

**Definition:**

*Financial benefits*  
*Water*

**Description**

**Benefit:** This impact area assesses benefits via their appreciation by markets (Di Maio et al., 2017). It is sensitive to various socio-economic factors because commodity prices reflect demand and are also influenced by value systems and policies through effects of financial incentives and tax regulations.

**Resource:** Even in rainfed agriculture, water can constitute a stressed resource, impacting for example on farmers' decisions whether or not to plant cover crops. Irrigation water is always a stressed resource. In cases of seasonal water shortages, the use of water can also be specified as use during critical time periods.

**Correlation with soil management**

[156] Technology and water management can improve water use efficiency

[249] Result indicates perception of water scarcity, irrigation infrastructure, water price and income increase irrigation water efficiency while time spent on farming and fragmentation decreases it

**Strength & weaknesses pertaining to measurement of this impact area**

**Financial Benefits:** Financial indicators are well suited for integrating or comparing agricultural production processes with products for very different end uses. For calculating benefit-cost ratios (BCR), indicators that reflect revenue should be used. In most other cases, indicators that reflect net benefits (after deduction of charges, costs and expenses) provide a more realistic picture of benefits generated. Price volatilities make efficiency calculations valid only for a certain point in time and space.

## Sample Indicators










<b>Indicator values from</b>		Survey	
Experiment or direct measurement		Statistical- or census data	
Expert assessment		Literature values	
Model		Maps or GIS	
Stakeholder participation		Not provided	

Table 1: Farm Scale



Indicator	Unit	Indicator values from
[175] Gross margin use efficiency (Total gross margin (Sum of gross income from grain, conserved fodder, and animal products)/Total rainfall)	\$ * mm <sup>-1</sup>	
[249] Irrigation water use efficiency (Optimal cost (when all inputs are technically and allocatively efficient)/Amount of irrigation water)	\$ * m <sup>-3</sup>	

Table 2: Regional Scale





Indicator	Unit	Indicator values from
[142] Water use efficiency (Economic output of crop yield/Amount of irrigation water)	\$ * m <sup>-3</sup>	
[156] Water use efficiency index (Value of agricultural output /Total agricultural water use (irrigation and precipitation))	\$ * m <sup>-3</sup>	
[233] Maximum revenue /Unit of Irrigation Water per ton of product	\$ * m <sup>-3</sup>	



Table 3: National Scale

Indicator	Unit	Indicator values from
[81] Irrigated agriculture water use efficiency (Gross value added by the portion of the agricultural sector that uses irrigation/Input of irrigation water)	\$ * m <sup>-3</sup>	



## References

ID	Citation	<sup>1</sup> Soil type/ texture
81	Giupponi, C., et al. (2018). "Spatial assessment of water use efficiency (SDG Indicator 6.4.1) for regional policy support." <u>Frontiers in Environmental Science</u> <b>6</b> (NOV).	n/a
142	Latinopoulos, D. (2009). "Multicriteria decision-making for efficient water and land resources allocation in irrigated agriculture." <u>Environment, Development and Sustainability</u> <b>11</b> (2): 329-343.	n/a
156	Long, K. S. and B. C. Pijanowski (2017). "Is there a relationship between water scarcity and water use efficiency in China? A national decadal assessment across spatial scales." <u>Land Use Policy</u> <b>69</b> : 502-511.	n/a
175	Moore, A. D., et al. (2011). "Evaluation of the water use efficiency of alternative farm practices at a range of spatial and temporal scales: A conceptual framework and a modelling approach." <u>Agricultural Systems</u> <b>104</b> (2): 162-174.	Black vertosol soil
233	Soliman, N. Y. and R. M. Barghash (2016). "The economic efficiency of water irrigation usage and restructuring cultivation of agricultural crops." <u>International Journal of ChemTech Research</u> <b>9</b> (10): 62-71.	n/a
249	Tang, J. and H. Folmer (2016). "Latent vs. Observed Variables: Analysis of Irrigation Water Efficiency Using SEM and SUR." <u>Journal of Agricultural Economics</u> <b>67</b> (1): 173-185.	n/a

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<sup>1</sup>**Soil type/ texture:** If provided, what are type and texture of the soils studied in the paper?