Disruptions in water service affect nearly every sector of a regional economy. Econometric procedures and practices have been developed and utilized throughout the literature that assess both the direct and indirect economic consequence of such calamities. These resulting models have typically examined the implications of such events using input/output models or social accounting matrices (SAMs), which operate based upon demand driven Leontief inverse matrix coefficients which detail how changes in demand for one economic sector affect changes in output for all other economic sectors.

Building upon this previous research base, the University of Missouri, developed the Economic Consequence Assessment Tool (ECAT), a dynamic, demand driven, supply constrained, SAM based model that incorporates resiliency strategies by both consumers and producers. Resilience strategies are estimated for each section of a local economy through the collection and use of survey data that describe how households and businesses reacted during real life disruption events. These are then used to predict the behavior of water utility customers as they respond to water disruption events, and to estimate the direct and indirect economic consequences of this behavior for the local and regional economies.

The initial ECAT program was developed as a standalone, Microsoft Excel based, spreadsheet program, which offered a theoretically rigorous, baseline product. This foundation was to then be integrated by The University of Alabama and Western Kentucky University within the developing decision support system (DSS) named Water Expert to provide a more usable application for the intended end users.

The resulting ECAT/Water Expert program reduces data inputs, increases integration possibilities, and provides a user-friendly experience. In a piecewise manner, ECAT/Water Expert was recreated using the Python 2.7 language, due to its ease of use, open source licensure, extensive usage in the scientific community, scalability, interoperability, and flexibility, the resulting program is functional on any of the popular operational platform (Windows, Apple, Linux, Android, etc.). Once fully developed, the software is slated to be tested by three utility partners once an initial beta version is developed and will undergo further refinement once these workshops have concluded.

It was intended that final users of ECAT would be water utility managers and superintendents that could use the information provided to run both what-if and real-time scenarios so that they may better react to and understand the ramifications of such interruptions on their local economy, which may be of use in updating their Emergency Response Plan (ERP), for capital planning projects, or in a number of other facets.
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