



WMO

Training Workshop on Integrated Flood Management for the Nile Basin Countries

23-27 November 2009-09-16 Nairobi, Kenya

Basin Flood Management planning

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Introduction remarks

- Basin wide flood management planning is applying IFM for a specific situation.
- Size of the basin determines the degree of details. The principals are the same
- Goals are only achieved if the plan is implemented. This needs action and therefore we speak often from an ACTION PLAN.

From theory to application

The 5 key elements of IFM

1. Manage the water cycle as a whole
2. Integrate land and water management
3. Adopt a best mix of strategies
4. Ensure a participatory approach
5. Adopt integrated hazard management approach

Point 1 requires basin wide planning:

Problems of large basin wide planning

Advantages

- Managing water circle as whole
- More options for solutions
- Improved information in particular for flood warning
- Sharing burdens and benefits

Disadvantages

- Large basins have political borders (national, regional, communal)
- Different objectives in different parts
- Complicated coordination and information of public

1. Manage water cycle as a whole

Linkages between upstream changes and downstream effects and vice-versa



Technical links

- River Dynamics
 - Vertical and horizontal behavior
 - Sediment transport
- Temporal discharge distribution
 - Low flow / flooding

Economic Social links

- Water use
 - Quantity / Quality
- Control measures
 - Dikes, reservoirs, etc.



2. Integrate Land Use

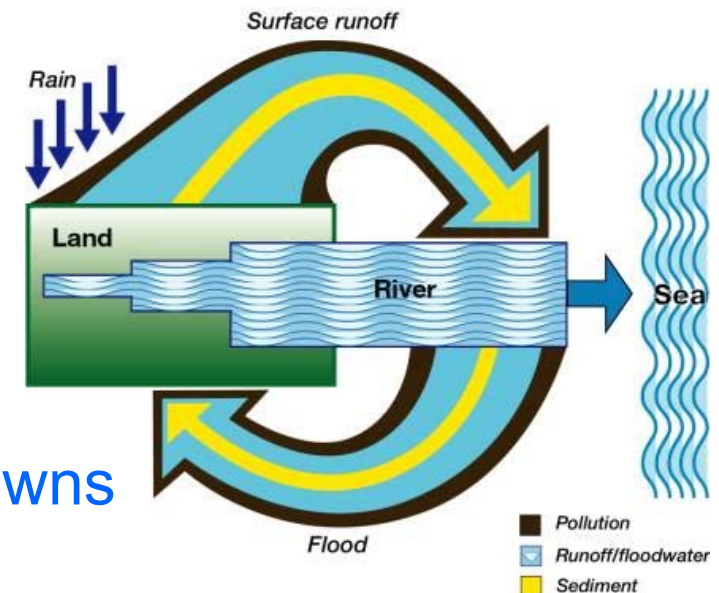
Recognition that a river basin is a dynamic system with many interactions/fluxes between land and water bodies

Land use plans and water management need a strong basis for coordination between the concerned authorities

Land use governs the demand

- of water for irrigation, industries and towns
- of protection levels at flood control
- flux of sediments (erosion depending on cropping patterns)
- pollution (towns, industries)

Integrated Water management without land use management is impossible





3. Adopt a Best Mix of Strategies

Strategy

Options

Reducing Flooding

Dams and reservoirs
Dikes, levees, and flood
embankments
High flow diversions
Catchment management

Reducing Susceptibility to Damage

Channel improvements
Flood plain regulation
Development and redevelopment
policies
Design and location of facilities
Housing and building codes
Flood-proofing

Mitigating the Impacts of Flooding

Flood forecasting and warning
Information and education
Disaster preparedness
Post flood recovery

Preserving the Natural Resources
of Flood Plains

Flood insurance
Flood plain zoning and regulation

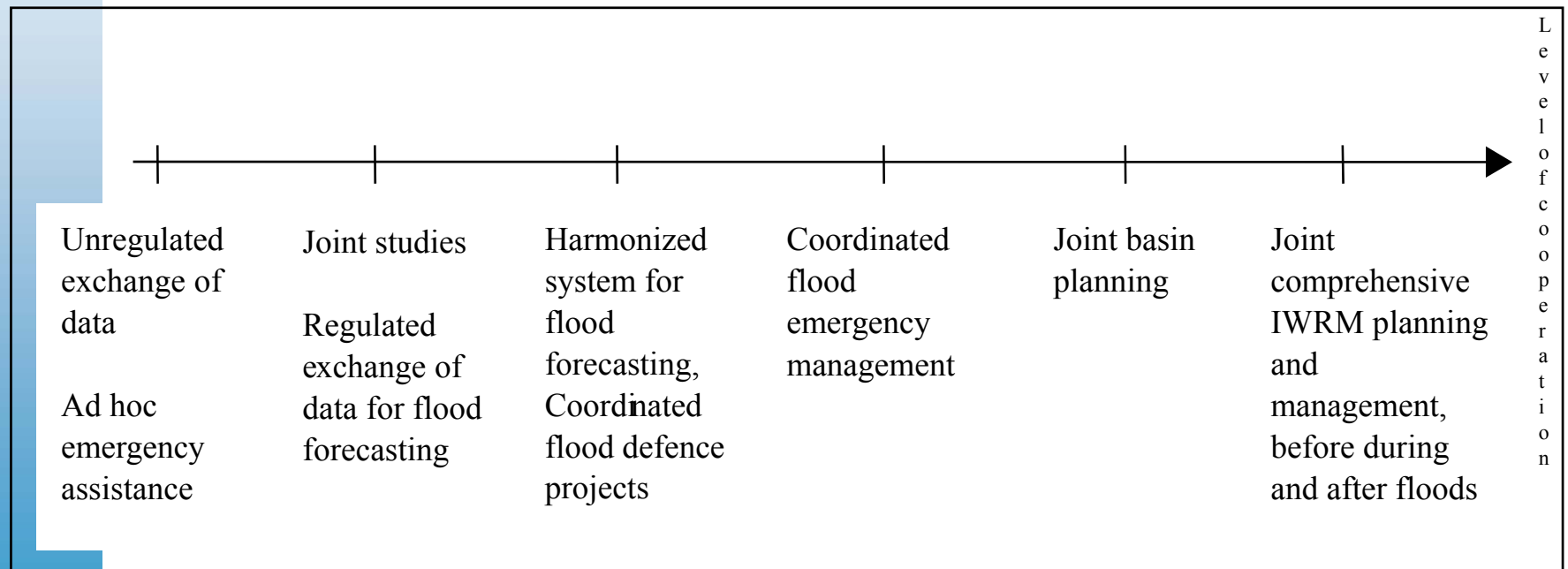
Full range of
structural and
non-structural
measures

**Tool box, select
according to
goals and natural
conditions**

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4. Ensure a participatory approach

- Cooperation evolves over long periods with multiple stakeholders on various administrative levels



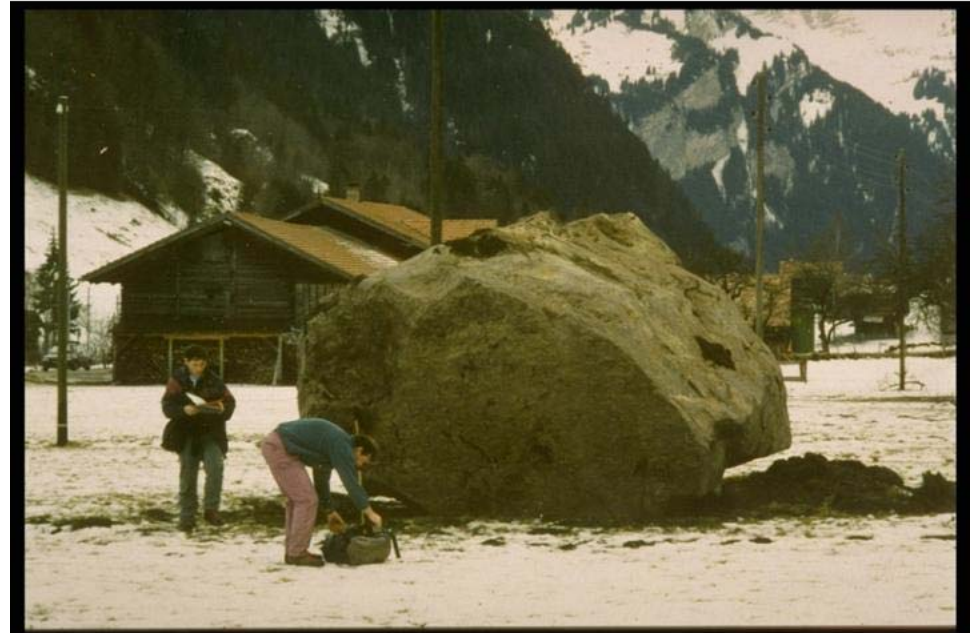
Level of cooperation can be adapted



WMO/GWP
ASSOCIATED
PROGRAMME ON
FLOOD MANAGEMENT

5. Adopt integrated hazard management

There is little sense to save one from flood hazards and expose him to land slides or rockfall





Requirements for an flood management plan

Basin plans are setting the frame. Degree of details depends on the size of the basin. To become operative they must be split into smaller action plans

Any plan must contain

1. Quantitative Objectives
2. Strategy
3. Definition of space
4. Measures
5. Resources
6. Time frame

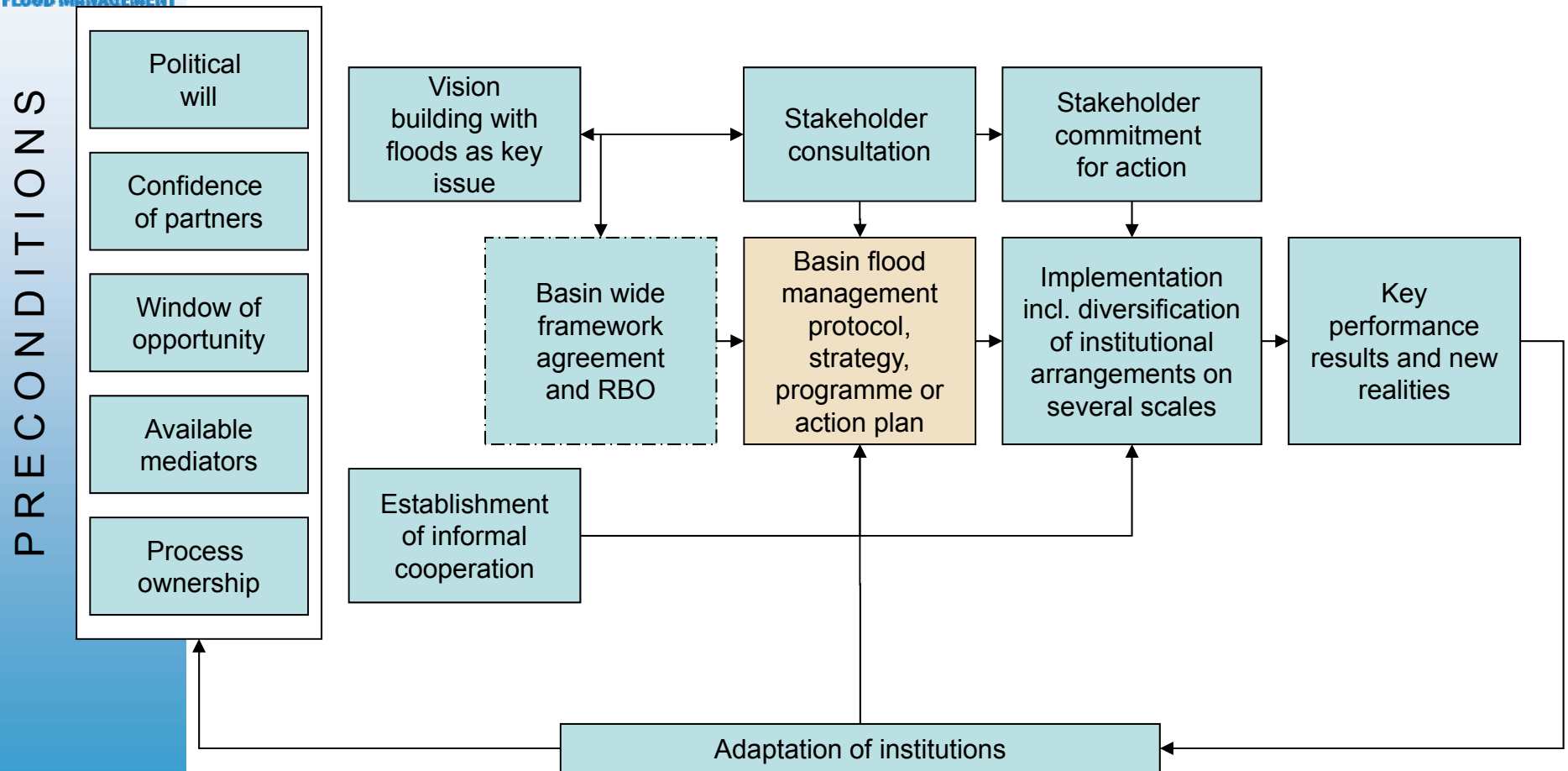
Example

1. Increase of net benefits by xx%
2. Mainly non structural measures
3. Flood plain of yy river
4. Alarm, flood proofing,
5. Persons, Budget
6. Finished in year

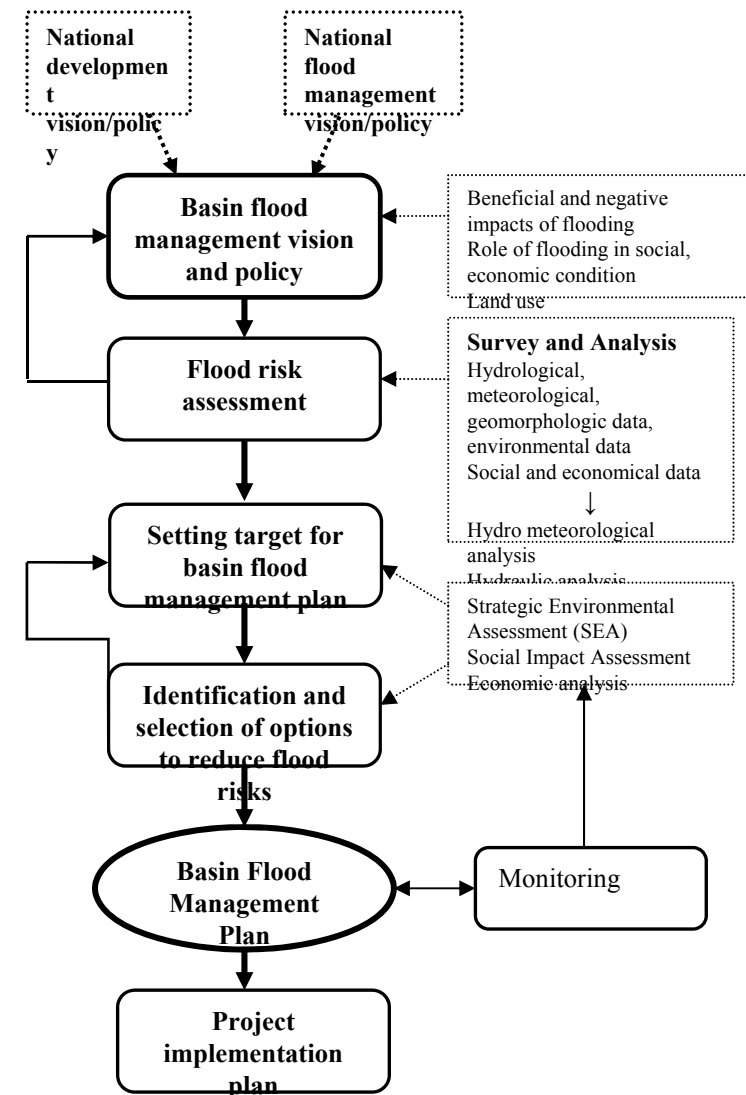
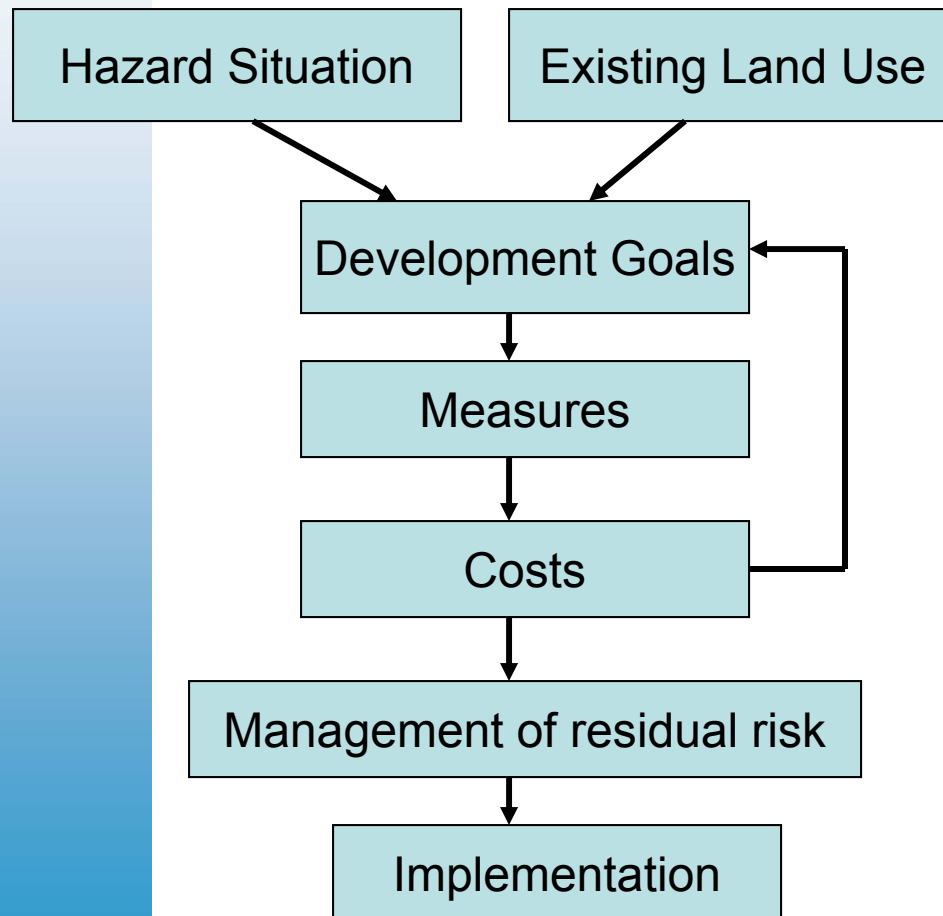
Plans must be continuously updated

To establish a plan a organization is needed

Flood Management Cooperation Process Model



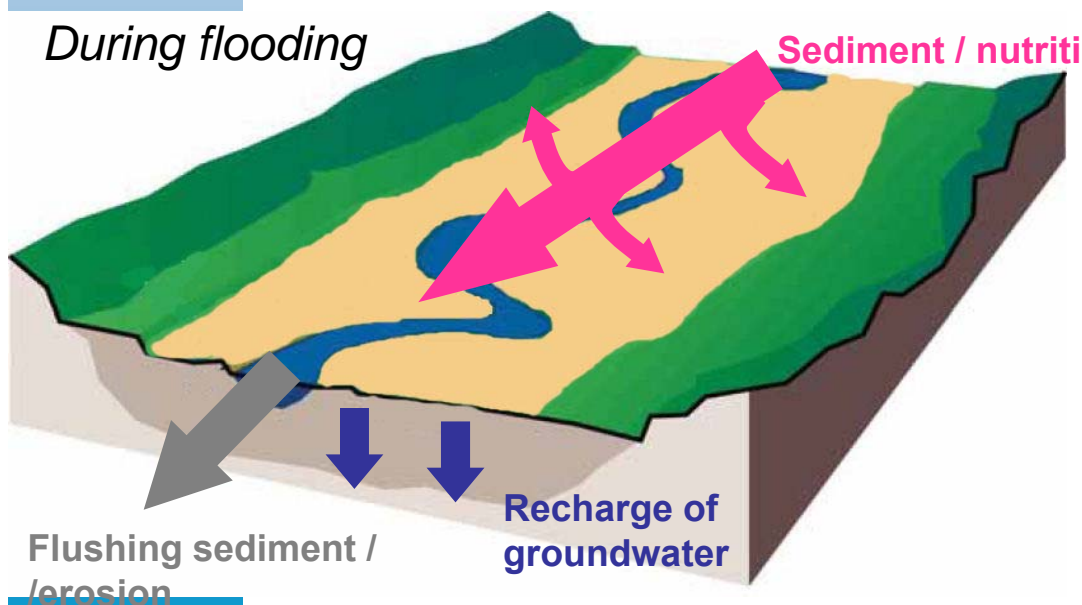
Planning is an iterative Process



Any planning starts with the collection and analysis of data and facts on the hydrologic processes

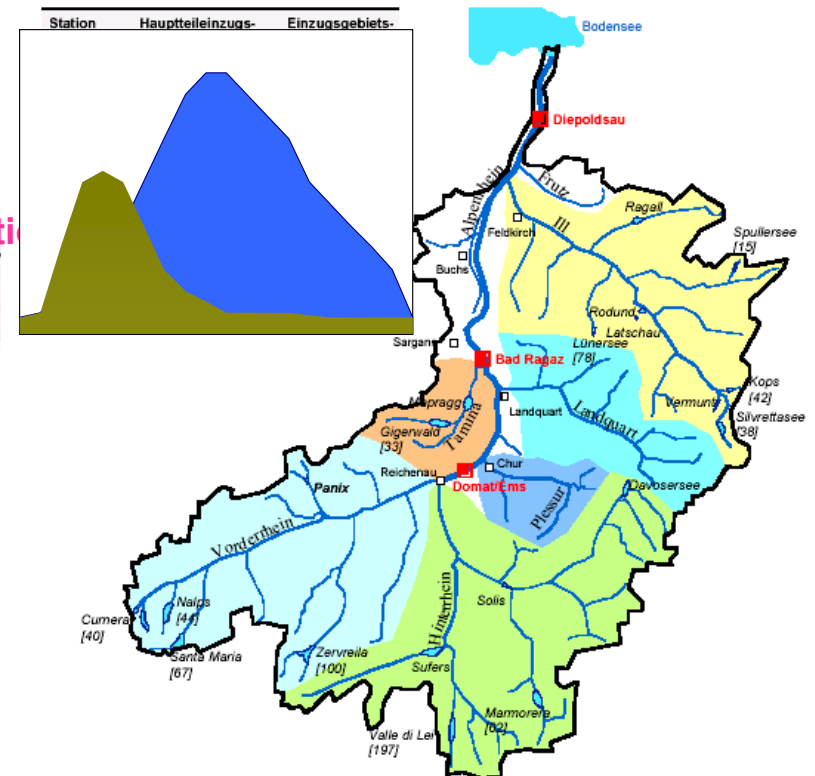


During flooding



Catchment data, Water balance, Hydrographs, **Sediment**

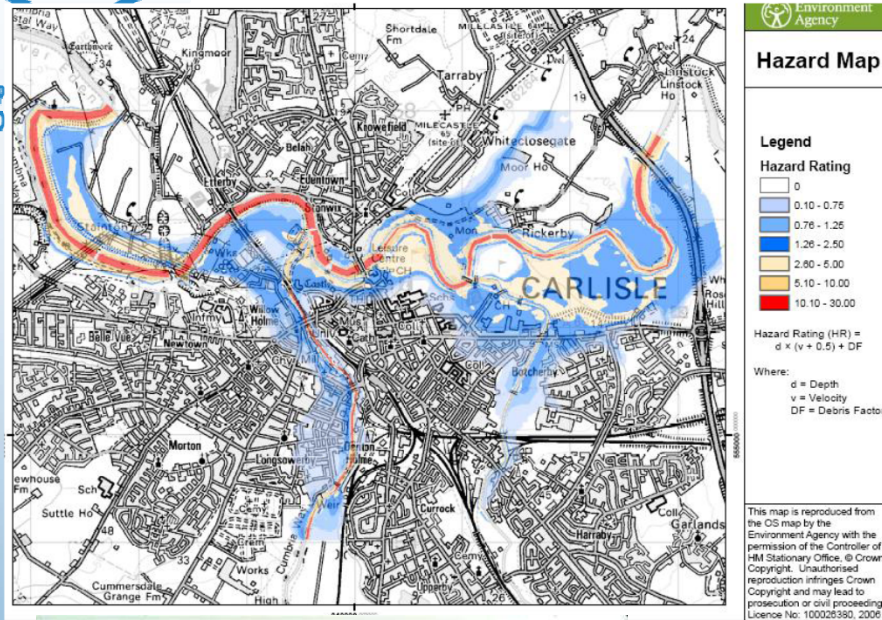
Calculations must be adopted to the needs and not to the available software





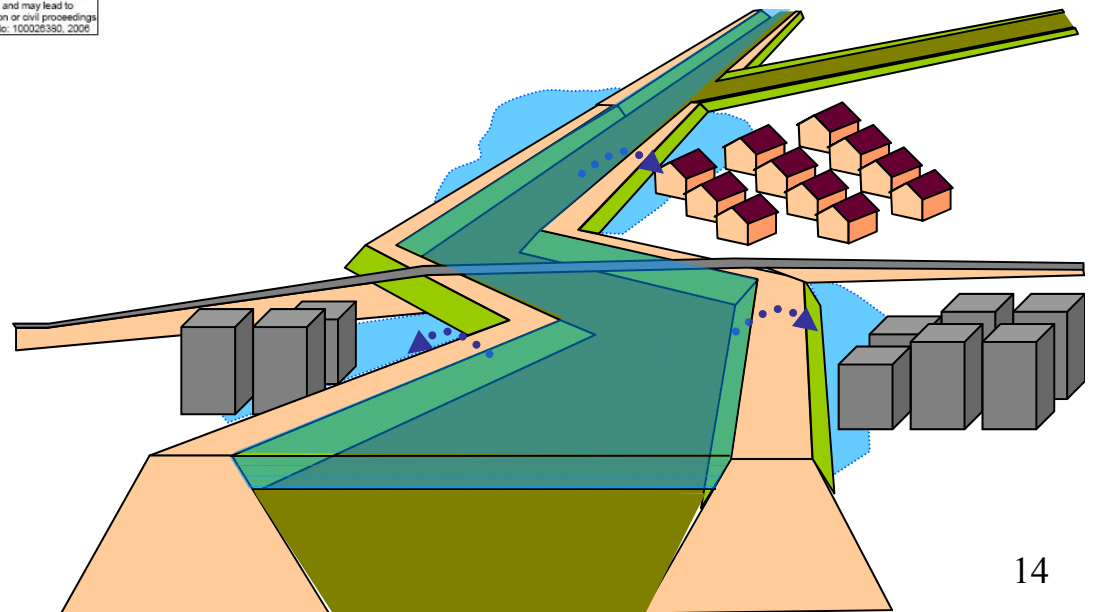
Parallel to the analysis of Basin hydrology and hazards the land use and the risks must be studied

FLO



Land use should not only include risk area but the complete basin including ecosystems

Processes which lead to flooding

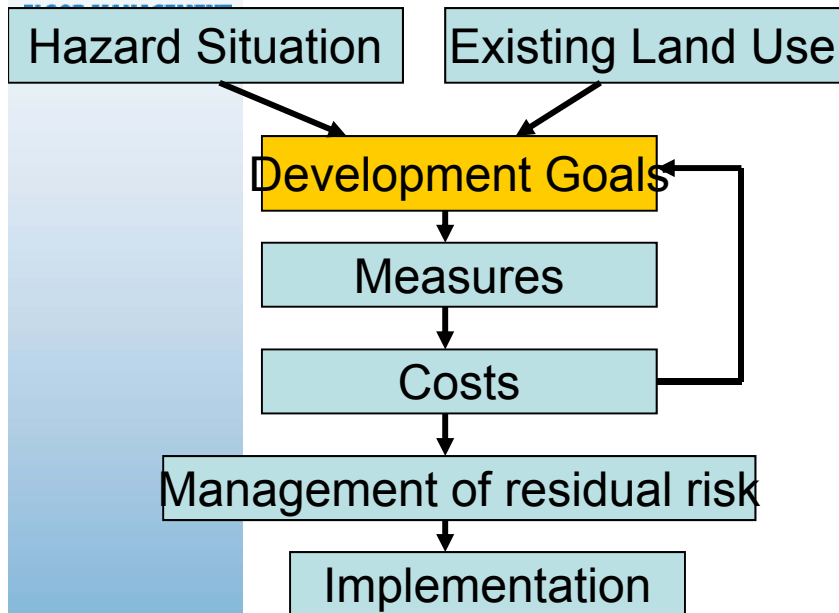




Formulation of goals needs all stakeholders

The needs of ALL stakeholders must be respected:

- 1. Livelihood**
- 2. Safety**
- 3. Sustainability**



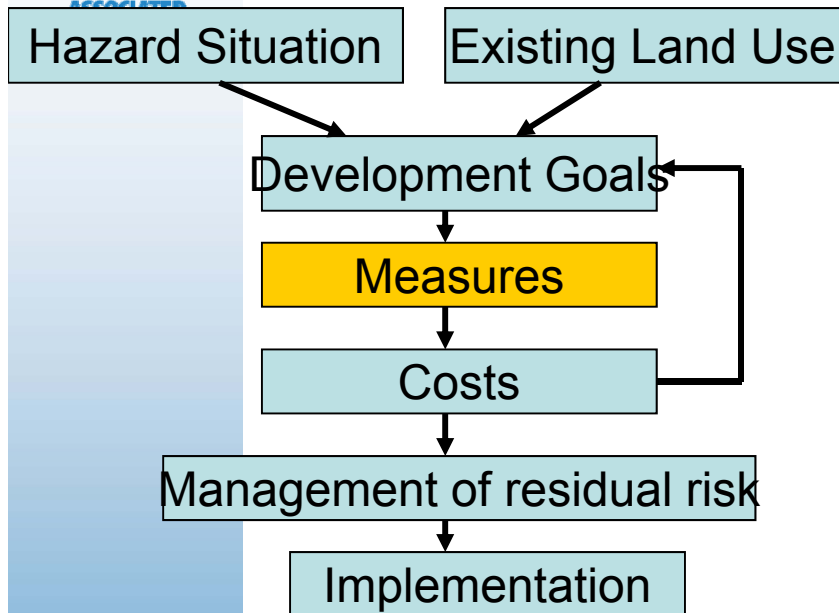
The price we are willing to pay to achieve these goals depends on the values of the society and the economic situation



Pyramid of Needs (After Abraham Maslow)



Information and Awareness raising



Functions

- Educating local communities & individuals in floodplain
- Promoting self-protection mind

Issues

- Attracting local levels
- Requiring well-educated trainers



MEASURES



兵庫県豊岡市

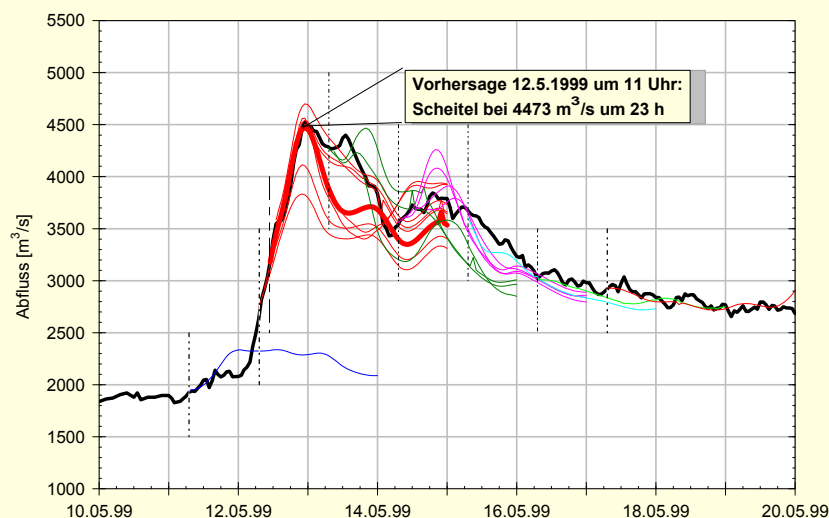
Flood forecasting & early warning

Functions

- Forecasting flood stages
- Warning to local communities

Issues

- Uncertainty in prediction (especially against flash floods)
- Station maintenance
- Cooperation between NMS&NHS
- Get the right response from Receivers of warnings



MEASURES



Emergency Measures: Mobile flood defences



Functions

- Temporary storage of rain water on the floodplain
- Recreation

Issues

- Fitting
- Deployment time

MEASURES



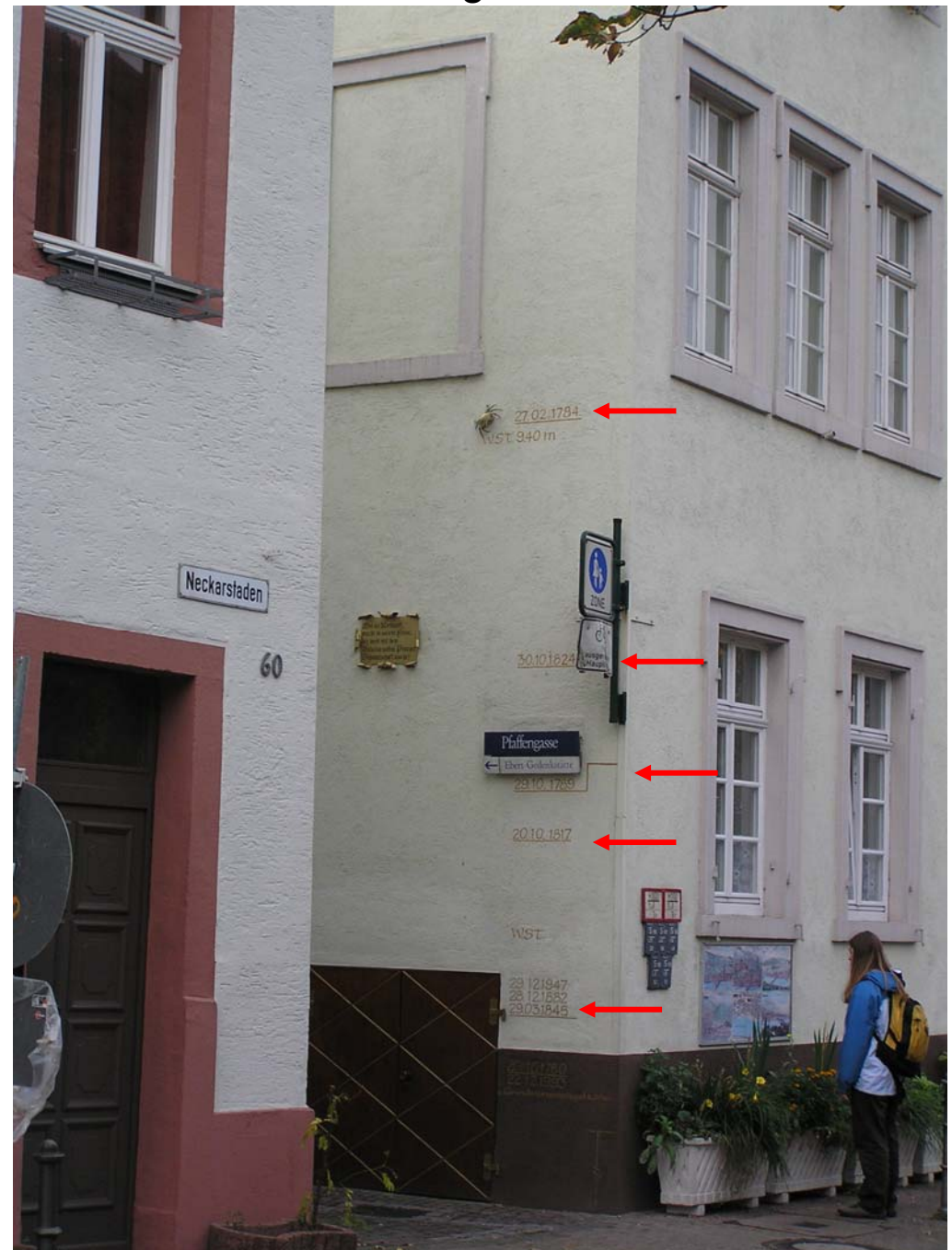
Individual protection

Needs the right information
On the local level:
What can happen where?

Knowledge on the **possible**
impact by visualization at
buildings

The best measure in this
case is a strong building.
Other protection
measures unrealistic

Heidelberg



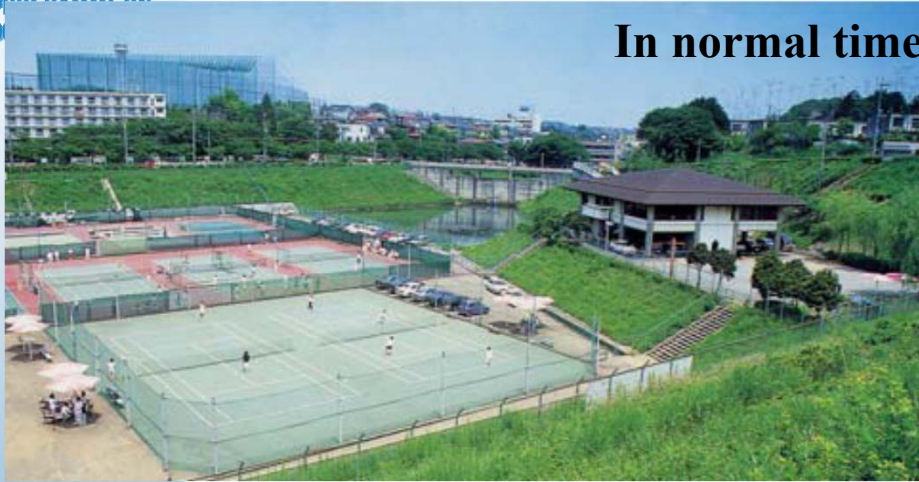
MEASURES



Soft structural measures

Rain water storage

In normal time



In flooding time



Functions

- Temporary storage of rain water on the floodplain
- Recreation

Think in dual use

MEASURES

Structural measures where necessary

A high damage potential and a lack of space requires dikes



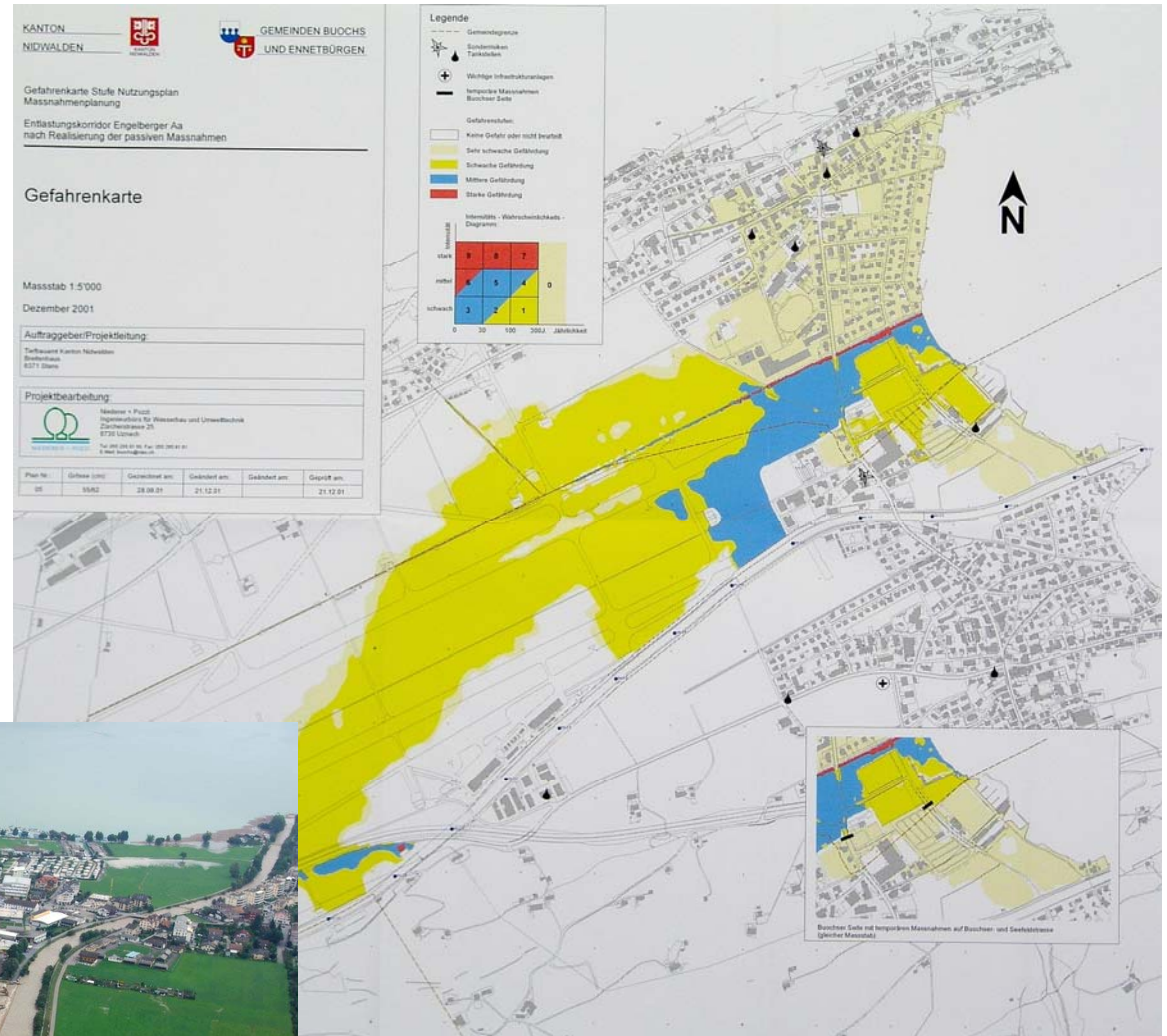
Safety of 2500 working places

MEASURES



Special case Extreme events

Extreme events are so rare that damage can be accepted and costs should be low

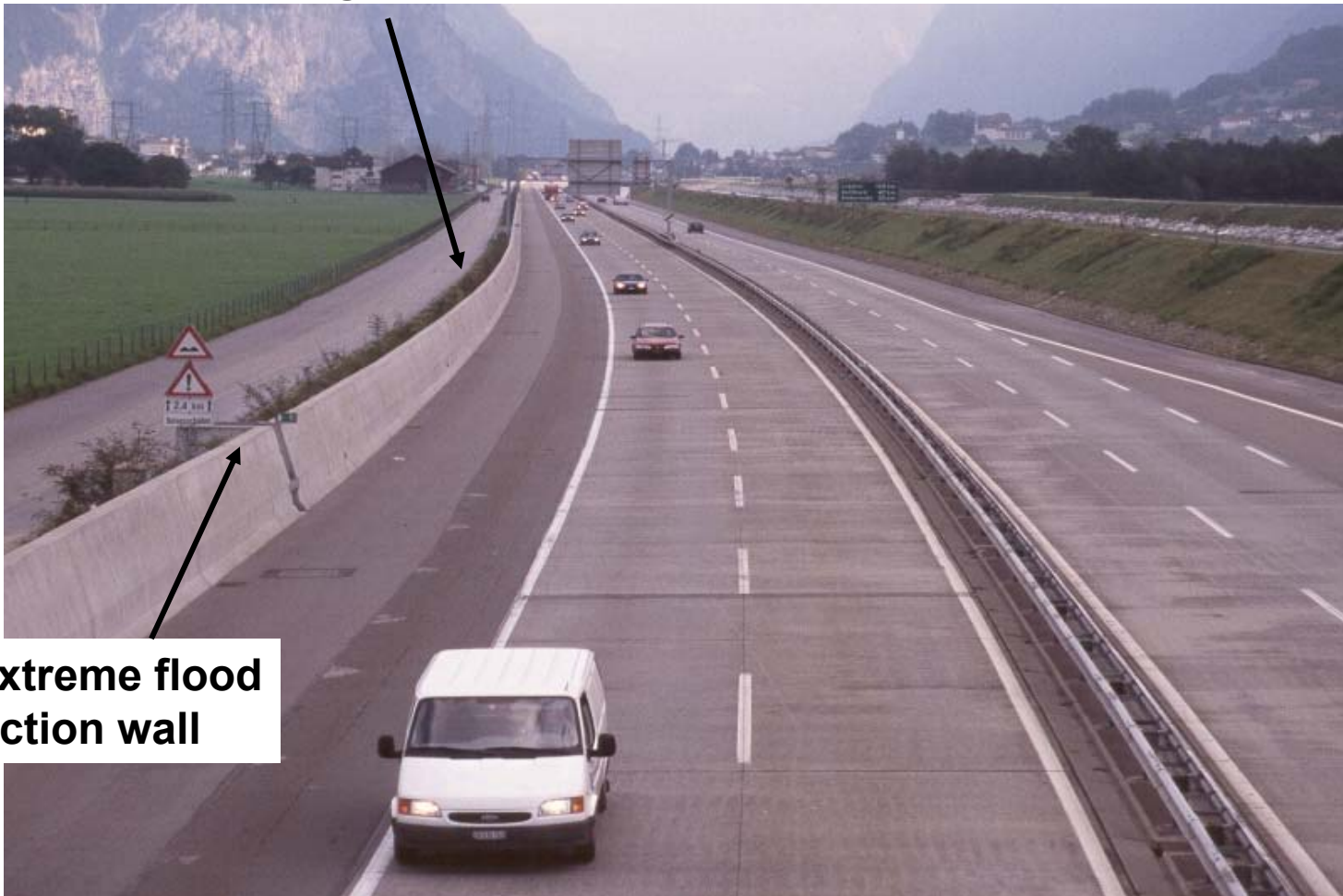


MEASURES



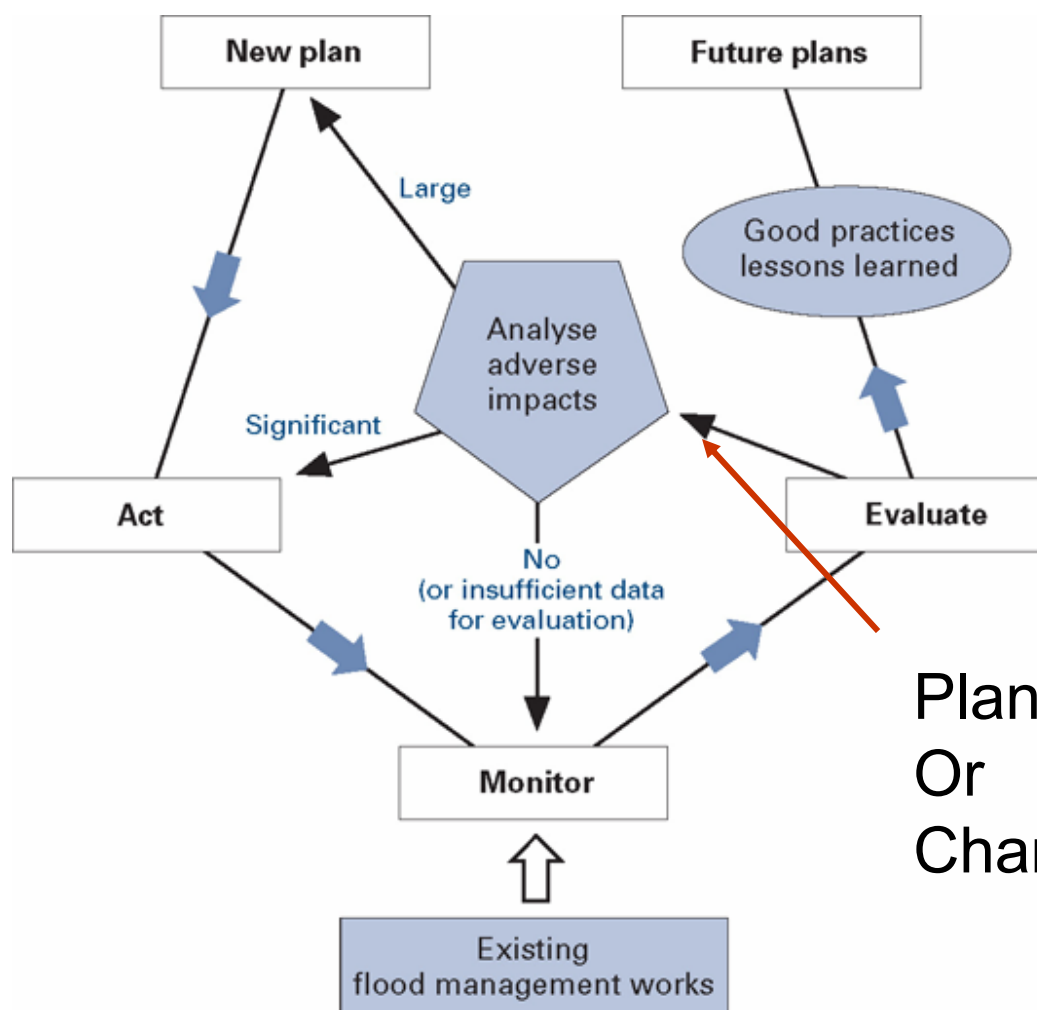
Special case: Extreme events Solutions with dual use

**Wall in normal days;
protection against noise**



**In case of extreme flood
Flood protection wall**

IFM: Adaptive Management



Planning errors
Or
Changes in goals

Remember always

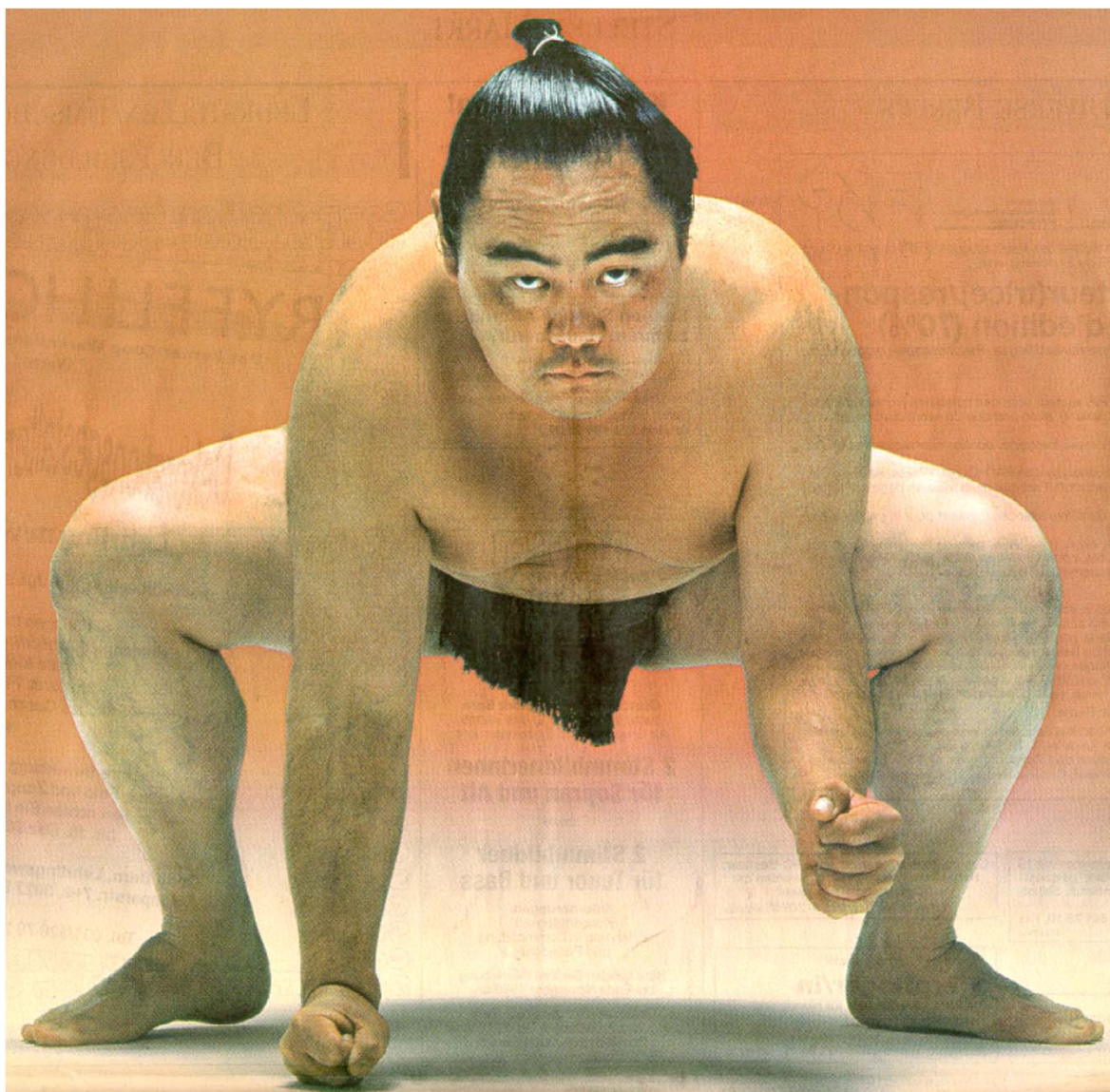
- Floods cannot be fully controlled, it should be accepted as a permanent fact of life;
- it is a perfectly natural phenomenon in terms of probability of occurrence and should be approached following a risk management process;
- Floods is not necessarily a problem as such and do not always lead to situations which require development of capital-intensive flood protection infrastructure;
- A Flood protection effort: attempt to mitigate flood damage.
- Disasters from flooding are the result of a random act of nature combined with poor risk management, uncontrolled development and mis-management of natural resources.



FLOODS

If you do not
find the strong
man, who
stops the
flood,

You have to live
with floods



Not every flooding needs expensive protection.
Sometimes you have to show patience....



*Indonesia
Yogyakarta*

Everywhere a set of measures is applied.

Why not in flood management?



Protection
structures

Protection
structures

Warning Alarm

Thank you for your attention