

Economic decision making is the key to triple bottom line analysis

A Practitioner's Guide to Economic Decision Making in Asset Management (SAM1R06b1/b2)

The Central Issue

Asset management is used to minimize life cycle costs to provide a desired level of service to utility customers at an acceptable level of risk. Asset management practices focus on assessing the viability of different strategies. These strategies include spending on new assets and replacing existing assets. In practice, there are a range of issues to consider relating to risk and analysis of both benefits and costs of those different strategies. Economic concepts inform this level of analysis along with societal impacts and values, such as the environment, when justifying investments. These factors – economic, societal, and environmental – are commonly referred to as the Triple Bottom Line (TBL). TBL, while not new to asset management practice, is well suited to economic analyses and the underlying concepts that inform asset management decision making.

Context and Background

This research builds on earlier published work that reviewed the concept of remaining asset life (SAM1R06d). Because of the different sizes and levels of asset management in the wastewater sector, decision support based on economic principles was considered the most appropriate to use. A report documenting current practices conceptually mapped the research needed to develop a guide. The researchers sought to support a continual improvement model of asset management and the desired full economic decision-making process.



The use of core economic principles at each stage of asset management is essential to all water resource recovery facilities.

Findings and Conclusions

This research product has two parts and uses many real-world examples to help explain the concepts presented. Part I presents background concepts including drivers, approaches, decision support tools, and frameworks relevant to economic decision making in asset management. It provides the basis for the Part II guidance document. Further insights into the development of a decision support framework and methods such as strategic budget setting, changes in service levels, investment decisions, and benefit cost analyses are in the guidance document. The subject of risk and worth of intervention using TBL analysis is also explored.

Several tools accompany the guidance. An Economic Assessment Spreadsheet Tool (EAST) is provided for assessing proactive and reactive decisions using a life cycle costing (LCC) approach. A tool named “Pairwise” can provide an estimated cost of an event’s consequences. Pairwise resolves difficulties of judgment on the relative importance of more than three non-quantified factors at one time, making it relatively easy to judge which is the more important of two factors, using pre-determined criteria.

Management and Policy Implications

This research supports a robust, transparent, auditable, and defensible approach to decision support. It includes easy-to-follow information for those new to economics while also presenting many complicated and valuable examples for the advanced reader. The research promotes the use of core economic principles at each stage of asset management.

Executive Summary



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Related WERF Research	
Project Title	Research Focus
SIMPLE: Sustainable Infrastructure Management Program Learning Environment (03CTS14)	This online knowledge enhances the ability to train personnel and provide guidance and tools to utilities of all types, sizes, and levels of practice in asset management. Moreover, SIMPLE helps practitioners learn how to extend the life of existing assets through changing strategies, tactics, and by implementing optimal maintenance practices and rehabilitation interventions, ultimately improving operational efficiency and reducing operational costs. SIMPLE contains over 16,000 pages of best practices and guidance developed over a 20-year period and from extensive international experience and collaboration with AM practitioners.
Condition Assessment Strategies and Protocols for Water and Wastewater Utility Assets (03CTS20CO)	Provides information on how to effectively use condition assessment tools and techniques to improve both long-term planning and day-to-day management of assets. The report is structured for two distinct audiences: 1) Utility planning managers who want to use cost-effective condition and performance assessment programs to support long-term planning decisions. 2) Engineering/maintenance managers who want to identify and understand the advantages and disadvantages of tools and techniques for measuring the condition and performance of utility assets to support daily maintenance and operation of assets.
Remaining Asset Life: A State of the Art Review (SAM1R06d)	Synthesizes the broad range of factors that influence remaining asset life. Covers the state of knowledge with respect to the estimation and prediction of remaining asset life, and if there is the capacity to translate between condition and performance data (e.g., the presence of significant defects) and the residual life of an asset.
Towards an Economic Decision Methodology for Remaining Asset Life - Research Road Map (SAM1R06g)	Contributes to the development of techniques, tools, and methods for estimating performance and residual life of assets and provides insights into an economic approach to decision making, applicable at multiple scales and in utilities of different levels of asset management sophistication. The researchers suggest a roadmap for building an asset management decision support framework based on economic principles, specifically focuses on sewers, and lays the foundation for further research into this area
Leading Practices for Strategic Asset Management (SAM1R06h)	Identifies, documents, and validates leading practices through site visits and a research forum held in 2010. Leading practices are presented in an easy-to-follow format that cites and explains the practice and provides examples. The research is intended to assist utility managers in the practice areas of Organization and People, Strategic Asset Planning, Business Risk, Maintenance, Secondary Data and Knowledge, and Accounting and Costing.

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