EGU2020-4395
https://doi.org/10.5194/egusphere-egu2020-4395
EGU General Assembly 2020
© Author(s) 2022. This work is distributed under
the Creative Commons Attribution 4.0 License.

Assessment of Water Footprint for Koshi River Basin (KRB), Nepal

Raj Deva Singh, Kumar Ghimire, and Ashish Pandey
IIT Roorkee, Water Resources Development & Management, India (rdsingh3@gmail.com)

Nepal is an agrarian country and almost one-third of Gross Domestic Product (GDP) is dependent on agricultural sector. Koshi river basin is the largest basin in the country and serves large share on agricultural production. Like another country, Nepalese agriculture holds largest water use in agriculture. In this context, it is necessary to reduce water use pressure. In this study, water footprint of different crop (rice, maize, wheat, millet, sugarcane, potato and barley) have been estimated for the year 2005 -2014 to get the average water footprint of crop production during study period. CROPWAT model, developed by Food and Agriculture Organization (FAO 2010b).

For the computation of the green and blue water footprints, estimated values of ET (the output of CROPWAT model) and yield (derived from statistical data) are utilised. Blue and green water footprint are computed for different districts (16 districts within KRB) / for KRB in different years (10 years from 2005 to 2014) and crops (considered 7 local crops). The water footprint of crops production for any district or basin represents the average of WF production of seven crops in the respective district or basin.

The study provides a picture of green and blue water use in crop production in the field and reduction in the water footprint of crop production by selecting suitable crops at different places in the field. The Crop, that has lower water footprint, can be intensified at that location and the crops, having higher water footprint, can be discontinued for production or measure for water saving technique needs to be implemented reducing evapotranspiration. The water footprint of agriculture crop production can be reduced by increasing the yield of the crops. Some measures like use of an improved variety of seed, fertilizer, mechanized farming and soil moisture conservation technology may also be used to increase the crop yields.

The crop harvested areas include both rainfed as well as irrigated land. Agricultural land occupies 22% of the study area, out of which 94% areas are rainfed whereas remaining 6% areas are under irrigation. The study shows 98% of total water use in crop production is due to green water use (received from rainfall) and remaining 2 % is due to blue water use received from irrigation (surface and ground water as source). Potato has 22% blue water proportion and contributes 85% share to the total blue water use in the basin. Maize and rice together hold 77% share of total water use in crops production. The average annual water footprint of crop production in KRB is 1248 cubic meter/ton having the variation of 9% during the period of 2005-2014. Sunsari, Dhankuta districts have lower water footprint of crop production. The coefficient of variation of water footprint of millet crop production is lower as compared to those of other crops considered

for study whereas sugarcane has a higher variation of water footprint for its production.