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The role of water balance accounting in the decision-making process leading to new small dams in the Preto River Basin in the Federal District, Brazil

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Water balance accounting models use system inflows and outflows to calculate how much water is available for human activities to be carried out. These models can also contribute to decision-making processes in areas suffering from seasonal water scarcity, as it is the case observed in the Preto River basin (PRB). Small dams are a widely used means to increase system storage in the PRB, once they can smooth seasonal water scarcity when planned carefully. The Water Evaluation and Planning (WEAP) system was used to investigate the role a water balance accounting model has in decision-making processes, and how this role can be extended or improved. Over the last two decades plans have been made for the construction of a couple of dozens of new small dams in the Preto River basin in the Federal District (DF) of Brazil. New small dams are planned to improve water availability for irrigation purposes during seasonal water scarcity. Researches carried out did not address the relation between stakeholder involvement in the decision-making process and water balances and allocation. This, while water allocation is a sensitive matter in the region. This case is well suited to investigate the role of models in decision-making processes. Various reasons for this can be listed. First of all, the decision-making processes leading to new small dams failed. With a water balance accounting model being used for the first time, results and progress of the current process can be compared with outcomes of earlier processes. Secondly, a water balance accounting model offers the opportunity to simulate the impacts of new small dams on the entire PRB. This bears the possibility to involve many stakeholders at the same time. Thirdly, the possibility to regard the PRB at a high level using water balance accounting joins to the tendency of a large share of public stakeholders in DF. Fourthly and lastly, an inverse line of thought can be proposed. In the PRB, WEAP was applied to generate information for the decision-making process leading to the implementation of new small dams. This application provided data concerning the impacts of small dam ensembles on a high scale. With WEAP, the requirements for locations of new small reservoirs were investigated. However, results indicated how dams influence the PRB system. What has become clear is the fact that localized research (as opposed to system research) into soil type, discharges and actual water use is necessary for gathering site-specific requirements. So formulating general requirements by means of a water balance accounting model indicated which specific requirements should be formulated in the future. Using WEAP in this context has also indicated that some reservoirs are not small in the eyes of some stakeholders. This is an important example of how the use of WEAP improves the notion stakeholders might have of the small dam project as initiated by policy makers. Applying WEAP showed that using a water balance accounting model allows for integration of important stakeholder and institutional information with technical data.