ICHARM Workshop

AGENDA for
Research & Applications
in
Governance (Institutions) & Integrated Flood and Water Management

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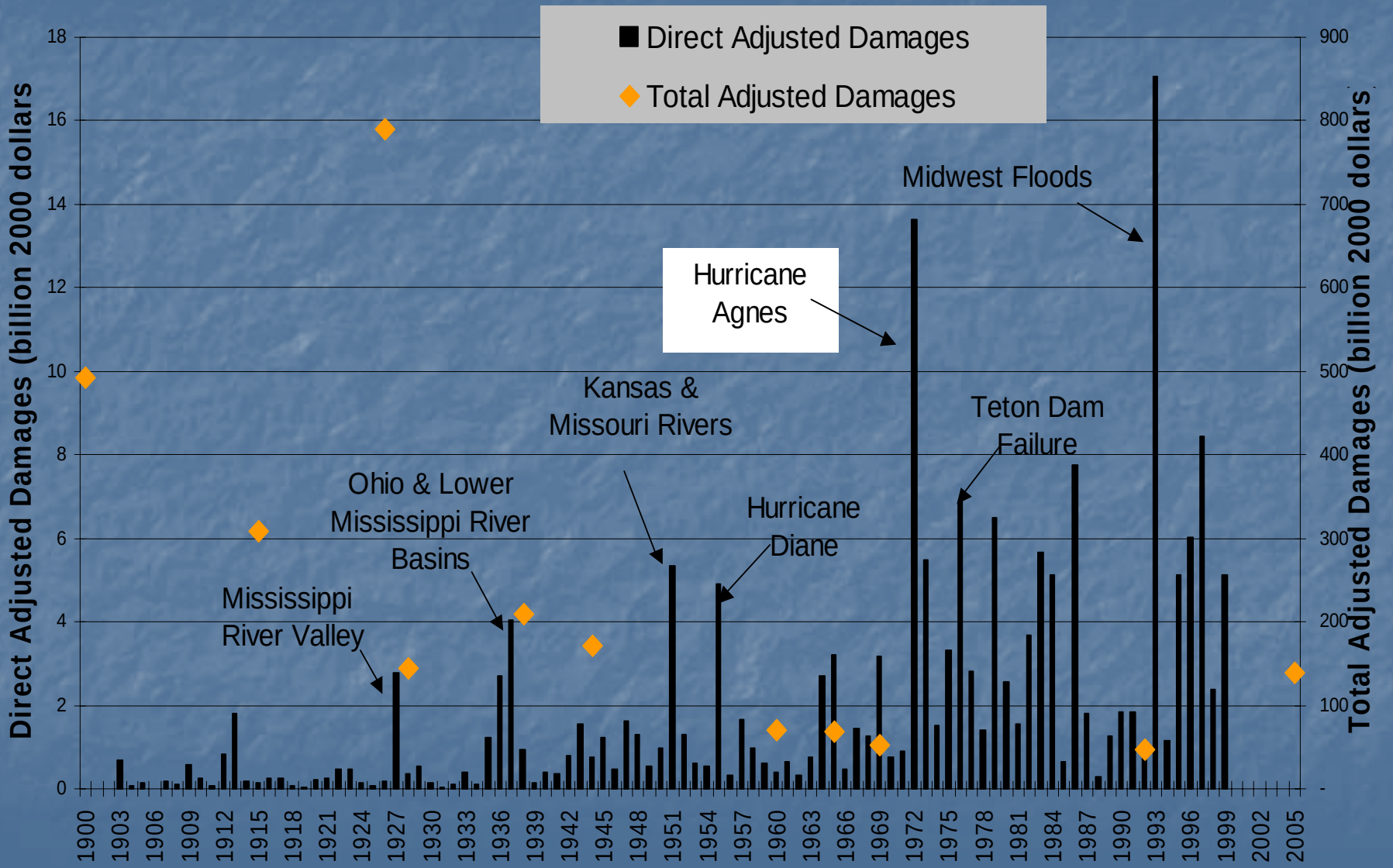
Policy, Planning, Programmatic & Engineering Responses to Katrina

- Many Agency Task Forces and independent Commissions, NSF, ASCE, NAS, etc.
- Representing all levels of government & agencies
- Little coordination among the groups (no integration)
- A priori legislation and decisions made separately, prescribing & constraining choices and actions
- Things will ‘settle down’ – federal gov’t bears most of costs – will influence responses
- Role of public participation? (what happens when the collective private interest conflicts with ‘public interest’?)

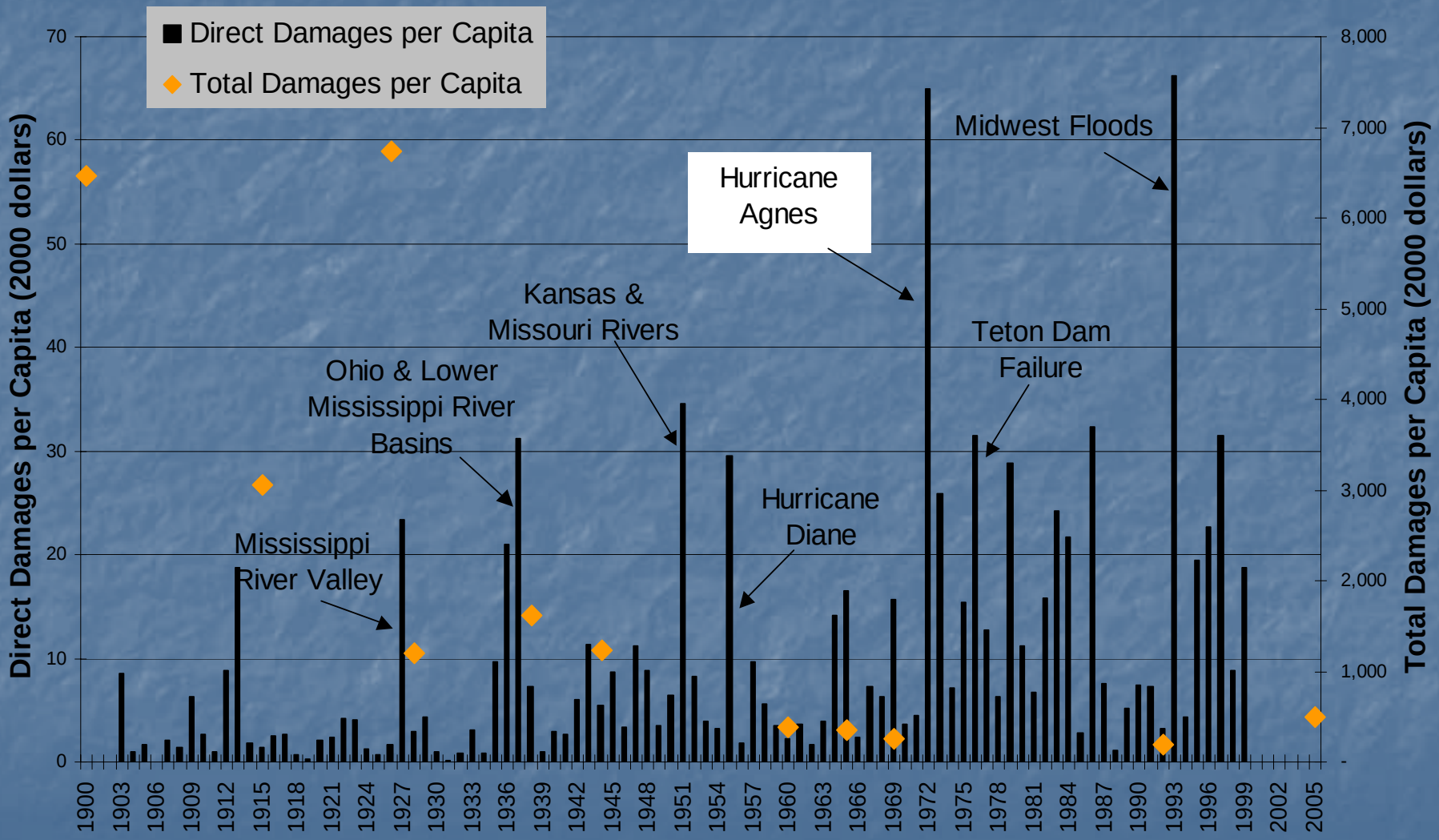
“Lessons learned”

- Too complacent w.r.t. evacuation plans
- Engineering design criteria not updated
- Simplistic, outdated methodologies, (1960’s)
- Fragmented decision authorities – too much subsidiarity, perhaps
- How to deal with residual risks of catastrophes – i.e beyond design criteria
- What is societal responsibility for stubborn individuals who do not evacuate?
- What new institutions are needed to manage in integrated manner?

Real Flood Damages 1903-1996 (billion 2000 dollars)

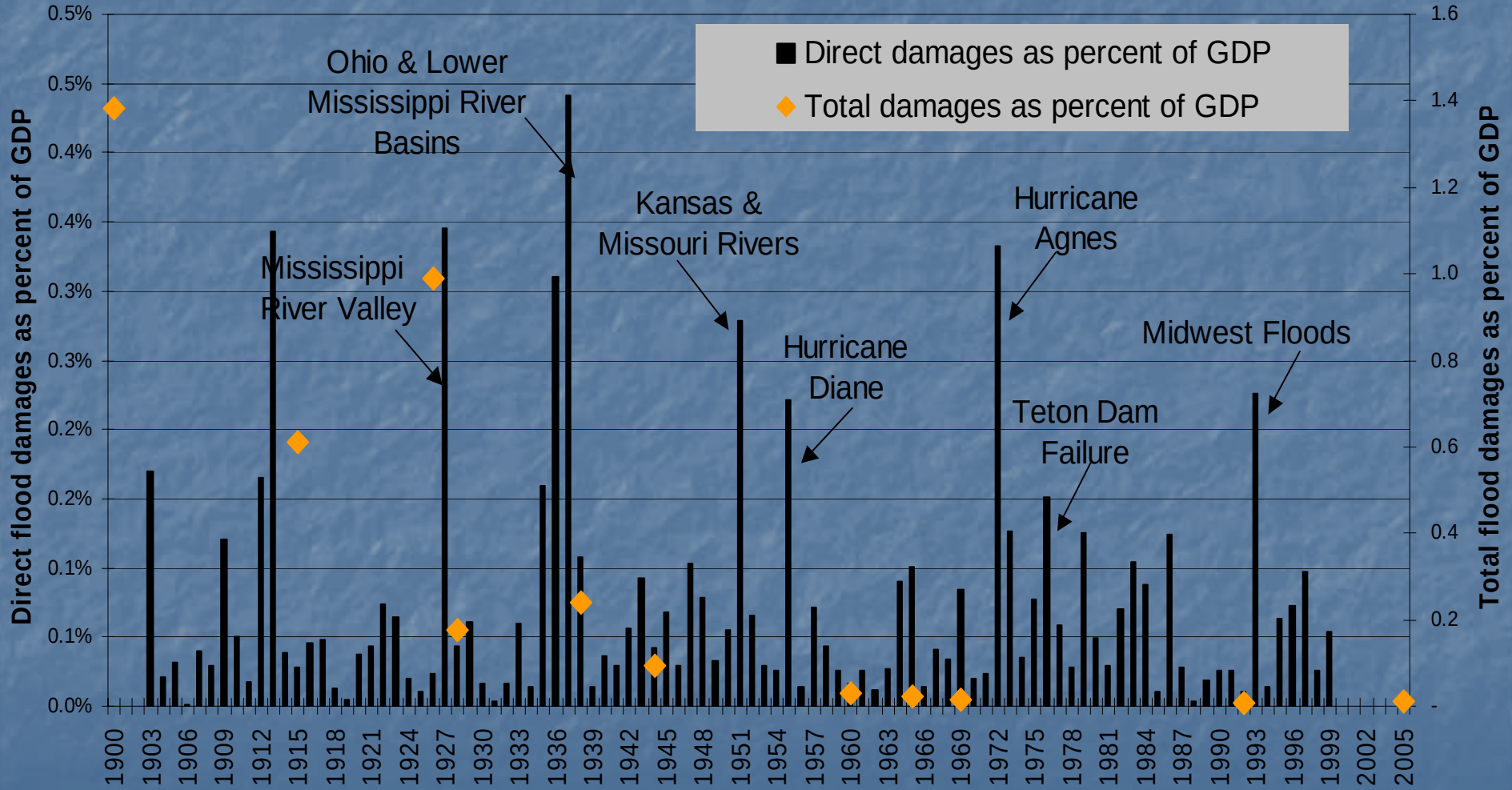


Real Flood Damages per Capita (2000 dollars)



Flood Damages as Percent of GDP

(Based on damages and GDP data in 2000 dollars)



US Flood Policy Development & Non-Structural Floodplain Management

- Gilbert White, 1942 Dissertation
- Executive Order 11988, *Floodplain Mgmt* (1977)
- P&S requirement for nonstructural plan (1980)
- Water Resources Development Act (WRDA1986)
- Unified Nat'l Prog for Floodplain Mgmt (1992)
- Upper Miss R. Flood (1993)
- "Galloway Committee" Report (1994)
- "Challenge 21" Legislation (WRDA 99)
- Response to Katrina (2005- ?)

PRINCIPLES: Unified Nat'l FPM Program

- Modify Human Susceptibility to Flood Damage *(relocation, flood warning forecasting, disaster preparedness, assistance, land acquisition, etc.)*
- Modify Impact of Flooding on People and Comm-unities *(emergency response, flood recovery)*
- Preserve and Restore Natural Floodplain Resource *(land acquisition, restore wetlands/habitats)*
- Modify Flooding *(dams, dikes, detention basins*

"CHALLENGE 21"

- WRDA 99 (PL 106-53), Section 212: *"Flood Mitigation and Riverine Restoration Program"*
- *"…projects to reduce flood hazards and restore the natural functions and values of U.S. rivers"*
- *"…studies and projects shall emphasize, to the maximum extent practicable, nonstructural approaches to preventing or reducing flood damages"*
- *ensure the restoration of natural functions and values of floodplains.*

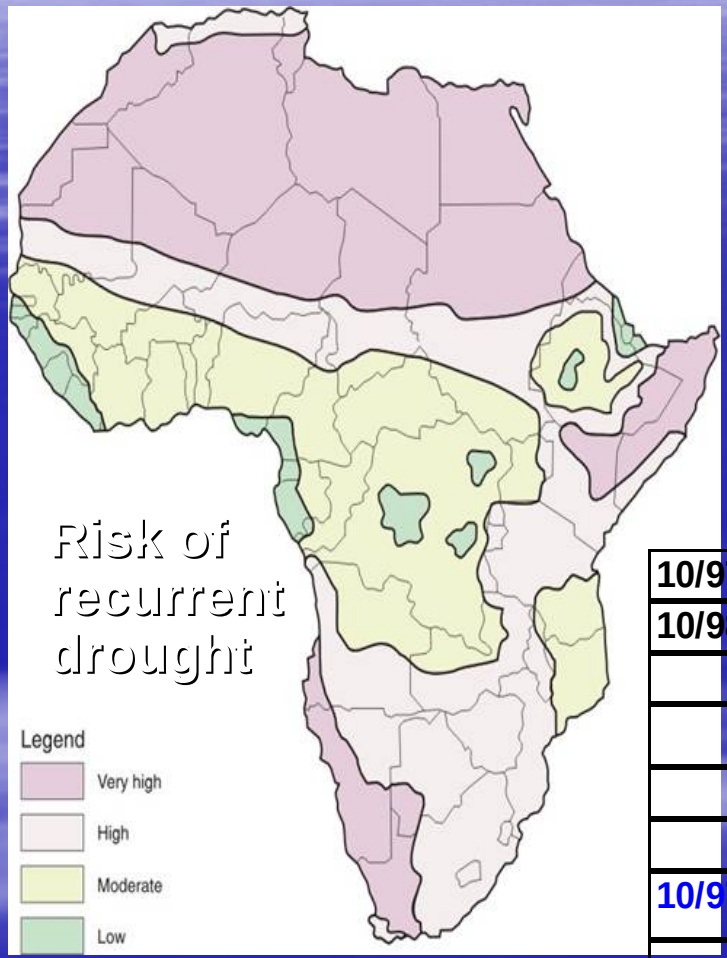
Policy Impediments to FDR (IWR;1998)

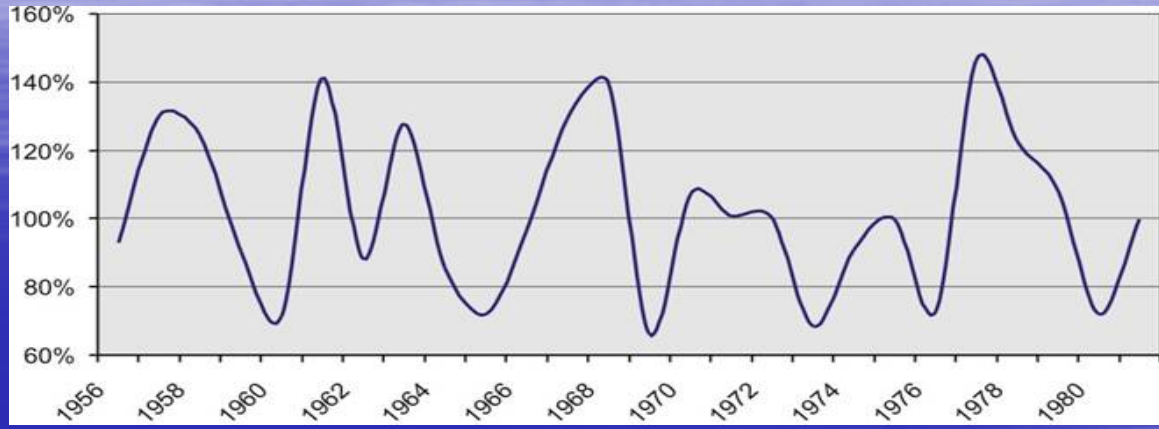
- Full accounting of environmental, economic and social benefits difficult
- Current project justification (BCA) procedures skew results and choice of alternatives
- Emergency flood relief and recovery payments by agencies creates dis-incentives against non-structural measures
- FPM is not being pursued in coordinated manner – land use decisions contrary to FPM principles

Avoiding Flood Disasters: An Applied Research Agenda for ICHARM

- A key determinant of achieving Sustainable Development
- Disaster Preparedness
- Warning and Evacuation planning
- Planning “best” combination of structural & non-structural approaches (minimize risk-costs) – how to choose “best”
- Post-disaster assistance, relief & recovery
- Rehabilitation and reconstruction

Climate Variability Undermines Growth



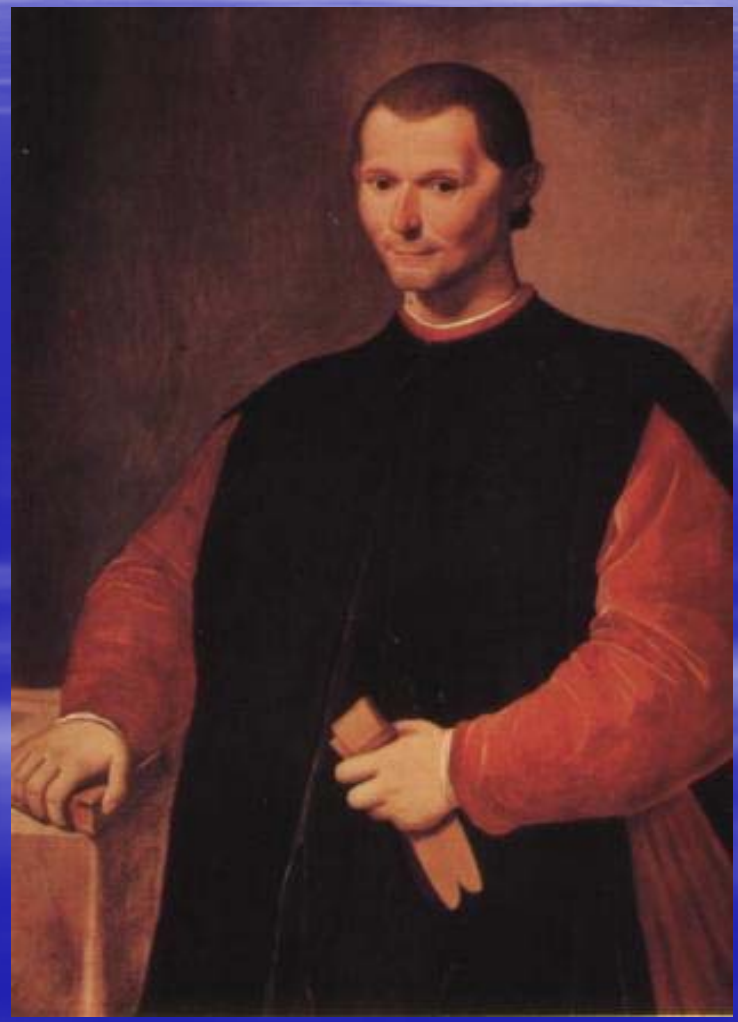


Kenya: variability & shock

10/97 – 2/98 Flood	Infrastructure Damage		$2.39 b
10/98 –5/00 Drought	Crop loss	$0.24 b	
	Livestock loss	$0.14 b	
	Reduction in hydropower	$0.64 b	
	Reduced industrial prod.	$1.39 b	
	TOTAL	$2.41 b	$2.39 b
10/97 – 05/00	Cost of Climate Variability		$4.8 b
	Approx (annual) GDP	($9 b/yr)	$22 b
	Impact as % GDP/annum		22%

Natural legacy:
extreme climate variability

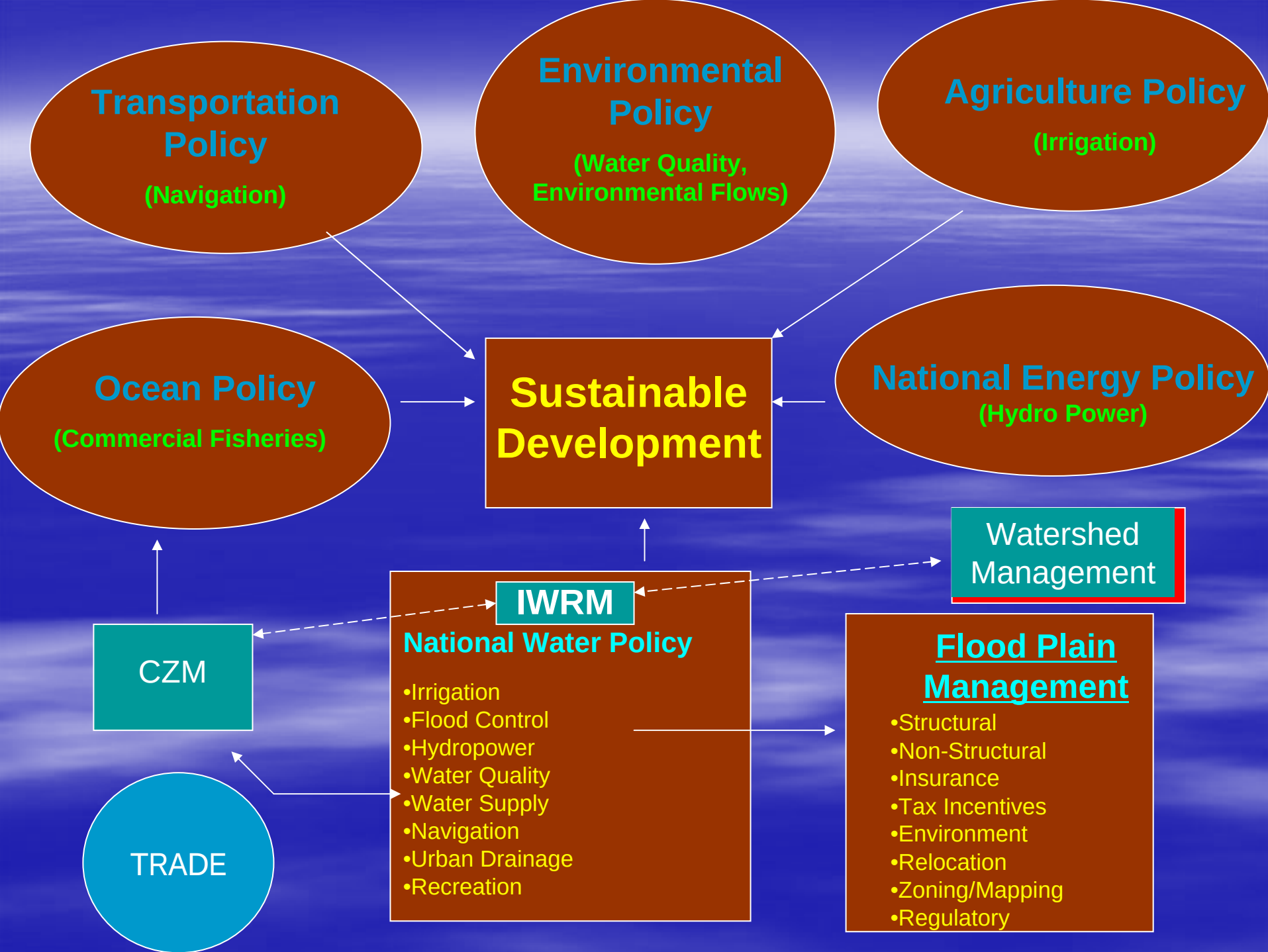
Leonardo's Collaboration with Niccolo: Vision and Virtual Reality



IWRM & Governance

- Flood management is integral part of IWRM
- 'Governance' is policy keystone of IWRM:
  - what needs to be done ?
  - who should do it ?
  - how it should be done?
  - who makes the decisions?

- IWR **Management** is the effective and efficient *coordination* and *implementation* of policies, programs & public participation
- IWRM is the implementation arm of SD


Transportation Policy
(Navigation)
Environmental Policy
(Water Quality, Environmental Flows)
Agriculture Policy
(Irrigation)
Ocean Policy
(Commercial Fisheries)
Sustainable Development
National Energy Policy
(Hydro Power)
Watershed Management
IWRM
National Water Policy
•Irrigation
•Flood Control
•Hydropower
•Water Quality
•Water Supply
•Navigation
•Urban Drainage
•Recreation
CZM
TRADE
Flood Plain Management
•Structural
•Non-Structural
•Insurance
•Tax Incentives
•Environment
•Relocation
•Zoning/Mapping
•Regulatory

Water management (and water reform) is ALWAYS political…..

Ancient Chinese Characters describing water management

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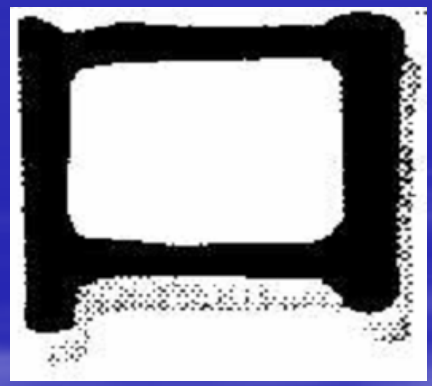

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river + dyke = Political order

Governance encompasses:

- Coordination among Institutions to achieve goals (SD: economic efficiency, equity & environmental)
- Organizational and Administrative restructuring
- Legislation to achieve goals (programs, policies and regulations)
- Joint research initiatives, technology transfer
- Policy formulation
- Legal and regulatory frameworks
- Economic incentives
- Role of public participation in decision making
- Performance assessment; monitoring, appraisal

ICHARM: Too much science – too little management?

- Flood forecasting is not the sole answer - just one of many initial technical prerequisites for integrated flood plain mgmt
- Flood forecasting techniques, by themselves do not translate to flood warning and evacuation (see Katrina)
- What is the integrated flood management plan which reduces risks, and manages residual risks in an effective, efficient manner?

Basic Advice to ICHARM

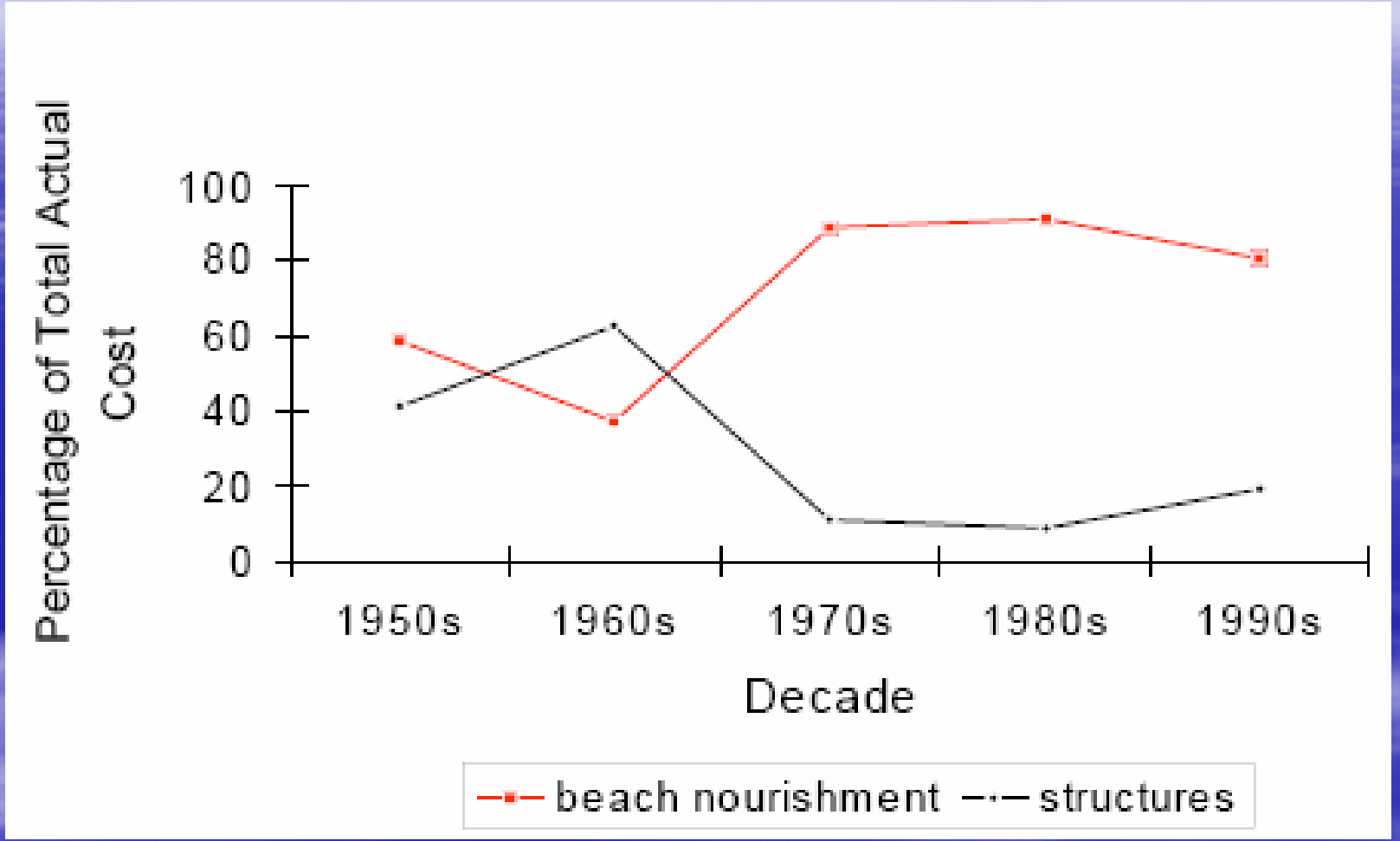
- Budget allocation: ~25% new research; ~50% tech transfer of “best practicable” methods; ~25% training, capacity-building
- Many overlapping initiatives underway – needs upgrading, synthesis, comparative analysis
- Peer review – what works, in what circumstances, what is cost-effective
- Technology transfer and training to developing nations -best practicable methods

ICHARM Program Support to, and Coordination among:

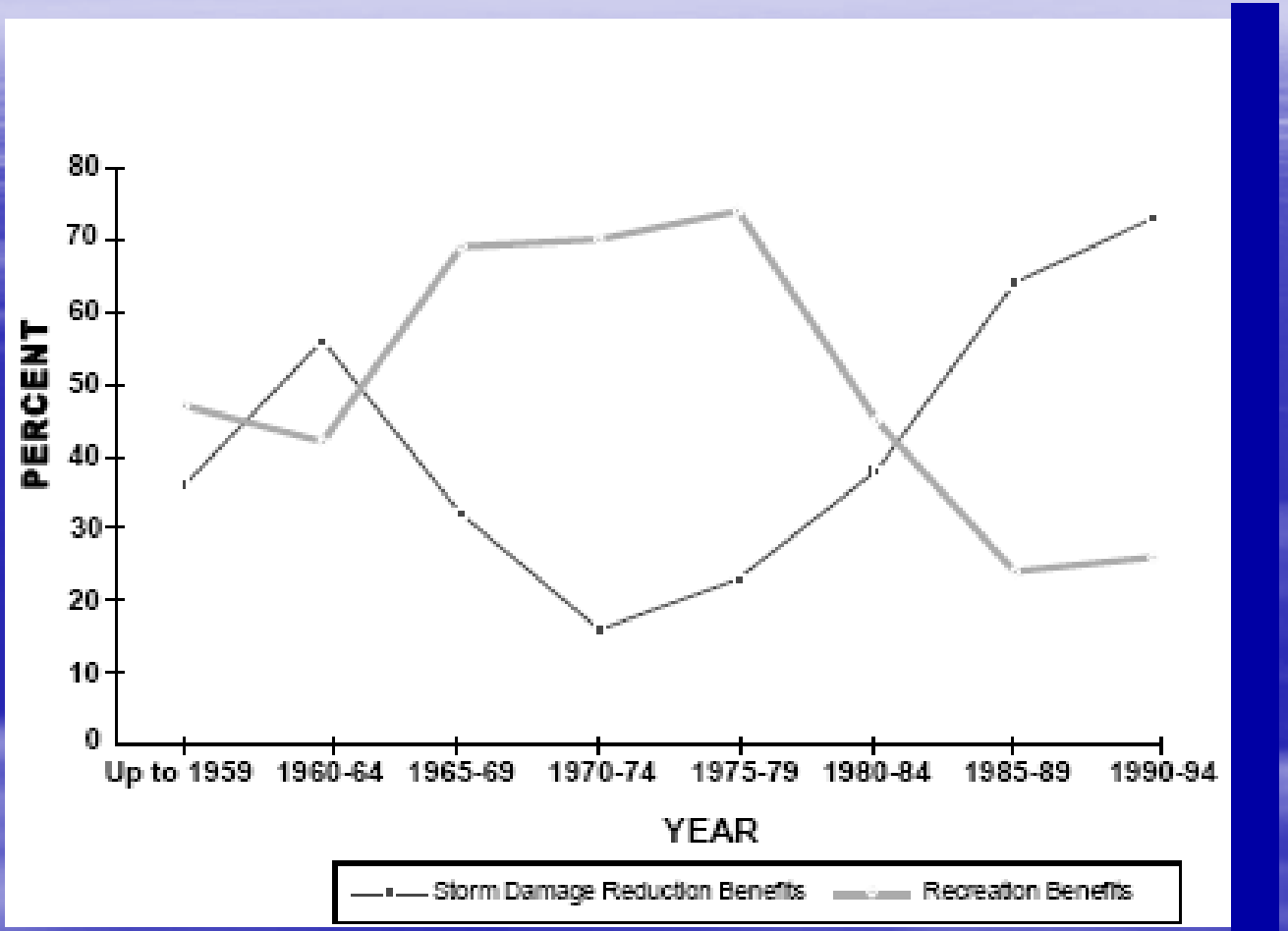
- UNESCO IHP, Phase VII Effort (2008-2013)
- UN MDG's
- UN International Decade for Water
- International Development Agencies (World Bank, ADB, USAID, UNDP, CIDA, etc.)
- National approaches (Japan, Netherlands, US, Bangladesh, etc.)
- Comparative analysis of various programs and approaches – similarities and unique
- There are many useful methods - consolidate

Institutional Aspects of Technical Decisions which influence plans & designs

- **Methodological** (e.g. engineering standards vs. risk-cost analysis; project justification rules; EIS, BCA, etc.)
- **Regulatory** (building codes, land uses, ecological zones, etc.)
- **Economic** (economic incentives, cost-sharing, tax codes, insurance, discount rate, etc.)
- **Social** (public inputs, institutional veto powers)



Source: Corps of Engineers (June 1996) “Final Report: An Analysis of the Corps of Engineers Shore Protection Program,” IWR Report 96-PS-1



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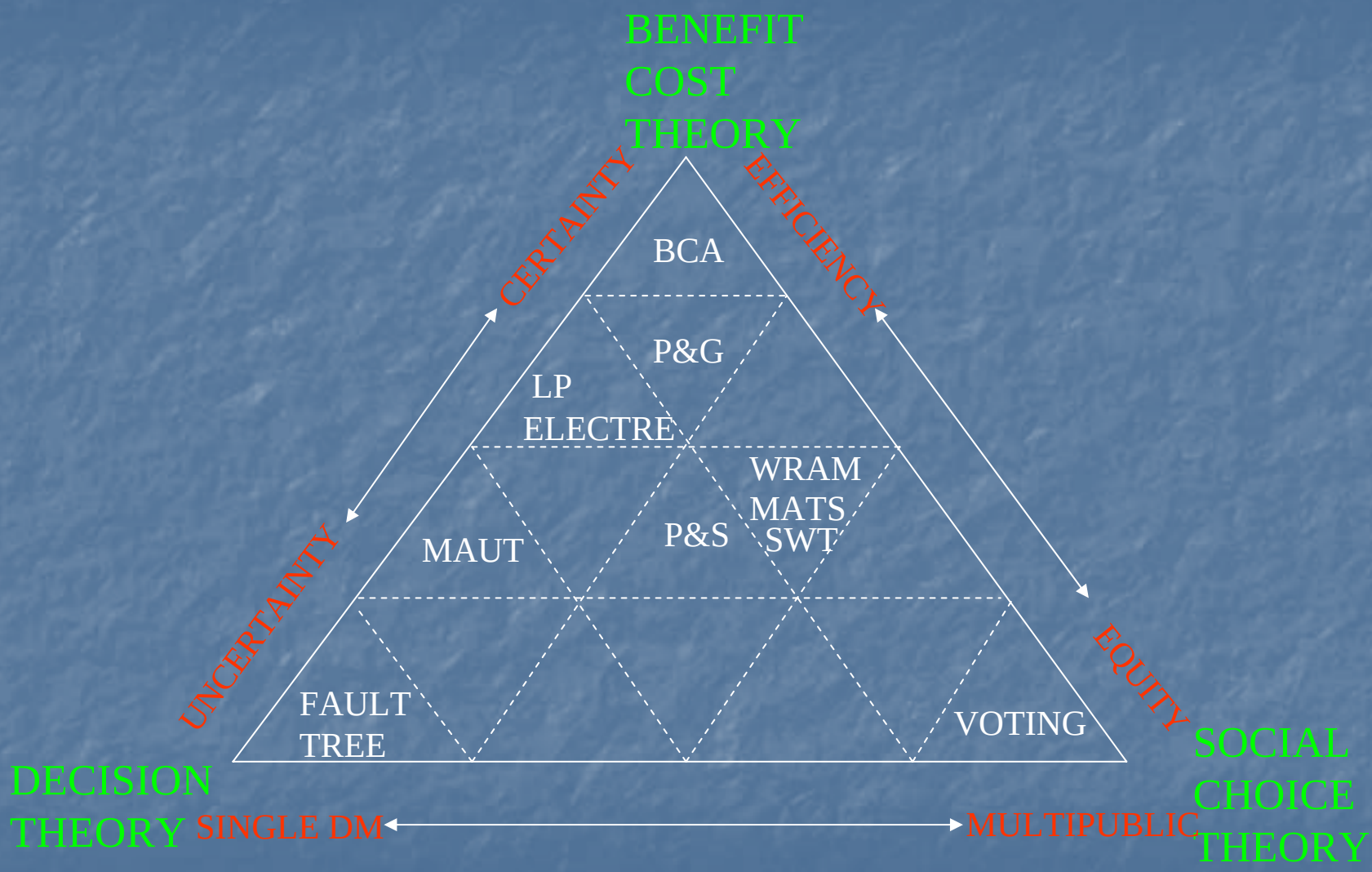
Existing Planning/Evaluation Paradigms

- **Descriptive** (NOAA/CZM, McHarg, GIS)
- **Indicative** (normative, P&S/P&G, BCA)
- **Prescriptive** (regulatory planning- an oxymoron?)
- **Proscriptive** (to avoid, NEPA/EIS)
- **ERSATZ** (Ecorestoration sitting around the table *Zeitgeist*, or, see EPA Watershed guidelines)
- **"Garbage Can" Planning** (see Ersatz)

Normative Evaluation Philosophies



US Impact Accounting System

- **National Economic Development (NED)**
  - beneficial and adverse effects on the national economy in monetary terms
- **Environmental Quality (EQ)**
  - effects of plans on significant environmental resources and ecological, cultural and esthetic attributes
- **Regional Economic Development (RED)**
  - distribution of regional economic activity from each plan in terms of regional income and employment
- **Other Social Effects (OSE)**
  - effects on urban and community impacts, life, health, safety factors; displacement, long term productivity; energy requirements and energy conservation

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Thanks