Nutrition-sensitive value chains development in Tajikistan

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Background

• “Nutrition-sensitive agriculture” seeks to prioritize nutrition when making investments and interventions in agriculture

• Commodity is determined as nutrient-rich if meets the threshold for being a high source of at least one micronutrient
  • Bio-fortified
  • Legume, nut, or seed
  • Animal-sourced food
  • Dark yellow or orange-fleshed root or tuber
  • Fruit or vegetable

• The purpose of the study was to produce evidence on horticulture value chains in 12 districts of Khatlon region in Tajikistan

• IFPRI in collaboration with Tajik Academy of Agricultural Sciences (TAAS), and Center for Sociological Research “ZERKALO”
Methodology and data sources

• Study uses both qualitative and quantitative methods
• Four interconnected steps
  • Data collection and analysis; value chain mapping; analysis of opportunities and constraints; and recommendations for future actions
• Data sources
  • Policy and legal documents
  • Secondary data from official sources
  • Primary household (and farm) survey data
  • Primary qualitative data from focus groups and semi-structured interviews
Focus groups and semi-structured interviews

• Farmers
• Traders
  – Large and small wholesale traders
  – Retail traders in traditional bazaars
• Processors
• Supermarkets and grocery stores
  – Paykar, Yovar, Auchan, and others
• Informal discussions with policymakers and local government officials
Household survey

• Non-probability sampling techniques to oversample households engaged in horticulture production and sales
• Sample includes 1,200 households in the ZOI
  – 482 households have access to presidential land
  – 295 households engaged in individual dehkan farming
  – Some households rent plots from others
Some relevant agricultural changes:
Cropping patterns has changed in favor of horticulture crops

- Horticulture cropland grew significantly faster in Khatlon province than in the country
  - 75% in Khatlon vs 53% in Tajikistan during 2005-2017 period
  - Khatlon became the largest producer of fruits and vegetables in Tajikistan, producing 42% of fruits and 55% of vegetables

- Nevertheless, horticulture crops account only 20% of total cropland in Khatlon while they account 26% and 30% of such land in Tajikistan and Sugd, respectively

- Fruits and vegetables production in Khatlon grew not only because of more land but also due to increasing yields

- Cotton and cereals still remain two major crops in Khatlon
  - 73% of total cropland in Khatlon versus 58% in Sugd
Growth of horticulture cropland is driven by dehkan farms, but they still allocate significantly lower share of their land for fruits and vegetables.

Source: Authors’ estimates using data from Agency on Statistics under President of Tajikistan
Yields in horticulture sector grew considerably, but there is still significant gap between household plots and dehkan farms.

Source: Authors’ estimates using data from Agency on Statistics under President of Tajikistan.
Agricultural land use in the ZOI

- Basic plot characteristics from survey
- Many families use multiple plots

<table>
<thead>
<tr>
<th>Plot Type</th>
<th>Household plot</th>
<th>President. plot</th>
<th>Individual dehkan</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plot size (in hectares)</td>
<td>0.15</td>
<td>0.11</td>
<td>2.48</td>
<td></td>
</tr>
<tr>
<td>Possesses legal document (%)</td>
<td>96.8%</td>
<td>96.3%</td>
<td>95.3%</td>
<td>96.5%</td>
</tr>
<tr>
<td>Irrigated (%)</td>
<td>85.0%</td>
<td>77.6%</td>
<td>78.7%</td>
<td>82.3%</td>
</tr>
<tr>
<td>Good soil quality (%)</td>
<td>57.5%</td>
<td>54.6%</td>
<td>61.8%</td>
<td>57.6%</td>
</tr>
<tr>
<td>Low soil salinity (%)</td>
<td>40.5%</td>
<td>45.2%</td>
<td>40.2%</td>
<td>42.4%</td>
</tr>
<tr>
<td>N (households)</td>
<td>1197</td>
<td>482</td>
<td>295</td>
<td></td>
</tr>
</tbody>
</table>
Commonly grown crops

• Among households surveyed the most commonly grown crops in the past year were:
  – Potatoes (59.8% of households)
  – Tomatoes (58.2%)
  – Cucumbers (17.4%)
  – Sweet corn (17.3%)
  – Apricots (15.2%)
  – Onions (15.1%)
  – Grapes (14.2%)
Commonly grown crops

• Crop choice was partly determined by land category

• The most commonly grown crops on...
  – Household plots: tomatoes, potatoes, cucumbers, apricots, grapes
  – Presidential plots: wheat, sweet corn, alfalfa, forage corn, potatoes
  – Dehkan farms: cotton, potatoes, onions, tomatoes, wheat
Many households farm two seasons

<table>
<thead>
<tr>
<th>Allocated land</th>
<th>Household plot</th>
<th>Presidential plot</th>
<th>Individual dehkan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grains</td>
<td>1.4%</td>
<td>36.4%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Cotton and technical crops</td>
<td>3.4%</td>
<td>4.7%</td>
<td>93.6%</td>
</tr>
<tr>
<td>Horticultural crops</td>
<td>94.2%</td>
<td>49.2%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Forage crops</td>
<td>0.8%</td>
<td>8.6%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Other/unfarmed/unspecified</td>
<td>0.2%</td>
<td>1.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Total plot size</td>
<td>0.16</td>
<td>0.12</td>
<td>2.66</td>
</tr>
<tr>
<td>N (primary season households)</td>
<td>1178</td>
<td>344</td>
<td>238</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Allocated land</th>
<th>Household plot</th>
<th>Presidential plot</th>
<th>Individual dehkan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grains</td>
<td>2.3%</td>
<td>50.9%</td>
<td>15.2%</td>
</tr>
<tr>
<td>Cotton and technical crops</td>
<td>0.2%</td>
<td>4.1%</td>
<td>43.1%</td>
</tr>
<tr>
<td>Horticultural crops</td>
<td>18.6%</td>
<td>22.6%</td>
<td>30.1%</td>
</tr>
<tr>
<td>Forage crops</td>
<td>78.3%</td>
<td>21.0%</td>
<td>11.5%</td>
</tr>
<tr>
<td>Other/unfarmed/unspecified</td>
<td>0.6%</td>
<td>1.3%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Total plot size</td>
<td>0.16</td>
<td>0.15</td>
<td>2.68</td>
</tr>
<tr>
<td>N (secondary season households)</td>
<td>693</td>
<td>88</td>
<td>90</td>
</tr>
</tbody>
</table>
Access to inputs and advisory services

• Limited access to fertilizer and chemicals:
  – Mostly imported fertilizers used by almost 2/3 of dehkan farms and little more than half of other forms of plots
• Most farmers have no access to improved seeds, seedlings, and saplings
  – Commercial purpose of production seem to have supportive effect on improved seed use.
  – Despite similarly small arable land size, households more often use improved seeds on presidential plots than in household plots to produce crops such as potato, tomato and onions.
• Advisory and extension services remain predominantly unavailable and hard to access for local farmers
  – Only 1/20 of households used advice and main source is acquaintances (30.6%) and donor agencies (27.1%)
Machinery and hired labor use

- Nearly all farmers use machinery for plowing
- Limited use of machinery for other activities
- Most households rely on family labor
- Only a small fraction of households use hired labor, mainly in rented land and dehkan farms

<table>
<thead>
<tr>
<th>Crops</th>
<th>All HHs that grow as a major crop (number)</th>
<th>HHs that use own or rented machinery (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potatoes</td>
<td>492</td>
<td>26.6%</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>366</td>
<td>26.8%</td>
</tr>
<tr>
<td>Onions</td>
<td>111</td>
<td>62.2%</td>
</tr>
<tr>
<td>Cucumbers</td>
<td>88</td>
<td>19.3%</td>
</tr>
<tr>
<td>Apricot</td>
<td>66</td>
<td>4.5%</td>
</tr>
<tr>
<td>Almond</td>
<td>65</td>
<td>1.5%</td>
</tr>
<tr>
<td>Grape</td>
<td>61</td>
<td>4.9%</td>
</tr>
<tr>
<td>Carrots</td>
<td>52</td>
<td>23.1%</td>
</tr>
<tr>
<td>Pepper (sweet)</td>
<td>46</td>
<td>41.3%</td>
</tr>
<tr>
<td>Peach/Nectarine</td>
<td>36</td>
<td>5.6%</td>
</tr>
</tbody>
</table>
Horticulture Value Chains in Tajikistan

- **Consumers**
  - Urban
  - Rural
  - Foreign
  - Traditional bazaars
  - Corner shops
  - Supermarkets

- **Retailers**
  - Fruits & vegetable processors
  - Milk processors

- **Processors**
  - Wholesalers
  - Small traders

- **Traders**
  - Households
  - Dehkan farms
  - Agricultural enterprises

- **Farmers**
  - Seeds
  - Fertilizer
  - Machinery
  - Crop protection
  - Veterinary
  - Crop insurance
  - Advisory
  - Finance

- **Input providers**
Traders are key players in the horticulture value chains

<table>
<thead>
<tr>
<th>Crops</th>
<th>Household plots</th>
<th>Presidential plots</th>
<th>Dehkan farms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trader</td>
<td>WM</td>
<td>Self retail</td>
</tr>
<tr>
<td>Vegetable crops</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tomato</td>
<td>41.9</td>
<td>25.9</td>
<td>1.3</td>
</tr>
<tr>
<td>Cucumber</td>
<td>43.7</td>
<td>36.6</td>
<td>2.8</td>
</tr>
<tr>
<td>Carrot</td>
<td>37.2</td>
<td>44.2</td>
<td>2.3</td>
</tr>
<tr>
<td>Peppers</td>
<td>40.5</td>
<td>40.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Potato</td>
<td>50.4</td>
<td>32.5</td>
<td>2.2</td>
</tr>
<tr>
<td>Onions and garlic</td>
<td>51.4</td>
<td>32.9</td>
<td>2.9</td>
</tr>
<tr>
<td>Gourds</td>
<td>68.2</td>
<td>9.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Eggplants</td>
<td>66.7</td>
<td>33.3</td>
<td>0.0</td>
</tr>
<tr>
<td>Fruits and nuts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apricot</td>
<td>65.4</td>
<td>21.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Almond</td>
<td>66.7</td>
<td>24.1</td>
<td>3.7</td>
</tr>
<tr>
<td>Grape</td>
<td>64.4</td>
<td>15.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Stone fruits</td>
<td>49.4</td>
<td>35.1</td>
<td>1.3</td>
</tr>
<tr>
<td>Nuts and seeds</td>
<td>27.3</td>
<td>36.4</td>
<td>0.0</td>
</tr>
<tr>
<td>Pome fruits</td>
<td>40.9</td>
<td>36.4</td>
<td>0.0</td>
</tr>
<tr>
<td>Pomegranate</td>
<td>70.0</td>
<td>5.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Lemon</td>
<td>73.1</td>
<td>7.7</td>
<td>0.0</td>
</tr>
<tr>
<td>Berries</td>
<td>38.1</td>
<td>52.4</td>
<td>9.5</td>
</tr>
<tr>
<td>Legumes</td>
<td>0.0</td>
<td>100.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Leafy greens</td>
<td>42.4</td>
<td>25.9</td>
<td>1.3</td>
</tr>
</tbody>
</table>
Wholesale trade

- Two types of wholesale traders operate in the market
  - Large-scale wholesale traders purchase fruits and vegetables directly from farmers both at farmgate and at the market
  - Then, they sell these products to smaller wholesale traders, which sell to private retail traders
- No long-term contracts, all transactions are spot market transactions, exchanging the product to cash, which increases market risk
- The reported price margin for large wholesale traders is 10-15% and for small wholesale traders 15-20%
- Traders have no access to credit and use their own resources
Processing of horticulture products

- Processing industry in Khatlon is underdeveloped
  - Only 8 of 23 processing enterprises, which produce canned vegetables and fruits, dried fruits, and dairy products, are located in the ZOI
- The processing companies purchase fresh fruits and vegetables from households and dehkan farms while some have their own farm specialized in horticulture products cultivation
  - No formal long-term contractual agreements
- While the processing companies mainly sell their products to supermarkets and small grocery stores in domestic market, some export their products
Retailing of horticulture products

• The retail sector in the horticulture value chains include traditional bazaars, corner grocery stores, and limited number of supermarkets

• Private traders in bazaars conduct one-day operation:
  – Operational expenses include payments for: a trading spot (TJS10 per 1 m counter), renting uniform (TJS10) and weighing scale (TJS10)
  – Price margin: 20-30% depending on type and quality of product

• Supermarkets also mainly buy fruits and vegetables from traders
Retailing of horticulture products

• Main impediments for the development of formal retail trade in horticulture products
  – Underdeveloped payment system, which requires cash transactions
  – Low per capita income leads to low demand for quality products
  – Market for fruits and vegetables is not organized well leading to huge price fluctuations
  – Public food safety standards are not very clear and depend on the interpretations of different respondents
Conclusions

• Horticulture production and yields grew significantly in the ZOI, but region has not fully exploited its agro-climatic advantages

• Households that have access to more land and grow horticulture crops as a major crop more likely to consume nutrient-rich commodities

• Allocation of more land to fruits and vegetables may help to improve household welfare because horticulture crops yield more, earn more and employ more per hectare than cotton and cereals

• Improved access to quality inputs (seeds, seedlings & saplings), technologies, and machinery may help to increase yields and production
Conclusions

• Fragmentation in production may prevent leveraging the strengths of horticulture, and the small size of producers and underdeveloped value chains may discourage investment

• The lack of reliable marketing and price information creates additional uncertainty and difficulty to make longer term plans for farmers as well as other participants

• Tajikistan has strategic opportunity to expand its production and exports in horticulture products
  - Currently, earnings from exports of fruits and vegetables equal to USD15-20 million per year

• To increase exports of horticulture products it needs to improve connectivity, diversify markets, and upgrade value chains
Thank you