Defra / Environment Agency
Flood and Coastal Defence R&D Programme

Flood Risk Assessment Guidance for New Development

Phase 2

Framework and Guidance for Assessing and Managing Flood Risk for New Development – An Overview

R&D Technical Report FD2320/TR1

Environment Agency

defra
Department for Environment
Food and Rural Affairs

Defra / Environment Agency
Flood and Coastal Defence R&D Programme

Flood Risk Assessment Guidance for New Development
Phase 2

Framework and Guidance for Assessing and Managing Flood Risk for New Development – An Overview

R&D Technical Report FD2320/TR1

October 2005

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Statement of use
This report provides an overview of the framework for assessing and managing flood risk for new development and the guidance and tools produced to support this framework. Full details can be found in Technical Report 2 (FD2320/TR2).

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EXECUTIVE SUMMARY

This research and development (R&D) project was carried out as part of the Joint Defra/Environment Agency (EA) R&D Programme for Flood and Coastal Defence, under the theme of Risk Evaluation and Understanding Uncertainty.

Defra and the EA identified a need for a framework that would be based on a robust risk-based approach, to assist practitioners in undertaking appropriate assessments of flood risk for new development and also enable improved decision-making, by improving transparency and accountability.

Project FD2320 has developed such a framework by simplifying existing processes, guidance and tools and integrating these with the latest findings from research projects.

In summary, the framework provides the following:

- Links between the different decision-scales (i.e. national, regional, sub-regional, local or site-specific) and different assessment types, such as National Flood Risk Assessments (NaFRA), Catchment Flood Management Plans (CFMPs), Shoreline Management Plans (SMPs) and strategic or site-specific Flood Risk Assessments (SFRAs and FRAs respectively).
- Links to the related activities of flood risk management planning and Sustainability Appraisals.
- Directs users to the latest R&D and new or existing guidance and tools, identifying gaps in understanding of flood risk and development that will be filled by ongoing R&D projects.

At the core of the framework is a generic approach that can be applied at all decision scales. This has been based on the *Guidelines for Environmental Risk Assessment and Management* (DETR *et al.*, 2000), which is generally recognised within the UK as the best practice approach to assessing and managing environmental risk. This approach has already been adopted in the Flood and Coastal Defence Project Appraisal Guidance (MAFF, 2000) and refined by the Risk Assessment for Strategic Planning (RASP) methodology (Sayers *et al.,* 2002). Therefore, the basis of the framework is wholly consistent with current Defra and Environment Agency practices.

The guidance that accompanies the framework has been provided in two parts:

a) A set of **decision guidance** to enable users to determine:
- What information is needed for a particular development planning scale,
- Which flood risk indicators can be used as part of the decision-making process, and
- Which types of assessment of flood risk can be used to provide the required information.

b) A set of **support guidance** to enable effective use of the framework, including:
- How to use/navigate the framework,
- How to manage the assessment processes (i.e. reporting, information management, auditing and control, stakeholder engagement and linkage to statutory requirements), and

- Key issues identified during the consultation exercises as worthy of separate guidance (i.e. climate change, risks to people behind defences, safe access and exit, brownfield development and mitigation measures).

A lot of the guidance produced by this project should only be considered as interim, based on the science currently available, and should be updated or added to in the future. The framework and guidance have been designed with this in mind by being in a modular format for easy access and amendment.

At the present time, the project outputs should only be considered as R&D recommendations; they do not represent the policies of Defra, the Office of the Deputy Prime Minister or the EA. However, some of the guidance and tools are useful to support practitioners in the short-term and this is being encouraged.

The project outputs need to be tested and parallel policies and practices need developing by the relevant stakeholder groups. This was outside of the scope of the project. However, the project has provided recommendations regarding how the project outputs should be taken forward over the short and medium to long terms.

This project has resulted in the following:

- An improved means of communicating risk-based approaches outside the R&D community, with particular emphasis on consistency of terminology and the use of plain English as much as possible.
- An improved understanding of the practical application of risk-based approaches within development planning.
- An improved understanding of the relationships between development planning (at all decision scales) compared to flood risk management planning (undertaken by Defra, the EA and other flood defence authorities).
- A recognition that the majority of current guidance is still applicable, if not taking full advantage of latest R&D. Where current guidance is still recommended, the outputs from this project can be used to add value by improving transparency, confidence and accountability in the decision-making processes.

This report (Technical Report 1) is intended as an introduction to the framework for those using it for the first time. It can also be used as an aid for regular users to determine which guidance and tools they need to refer to in a given circumstance.

The framework, guidance and tools are provided in full in Technical Report 2 (FD2320/TR2) – *Framework and guidance for assessing and managing flood risk for new development – Full documentation and tools*. To maximise usability, to enable more effective implementation and to provide a means to update and control the framework and guidance once implemented, the guidance notes and tools have been designed to be viewed digitally as separate, but linked, modules. Therefore, **a "digital version" of all guidance notes and tools is also available and it is recommended that the digital version is used on a day to day basis rather than referring to the large single volume report.** The modular versions of the guidance notes and the digital tools have been provided as part of the project deliverables on CD-ROM and are also provided on the Defra/EA R&D website.

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Appendices

1. INTRODUCTION

1.1 Purpose of the Project

Unwise property development can increase flood risk. Understanding and reducing flood risks associated with new developments is a high priority for Government and the Environment Agency (EA).

Planning Policy Guidance 25 (DTLR, 2001) and Technical Advice Note 15 (National Assembly for Wales, 2004) recognise the need for flood risk to be considered at all stages of the planning and development process in England and Wales.

Although both documents have provided a major step forward in encouraging a risk-based approach to development planning, it was clear at the outset of this project that some significant questions remained, including the following:

- How can these guidelines be interpreted and applied effectively (both at the local and site-specific scales) with proportionate effort in relation to the scale of the development and the scale of the flood risk?
- How can the flood risk issues raised by proposed development be considered on a wider spatial planning scale (i.e. at national, regional or sub-regional scales) and vice versa?
- How can other studies and plans carried out by the Government, the EA and other Operating Authorities (such as Catchment Flood Management Plans - CFMPs, Shoreline Management Plans - SMPs, etc.) usefully influence and contribute to assessments of flood risk required for development planning and vice versa?
- How can practitioners take full advantage of advances in science, policy and new guidance without being overwhelmed with information?

The project identified a need for a framework that would be based on a robust risk-based approach, to assist practitioners in undertaking appropriate assessments of flood risk and also enable improved decision-making, by improving transparency and accountability. The project has developed such a framework by simplifying existing processes, guidance and tools and integrating these with the latest findings from research projects.

1.2 Purpose of this Report

This report provides an overview of the framework, guidance and tools, which are provided in full in Technical Report 2 (FD2320/TR2) – *Framework and guidance for assessing and managing flood risk for new development – Full documentation and tools*.

This report is intended as an introduction to the framework for those using it for the first time. It can also be used as an aid for regular users to determine which guidance and tools they need to refer to in a given circumstance. However, reference should be made to TR2 for specific guidance and tools.

2. THE FRAMEWORK

2.1 Purpose of the Framework

The purpose of the framework is to link the three main aspects of flood risk assessment and management for new developments, as illustrated in Figure .1.

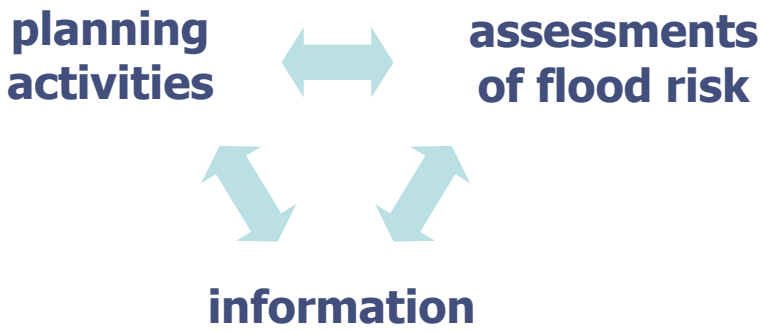


Figure .1 Aspects of the Framework

The framework provides the context for and the links between the following:

- Decision scales for new development, these being:
  - National,
  - Regional,
  - Sub-regional,
  - Local, and
  - Site-specific

- Types of assessment of flood risk, these being:
  - National Flood Risk Assessments (NaFRA),
  - Catchment Flood Management Plans (CFMPs),
  - Shoreline Management Plans (SMPs),
  - Strategic Flood Risk Assessments (SFRAs), and
  - Site-specific Flood Risk Assessments (FRAs).

- Related activities of flood management planning and Sustainability Appraisals.

The framework directs users to the following:

- The latest research and development
- New or existing guidance
- New or existing tools

The framework also identifies gaps that will be filled by ongoing R&D projects.

2.2 Basis of the Framework

The information management method that has been adopted to develop the framework is known as the Business Elements Method, developed at the London School of Economics, in conjuncture with HR Wallingford. This method is able to encompass all aspects of the work, including supply chains, roles and responsibilities, monitoring and control procedures, as well as data handling and assessment methods. The method

incorporates sound tools and techniques that have been successfully applied in many settings (Millard and Sayers, 2000).

At the core of the framework is a Generic Approach that can be applied at all decision scales. This has been based on the DETR report *Guidelines for Environmental Risk Assessment and Management* (DETR, 2000a), which is generally recognised within the UK as the best practice approach to assessing and managing environmental risk. This approach has already been adopted in the Flood and Coastal Defence Project Appraisal Guidance (MAFF, 2000) and refined by the Risk Assessment for Strategic Planning (RASP) methodology (Sayers *et al.,* 2002). Therefore, the basis of the framework is wholly consistent with current Defra and Environment Agency practices.

The Generic Approach is also consistent with the HM Treasury Principles of Managing Risks to the Public (HM Treasury and Cabinet Office, 2004).

2.3 Structure of the Framework

The framework has five parts:

- Generic Approach
- Activity Chart
- Information Chart
- Guidance Documents (Decision Guidance and Support Guidance)
- Tools

The relationships between these parts are illustrated in the Figure .2. These five parts are described in more detail in the remainder of this report.

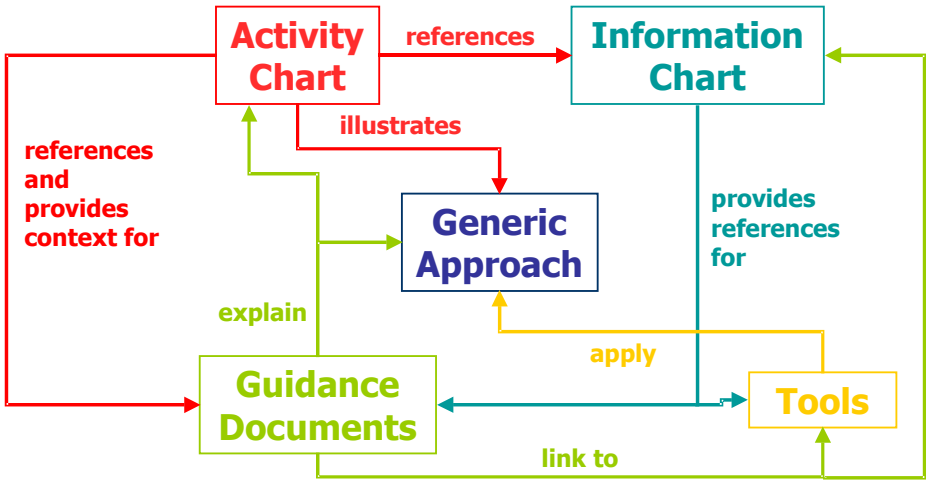


Figure .2 Relationships between Framework Parts

3. ACTIVITY CHART

3.1 Purpose of the Activity Chart

The Activity Chart encapsulates on a single sheet the principles of the framework and the guidance that supports it. If used in conjunction with the Information Chart, it enables the user to access all parts of the framework quickly and easily. A copy of the Activity Chart is provided in Appendix A of this report.

The concept of the Activity Chart has been developed in such a way as to enable conversion into a web-based tool that will enable the full guidance documents, associated tools and information to be accessible directly behind the boxes on the chart. This product could be developed as part of the implementation of the project.

3.2 Structure of the Activity Chart

The Activity Chart is split into 4 parts as shown in Figure .3. All parts inter-relate and where a user might wish to start will depend on the user's needs.

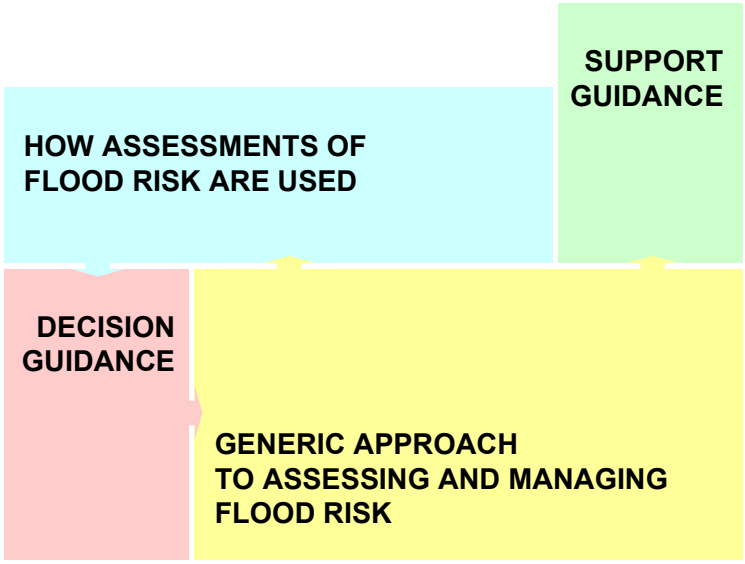


Figure .3 Layout of the Activity Chart

- The Generic Approach is described in Section 4 of this report.
- How assessments of flood risk are used is explained in Section 5.
- A summary of the Decision Guidance is provided in Section 6.
- A summary of the Support Guidance is provided in Section 7.

3.3 How to Use the Activity Chart

The Activity Chart is intended to be self-explanatory, if symbols are checked against the relevant key.

The Activity Chart is best viewed as a digital PowerPoint Slide Show. This enables the user to utilise the hyperlinks to enlarged versions of the boxes, which in turn provide hyperlinks to the guidance notes and tools. Instructions for navigating the digital version are included in the digital file.

4. THE GENERIC APPROACH

4.1 Purpose of the Generic Approach

The Generic Approach can be applied at all decision-making and assessment scales either by those undertaking the decision-making or those undertaking the assessments.

A single approach is required, because the decision-making and assessment processes are iterative. It is important for assessments to be designed to suit the decision-making needs.

The Generic Approach enables:

- Those undertaking assessments to determine how to carry out an appropriate assessment,
- Those reviewing assessments to determine whether the assessment has been carried out appropriately,
- Those undertaking the decision-making to use the results of the assessment appropriately, and
- Those reviewing the decision-making to determine whether the decision-makers have used the results of the assessment appropriately.

It should be noted that not all elements of the Generic Approach need to be undertaken in detail depending on the type of assessment being undertaken (i.e. NaFRA, CFMP, SMP, SFRA or FRA) and the level of detail (i.e. coarse, intermediate or detailed). The Decision Guidance provides further details of how to interpret the Generic Approach in different circumstances.

4.2 Structure of the Generic Approach

This approach has been developed into a series of simple, user-friendly processes, which can be applied to any type of assessment of flood risk. There are 5 processes, as listed below.

- Process 1 – Problem Formulation
- Process 2a – Tiered Risk Assessment
- Process 2b – Stages of Risk Assessment
- Process 3 – Options Appraisal
- Process 4 – Monitoring and Review

These processes have been drawn up into a series of flow-charts. A key for the flow-charts is provided in Figure .4. The different elements of each process are shown in Figure .5 and Figure .6.

Each process has been subdivided into **process parts**, these being the key activities that make up the process. Sometimes (but not always) a breakdown is provided of the tasks or issues that should be considered during a process part. These have been called **process tasks**.

Each process part has been given a unique reference, e.g. 1.1, which enables cross-referencing to an Assessment Check-list that has been provided as a tool (see Section 8).

An additional grey box in the left-hand corner of each process box indicates to which part of the Strategic Environmental Assessment (SEA) process these activities would usefully contribute.

A letter S in an orange circle has also been used to indicate where it is recommended to have stakeholder involvement.

Green and magenta symbols have also been given to some of the process tasks to identify links or parallel processes within Flood Management Planning or Sustainability Appraisals respectively.

Further details of SEAs, Sustainability Appraisals and stakeholder engagement are provided in the Support Guidance (see Section 7.4).

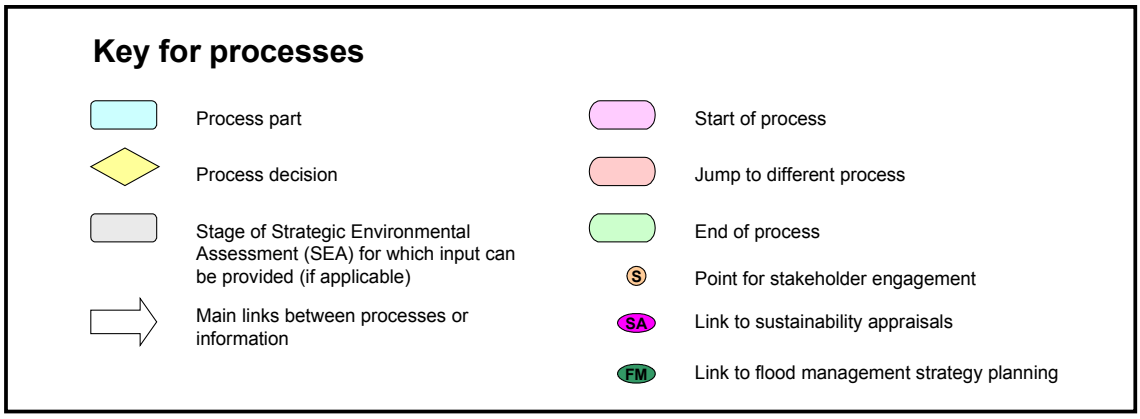


Figure .4 Key for Generic Approach Flow-Charts

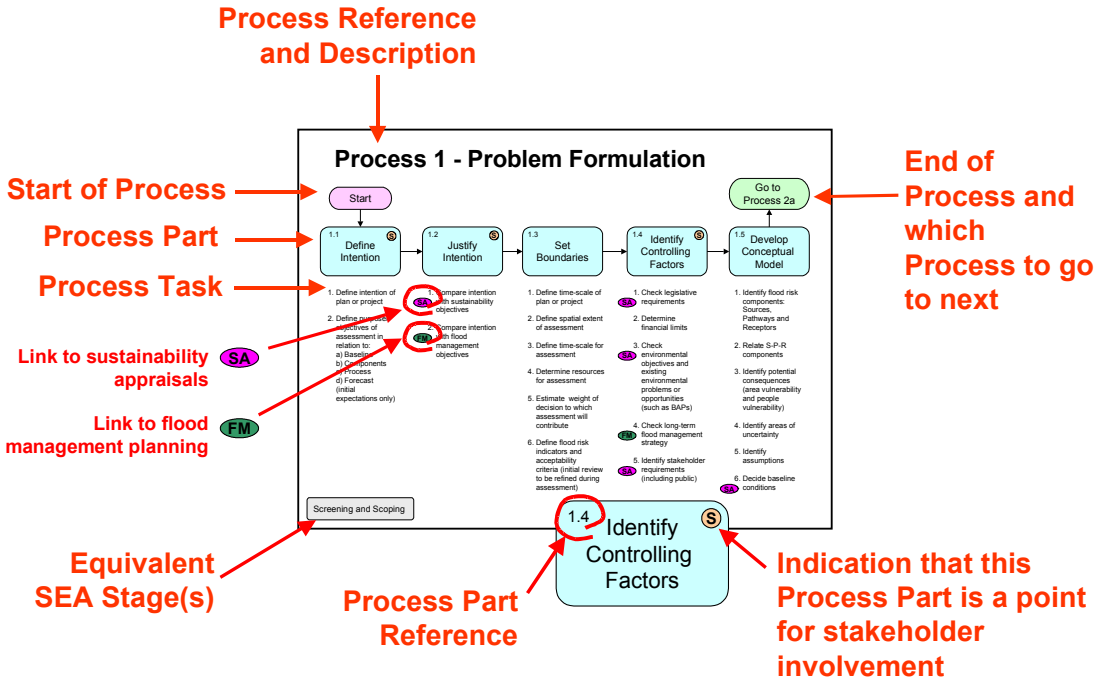


Figure .5 First Example of Process Box

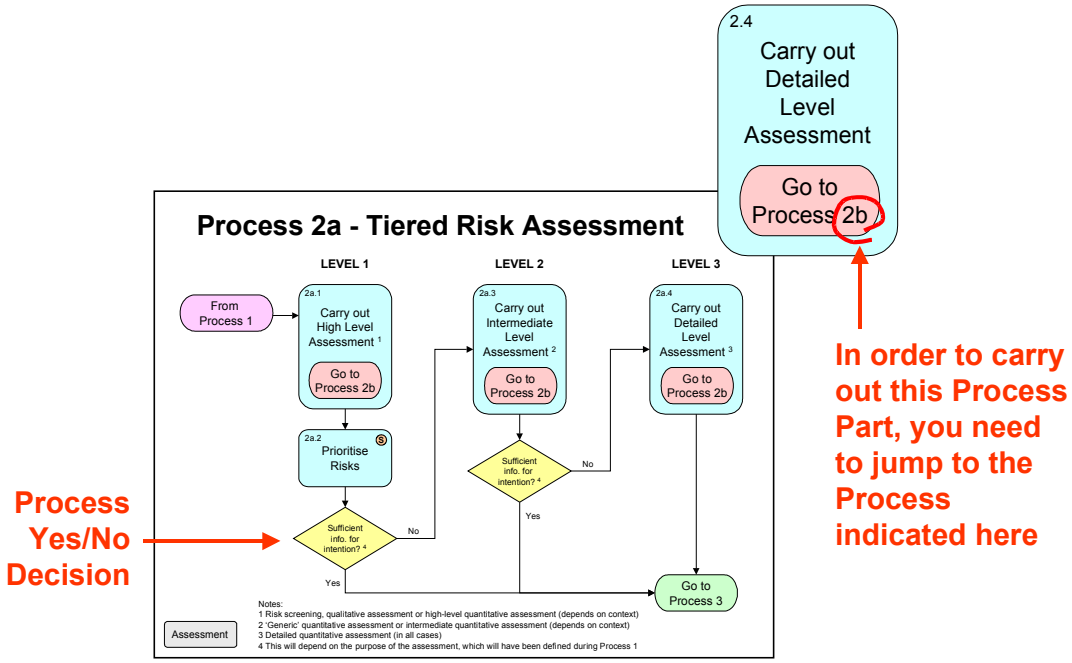


Figure .6 Second Example of Process Box

4.3 Process 1 – Problem Formulation

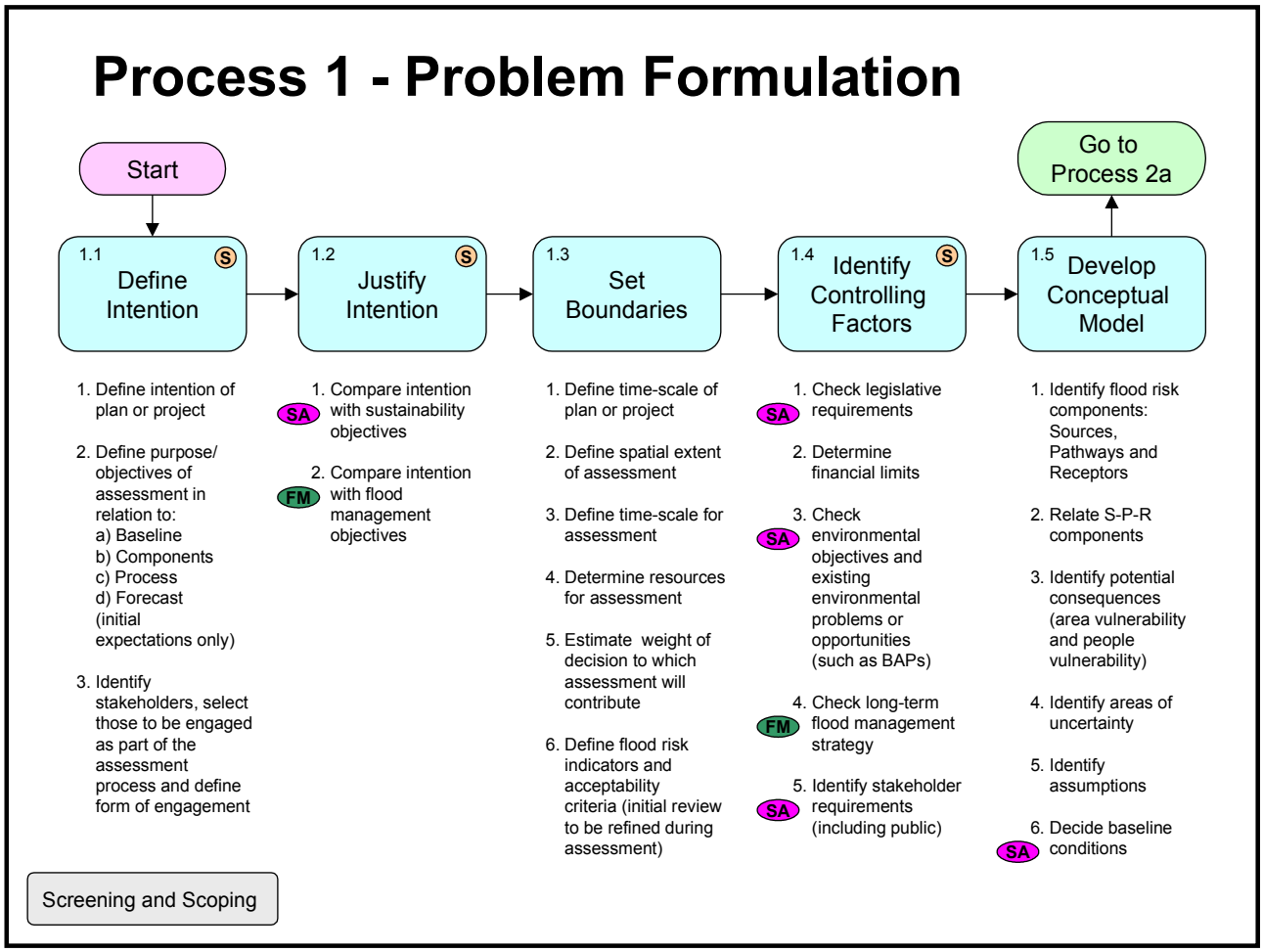


Figure .7 Process 1 – Problem Formulation

Whether undertaking a decision-making exercise based on the results of an assessment of flood risk or undertaking the assessment itself, it is necessary to understand what you are trying to achieve and the boundaries that you must work within.

As stated in DETR (2000a), "it is often tempting to omit any formal documented definition of the problem, particularly where there is pressure to complete the risk assessment quickly. However, failure to define the problem clearly is to lose the focus of the assessment itself, and may even result in an inappropriate output."

Benefits of undertaking this process include:

- Identification of flood risk management objectives and sustainability objectives, which enables more holistic decision-making to be undertaken and, in turn, should result in better 'value for money' solutions.
- Early buy-in from stakeholders, which reduces the likelihood of delays at later stages (see Section 7.4.4 for further details).
- Recognition that assessments are undertaken with limited time and budget, but by careful planning and an appropriately focused assessment, robust decisions can still be undertaken.

4.4 Process 2a – Tiered Risk Assessment

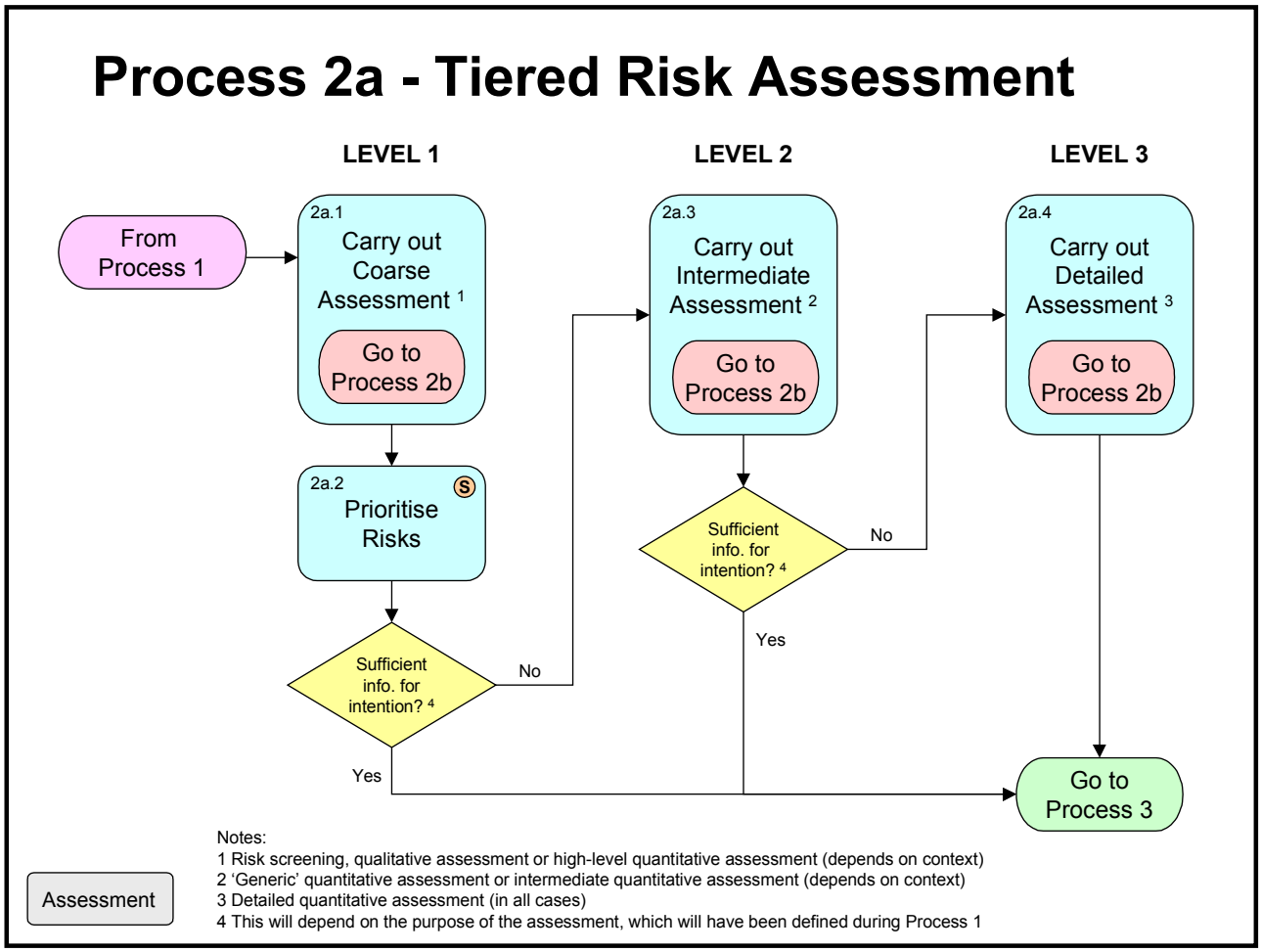


Figure .8 Process 2a – Tiered Risk Assessment

The purpose of undertaking a tiered approach is to allow proportionate effort to be applied, based on a number of factors including the following:

- Decision-making requirements,
- Scale of the risk,
- Degree of uncertainty,
- Scale of the development, and
- Unique characteristics of the site.

All assessments undertake a coarse assessment (Level 1). The baseline conditions used to decide whether to proceed to the next level of detail are determined during Process 1 – Problem Formulation, although these may need refining as understanding of the risks associated with a development improves.

This process is fully compatible with the new CIRIA guidance C624 *Development and flood risk – guidance for the construction industry* (Lancaster *et al.*, 2004).

4.5 Process 2b – Stage of Risk Assessment

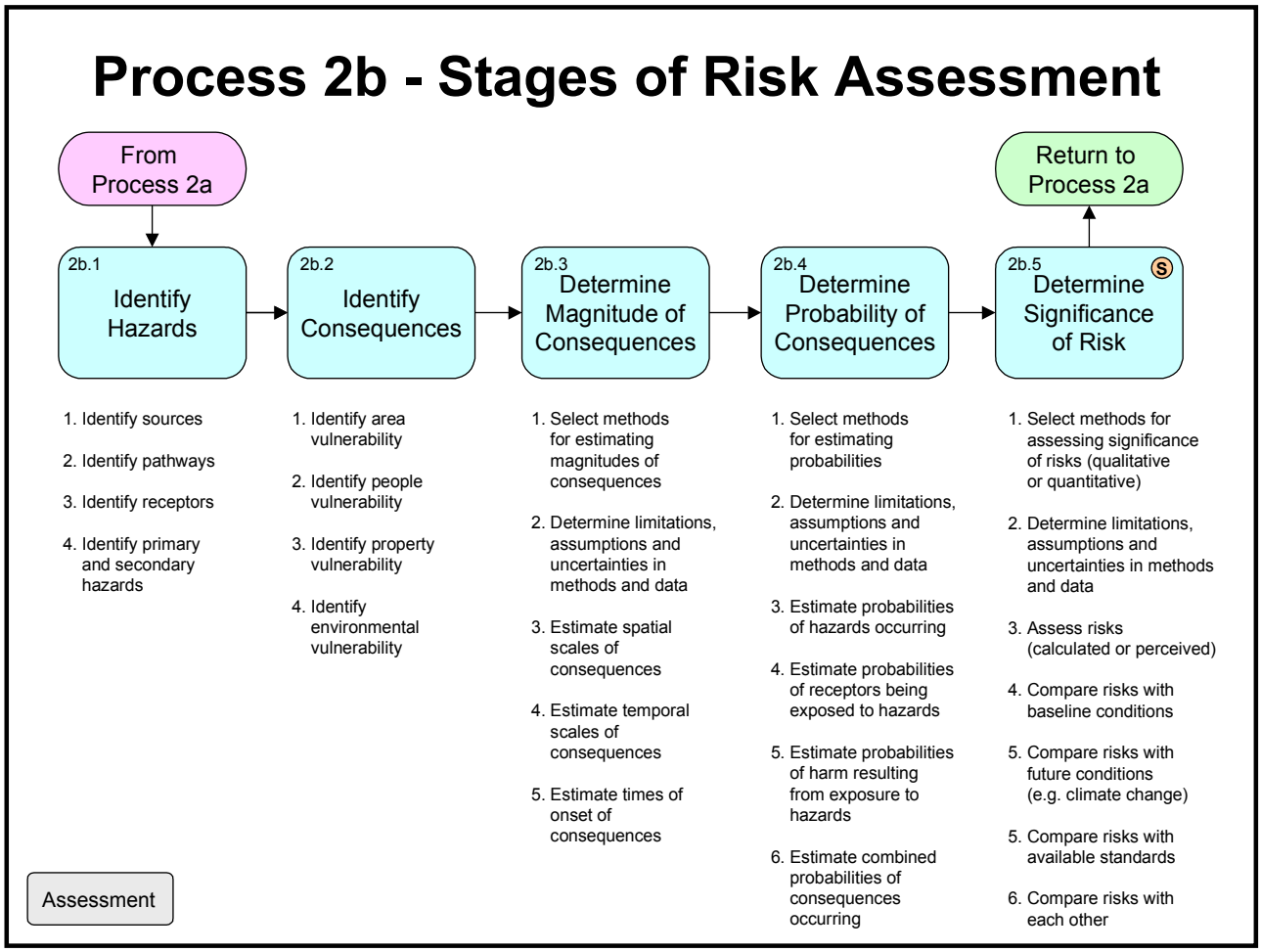


Figure .9 Process 2b – Stages of Risk Assessment

The stages described above are undertaken for each level of the tiered risk assessment. However, the complexity of approach increases for levels 2 and 3, in order to reduce the degree of uncertainty.

For a coarse assessment (Level 1) the analysis will tend to be based on existing information and a qualitative assessment of some of the risk components. However, depending on circumstances, a quantitative analysis can sometimes be undertaken, but the degree of uncertainty in either the input data or results is usually high.

For an intermediate assessment (Level 2) the analysis usually becomes more quantitative, but still with a moderate degree of uncertainty in either the input data or results. The prioritisation process (see Process 2a – Tiered Risk Assessment) may result in only some of the flood risks being considered with this or the next level of detail.

A detailed assessment nearly always involves detailed quantitative analysis, with the intention of reducing the degree of uncertainty as much as possible.

4.6 Process 3 – Options Appraisal

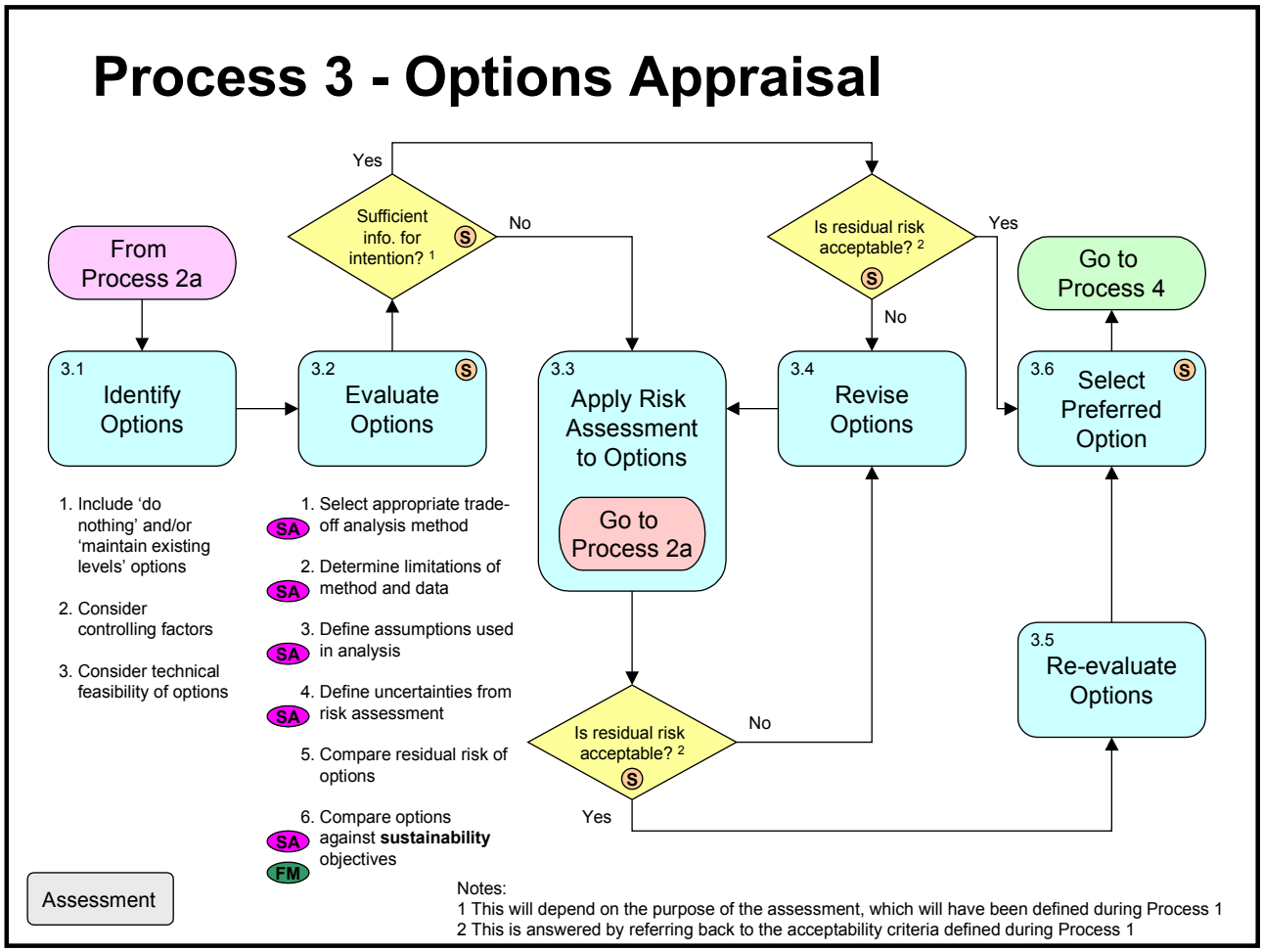


Figure .10 Process 3 – Options Appraisal

Whichever level of assessment of flood risk is required, all development planning activities will require an Options Appraisal stage. This is an appraisal of development options, taking all planning issues into account (not just those associated with flood risk) including sustainability objectives. All spatial planning should promote sustainable development and the evaluation of options should be accompanied by a Sustainability Appraisal.

A review of residual risk is required as part of this process and appropriate mitigation measures need to be considered. It is sometimes necessary to undertake an iterative approach to reviewing the residual risk to understand the trade-off between these means of mitigation versus alternative spatial planning decisions.

4.7 Process 4 – Monitoring and Review

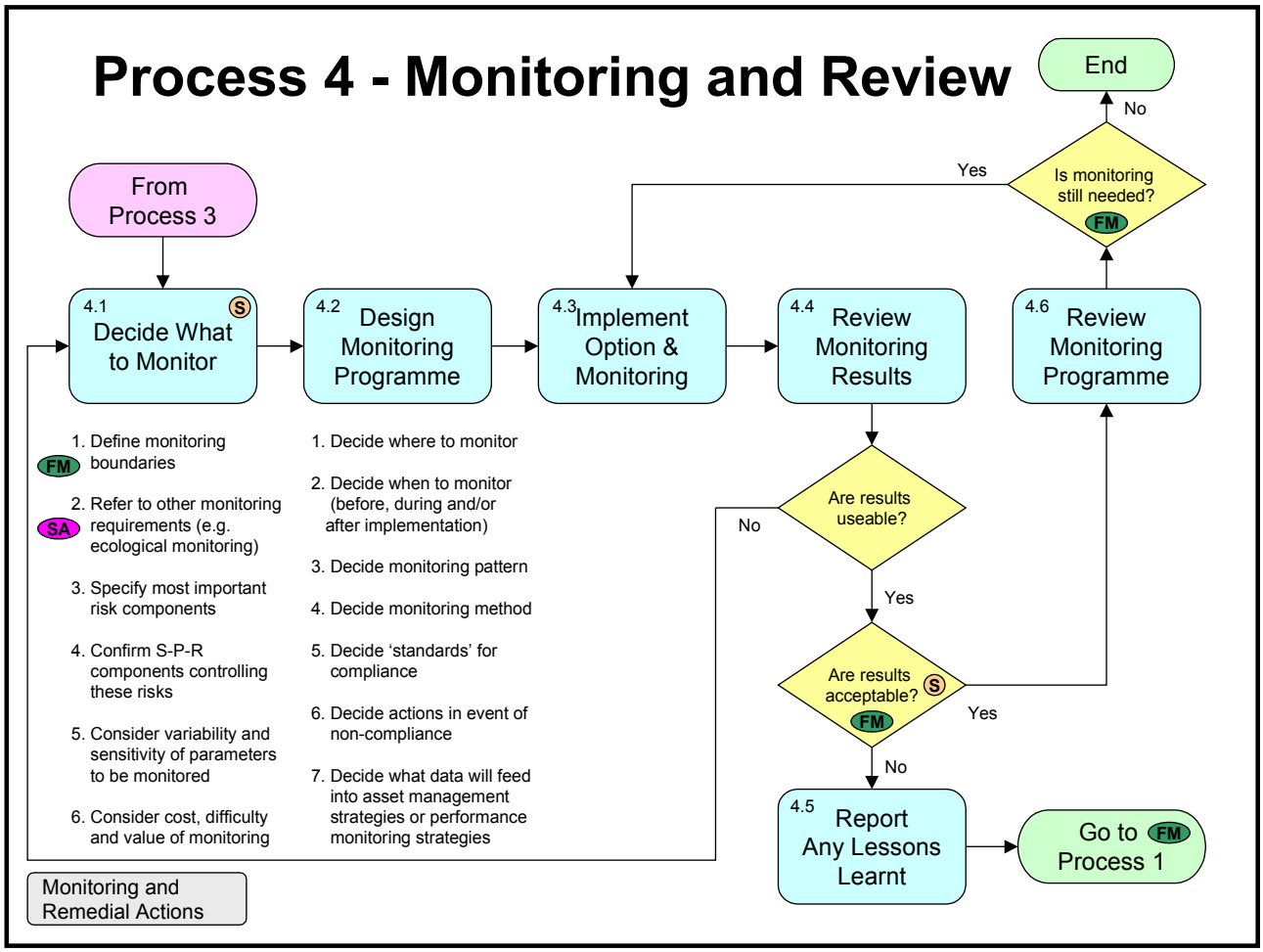


Figure .11 Process 4 – Monitoring and Review

The monitoring and review process is an integral part of flood risk management and key for determining and ensuring sustainable development. This process is vital to ensure successful transfer of responsibilities between different functions within organisations, for example, from planning authority to operating authority.

At the present time, perhaps this process is more aspirational than current practice, but should be encouraged as part of a best-practice approach. Based on Defra's consultation exercise (Defra, 2004), it is clear that there is a need for greater integration between flood risk management of new developments and existing development and this process provides a link between the two. (This is currently being considered as part of several ongoing R&D projects, including WaND, AUDACIOUS and the Flood Risk Management Research Consortium, details of which are provided in the Information Chart.)

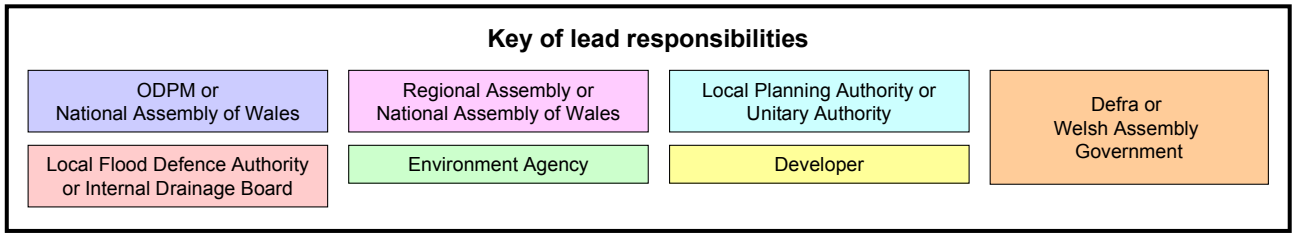
5. USING ASSESSMENTS

It should be noted that the purpose of this project is to look at the development planning process. However, it is important to identify the links between this process and other processes, to provide clarification regarding the existing and potential application of assessments across stakeholders in development planning and flood risk management. These links have been identified on an initial basis, but could be explored further as part of a follow-on project.

Three different diagrams are provided on the Activity Chart:

- Development Planning
- Flood Management Planning
- Sustainability Appraisals

A key of "lead responsibilities" has been provided, which gives a colour for each of the main organisations responsible for the activities shown on the diagrams. However, it should be remembered that other stakeholders are involved in these activities.



5.1 Development Planning

Figure .12 shows how different types of assessment can inform the stages of the development planning process.

The primary purpose of SFRAs and FRAs is to inform the development planning process. Hence, these are the responsibility of the LPAs and Developers respectively. NaFRAs, CFMPs and SMPs can also inform the development planning process, but are undertaken by the EA and flood defence authorities and are primarily intended to inform the flood management planning process, as illustrated in Figure .14.

The term "strategic", however, could be applied to other assessments of flood risk that could be undertaken in order to inform other scales of planning, i.e. national, regional or sub-regional scales. This has been illustrated in Figure .13. In this model, it is recognised that although National Flood Risk Assessments (NaFRAs), Catchment Flood Management Plans (CFMPs) and Shoreline Management Plans (SMPs) can provide valuable information for use at the larger scales, they are not designed to answer the specific questions posed at these planning scales. This would be the purpose of the "strategic" flood risk assessments.

This aspirational model (Figure .13) recognises that with every scale of planning an appropriate flood risk assessment should be undertaken by the relevant decision-making organisation, as this is the best means to take full account of current and future flood risks, as recommended in PPG25 (DTLR, 2001).

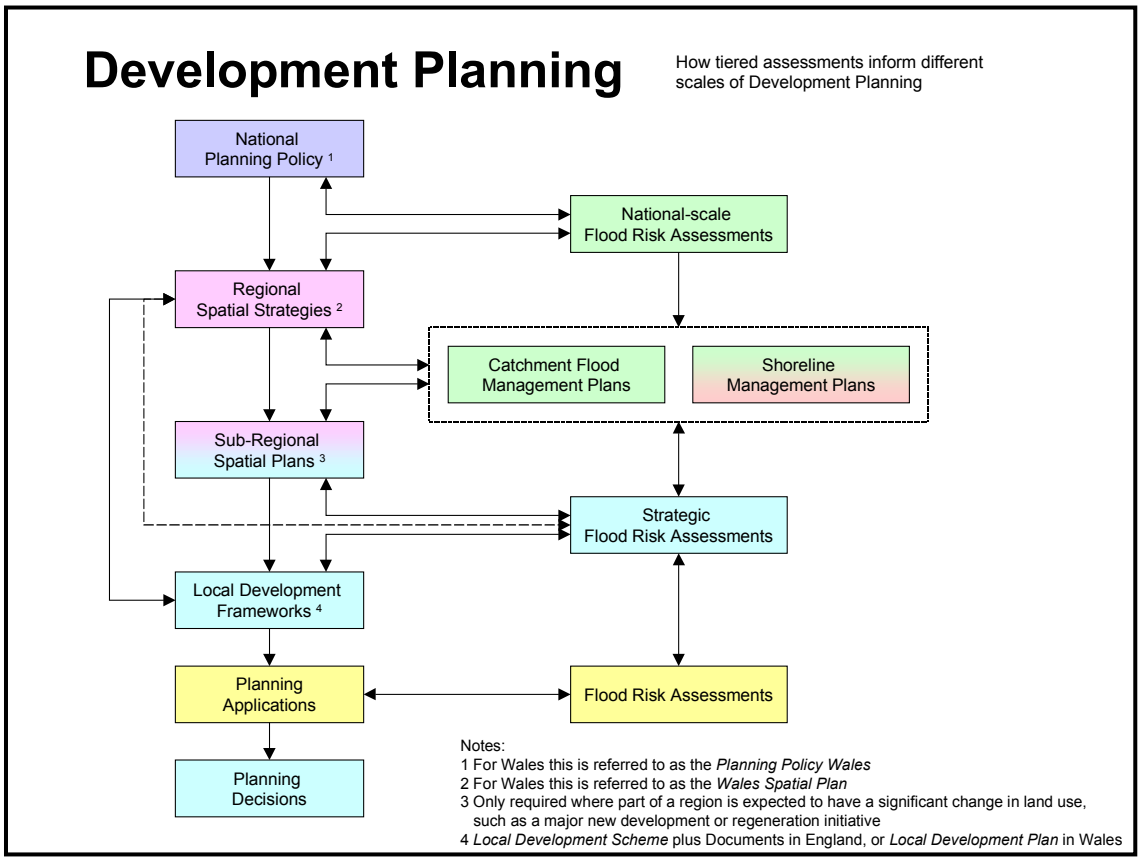


Figure .12 How Assessments of Flood Risk Inform Development Planning

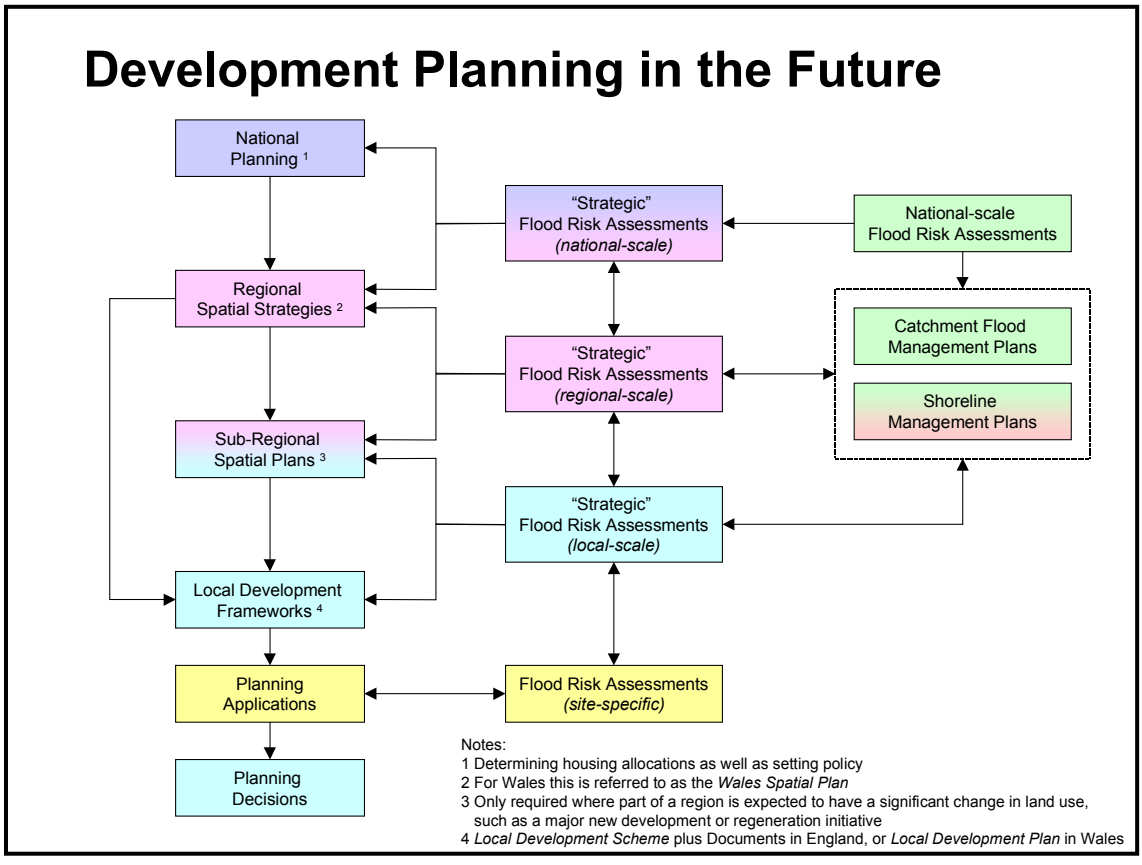


Figure .13 How Assessments of Flood Risk Might Inform Development Planning in the Future (Aspirational Model)

5.2 Flood Management Planning

Figure .14 shows the primary purpose of the EA's assessments of flood risk; this being to inform their strategic planning for flood risk management. However, links between this process and the development planning process should be encouraged to ensure holistic decision-making. Identification of these links should be undertaken during Process 1 – Problem Formulation (see Section 4.3).

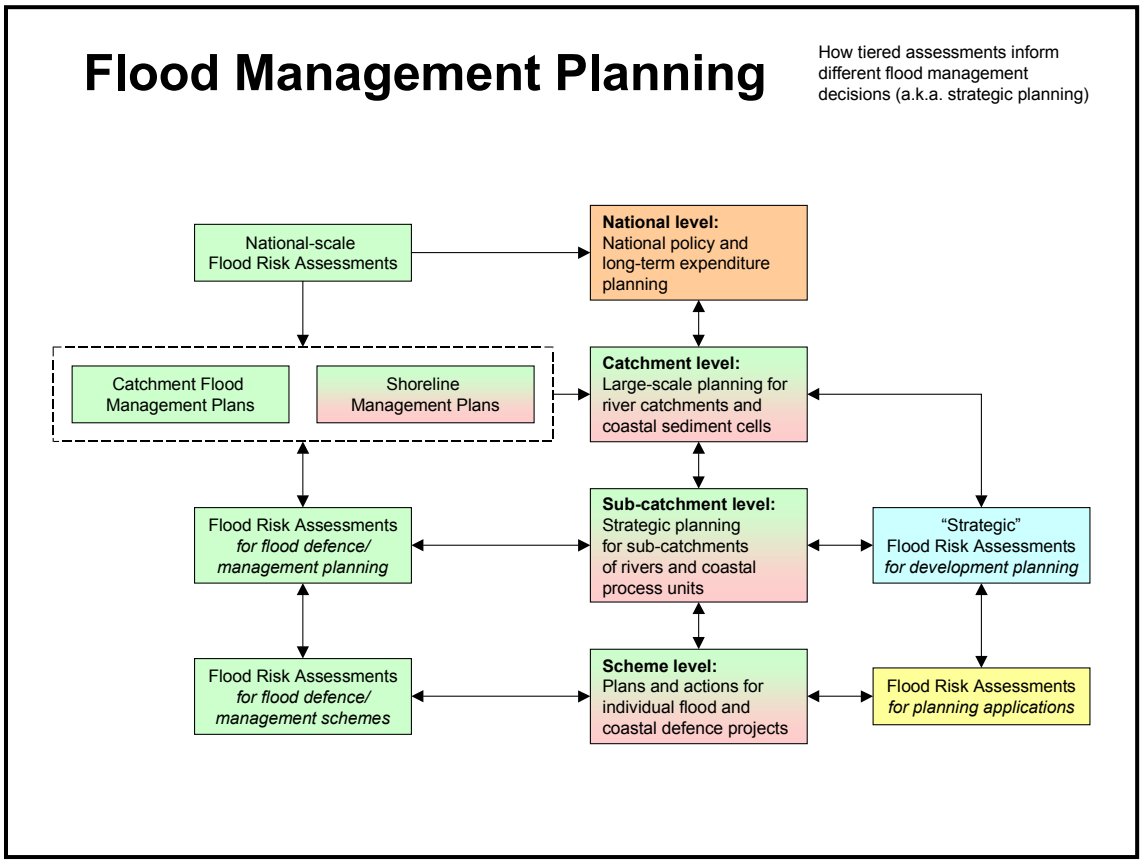


Figure .14 How Assessments of Flood Risk Inform Flood Management Planning

5.3 Sustainability Appraisals

There is a mandatory requirement for Regional Spatial Strategies and Local Development Frameworks to include a Sustainability Appraisal (ODPM, 2003). Again, assessments of flood risk can inform this process and, as with development planning and flood management, it has to be an iterative process should the outcome not be considered acceptable. This has been illustrated in Figure .15.

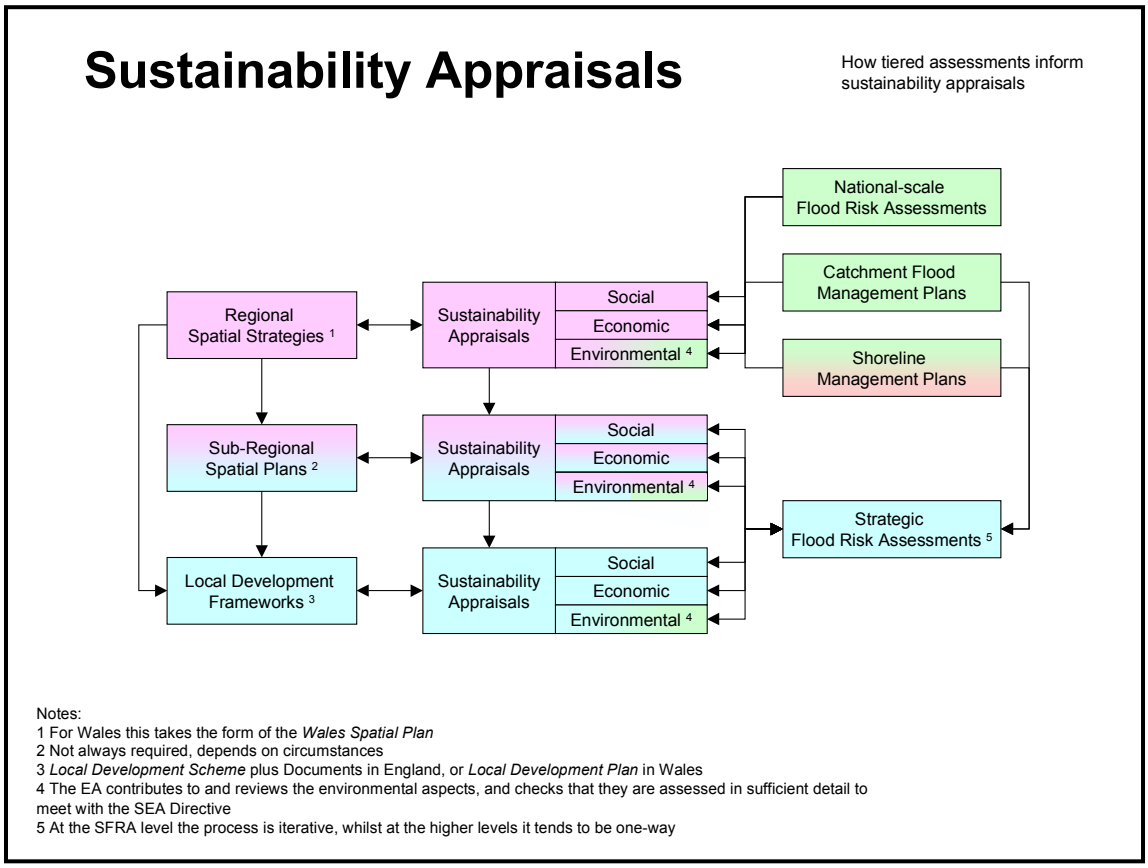


Figure .15 How Assessments of Flood Risk Inform Sustainability Appraisals

6. DECISION GUIDANCE

6.1 Purpose of the Decision Guidance

There are 3 parts to the decision guidance. These are:

- **What's needed for development planning? -** which contains 4 guidance notes regarding what is an appropriate assessment of flood risk to enable development planning to be carried out effectively (at all scales of decision-making). Guidance is given from the context of the planning needs and expands on the information already provided in PPG25 (DTLR, 2001) and TAN15 (National Assembly for Wales, 2004).

- **Which indicators can be used?** - which directs the user to a guidance note and associated tools that enable the selection of suitable flood risk indicators for the planning needs.

- **Which type of assessment can be used?** – which contains 5 guidance notes for the 5 main types of assessment. These notes describe the specific approach for each assessment type, based on the Generic Approach.

6.2 Structure of the Decision Guidance

All guidance notes provide information regarding:

- Data and information
- Roles and responsibilities
- Processes and procedures
- Tools and technology
- Audit and control.

References to ongoing R&D are provided via the Information Chart (see Section 9) and cross-references to support guidance for the framework are also provided (see Section 7).

Each guidance note has been given a unique reference, so that, if accessing these digitally, these can be found easily either via the Activity Chart or directly.

The intention is for these guidance notes to be updated individually as the need arises (either due to legislative changes, organisational changes or new science). They are not long or complex, but provide context, key information and relevant cross-references to larger documents for further details, should the reader wish to refer to them.

On the Activity Chart a key is provided of "lead responsibilities", which gives a colour for each of the main organisations responsible for the activities described in the guidance notes provided. However, other stakeholders should still refer to these guidance notes. Further details of stakeholders are provided within the guidance notes under Roles and Responsibilities.

The following sections provide summaries of the contents of the Guidance Notes.

6.3 What's needed for Development Planning?

There are 4 guidance notes summarising the needs within the planning process for the assessment and management of flood risk.

6.3.1 D1.1 National Development Planning

National Development Planning is undertaken by central Government to decide the quantity and distribution of new housing and other development in the country. Flood risk is one of the many factors to be considered in National Development Planning. There is no formal method of assessing flood risk for development planning on a national basis. Guidance Note D1.1 provides a recommended approach to undertaking an assessment of flood risk for National Development Planning, based on the Generic Approach.

6.3.2 D1.2 Regional Spatial Strategies

Regional Planning Guidance has been replaced by statutory Regional Spatial Strategies (RSS). The main purpose of a RSS is to provide a spatial framework within which Local Development Frameworks (LDFs) and Local Transport Plans can be prepared. There should be a two-way relationship with the RSS informing as well as taking account of other strategies, including the Regional Development Authorities' regional economic strategies and those on air quality, energy, climate change, biodiversity, sustainability and water resources, in so far as these are relevant at the regional scale.

The RSS provides a spatial framework for the region over a 15 to 20 year period. The aim is an integrated, strategic approach with regional and sub-regional priorities for housing being formulated together with priorities for environmental protection and improvement, transport, other infrastructure, economic development, agriculture, minerals and waste treatment and disposal (ODPM, 2004a and 2004d).

Because Structure Plans have been abolished, the RSSs will include sub-regional strategies (where necessary) to bridge the gap between the regionally strategic level and the more detailed local planning level. These will tend to be for geographic areas of significant change to policy or substantial change in land use. In some cases there may be a need for separate sub-regional strategies (as required for Thames Gateway, which cuts across three regions).

Guidance Note D1.2 provides an overview of what information on flood risk and flood management should be provided for regional planning and sub-regional planning. It also provides an overview of what constitutes an appropriate assessment of flood risk for development planning at the regional or sub-regional scales, with cross-references to other more detailed guidance documents for best practice.

6.3.3 D1.3 Local Development Frameworks

Local Development Frameworks (LDFs) are portfolios of Local Development Documents (LDDs) that define the spatial planning strategy for local authorities. These documents were introduced as a result of the Planning and Compulsory Purchase Act 2004 and accompanying Town and Country Planning Regulations 2004. These frameworks replace the existing system of structure, local and unitary development plans.

LPAs have two functions that need to be defined in the LDFs. These being:

- Spatial Planning
- Regulation and Control

LDFs are referred to as spatial plans rather than land use plans. The land use planning system traditionally focused on regulation and control of land use. This is still one of the functions of a LDF, but added to this is the aim to bring together and integrate with other strategies, plans and programmes that have an impact on spatial development (at both local and regional levels). These might include:

- Community strategies
- Employment and economic development/regeneration
- Education
- Health
- Crime prevention
- Waste and recycling
- Transport
- Biodiversity
- Environmental protection
- **AND** Flooding and coastal erosion management

Areas where flooding issues have been identified and, therefore, will need to be addressed (usually referred to as flood risk areas) will require detailed policies and/or constraints in the LDDs.

The LDF should identify sufficient land for new development to meet needs identified through the relevant RSS (including adjoining regions, if necessary) as well as taking account of community and other stakeholder aspirations in terms of the location of development (ODPM, 2004b).

All LDDs should be consistent with national planning policy and should be in general conformity with the RSS. Unlike previous regional planning guidance, RSSs have development plan status. Therefore, it is important that there is a consistency of approach for assessing and managing flood risk at the national, regional and local scales.

All LDDs are guided throughout by the requirements of the Strategic Environmental Assessment (SEA) Directive and Sustainability Appraisals. (Further details are given in Guidance Note S2.5 Linkage to Statutory Requirements).

Guidance Note D1.3 provides an overview of what information on flood risk and flood management should be provided for local development planning. Guidance Note D3.4 then provides details of what constitutes an appropriate assessment of flood risk at the local scale.

6.3.4 D1.4 Planning Applications

Flood risk is a material consideration to be taken into account by LPAs when determining planning applications. The planning process requires an assessment to be made of any flood risks related to proposed developments. Separate planning policy

guidance is provided for England and Wales. These are PPG25 (DTLR, 2001) and TAN15 (National Assembly of Wales, 2004) respectively.

These assessments are usually referred to as site-specific Flood Risk Assessments (FRAs), although TAN15 describes them as Flood Consequences Assessments (FCAs) and they are also sometimes known as Project Flood Risk Assessments. For simplicity, these are collectively referred to as FRAs in this project.

Guidance Note D1.4 provides an overview of the requirements to assess the flood risk associated with planning applications for new development. Guidance Note D3.5 then provides details of what constitutes an appropriate assessment of flood risk at the site-specific scale.

6.4 Which indicators can be used?

There is one guidance note and two tools (see Section 8) that refer to or apply flood risk indicators. The guidance note is described below.

6.4.1 D2.1 Flood Risk Indicators

A flood risk indicator for development planning is a measurable attribute of the impact of a development on flood risk. Flood risk indicators are used (usually in combination) to inform the decision-making process but they do not define what is or is not acceptable.

A flood risk indicator can relate to the sources, pathways, receptors or consequences of flooding. The measurable attributes are in a number of different forms:

- A measure of the probability of flooding (or hazard),
- A measure of a parameter that contributes to the probability of flooding,
- A measure of the risk of flooding (i.e. probability * consequence), or
- A measure of a parameter that contributes to the consequence of flooding (such as exposure type or vulnerability).

Therefore, the term *flood risk indicator* is used to refer to either flood hazard or flood risk.

Guidance Note D2.1 outlines recommended flood risk indicators and provides information on their application. This includes a pragmatic review of the tools that are currently available for practitioners to calculate indicators. It also describes a selection method for identifying the most suitable indicators for different decision-making purposes.

Two tools have been provided with this guidance and further details are given in Section 8 of this report.

6.5 Which type of assessment can be used?

There are 5 guidance notes summarising the 5 main types of assessment used for determining flood risk and flood management requirements.

6.5.1 D3.1 National Flood Risk Assessments (NaFRA)

The objective of the NaFRA studies is to gain a better understanding of the existing risk arising from fluvial, tidal and coastal flooding and the investment levels that might be necessary to deal with this at a national or regional scale.

In particular, the NaFRA studies help to decide policy and actions at a national scale, such as:

- Construction of flood defences where they are most needed to protect people and property,
- Maintaining and operating defences and defence systems to minimise flood hazard,
- Flood forecasting and warning to minimise consequences in the event of flooding, and
- Restricting development in flood risk areas to minimise flood risk.

To make decisions on the above actions, the following questions have to be answered:

- What is the national risk from flooding?
- Which flood defence systems pose the greatest risk on a national scale?
- Where are the maintenance priorities?
- Where are the flood warning priorities?
- Where are the flood defence capital investment priorities?
- What impact might climate change have on the above?

Guidance Note D3.1 provides summary information regarding NaFRAs and links the NaFRA process to the Generic Approach for assessing and managing flood risk for new development.

6.5.2 D3.2 Catchment Flood Management Plans

Catchment Flood Management Plans (CFMPs) are high-level strategic planning studies through which the EA aims to work in partnership with other key decision-makers within a river catchment to explore and define long-term sustainable policies for flood risk management.

A CFMP aims to understand the causes of flooding at a catchment scale and to co-ordinate action to reduce both the probability and impact of flooding (flood risk).

The current programme of CFMPs supports one of the EA's main goals, which is to reduce flood risk from rivers and the sea to people, property and the natural environment by supporting and implementing government policies. CFMP roll-out has only recently started.

Guidance Note D3.2 provides summary information regarding CFMPs and links the CFMP process to the Generic Approach for assessing and managing flood risk for new development.

6.5.3 D3.3 Shoreline Management Plans

A Shoreline Management Plan (SMP) is a strategic document that provides "a large-scale assessment of the risks associated with coastal processes and presents a policy framework to reduce these risks to people and the developed, historic and natural environment in a sustainable manner" (Defra, 2001). The entire coastline of England and Wales is covered by first generation SMPs and these are currently being revised.

A SMP aims to identify policies to reduce risk. SMPs provide the basis for sustainable shoreline management policies over 50 years within a sediment cell or sub-cell(s) and set the framework for future management of risk along the coastline from flooding and coastal erosion, including cliff instability.

Although not directly implemented in order to undertake development planning, SMPs help inform the planning process, strengthening the move to prevent development in flood risk areas or areas at risk from coastal erosion (Department of the Environment and the Welsh Office, 1992).

Guidance Note D3.3 provides summary information regarding SMPs and links the SMP process to the Generic Approach for assessing and managing flood risk for new development.

6.5.4 D3.4 Strategic Flood Risk Assessments

A Strategic Flood Risk Assessment (SFRA) is the term currently used for the type of assessment of flood risk undertaken to inform the spatial planning process at the local scale.

SFRAs enable LPAs to designate areas for development following the Sequential Test (as described in PPG25). They can be used to set planning constraints within these development areas and, if desired, beyond in the event of windfall planning applications. SFRAs can also be used within urban areas to identify the potential future impacts of climate change and uncontrolled development and the actions that may be taken to mitigate these.

A SFRA is not a spatial plan or a planning policy, but it informs the planning process of the following:

a) Present flood risks and future flood risks (without new development), and
b) Residual flood risks, both present and future (with new development for the life-time of that development).

Because of this, it is part of an iterative process and should not be considered separately from the flood risk management requirements resulting from the spatial plan.

Guidance Note D3.4 provides an overview of what constitutes an appropriate assessment of flood risk and the management of that risk for development planning at the local scale. It provides summary guidance regarding the required content of SFRAs with cross-references to other more detailed guidance documents for best practice. It also provides summary information regarding the roles and responsibilities of the LPAs and the EA as part of SFRAs and it shows how SFRAs fit into the overall framework for assessing and managing flood risk for new development.

6.5.5 D3.5 Flood Risk Assessments

The term flood risk assessment is often used generically for any type of investigative study to determine flood risk, which can be carried out by a number of different organisations for different purposes. The term is also used to refer to a specific type of study that is required with planning applications.

A Flood Risk Assessment (FRA), as referred to in this project, is site-specific and is the recognised best practice approach for determining the following:

- Actual flood risk to the development site,
- Change in flood risk to the surrounding area caused by the development site, and
- Residual risk once flood management/mitigation measures are in operation to both the development itself and the surrounding area.

This type of assessment is also known by the following names:

- Flood Consequences Assessment, as used in TAN15,
- Site-based Flood Risk Assessment,
- Project Flood Risk Assessment.

Guidance Note D3.5 provides an overview of what constitutes an appropriate assessment of flood risk for new developments and the management of that risk at the site-specific scale for submission with planning applications. It provides summary guidance regarding the required content of FRAs with cross-references to other more detailed guidance documents for best practice, in particular Lancaster *et al.* (2004). It also provides summary information regarding the roles and responsibilities of the Developer, LPAs and the EA as part of the FRA process and shows how FRAs fit into the overall framework for assessing and managing flood risk for new development.

7. SUPPORT GUIDANCE

7.1 Purpose of the Support Guidance

These guidance notes cover the main support activities required to implement the framework effectively.

There are 3 parts to the support guidance. These are:

- **How to navigate the framework**, which is helpful if using the framework for the first time and contains 4 guidance notes.

- **How to manage the assessment processes**, which provides 5 guidance notes covering the main support activities required to implement the framework effectively.

- **Key issues**, which provides additional guidance of the five most pressing technical issues as identified by the consultation process undertaken at the start of this project.

7.2 Structure of the Support Guidance

All guidance notes provide information regarding:

- Data and information
- Roles and responsibilities
- Processes and procedures
- Tools and technology
- Audit and control.

References to ongoing R&D are provided via the Information Chart (see Section 9) and cross-references to decision guidance for the framework are also provided (see Section 6).

Each guidance note has been given a unique reference, so that, if accessing these digitally, these can be found easily either via the Activity Chart or directly.

7.3 How to Navigate the Framework

7.3.1 S1.1 Introduction to the Framework

Guidance Note S1.1 is similar to Section 2 of this report. It is primarily designed for those who will be using the digital version of the framework and guidance without reference to this report.

7.3.2 S1.2 How to Use the Activity Chart

Guidance Note S1.2 is similar to Section 3 of this report. However, it also provides additional instructions for how to use the digital version of the Activity Chart.

7.3.3 S1.3 How to Use the Information Chart

Guidance Note S1.3 is similar to Section 9 of this report. However, it also provides additional instructions for how to use the digital version of the Information Chart.

7.3.4 S1.4 Glossary and Abbreviations

Guidance Note S1.4 provides definitions of terms and abbreviations used in the Activity Chart and the guidance notes. It also provides commonly used terms from the key references provided in the guidance notes, as listed in the Information Chart.

7.4 How to Manage the Assessment Processes

7.4.1 S2.1 Reporting

The requirements of all reports are the following:

- **Complete** – the assessment processes and required outcomes are described in full, so that they are auditable.
- **Accurate** – the information provided is correct and unambiguous.
- **Compliant** – the content of the report should be agreed with those that will use it for decision-making (preferably prior to the commencement of the assessment). This includes the need for it to be understandable for its intended users.
- **Authorised –** the report should be reviewed and signed off, as appropriate, prior to use for decision-making purposes.

Guidance Note S2.1 provides generic guidance regarding reporting of assessments of flood risk and the management of that risk for new developments, based on the requirements listed above.

7.4.2 S2.2 Information Management

Information management is the skilful handling of knowledge in order to produce the desired results. In other words, it is about providing the right information at the right time to enable organisations to carry out their operations to the best of their abilities.

The five principles, as defined in the R&D project FD2314 *Position Review of Data and Information Issues within Flood and Coastal Defence* (McCue *et al.*, 2004), can serve as guidelines for those involved in assessing flood risk, irrespective of the methods employed. The principles bring together everything from high- level policy issues to detailed analysis. They are intended to provide a framework within which all those involved can develop comprehensive procedures.

The five principles take the form of a set of statements of objectives for information management. These are:

- **Data and Information** - Recognise and understand all types of data and information.
- **Roles and Responsibilities** - Understand the legal issues (such as statutory requirements) and execute "duty of care" responsibilities.
- **Processes and Procedures** - Identify and specify all processes and procedures (whether research science, development of application, business process or policy based).

- **Tools and Technologies** - Identify tools and enabling technologies to support processes and procedures.

- **Audit and Control** - Monitor and audit processes and procedures and set in place remedial actions should they be required.

All guidance notes provided as part of this project are broken down into these five principles, to enable users to identify these common principles across all topics.

Guidance Note S2.2 provides an introduction to the principles of effective information management across the whole process of assessment and management of flood risk for new development. It also provides generic guidance regarding data management and control associated with assessing and managing flood risk.

7.4.3 S2.3 Auditing and Control

All decisions regarding new development and, hence, assessments of flood risk that support the decision-making process, should be:

- Robust
- Transparent, and
- Auditable.

Within the context of the framework for assessing and managing flood risk for new development, auditing and control are defined as the following:

- **Auditing** is comparing the 'required processes' with those that have actually been carried out. Therefore, auditability is the degree to which the assessment and decision-making processes can be traced back to the source data and information (transparency) and can be supported by proven science (robustness).

- **Control** is determining whether any remedial actions need to be carried out (based on the results of the audit) and ensuring that these happen.

These activities are summarised in Figure .16.

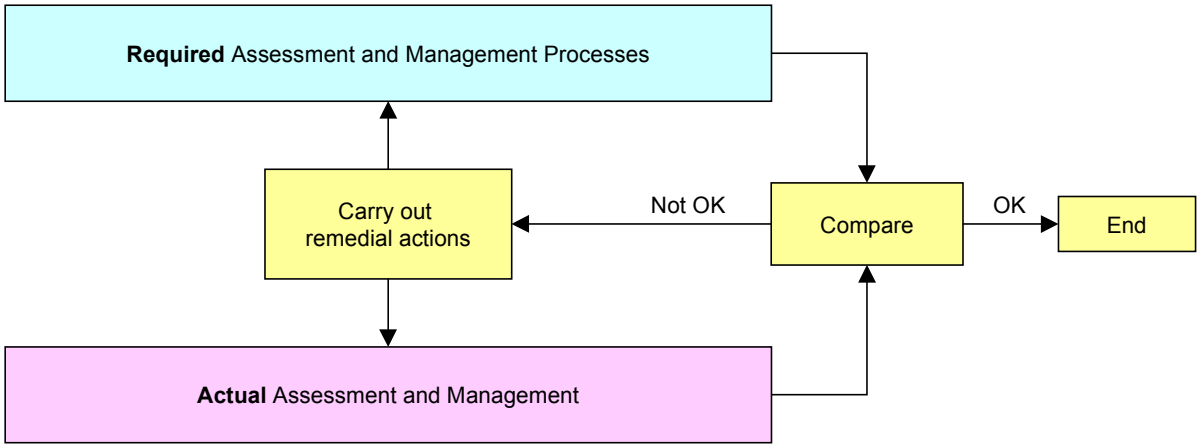


Figure .16 Simplified Representation of the Audit and Control Model

Guidance Note S2.3 provides a recommended approach to auditing and control of the assessment and management of flood risk for new development. It provides references to existing tools available to assist with auditing and control, and provides details of new tools to support the framework and guidance provided as part of this project.

7.4.4 S2.4 Stakeholder Engagement

Stakeholder engagement enables those with an interest in the outcomes of the assessment and management of flood risk for new development to be informed about the decisions being made and to influence those decisions.

The way in which stakeholders are engaged should be proportionate to the likely impact of the policy, plan or project and the degree of debate or concern about it.

Stakeholder engagement, including with the public (ODPM, 2004c), is an essential part of a sustainable development strategy and a requirement of Sustainability Appraisals.

The benefits of appropriate stakeholder engagement are numerous and include the following:

- Decisions are soundly based on shared knowledge, experiences and scientific evidence;
- Decisions are influenced by the views of those who are likely to be affected;
- Innovative and creative options are considered;
- Outcomes are workable and acceptable to stakeholders: and
- Reduces delays in process at late stages.

Recent experience as part of Shoreline Management Plans has shown that stakeholder engagement, in particular early involvement of Elected Members, increases the likelihood of acceptance and understanding of recommended policies (Jay *et al.*, 2004). This experience also highlighted that stakeholder engagement can be time-consuming and, therefore, costly. The benefits of the process being realised more through the consultation and adoption stages rather than during the preparation.

Guidance Note S2.4 provides generic guidance regarding stakeholder engagement in assessments and management of flood risk for new developments. This takes into consideration the Defra's consultation exercise *Making Space for Water* (Defra, 2004), building on Hosking (2004) and DETR (2000a).

7.4.5 S2.5 Linkage to Statutory Requirements

The Information Chart provided as part of the framework contains a worksheet called Statutes & Regulations. In this worksheet, can be found a list of 44 Directives, Acts, Regulations, Orders and Bylaws that relate to Development Planning and assessments of flood risk.

The CIRIA guidance C624 (Lancaster *et al.*, 2004) lists relevant planning regulations (as they existed in March 2004) including the Land drainage Act 1991, the Water Resources Act 1991, Internal Drainage District byelaws and other byelaws with which the EA must comply. PPG25 (in particular Appendix B) also provides a list of relevant legislation.

During the consultation process of this project, the following statutory requirements were identified as requiring further integration into the framework for development planning:

- Environmental Impact Assessments (EIAs)
- Strategic Environmental Assessments (SEAs) as part of Sustainability Appraisals
- River Basin Management Plans (RBMPs) and the Water Framework Directive (WFD)
- Habitats Directive

Guidance Note S2.5 provides summary information regarding these four key areas of legislation, recognising that these should be integrated into development planning to a greater degree.

However, this guidance does not provide a definitive list of all statutory requirements that need to be taken into consideration when assessing and managing flood risk for new development. The responsibility for determining the relevant statutory requirements remains with the bodies carrying out the assessments and managing the flood risk.

7.5 Key Issues

7.5.1 S3.1 Climate Change

Limiting and adapting to climate change is a key theme on the EA's Corporate Strategy (Environment Agency, 2002).

In a warmer climate, rising sea levels and changing patterns in seasonal rainfall will increase pressure on flood risk management systems. There is still considerable uncertainty regarding the amounts of warming and its likely impact on flood risk over the next 100 years. Its potential impact on flood risk was assessed as part of the *Foresight* project on Future Flooding in the UK (Office of Science & Technology, 2004). This study showed that risks increase under all climate change scenarios and to unacceptable levels for some scenarios. It demonstrated the need to develop long-term policies to adapt to an evolving and uncertain future.

The EA's long-term objective on climate change is to achieve drastic cuts in the emissions of greenhouse gases and for society as a whole to take account of, and be prepared for, the probable changes to our climate. This means that climate change must be considered in planning future development to prevent increasing the risks of property damage, serious harm or deaths from flooding.

Guidance Note S3.1 describes how climate change should be taken into account in development planning. It presents the Defra/Environment Agency precautionary allowances for climate change (HR Wallingford, 2003a) and discusses more detailed approaches for assessing the impacts of climate change on flood risk.

7.5.2 S3.2 Risk to People behind Defences

Flood defences reduce the risk of flooding, but do not eliminate flood risk completely. The reduction in flood risk that the defence provides depends on the standard of

protection and the performance and reliability of the defence. Flooding may still occur in defended areas if the defence is overtopped or breached, or if flooding occurs as a result of non-fluvial sources such as groundwater flooding or poor drainage. Development behind defences should, therefore, be planned with due regard to the flood risk in the defended area.

Guidance Note S3.2 presents methods for assessing flood risk to people in defended areas that can be applied at the **sub-regional**, **local** and **site-specific** scales (i.e. as part of a SFRA or site-specific FRA). It provides the EA with a simple means of communicating to LPAs and Developers the likely flood risk to people associated with developing behind defences, given the potential flood hazard and the condition of the defences. It has been designed to be complementary to a separate EA guidance document that provides specific guidance to EA staff regarding the EA's policies and principles for development behind defences.

7.5.3 S3.3 Safe Access and Exit

New developments are required to provide safe access and exit during a flood and the measures by which this will be achieved should be clear in the site-specific FRA. Safe access and exit is required to enable the evacuation of people from the development, provide the emergency services with access to the development during a flood and enable flood defence authorities to carry out any necessary duties during the period of flood.

A safe access or exit route is a route that is safe for use by occupiers without the intervention of the emergency services or others. A route can only be completely safe in flood risk terms if it is dry at all times. However, this is not always practicable. Therefore, a more detailed analysis is sometimes required.

Safe routes should be identified both inside and beyond the boundary of the new development. Even where a new development is above the floodplain and considered acceptable with regard to its impact on flood flows and flood storage, it should be demonstrated that the routes to and from the development are also safe to use.

Guidance Note S3.3 presents simple methods for assessing the conditions that constitute safe access and exit that can be applied at the **site-specific** scale, i.e. as part of a FRA. It also provides the EA with a means of communicating to LPAs and Developers the likely flood risk to people associated with access and exit from the site.

7.5.4 S3.4 Brownfield Development

LPAs should give preference to reusing previously developed sites and empty properties (i.e. brownfield sites) before the use of any greenfield sites (DETR, 2000b). However, many brownfield sites have a flood risk associated with them and, therefore, require a FRA (ideally preceded by a SFRA).

This is sometimes perceived as conflicting with the guidance in PPG25, which states that sites of lowest flood hazard should be considered first. However, with regard to previously developed land, PPG25 recognises that a 'balanced flexible approach is required'.

Guidance Note S3.4 provides summary guidance regarding how the generic approach should be applied to development on brownfield sites. It also provides summary information regarding the roles and responsibilities of LPAs and the EA in assessing the appropriateness of brownfield development.

7.5.5 S3.5 Mitigation Measures

Mitigation measures are actions designed to reduce either the probability or the consequences of the risk, in this case flooding. Flood Risk Management (FRM) combines the functions of mitigating and monitoring flood risks and may include pre-flood, flood-event or post-flood activities.

Guidance Note S3.5 provides guidance on when and how to take into consideration mitigation measures when assessing flood risks for new developments. It does not provide guidance on the design and implementation of specific mitigation measures, as this information is already available from a number of different sources.

8. TOOLS

Three tools have been produced by the project to assist users of the guidance. These are in addition to the Activity Chart and Information Chart that are also "tools" of the framework.

8.1 D2.1 TOOL 1 Flood Risk Indicators Tables

Two tables have been produced to accompany Guidance Note D2.1 Flood Risk Indicators:

- Table A contains a list of flood risk indicators. Each indicator has been grouped according to whether the information it gives is primarily about the flood hazard, area characteristics or people characteristics. It provides information on the suitability of the indicator at each planning scale for the three levels of assessment, these being coarse, intermediate and detailed. The table identifies whether the indicator provides a STATEMENT about existing flood hazard or risk, or assesses a CHANGE in flood hazard or risk caused by the development. It also provides information regarding the type of information the indicator provides, i.e. economic, social or environmental. A filtering system can be applied to this table to enable users to select a list of suitable indicators for a particular decision-making purpose.

- Table B contains the same list of flood risk indicators and summarises the principles of application for each flood risk indicator. These being:

    - Information Provided (by the indicator)
    - Usage for Decision-Making
    - How to Calculate
    - Data and Information Required
    - Roles and Responsibilities
    - Available Tools and Technologies
    - Auditing and Accuracy

8.2 D2.1 TOOL 2 Flood Risks to People Calculator

An overarching objective of flood risk management is to reduce the risks of death or serious harm to people. A range of methods for estimating and mapping "Risks to People" are under development as part of the Defra and Environment Agency Flood Risk R&D programme.

Phase 1 of the "Risks to People" project was completed in July 2003 and provided a simple method for combining information on flood hazards with information on the vulnerability of areas and people at risk from flooding (HR Wallingford, 2003b).

An Excel spreadsheet has been developed as part of this project that evaluates the "Risks to People", referred to as the Flood Risks to People Calculator.

A supplementary guidance (Guidance Note D2.1 ADD2) is provided that accompanies this tool. The guidance note summarises the Flood Risks to People Phase 1 method, describes the spreadsheet and gives examples of how to use it.

8.3 S2.3 TOOL Assessment Check-List

An assessment check-list has been produced as part of this project, which translates the Generic Approach into a series of audit questions, with a scoring system, which can be used as the basis for auditing all of the processes identified in the framework.

9. INFORMATION CHART

9.1 Purpose of the Information Chart

The purposes of the Information Chart are:

- To provide links to all of the guidance documents and tools provided with the framework, and
- To provide links to the information referred to in the guidance documents and tools.

If used in conjunction with the Activity Chart, it enables the user to access all parts of the framework quickly and easily.

The chart has been developed in such a way that a follow-on project could convert it into a web-based tool (in conjunction with the Activity Chart) that will enable the full guidance documents and information to be accessible directly.

9.2 Structure of the Information Chart

The Information Chart is in the form of an Excel spreadsheet with 5 worksheets:

- Framework Contents
- References
- Research & Initiatives
- Statutes & Regulations
- EA Guidance

The content of each is described in the following sections.

9.2.1 Framework Contents

This worksheet contains a list of the contents of the framework, which can be opened via hyperlinks.

9.2.2 References

This worksheet contains published or soon to be published documents referred to in the guidance notes. If the document is available on the internet, the hyperlink to the appropriate website or the document itself is also provided.

9.2.3 Research & Initiatives

This worksheet contains a list of research projects or initiatives relevant to this project. This list is not exhaustive and should not be considered as such, but it is intended to cover the most prominent work that is currently underway or has been completed recently. Hyperlinks to websites for further information are provided where available. In some cases, the final documents may have been produced and might be included under References as well.

Each project or initiative has been reviewed and referenced with respect to Technical Themes and Sources-Pathways-Receptors-Consequences. Therefore, it is possible at a quick glance to determine which projects/initiatives might be of relevance to a particular user. Project descriptions have been appended to Technical Report 2, FD2320/TR2.

9.2.4 Statutes & Regulations

This worksheet contains a list in reverse chronological order of all Directives, Acts, Regulations, Orders and Bylaws referred to either directly in the guidance and tools of this framework or in the references provided.

This should not be treated as a definitive list of all statutory requirements that need to be taken into consideration when assessing and managing flood risk for new development. The responsibility for determining the relevant statutory requirements remains with the bodies carrying out the assessments and managing the flood risk.

Hyperlinks to websites are provided where available. Additional comments are provided in a few cases.

9.2.5 EA Guidance

A substantial number of guidance documents either in use or in development at the Environment Agency have been provided for reference in this project.

The information contained in each guidance document has been summarised into the 5 principles of information management, namely:

- Information and Data
- Roles and Responsibilities
- Processes and Procedures
- Tools and Technology
- Audit and Control

A brief description of what is provided under each heading is given, along with additional comments.

Each guidance document has been reviewed to determine whether any science/engineering specifications are provided, whether these figures need reviewing and whether any other statements should be reviewed.

Each guidance document has been reviewed with respect to Sources-Pathways-Receptors-Consequences. Therefore, it is possible at a quick glance to determine which guidance might be of relevance to a particular aspect of risk.

Cross-references to the other worksheets are provided in brackets, based on a colour coding system. The colours are as follows:

- References are blue
- Research projects and initiatives are red
- Statutes and regulations are yellow
- Other EA guidance is green

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Appendices

Appendix A

Activity Chart

FD2320 Flood Risk Assessment Guidance for New Development

Framework for Assessing and Managing Flood Risk for New Development

Activity Chart

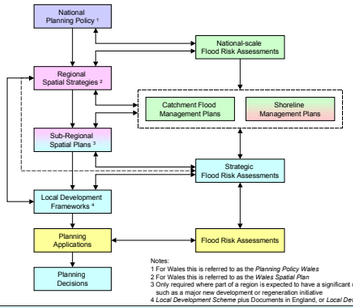
HOW ASSESSMENTS OF FLOOD RISK ARE USED

Key of lead responsibilities

- ODPM or National Assembly of Wales
- Regional Assembly or National Assembly of Wales
- Local Planning Authority or Unitary Authority
- Defra or Welsh Assembly Government
- Local Flood Defence Authority or Internal Drainage Board
- Environment Agency
- Developer

Development Planning

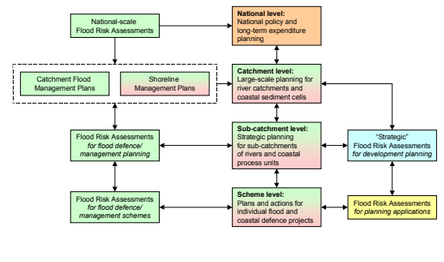
How tiered assessments inform different scales of Development Planning



Notes:
1 For Wales this is referred to as the *Planning Policy Wales*
2 For Wales this is referred to as the *Wales Spatial Plan*
3 Only required where part of a region is expected to have a significant change in land use, such as a major new development or regeneration initiative
4 *Local Development Scheme* plus Documents in England, or *Local Development Plan* in Wales

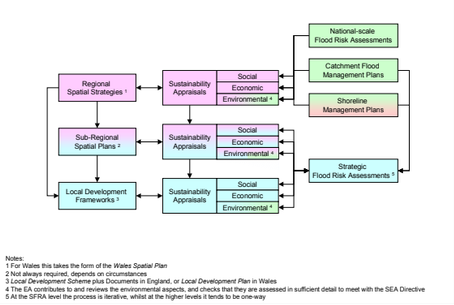
Flood Management Planning

How tiered assessments inform different flood management decisions (a.k.a. strategic planning)



Sustainability Appraisals

How tiered assessments inform sustainability appraisals



Notes:
1 For Wales this takes the form of the *Wales Spatial Plan*
2 Not always required, depends on circumstances
3 *Local Development Scheme* plus Documents in England, or *Local Development Plan* in Wales
4 The EA contributes to and reviews the environmental aspects, and checks that they are assessed in sufficient detail to meet with the SEA Directive
5 At the SFRA level the process is iterative, whilst at the higher levels it tends to be one-way

DECISION GUIDANCE

Key of lead responsibilities (note that other stakeholders should still refer to these guidance notes)

- ODPM or National Assembly of Wales
- Regional Assembly or National Assembly of Wales
- Local Planning Authority or Unitary Authority
- General Guidance
- Local Flood Defence Authority or Internal Drainage Board
- Environment Agency
- Developer

What's needed for Development Planning?

- **National Planning** — Provides an overview of what information on flood risk and flood management should be provided for national planning.
- **Regional Spatial Strategies** — Provides an overview of what information on flood risk and flood management should be provided for **regional** planning and **sub-regional** planning
- **Local Development Frameworks** — Provides an overview of what information on flood risk and flood management should be provided for local development planning.
- **Planning Applications & Decisions** — Provides an overview of the requirements to assess the flood risks associated with planning applications for new development

Which indicators can be used?

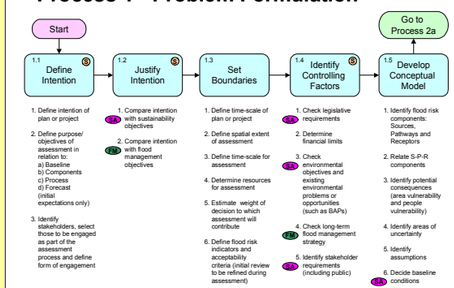
D2.1 Flood Risk Indicators

- Recommends suitable flood risk indicators for different planning needs
- Provides information on application
- Suggests existing data, models and assessments that can be used
- Describes a selection process
- Provides a simple spreadsheet tool for estimating change in risk to people caused by new development

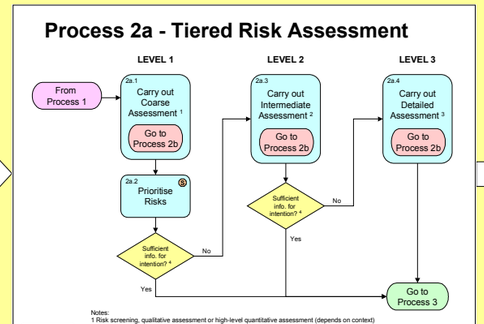
Which type of assessment can be used?

- D3.1 **National-scale Flood Risk Assessments** — Provides an overview of the NaFRA process to support the development of fluvial and coastal flood management **policies**, the allocation of resources and monitoring the performance of flood mitigation activities.
- D3.2 **Catchment Flood Management Plans** — Provides an overview of the CFMP process; summary information regarding the roles and responsibilities; and shows how CFMPs fit into the overall framework for assessing and managing flood risk for new development.
- D3.3 **Shoreline Management Plans** — Provides an overview of the SMP process; summary information regarding the roles and responsibilities; and shows how CFMPs fit into the overall framework for assessing and managing flood risk for new development.
- D3.4 **"Strategic" Flood Risk Assessments** — Provides an overview of what constitutes an appropriate assessment of flood risk at the local scale; summary information regarding the roles and responsibilities of LPAs and the EA; and shows how SFRAs fit into the overall framework for assessing and managing flood risk for new development.
- D3.5 **Flood Risk Assessments** — Provides an overview of what constitutes an appropriate assessment of flood risk at the site-specific scale; summary information regarding the roles and responsibilities of Developers, LPAs and the EA; and shows how FRAs fit into the overall framework for assessing and managing flood risk for new development.

Process 1 - Problem Formulation

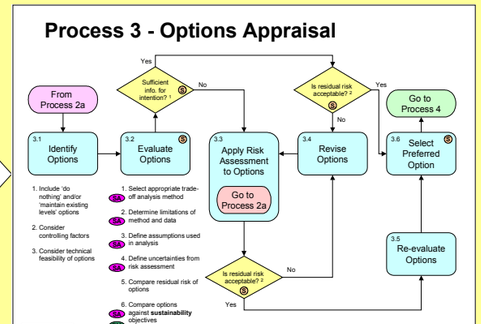


Process 2a - Tiered Risk Assessment



Notes:
1 Risk screening, qualitative assessment or high-level quantitative assessment (depends on context)
2 'Generic' quantitative assessment or intermediate quantitative assessment (depends on context)
3 Detailed quantitative assessment (in all cases)
4 This will depend on the purpose of the assessment, which will have been defined during Process 1

Process 3 - Options Appraisal

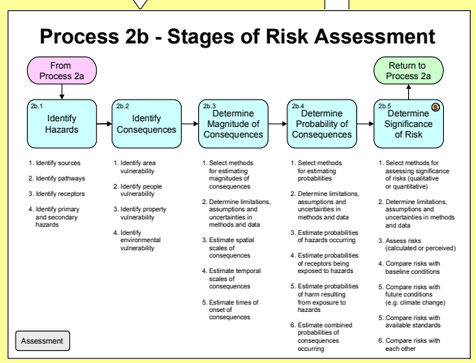


Notes:
1 This will depend on the purpose of the assessment, which will have been defined during Process 1
2 This is answered by referring back to the acceptability criteria defined during Process 1

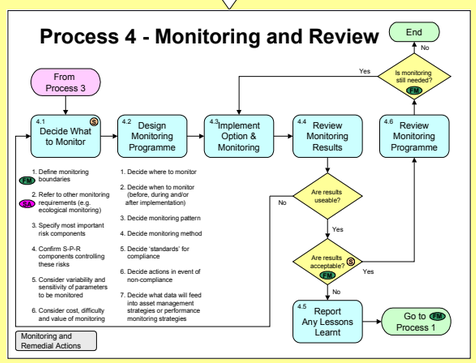
Key for processes

- Process part
- Process decision
- Stage of Strategic Environmental Assessment (SEA) for which input can be provided (if applicable)
- Main links between processes or information
- Start of process
- Jump to different process
- End of process
- Point for stakeholder engagement
- Link to sustainability appraisals
- Link to flood management strategy planning

Process 2b - Stages of Risk Assessment



Process 4 - Monitoring and Review



GENERIC APPROACH TO ASSESSING AND MANAGING FLOOD RISK

SUPPORT GUIDANCE

How to navigate the framework

- FIRST TIME USERS START HERE
- S1.1 Introduction to the Framework — Purpose of the framework and the principles behind it, plus full list of guidance documents and tools provided in the Framework
- S1.2 How to use the Activity Chart — Read this guidance document to find your way around the Activity Chart
- S1.3 How to use the Information Chart — Read this guidance document to find your way around the Information Chart, which accompanies the Activity Chart
- S1.4 Glossary and Abbreviations — Read this guidance document to find definitions of terms and abbreviations used in the Activity Chart and Guidance Documents

How to manage the assessment processes

- S2.1 — Includes: •Generic reporting requirements •Specific reporting requirements for different types of assessments •Suggested table of contents
- S2.2 Information Management — Includes: •Principles of information management •Types of data/information •Generic data control •Data flows between assessments •NFCDD •Data Control Check-list •Process Health-Check
- S2.3 Auditing and Control — Includes: •Appropriateness of: Approach Science Decisions •Policy compliance •Assessment Check-list •Process health-check
- S2.4 Stakeholder Engagement — Includes: •Why do it •Who should be involved •How to do it •Stakeholder Engagement Check-List
- S2.5 Linkage to Statutory Requirements — Lists over 40 Directives, Acts, Regulations, Orders and Bylaws Summarises: •Environmental Impact Assessments (EIAs) •SEA Directive •Water Framework Directive •Habitats Directive

Key issues

- S3.1 Climate Change — Provides simple guidance on suitably precautionary approaches to climate change, as required for different types of assessment.
- S3.2 Risks to People Behind Defences — Provides simple guidance regarding currently available approaches with different degrees of complexity, with particular regard for flood risks to people.
- S3.3 Safe Access and Exit
- S3.4 Brownfield Development — Provides summary guidance regarding how the generic approach should be applied to development on brownfield sites
- S3.5 Mitigation Measures — Provides guidance on when and how to take into consideration mitigation measures when assessing risk (incl. building standards and flood warning)

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