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## Benefit-Cost Analysis - An Overview

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Thursday, February 17, 2011

Workshop Session II

Time of Session: 1:30-3:00pm

Session Title: Benefit-Cost Analysis- An Overview

Speaker: Joseph Johnson, Witt Associates

Room: 204

Head Count: ?

Note Taker: Mallikharjuna Reddy Avula

- Notes: **What is BCA?**
  - Benefit-cost analysis (BCA) is a technique for evaluating a project or investment by comparing the economic benefits with the economic costs of the activity
- **Why is it important?**
  - To quantify the return on investment
  - When we use BCA, some of the projects become more cost effective some of them are not
  - Statutory requirement of Stafford Act to know cost effectiveness of the projects

### **BCA is necessary for following several Federal Grant Programs**

- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)
- Repetitive Flood Claims (RFC)
- Severe Repetitive Loss (SRL)
- Hazard Mitigation Grant Program (HMGP)
- Public Assistance (PA)

### **History of BCA**

1848- BCA was first used by Jules Dupuit for flood management projects

1902- US Army Corp of Engineers (USACE) started using BCA for their projects

1936- Flood Control Act mandated BCA that was already in practice by USACE

1972- Hurricane Agnes necessitated the amendment of Disaster Relief Act in 1974 that mandated BCA in mitigation planning

### **Understanding BCA**

- Benefit-Cost Ratio is dollar value of benefits (avoided future damages) to project cost
- Comparison of before -and after mitigation conditions
- Avoided future damages are benefits of the project
- If, benefits are greater than the cost then the project is cost effective
- Some projects are more cost effective than others
- Used in early project evaluation process
- Uses technical information
- Credible and defensible to FEMA
- Credible and reasonable data sources – federal, state and local agencies

### **Benefit-Cost Ratio (BCR)**

- A project is cost effective if  $BCR > 1$
- Benefits are most difficult to count than present day project costs
- Benefits happen in future and must be calculated at present based on statistics
- Projects occur right upfront

### **What is a benefit?**

- A benefit is an avoided future loss
- Benefits- Damages, death and injuries, loss of function, buildings, contents, road, bridges, utility lines, displacement costs etc.
- Death benefits are not considered when ample of time is available for evacuation (in case of hurricanes, tornadoes etc.)
- FEMA uses statistical values for death and injuries
- Benefits of Loss of function is largest single benefit for projects that protect critical infrastructure and utilities
- Some portion of grants are reserved for non-BCA projects

## **Key to BCA success**

- Start early
- Provide reasonable and defensible data
- Can be easily verifiable and recreated

For more information and BCA software visit;

<http://www.bchelpine.com/index.html>