



flood prevention committee



Ministry of Energy
Deputy for water and sewage affairs

Lessons Learned from Past Floods towards

Integrated Flood Management in Iran

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Training workshop of Integrated Flood Management,
11-14 may 2009 – I.R.Iran, Tehran

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- Occurrence, Damages and Human losses

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- Challenges
- Recommendation

1. Floods in Iran

Map of Iran



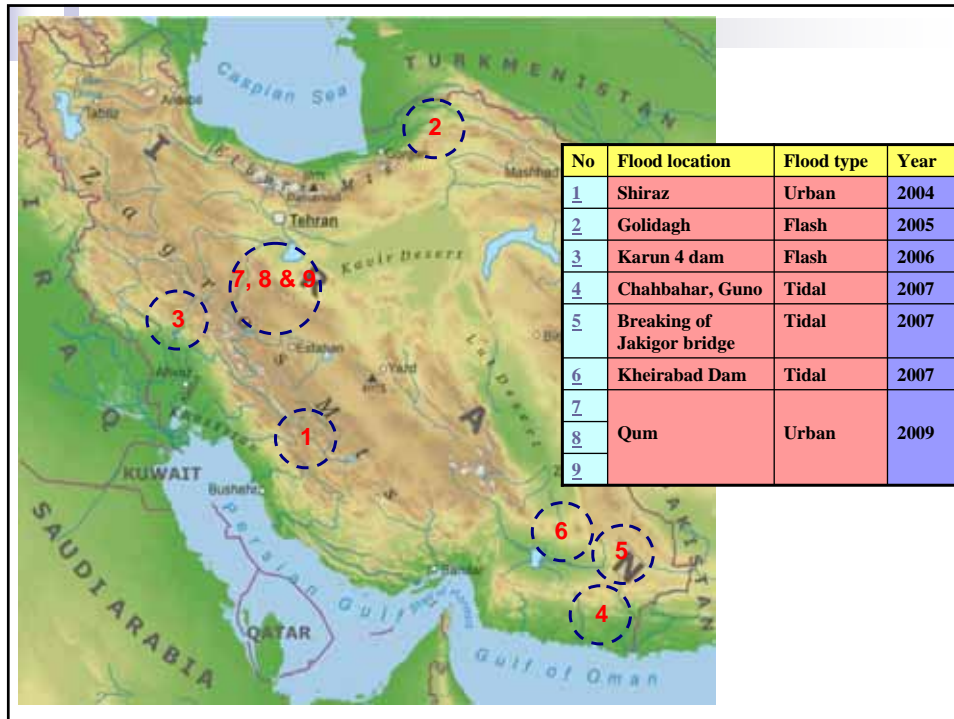
Annual Precipitation (mm) in sub – basins

Basin	Total area (km ²)	As % of total area	Rainfall (mm/year)	Rainfall (km ³ /year)	As % of total rainfall
Persian Gulf and Gulf of Oman Sea	424 209	26	380	161	39
Orumie Lake	51 801	3	347	18	5
Caspian Sea	175 051	11	423	74	18
Hamoun Lake	103 169	6	107	11	3
Central Plateau	824 356	51	166	137	33
Qara-Qum	44 165	3	226	10	2
Total	1 622 751	100	253	411	100

Non-uniform spatial and temporal distribution

Example of floods

Narrating by clips



Masouleh Flood

- Jul.30th, 1998
- More than 50 Human losses
- More than 1 million U.S. \$ Damages
- Effective factor : River channel encroachment



Golestan Flood-2001

- Aug.10th, 2001
- More than 200 Human losses
- More than 60 millions U.S. \$ Damages
- Effective factor : Lacking of public education



Doogh River – Golestan National Park Route

Before 2001 flood →



← After 2001 flood

9

Nature of floods in Iran

Types of Floods

- Flash Floods
- Long-lasting Floods
- Mountainous Rivers Floods
- Seasonal River Floods
- Tidal Rivers Floods
- Urban Floods

■ Causes of floods in Iran

- Natural
- Man - made

■ Causes of Floods in Iran

■ Natural

- Intense rainfall
- Inadequate vegetation and soil cover
- Steep mountain terrain



Causes of Floods in Iran

■ Man-made

- Land use changes
- Flood plain encroachment
- Deforestation



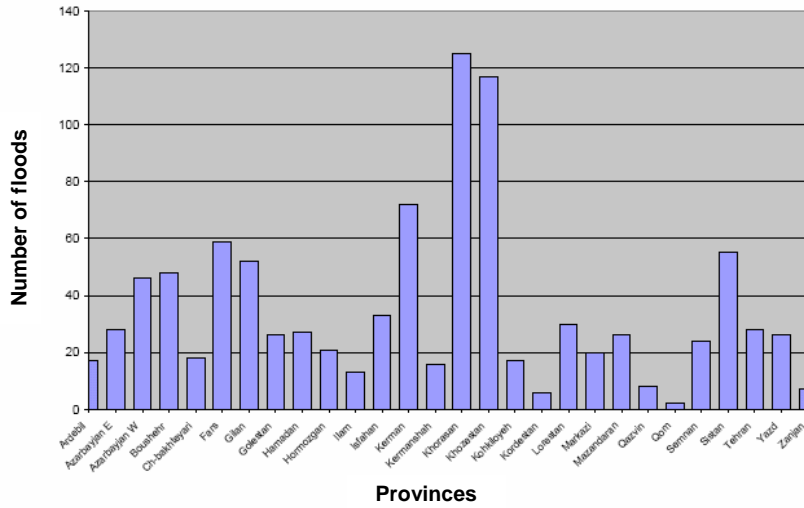
Causes of Floods in Iran

■ Man-made

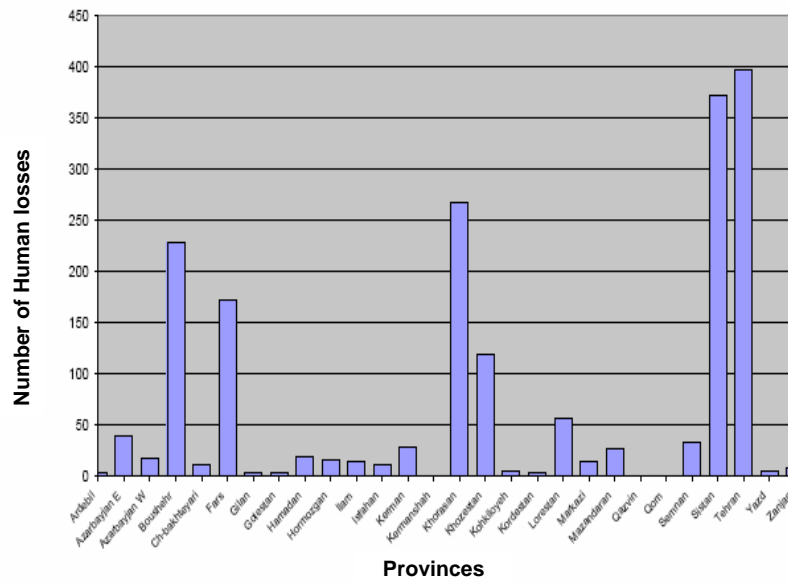
- Extensive gravel mining
- Improper design of infrastructure
- Improper urban drainage network



Frequency of Flood occurrence in different provinces in recent 25 years



Human losses due to flood occurrences in recent 25 years



2. Moving towards IFM

(1990-2009)

Integrated Flood Management in Iran

- **INTEGRATED**
 - Land and Water Management
 - Uplands and Lowlands
 - Structural and Non-structural
 - Short term and Long-term
 - Local and basin level measures
 - decision making between different organizations
 - Development needs with ecologic and economic concerns
 - Functional Integration of Institutions
- **FLOOD**
 - Flash flood
 - Long-lasting floods
 - urban flood
 - Flood in small basin
 - Flood in large basin
 - impacts of flooding
- **MANAGEMENT**
 - Sustainable management
 - Flood action plan
 - Time management before, during and after flood events
 - National sources and facilities
 - Institutional structure
 - Training and maneuver

Review of IFM process in Iran

	Institutional	legal	Technical		Human resources	Finance
			Structural	Non structural		
Before 1989						
1989-1992						
1992-1995						
1995-2000						
2000-2005						
2005 till now						

P Poor M Medium G Good
Good

Review of IFM process in Iran

	Institutional	legal	Technical		Human resources	Finance
			Structural	Non structural		
Before 1989	P	P				
1989-1992	M1	-				
1992-1995	M2	-				
1995-2000	M2	M1				
2000-2005	M3	M2				
2005 till now	G1	M2				

P Poor M Medium G Good
Good

Review of IFM process in Iran

	Institutional	legal	Technical		Human resources	Finance
			Structural	Non structural		
Before 1989	P	P	P	P		
1989-1992	M1	-	P	P		
1992-1995	M2	-	M1	P		
1995-2000	M2	M1	G1	M1		
2000-2005	M3	M2	G2	M1		
2005 till now	G1	M2	G2	M2		

P Poor M Medium G Good

Review of IFM process in Iran

	Institutional	legal	Technical		Human resources	Finance
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Before 1989	P	P	P	P		
1989-1992	M1	-	P	P		
1992-1995	M2	-	M1	P		
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2005 till now	G1	M2	G2	M2		

P Poor M Medium G Good

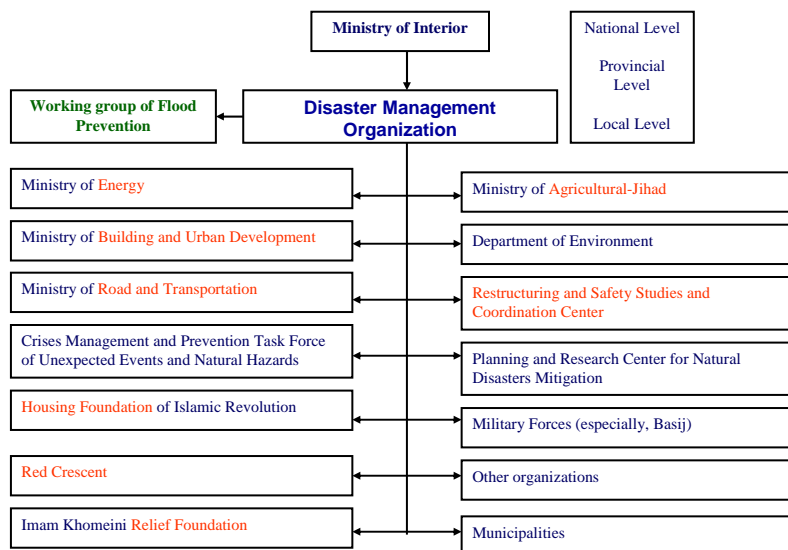


Progress in Institutional Set-up and Legal

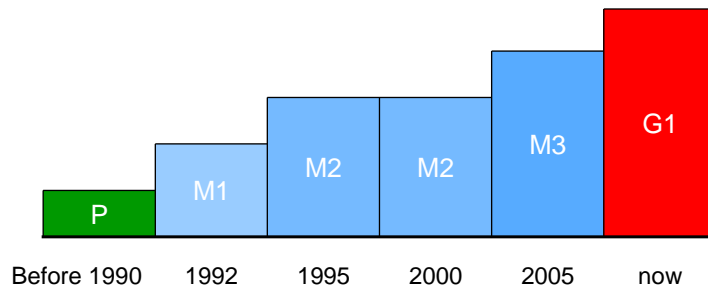
Stage 1	Before 1990	A limited group was responsible to allocate fund for paying compensation to victims and reconstructing damages, before 1989
Stage 2	1992	Approval of the law of "National Committee of Natural Hazard Mitigation" and "Flood Control Committee" by Islamic parliament, 1991
Stage 3	1995	Establishment of the River Engineering and Flood Control Bureau in the Ministry of Energy (national level), 1995
Stage 4	2000	Establishment of the River Engineering and Flood Control Bureau in provinces, 1997
Stage 5	now	Approval of "Crisis Management Task Force" by the government, 2003 Establishment of Disaster Management Organization*, 2008

*Supreme Council National Disaster Management headed by president of IRI

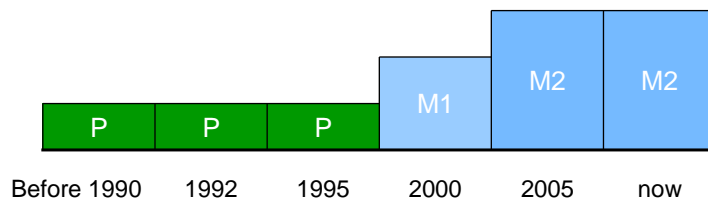
Exist Institutional Set-up



Progress in Institutional Set-up



Progress in Legal Issues



Technical approaches and methods

Change in approaches

Stage	Structural	Non-structural
Stage 1	<ul style="list-style-type: none"> -Construction of Flood walls -Reconstruction of damages 	-
Stage 2	<ul style="list-style-type: none"> -Construction of Flood walls -Reconstruction of damages 	-
Stage 3	Providing river works standards	Establishment of River Engineering Committee to provide proper standards
Stage 4	<ul style="list-style-type: none"> - Study and implementation of River Engineering projects (Pilot projects) -Application of different structures (Dikes, Groins, ...) along with dredging for river channel improvement, protection and control of erosion or sedimentation -Providing guidelines, standards and books for river works 	<ul style="list-style-type: none"> -Initiation and early studies of Flood Warning Systems (4 projects) -Initiation of floodplain delineation and flood zoning maps

Technical approaches and methods

Change in approaches

Stage	Structural	Non-structural
Stage 5	<ul style="list-style-type: none"> -Aforementioned issues -Study and implementation of more than 100 Flood control and river engineering projects -Application of mathematical and physical models 	<ul style="list-style-type: none"> -Publication of maps -Initiation and providing FAP
Stage 6	<ul style="list-style-type: none"> -Aforementioned issues -Application of new technologies (RS & GIS) 	<ul style="list-style-type: none"> -Study and implementation of 3 types of FWS <ul style="list-style-type: none"> -Meteorological FWS (general) -Hydrological and hydraulic FWS (large rivers) -Hydrological FWS (small river basins) -Coordination with Deputy of Dams operation and management -Providing FAP (in progress)

Technical Training

- Holding Seminar, Workshop, Exhibition in flood issue
- Producing Films and Text books
- Standard manuals for designing, operation and maintenance
- Hydro-Environmental Mathematical Analysis Tool (HEMAT) Model for steady and unsteady flow, sediment & water quality
- Iran rivers & flood website: (www.iranfloods.ir)
- Providing flood data and information bases
- Promotion of Flood Risk Management instead of Crisis Management

Public Awareness



Production of TV contests



Training workshops for students in Kalale-Golestan



Sign of flood warning



Floods don't warn us, they are serious danger

Flood Warning-Public and Contribution-flood risk map



Training workshop for providing flood action plan



Warning village's inhabitants



MANOEUVRE



Coordination of Authorities

Signing letter of agreement between

Ministry of Energy

Municipality of Tehran

Tehran city council

ENERGY MINISTER, CHAIRMAN OF TEHRAN ISLAMIC CITY COUNCIL AND THE MUNICIPALITY OF THE CAPITAL SIGN DEAL TO PROTECT RIVERS RUNNING THROUGH URBAN AREAS

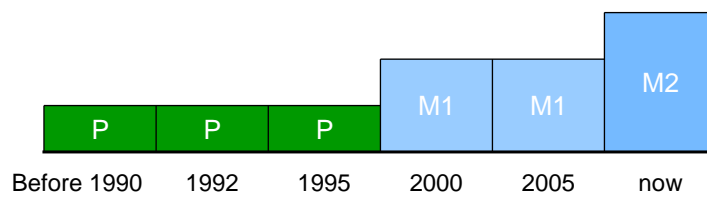
TEHRAN MAYOR, CITY COUNCIL SIGN DEAL TO PROTECT URBAN RIVERS

The Energy Minister, Fattah Fattah, and the Chairman of the Tehran Islamic City Council, Mehdi Karubi, along with the Mayor of Tehran, Gholamreza Aghajani, signed a letter of agreement on October 29 to protect rivers running through urban areas.

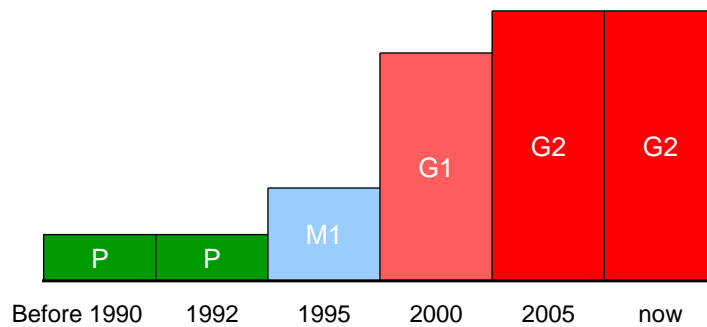
Fattah Fattah said it is the first time water consumption in the first seven months of a given year is not more than the corresponding period the year before.

Tehran and Khosrovi provinces come first on the list of top energy consumers in the country.

Progress in Non-Structural Measures



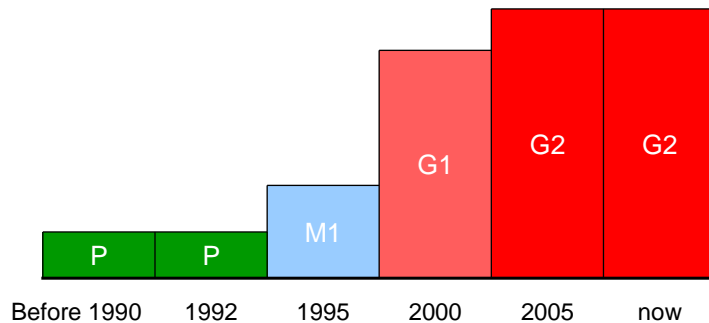
Progress in Structural Measures



Human resources development

Stage 1	-
Stage 2	-
Stage 3	<ul style="list-style-type: none"> -Holding training workshops -Employment of Hydraulics and Civil Engineers
Stage 4	<ul style="list-style-type: none"> -Establishment of MSc River Engineering courses in universities -Establishment of River Engineering Consultancies (with government approval) -Contractor construction companies with speciality in flood control works -Holding short-term training courses and workshops -Sending experts abroad for training river engineering and flood control -Publication of books and magazines
Stage 5	<ul style="list-style-type: none"> -Establishment of MSc crisis management courses -Preparation of training videos and documentaries to broadcast from national TV -Broadcasting training programs from national and provincial radio stations -Establishment of PhD courses in the universities -Publishing books and CDs for training -Holding training workshops and technical exhibitions
Stage 6	Employment of graduated PhD experts in flood management organizations

Human Resources Development



Finance

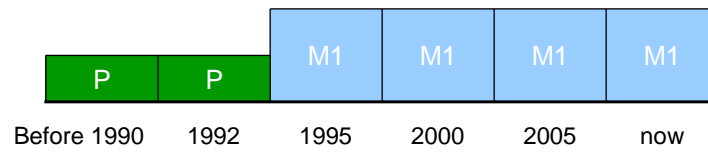
Stage 1	Limited funds for casualties and reconstruction of damaged structures
Stage 2	As mentioned above
Stage 3	Providing and allocating special funds for flood control and river engineering projects
Stages 4, 5 & 6	- As mentioned above + - Special funds to provide flood zoning maps (The proportion has not been sufficient)

World Bank has accepted the proposal of the project for the value of 200 M US\$ loan for 12 years period:

" Moving Towards a National Integrated Flood Management Strategy"

- Goal 1: Developing a structured institutional set-up for strengthening inter-organization coordination
- Goal 2: Integrated long-term disaster management activities with national plans
- Goal 3: Development of local Integrated Flood Management action plans
- Goal 4: Integrated long-term disaster management activities with provincial & local plans

Finance



3. conclusions

- Challenges
- Recommendation

Challenges

- Diversity of flood issues
 - Geographical
 - Institutional
 - Functional
- Financial
- Legal
- Human resources development
- Coordination

Challenges

As it has been experienced so far:

IFM is not:

- a project, quantitative and tangible target
- not a long term plan
- not simple
- not rapid
- not one-dimensional

IFM is:

- a process
- culture, behavior
- difficult, slow, step by step
- multi-dimensional and multi-disciplinary

Recommendations

- Education, training and public awareness
- Applying advanced technologies (RS & GIS, Math Models, flood warning systems, ...)
- Foundation of different types and levels of work groups

Thank you
for your patience



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