IMPROVING WATER PRODUCTIVITY WITHIN WATER, FOOD & ENERGY NEXUS IN AFGHANISTAN

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Introduction

• Afghanistan is an agriculture country with about 80% of population engagement.
• Agriculture is one of the main contributor in country economy (1/3 to the GDP) and source of employment.
• Most of Agriculture is depend on irrigation because of arid & semi arid climatic conditions.
• Decades of civil work has deteriorated the irrigation infrastructure.
• To Improved existing irrigation system, MAIL ministry have lunched different irrigation projects such as OFWMP, CLAP & SWIM.
• OFWMP is working in 5 regions (23 provinces) of country with project development objective is to improved Agriculture productivity by enhancing efficiency of water used.
Continued…

AFGHANISTAN
OFWM Project Master Map

Legend
- Capital Kabul
- Irrigation Schemes Phase II
- Completed Schemes IA
- Ongoing Schemes IA
- HEIS (Drip Irrigation System)
- IDS (Irrigation Demonstration Sites)
- FFR (Farmer Field School)

AFG Road & Rivers
AFG Lakes and Culture Area

Irrigation Schemes - IA's - IDS - FFS and HEIS

<table>
<thead>
<tr>
<th>ID</th>
<th>Region</th>
<th>IA 1</th>
<th>IA 2</th>
<th>IA 3</th>
<th>IDS</th>
<th>Phase I</th>
<th>Phase II</th>
<th>Completed</th>
<th>Cumulative</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Central Region</td>
<td>129</td>
<td>9</td>
<td>10</td>
<td>10</td>
<td>18</td>
<td>31</td>
<td>18</td>
<td>31</td>
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<tr>
<td>2</td>
<td>Baghlan Region</td>
<td>159</td>
<td>9</td>
<td>11</td>
<td>16</td>
<td>26</td>
<td>9</td>
<td>16</td>
<td>26</td>
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<tr>
<td>3</td>
<td>East Region</td>
<td>117</td>
<td>7</td>
<td>9</td>
<td>12</td>
<td>18</td>
<td>11</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>North Region</td>
<td>137</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>24</td>
<td>3</td>
<td>14</td>
<td>24</td>
</tr>
<tr>
<td>5</td>
<td>North Region</td>
<td>117</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>24</td>
<td>3</td>
<td>14</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>604</td>
<td>51</td>
<td>111</td>
<td>50</td>
<td>95</td>
<td>142</td>
<td>50</td>
<td>277</td>
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</tbody>
</table>

3rd World Irrigation Forum
1-7 September 2019, Bali, Indonesia
Component A: Irrigation Rehabilitation and Management
   A1) Establishment and strengthening of irrigation associations (IAs)
   A2) Improvement of infrastructure for the existing irrigation schemes

Component B: Support for Enhancing Productivity.

Component C: Project Management, Coordination and Monitoring and Evaluation

Component D: Institutional Strengthening and Capacity Building of the MAIL
Approach

For assessment of Crop Water Productivity (CWP) and conveyance efficiency, a representative sample of 5 rehabilitated irrigation schemes, in five regions were selected.

1. Nangarhar
2. Kabul,
3. Baghlan
4. Herat and
5. Mazar-e-Sharif
Methodology

- Preparation of farm map clearing showing the details, including: irrigated fields (plots), irrigation channels (watercourses or ditches), farm structures etc.
- Preparation of Crop Calendar or Plan clearly indicating the schedule of different activities like land preparation/tillage, sowing/planting, irrigation, and harvesting, etc.
- Taking soil sample for required fertilizer application.
- Installation of flow measuring device (cut-throat flume) permanently at the farm gate and rain gauge.
Measuring crop water productivity (CWP)

CWP can be measured in selected wheat plots as yield per unit of water used by the crop at a farm, i.e. crop product per unit of water consumed as under:

Crop Water Productivity = Crop Produce (Kg)/ Water Used (Cubic meter)
## Result & discussion

### a) Crop Water Productivity

<table>
<thead>
<tr>
<th>Regions</th>
<th>Average Wheat Yield in Kg (1000)</th>
<th>Average Water Applied (m3) (1000)</th>
<th>Water Productivity (Kg/m3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kabul</td>
<td>2.1</td>
<td>1.6</td>
<td>1.33</td>
</tr>
<tr>
<td>Nangarhar</td>
<td>4.4</td>
<td>6.4</td>
<td>0.68</td>
</tr>
<tr>
<td>Balkh</td>
<td>4</td>
<td>5.5</td>
<td>0.73</td>
</tr>
<tr>
<td>Baghlan</td>
<td>3.6</td>
<td>4.3</td>
<td>0.84</td>
</tr>
<tr>
<td>Herat</td>
<td>4.8</td>
<td>5.7</td>
<td>0.88</td>
</tr>
<tr>
<td>Overall Average</td>
<td>3.7</td>
<td>4.4</td>
<td>0.94</td>
</tr>
</tbody>
</table>
Water Productivity

Average Wheat Yield (Thousands)

Average Water Applied (m3) (Thousands)

KABUL
NANGARHAR
BALDKH
BAGHLAN
HERAT
OVERALL

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## Conveyance Efficiency

<table>
<thead>
<tr>
<th>Regions</th>
<th>Conveyance Efficiency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kabul</td>
<td>76%</td>
</tr>
<tr>
<td>Nangarhar</td>
<td>93%</td>
</tr>
<tr>
<td>Balkh</td>
<td>94%</td>
</tr>
<tr>
<td>Baghlan</td>
<td>80%</td>
</tr>
<tr>
<td>Herat</td>
<td>73%</td>
</tr>
<tr>
<td>Overall Avg</td>
<td>81%</td>
</tr>
</tbody>
</table>
Conclusion

• Significant increase in crop production, water productivity, water saving with the implementation of different On-Farm Water Management interventions and high-tech agronomic practices.
• Government should continued with such kind of irrigation projects on national level to provide efficient irrigation system to the farmer and other agricultural incentives.