Alleviating Tajikistan’s vulnerability to climate change: An agricultural policy approach

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Tajikistan’s extreme vulnerability

“Tajikistan is the most vulnerable among all 28 countries in the World Bank’s Europe and Central Asia (ECA) region”

Adapting to climate change in Europe and Central Asia, World Bank (2009)
What is vulnerability?

• An individual or household is *vulnerable to risks* (e.g., risks associated with climate change) if these risks may result in a loss of well-being to a level below some threshold.

• Vulnerability is a function of
  – *Exposure to risks* – natural factors
  – *Sensitivity to risks* – natural and household factors
  – *Adaptive capacity* (ability to recover) – household factors (physical and human capital)
Vulnerability factors of rural population in Tajikistan

- Low incomes (51% poor)
- Small farms: small cultivated area, small number of animals (0.3 ha in household plots, 3-20 ha in family dehkan farms, 1-3 cows)
- Low production technology: low crop and livestock yields
- Acute dependence on irrigation
- Soil degradation, steep slopes
Reforms strengthened individual farms and led to recovery

Agricultural output 1980=100  Growth driven by individual sector

![Graph showing agricultural output growth from 1980 to 2015](Taj_GAO-1980-2013_spliced.pr4)

![Graph showing growth driven by individual sector from 1998 to 2014](TajGAO98-14_2008AgYB-2010vTsifrakh_area.pr4)
Individual-sector farms achieve higher productivity.
Income – households’ primary tool to reduce vulnerability

• Income generation requires **resources**
  – Land, labor, livestock, trees, machinery, fertilizers
  – Information, knowledge, education

• Resources are deployed for **production**
  – Outcome depends on physical and human capital
  – Efficiency depends on farm organization

• Output allocated to
  – Consumption
  – *Sales* – commercialization
Evidence-based findings on factors that increase income

• Family income and wellbeing increase
  – with farm size
  – with commercialization

• Commercialization increases with farm size
The benefits of land reform for the rural population

More land to smallholders

Higher well-being

Higher commercialization
Policy conclusion I: More attention to small family farms

- Household plots contribute the greatest share of agricultural output, attain highest productivity
- Household plots are consistently ignored as “non-commercial, low-technology subsistence farms”
- Household plots and small family farms are the most vulnerable – and yet resilient – segment of agricultural sector
- *Size of very small farms should increase to increase income and reduce vulnerability*
How to get more land to small farms?

• Distribution from state reserve
• Development of land markets
  – Allow land transactions: leasing and subleasing, transferability of land shares
  – Institute simple and transparent registration procedures, with minimum transaction costs
  – Guarantee contract enforcement

*Land markets allow size adjustment: land flows from passive or inefficient users to active, efficient users*
Growing through “conquest of the desert”
How to improve milk yields in household farms?

• More attention to *feed*
  – Grasses and processed feed
  – Common grazing near the village
  – Use of herder (chaban) services

• More attention to *animal health* – vet services

• More attention to *genetics* – artificial insemination
The “curse of smallness”

• Difficulties with sale of products
• Difficulties with purchase of inputs
• Access to machinery
• Access to credit and insurance
• Access to water and irrigation systems
Policy conclusion II: Support development of market services

• Best practice experience to combat the curse of smallness:
  – Establishment of farmer-owned service cooperatives (supply, marketing, machinery)
  – Pasture-management associations
  – Water-user associations
Diversification: standard tool to reduce risk and vulnerability

• **Diversification of income sources**
  – Wage jobs outside agriculture
  – Entrepreneurial activities:
    • Processing
    • Non-agricultural cottage industries
    • Business development

• **Diversification of crop mix**
  – Less monoculture (cotton/wheat)
  – More horticulture (vegetables, fruits)
    • *Ideal for home processing: canning, jams, dried fruits*
Three groups of products in one family farm
Diversification of both income sources and farm products

Main income sources

<table>
<thead>
<tr>
<th>Income source</th>
<th>% respondents</th>
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<tbody>
<tr>
<td>Agriculture only</td>
<td>25</td>
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<tr>
<td>Agriculture and other sources</td>
<td>52</td>
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<tr>
<td>Non-ag sources overweight agriculture</td>
<td>17</td>
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<tr>
<td>Don’t know</td>
<td>6</td>
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Structure of product sales

<table>
<thead>
<tr>
<th></th>
<th>Dehkan farms, %</th>
<th>Household plots, %</th>
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</thead>
<tbody>
<tr>
<td>Cotton</td>
<td>36</td>
<td>0</td>
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<tr>
<td>Grain</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>Vegetables</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>Fruits</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Milk</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>Animals</td>
<td>5</td>
<td>36</td>
</tr>
<tr>
<td>Meat</td>
<td>0.1</td>
<td>1.5</td>
</tr>
</tbody>
</table>

PPCR Field Survey, May 2011
Policy conclusion III: Facilitating diversification

• Eliminate production targets on cotton, wheat
• Stop hukumat intervention in farm decisions
• Allow exercising land use rights without restrictions
• Allow free mobility of goods across oblast/raion lines

• Scrupulously observe the full intent of “freedom to farm” provisions
Conclusions: Improving Adaptive Capacity to Climate Change

• Emphasis on support for small family farms – the most vulnerable and yet the most resilient sector in agriculture
• Policies to support development of market services (marketing, input supply, access to credit)
• Policies to encourage diversification of income sources and product mix
Vulnerability to climate change is a subset of general vulnerability

“In terms of hazards and impacts we can expect more of the same… except more intensely and more frequently and perhaps in different places”

Philip Buckle, Dushanbe, 5/04/2011
Wellbeing, farm size, and commercialization in Tajikistan

Wellbeing increases with farm size

Wellbeing increases with commercialization

PPCR field survey, May 2011
Family income and well-being increases with farm size

Georgia Household Survey 2009: income and farm size

Azerbaijan WB survey 2003: well-being and farm size
Commercialization increases family income

Moldova 2000

Georgia 2003
Virtually all livestock in the household sector: 1-2 head/family
Difficulties in the livestock sector

Milk yields lowest in CIS

Area in feed crops declining