

Water Productivity of Wheat Crop in Afghanistan

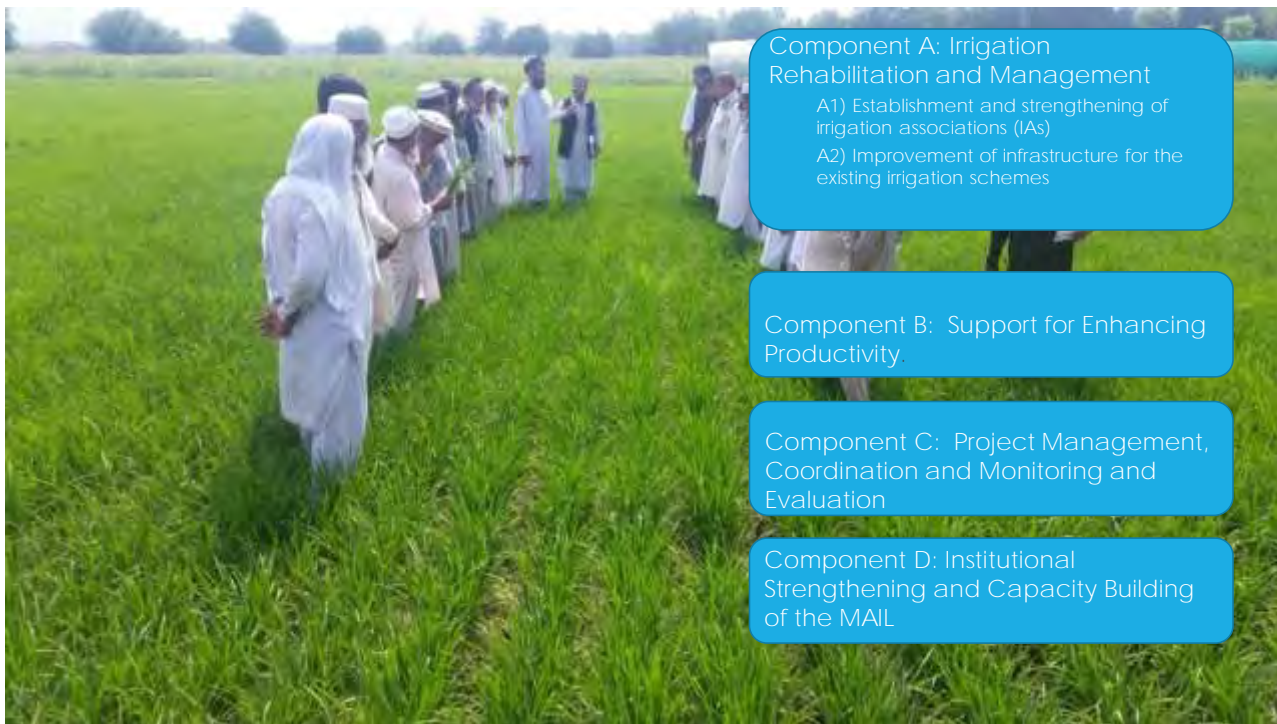
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On Farm Water Management Project (OFWMP), Ministry of Agriculture, Irrigation & Livestock (MAIL)

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Project Summary

Project Development Objective	Improving agricultural productivity in project area by enhancing the efficiency of water used
Project Duration	March 16, 2011-December 31, 2019
Coverage	23 provinces in five regions
Total Initial Budget	US\$ 41 Million
Additional Financing	US\$ 45 Million (Total budget US\$ 70 Million)



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

Measuring CROP Water Productivity (CWP)

CWP can be measured / calculated, in selected wheat plots of completed irrigation schemes/OFWM Project, as yield per unit of water used (depleted) by the crop at a farm, i.e. crop product per unit of water consumed as under:

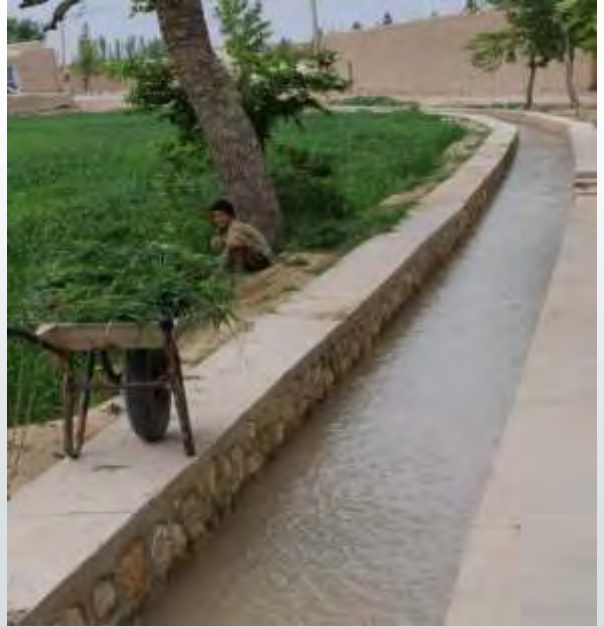
Crop Water Productivity = Crop Produce (Kg)/ Water Used (Cubic meter)



Approach

For assessment of CWP, a representative sample of 5 completed rehabilitated irrigation schemes, in five regions (Nangarhar, Kabul, Bamyan, Herat and Mazar-e-Sharif) have been selected.

The selection of representative Irrigation Schemes and farms carried out jointly by the Irrigation Agronomist and Water Management Specialist of the respective Area teams in consultation with the Core team.



Methodology

Preparation of Farm Map clearing showing the details, including: irrigated fields (plots), irrigation channels (watercourses or ditches), farm structures and location of tube-well, etc. record the size of each field (dimensions), in particular.

- Preparation of Crop Calendar or Plan clearly indicating the schedule of different activities like land preparation/tillage, sowing/planting, fertilization, irrigation, and harvesting, etc.
- Installation of flow measuring device (preferably a cut-throat flume) permanently at the farm gate for recording the inflow (discharge) at the farm during each irrigation rotation (turn) and installation of rain gauge to measure the rainfall data.



Methodology Cont....

- ▶ Recording irrigation data (time/duration of inflow and discharge) for different crop fields (plots) during each irrigation rotation (turn).
- ▶ Calculation of water inflow from both irrigation and rainfall during crop period in terms of cubic .meter / ha (Denominator).
- ▶ At the harvest of each crop, obtain crop yield data as well as data on straw and green fodder production in terms of kg/ha (Enumerator).
- ▶ Calculated crop water productivity (CWP), with respect to both total water supply (inflow) and total production, using the formula:

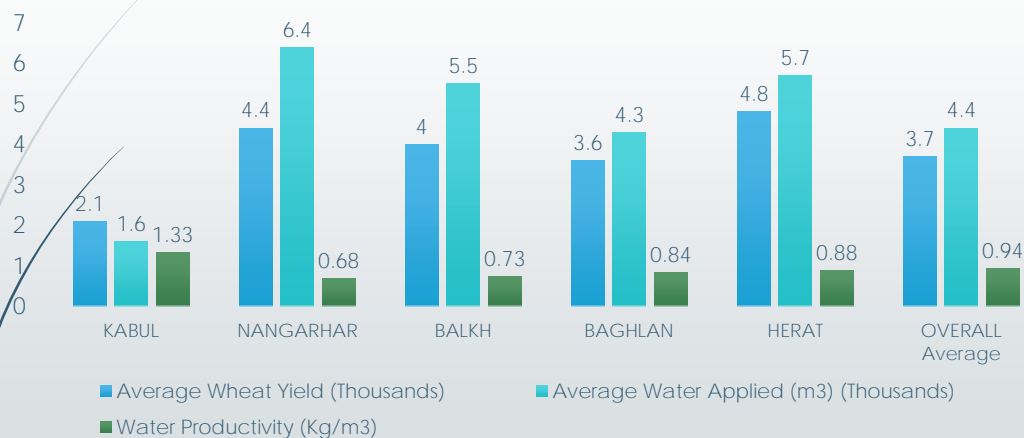
$$\text{CWP} = \text{kg/cubic meter}$$



Crop Water Productivity

Project Region	Average Wheat Yield (Thousands)	Average Water Applied (m3) (Thousands)	Water Productivity (Kg/m3)
Kabul	2.1	1.6	1.33
Nangarhar	4.4	6.4	0.68
Balkh	4	5.5	0.73
Baghlan	3.6	4.3	0.84
Herat	4.8	5.7	0.88
Overall Average	3.7	4.4	0.94

Water Productivity



Result and Discussion

- On average, the crop water productivity (CWP) for wheat crop in different Irrigation Demonstration Sites (IDSs) of five regions where the data was collected is, 0.94 KG/m³.
- While the maximum CWP is 1.40 kg/m³ in Gul Bafa irrigation Demonstration Site, Herat region and the minimum water productivity is 0.65 kg/m³ in Mir Roza Dar Irrigation Demonstration Site, Balkh region. In general, the CWP value has compares with the International standard value of CWP of the wheat crop and its lie in same range.
- Increase in CWP is because of different agronomic practices such as land preparation (Laser land leveling), sowing methods, improved seed varieties, on time application of fertilizers, weed & pest control and on time irrigation.



Any Question?
Thank you

