



Sustainable Flood Management - an overview

**Charles Ainger, Sustainable Development Director, MWH
- for the Scottish Executive and FIAC**

- **What SFM is**
- **Where it may take us**
- **How we'll implement it**

**SCOTTISH FLOODING SUMMIT
Perth, 10th September 2007**



MWH

BUILDING A BETTER WORLD



Evolving the ‘purpose’ of the SFM framework

“*a pragmatic, measurable, universally accepted and clearly understood definition...*” and then:

“*a wide-ranging, top-down framework, that **looked beyond** the current legislation and statutory responsibilities.*”

- act as long-term *vision* and also encourage.. learning
- provide *test criteria* for current or future policies and ..changes
- develop *measurement indicators* to assess progress..
- provide an ‘*audit trail*’ for detailed decision-making..
- improve....by ensuring that *all stakeholders* are involved..

And:

- ensure that *links* are made between...[all the different types of] Plans



What SFM is - Definition

*“Sustainable flood management provides the maximum possible social and economic **resilience*** against **flooding****, by protecting and working with the environment, in a way which is fair and affordable both now and in the future.”*

(* **‘resilience’** means: *‘able to recover quickly and easily’*. This approach can be used to deliver the National Flooding Framework ‘four As’:

Awareness + Avoidance + Alleviation + Assistance)

(** ***flooding*** means all types of flooding: surface (pluvial), sewer, river, groundwater, estuarine and coastal)



(Strathclyde)

And then: **Objectives**, and **Principles**



What SFM is: Objectives – *what* is to be achieved:

1. **Overall** – meet needs for flood resilience.

To meet this overall objective, the following needs must be balanced:

2. **Social** – enhance community benefit with appropriate access for everyone

3. **Environment** - Protect and work with the environment with respect for all species, habitats, landscapes, and built heritage

4. **Economic** – deliver resilience at affordable cost (construction, maintenance, running and renewal); with fair economic outcomes

5. **Future generations** – allow for future uncertainty, with a fair balance between meeting present needs and those of future generations.



Principles – *how* objectives might be delivered:

- 1. Strategic:** should reflect a strategic approach both nationally (across Scotland) and locally (within River Basin Management Plans)
- 2. Responsibilities:** all stakeholders share responsibility and should be actively engaged in and share responsibility for achieving SFM. ..
- 3. Options Appraisal:** ..consider sustainability issues from the earliest stages
- 4. Uncertainty:** A long-term view of sustainability means acknowledging and taking account of current and future uncertainties ..
- 5. Multiple Benefits:** ..seek opportunities for multiple benefits, but also cover costs and frequency of loss ..and seek wider funding
- 6. Openness:** ..process should be transparent; [with] ..shared..information
- 7. Democracy:** ..promote effective community engagement. Decisions ..at local level
- 8. Simplicity:** ..should be understandable, [with] ..ease of delivery..



Objective 5: Future Generations - Allow for future adaptability, with a fair balance between meeting present needs and those of future generations

Detailed meaning	Draft Measurement Indicators	Status	National Scale Measures
(i) Allowance for increased precipitation, storms or sea level rise (as a result of climate change)	(i) Composite indicator (expressed as percentage of current conditions), which includes changes in precipitation, sea level rise and storminess, and is a proxy for...	Potentially measurable subject to the results of research	Cumulative net headroom as percentage of design total, weighted by catchment area.
(ii) Allowance for increased or decreased 'catchment' response	(ii) Change in average runoff coefficient (expressed as percentage of current)	Potentially measurable subject to the results of research	Cumulative net headroom as percentage of design total, weighted by catchment area.
(iii) Cumulative net headroom as percentage of design total, weighted by catchment area.	(iii) Net headroom expressed as percentage of design total	Potentially measurable subject to the results of research	Cumulative net headroom as percentage of design total, weighted by catchment area.
(iv) Maximising natural capacity for flood response	(iv) Flood plain storage (m ³ and %age of 'natural' floodplain retained), and floodplain channel capacity (m ³ /s and %age of 'natural' channel retained)	Potentially measurable subject to the results of research	Percent of 'natural capacity' retained, for each type of flooding, weighted by area impacted by flooding
(v) Future affordability of continuing resilience	(v) Composite indicator taking into account design life, discount rate and predicted change in local income/wealth over time	Potentially measurable subject to the results of research	Cost-weighted average
(vi) Fail safe provision for design flood exceedence	(vi) Statement of the expectation, and estimate of the relative effect of exceedence – catastrophic, severe, minor	Facts?	Aggregated sum of exceedence risks weighted by population served by each proposal

[Various notes omitted for lack of space - see website]



Where it may take us: urbanisation pressures and rainfall increases?

Given these trends, unlikely that 'rural' catchment changes and engineering alone can cope

So: we will need to reclaim and re-design urban flood plains for flood resilience



- greater flood tolerance
- flood proofing
- un-culverting
- SUDS etc





How does the SFM framework help?

Objective 5: Future

Allow for future uncertainty...

Detailed Meaning:

- (i) Allowance for **increased** rainfall, storms or sea level rise
- (ii) Allowance for increased or decreased 'catchment' response
- (iii) '**Headroom**' potential, as the net result of both (i) & (ii)

.. with a fair balance between meeting present needs and those of future generations

Detailed Meaning:

- (iv) Maximising **natural capacity** for flood response (e.g. **flood plain storage & channel capacity**)
- (v) Future affordability of continuing resilience
- (vi) Fail safe **provision** for design **flood exceedance**

*Drives **against** 'paving the countryside', and **for** reclamation of urban flood plains for flooding*



Where it may take us: 'fair outcomes' within affordability?

- Personal - death
- Personal - injury
- Personal - shock
- Family treasures, memories, pets and key records
- Favourite house & garden 'features'
- Having to stay elsewhere
- Other furniture, garden & house structure
- House 'equipment', car
- Travel interruptions
- Commercial losses

Irreplaceables:
everybody suffers,
equally?

A basic human
right, to secure
these?



[Boscastle
2004
- BBC
Online]

Replaceables:
Those who own
most suffer
most?

Owners can afford to
pay for protection
&/or insurance?



How does the SFM framework help?

Objective 1: Overall

Meet needs for flood resilience.

Detailed Meaning:

Reduce the total sum of flooding impacts over time, to an agreed level:

- (i) Personal social impact (death and injury, evacuation, shock, and distress); **Irreplaceable**
- (ii) Potential damage to personal, commercial or public property;
- (iii) Travel interruptions ;
- (iv) Commercial/industrial losses and infrastructure disruption

Replaceable

Objective 2b: Social

..with appropriate access for everyone

Detailed Meaning:

- All those at risk **have appropriate access to the benefits** of SFM (reduced impacts); and.

*Strong on 'Irreplaceables',
and on fair outcomes*



How to implement it: responsibilities for catchment strategy planning for SFM ?

What organisational structure[s], resources and funding should we use,, and how does CSP fit with the other SFM roles?

- how do we implement catchment strategy planning?
- how it might fit with RBMPs (SEPA)?
- who should be responsible for EC Floods Directive flood plans?
- should/how might they then be coordinated at a national level?
- if so who should be responsible and what powers should that 'body' have?
- could different organisations be responsible for leading the information, planning, implementation, and emergency response roles?



(Strathclyde)



Sustainable Flood Management - an overview

What it is

- *a sentence definition, 5 objectives (what?), 8 principles (how?)*
- *with outline measurement proposals - to be evolved*

Where it may take us

- *pro-active strategies, possible prioritisation tool*
- *will provide best flood resilience, with fairness and affordability*

Next steps

- *SEA being prepared; SEA, partial RIA and consultation paper out to public consultation at end of 2007*
- *will review lessons from best practice examples*
- *feed into consultation process for new legislation*

[*What is SFM? Paper: [Http://www.scotland.gov.uk/Resource/Doc/1223/0028633.pdf](http://www.scotland.gov.uk/Resource/Doc/1223/0028633.pdf)*]



Thanks for listening

Contacts:

- Debi Garft,
Scottish Government: Debi.Garft@scotland.gsi.gov.uk
- Charles Ainger, MWH: charles.ainger@mwhglobal.com

Scottish Government FIAC Website:

<http://www.scotland.gov.uk/Topics/Environment/Water/Flooding/advisory-groups/fiac>