0</td>
<td>+/-</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>
Examples of Livelihoods Impacts

- not just increased income
- more stable incomes
- gender concerns
- time concerns
- knowledge transfer concerns
Types of Irrigation development

- New public schemes
- Rehabilitation of public schemes
- Private sector irrigation
- Groundwater irrigation
- Small-scale irrigation
- Micro-irrigation
- Water harvesting/wetlands development
Small Scale Irrigation - Bucket Kit

- suitable for kitchen gardens
- 2 lengths of 15 m drip tape
- bucket 1 m high
- cost $10
- distributed in over 100 countries
- scalable
Movable Sprinklers - Poweroll

- irrigates 10 - 30 ha
- operates on uneven fields
- 250,000 in use in western US
- water required 10 - 14 lps
- approx. $15,000 for 30 ha system
- supplemental irrigation for low growing crops
Pro-poor investments need to:

- Be supported by government policies which create level playing fields for poor farmers
- Quantify pro-poor benefits
- Be structured so that the poor can work their way out of poverty e.g. quick pay back, entry level technology
- Be creative: e.g. hybrid water projects
- Break bonds of dependency, destruct downward ratchets, create virtuous circles
A Vision for Irrigation in SSA

• Not a replica of Asian irrigation
• More individual, less communal
• More market driven, less government dependent
• Based on scalable, affordable technology
# Completed Sub-Saharan Africa Irrigation Projects 1987-1995

## Livelihood Analysis

<table>
<thead>
<tr>
<th>Name</th>
<th>Funding</th>
<th>Country</th>
<th>Approval Date</th>
<th>Type of Irrigation Investment</th>
<th>I</th>
<th>W</th>
<th>V</th>
<th>F</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Scale Irrigation and Conservation Project</td>
<td>7</td>
<td>Ethiopia</td>
<td>3/3/87</td>
<td>c, p, r, s</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+/-</td>
</tr>
<tr>
<td>Irrigation Rehabilitation Project (02)</td>
<td>21.2</td>
<td>Madagascar</td>
<td>7/12/94</td>
<td>p, r</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+/-</td>
</tr>
<tr>
<td>Antananarivo Plain Development Project</td>
<td>30.5</td>
<td>Madagascar</td>
<td>3/29/90</td>
<td>c, r</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+/-</td>
</tr>
<tr>
<td>Agricultural Services</td>
<td>45.8</td>
<td>Malawi</td>
<td>6/15/93</td>
<td>c, s</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+/-</td>
</tr>
<tr>
<td>Office du Niger Consolidation Project</td>
<td>39.8</td>
<td>Mali</td>
<td>5/17/88</td>
<td>r, p</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+/-</td>
</tr>
<tr>
<td>Agricultural Sector Adjustment and Investment Project</td>
<td>25</td>
<td>Mauritania</td>
<td>2/13/90</td>
<td>c, s</td>
<td>+/-</td>
<td>+/-</td>
<td>+/-</td>
<td>+/-</td>
<td>+/-</td>
</tr>
<tr>
<td>Agricultural Management and Services Project</td>
<td>10</td>
<td>Mauritius</td>
<td>5/28/91</td>
<td>c, s</td>
<td>+/-</td>
<td>+/-</td>
<td>+/-</td>
<td>+/-</td>
<td>+/-</td>
</tr>
<tr>
<td>Pilot Private Irrigation Promotion Project</td>
<td>6.8</td>
<td>Niger</td>
<td>4/18/95</td>
<td>s</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+/-</td>
</tr>
<tr>
<td>National Fadama Development Project</td>
<td>67.5</td>
<td>Nigeria</td>
<td>3/26/92</td>
<td>s</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+/-</td>
</tr>
<tr>
<td>Small Rural Operations Project (02)</td>
<td>16.1</td>
<td>Senegal</td>
<td>3/21/89</td>
<td>s</td>
<td>+/-</td>
<td>+/-</td>
<td>+/-</td>
<td>+/-</td>
<td>+/-</td>
</tr>
<tr>
<td>Irrigation Project (04)</td>
<td>33.6</td>
<td>Senegal</td>
<td>12/1/87</td>
<td>r, p</td>
<td>+/-</td>
<td>+/-</td>
<td>+/-</td>
<td>+/-</td>
<td>+/-</td>
</tr>
<tr>
<td>Agricultural Sector Investment Program Project</td>
<td>60</td>
<td>Zambia</td>
<td>3/30/95</td>
<td>c, r, s</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+/-</td>
</tr>
</tbody>
</table>

### Key:

**Irrigation Type**
- c = component of larger project
- p = public
- r = rehabilitation
- s = small scale

**Livelihood Impact Category**
- I = income
- W = well being
- V = vulnerability
- F = food security
- N = sustainable NR