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Perspectives from the Insurance Industry

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Affiliations

(Please note that any comments or opinions expressed by the author are not necessarily shared by the following organisations.)

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Abstract

As yet, there is little sign of awareness on the part of insurers of the principles of SUDS, or of any dialogue between SUDS practitioners and insurers. The author represented insurance interests as a member of the UK Steering Committee for the CIRIA SUDS manuals, and, uniquely, is a member of every Flood Liaison and Advice Group set up in Scotland under NPPG 7 or SPP 7, so no one is more aware of the potential issues. He has been able to advise most Scottish local authorities not only on insurance industry concerns, but also on best practice in other areas, but as yet has not had the opportunity to explain the issues to the academic community.

Following the publication of PPG 25 in 2001, which allowed floodplain development to continue in England, insurance companies became increasingly concerned about flood losses, and cancelled their guarantee to provide flood cover to all homes at the end of 2002. They are becoming increasingly selective about what risks they will accept, and in particular, some insurers will not accept properties which are within 100 metres of a watercourse or pond. At the same time, liability insurance is becoming much more expensive as people become more litigation conscious and some councils are concerned about the safety aspects of ponds in housing areas. This paper will look at the implications of hardening insurance attitudes for the future of SUDS.

The author has recorded many "frequently asked questions" raised by 28 local authorities about SUDS, along with answers from an insurance perspective, and will seek suggestions on how to establish a dialogue with the insurance industry to resolve possible future problems.

Disclaimer

The contents of this paper are for information and discussion purposes only. The author does not claim to represent any of the organisations mentioned in the paper, but is simply recording an independent and personal opinion, based on extensive research and private discussions with a wide range of those people most closely involved in the issues, whose assistance he acknowledges with thanks.

The author makes no warranty regarding the accuracy or comprehensiveness of the contents. The report is not intended as professional advice, and no liability is accepted for any actions taken on the basis of the information contained in it.

Introduction

The writer welcomes this opportunity to raise some insurance issues with this eminent group of experts on SUDS. He hopes that his comments will provide some food for thought, and perhaps even lead to dialogue and action. While he has been a great advocate of SUDS for some years, he is concerned that failure to consider insurance concerns could result in problems with insurability which would cause considerable distress to many members of the public. Climate change will increase the incidence of severe rainfall events and coastal storms. Engineering solutions would cost £52 billion just to manage the additional risks from climate change over the next 95 years. This compares with £22 billion when using engineering in concert with a range of non-engineering measures[1]. SUDS can form part of a non engineering strategy, but only if it is properly designed and takes climate change fully into account. Insurers can help with modelling skills, data, and advice. Ignore the insurance industry input and society may have to face blighted and uninsurable communities.

Do we need SUDS?

Why do we need SUDS? The writer first encountered SUDS in the great plains of Canada many years ago. The location was over a thousand miles from the nearest ocean and it made sense to direct surface water from paved areas into groundwater to ease the strain on rivers. Here in Britain, where no-one is more than 75 miles from the sea, why can't we just keep directing surface water to rivers and the sea instead of going to all this trouble?

Perhaps the Victorians had the right idea in building miles of underground pipes to keep unwanted water out of sight.

Of course the problems are different now. In recent times flooding from drains and sewers has become a major issue, not least for the insurance industry. Such floods accounted for 14% of the properties flooded in autumn 2000. There are a number of reasons for this:

- Lack of maintenance is leading to leakage and collapse of drains or sewers.
- Many surface and groundwater inputs are unknown or unauthorised.
- Urbanisation has increased inputs of both effluent and run off.

[1] Evans, E., and Hall, J., December 2004. *"A new climate for flood planning"* Ingenia, the Journal of the Royal Academy of Engineering.

- Screening facilities were not designed for modern items such as sanitary products.
- There have been a number of extremely severe rainfall events, consistent with climate change projections.
- The capacities of many urban watercourses to convey runoff has been reduced or limited as a result of culverting.

Many communities around the country are plagued by a sewage system on the point of collapse. In England and Wales, there are more than 186,000 miles of public sewers. During 2002, only 24 miles of them were upgraded or replaced. In August 2002, five mainline railway stations in London were closed during the evening peak period due to flooding (the writer recalls wading through ankle deep sewage water in Liverpool Street Station). In Leicester in the summer of 2003, one of the city's sewers erupted sending a 20 metre high geyser of sewage into the air.

Even new drainage systems do not seem to fully take extreme events into account. In 2002, 37 sewage and surface water outfalls into the River Tay at Dundee were diverted into a single pipe serving a 270,000 population equivalent. This eliminated pollution in the Tay, but resulted in floods in the centre of Dundee in 2002 and again in 2004, when the new single pipe could not cope with the high rainfall.
Water Companies can be held liable for flooding caused by CSOs if the flood enters property, but are not liable for flooding of gardens or roads (Marcic v Thames Water Utilities, 2003) as a result they frequently do not turn out to deal with such problems even though they could be the harbinger of much more serious floods to come.

Insurance companies are pretty well resigned to the situation that sewage backup flooding can happen almost anywhere, and they build this into their premium. So long as the pipes and combined sewer overflows (CSOs) are underground and largely unmapped, they have little choice. They know that the situation will only get worse as these pipes deteriorate over time and climate change brings more frequent severe rainfall.

Above ground flood hazards are something else: insurance companies overseas have long marvelled at the fact that British insurers have had better river and coastal flood maps than their government or mapping agency. The situation is only now starting to change after the Norwich Union, in a piece of inspired altruism, decided to make its £5m digital elevation model available to the British environment agencies in an effort to help them to reduce the amount of new building going on in the floodplain. The result is the second generation indicative flood maps published in England and Wales in 2004 and due to be published in Scotland later in 2005.

Why are insurers in the UK so well prepared to identify flood hazard areas? The reason is partly government policy. Most countries in the world have a spirit of "solidarity" best summed up by Thomas Jefferson, the author of the USA's Declaration of Independence, who said *"The care of human life and happiness, and not their destruction, is the first and only legitimate object of good government"*[2]. Many countries in addition to the USA

[2] Thomas Jefferson's speech in 1809 to the citizens of Washington County, Maryland, USA.

have the ethos of "solidarity" in which the government helps citizens who suffer from natural and other disasters. This ethos is not so deep rooted in Britain, indeed a British government minister[3] went so far as to say in connection with government compensation for flood damage: *"That would not be a wise or sensible position for any government to take."* This implied insult to the USA, not to mention almost all of our European neighbours, fortunately went un-noticed overseas.

In the absence of government compensation, combined with an undertaking by insurers in 1961 to provide cheap flood insurance for all, has resulted in a public perception that insurers have a "social duty" to provide cheap cover for everyone[4] and are able and willing to do so.
There is a high take up of private insurance in the UK, at least amongst those who can afford it, which has meant that the insurers are financially strong and technically sophisticated in managing risks. Everyone seems to take it for granted that cheap flood insurance will always be available. Many people are in for a shock after 2007. To understand why, it is necessary to look at the history of flood insurance in the UK.

The Insurance "Guarantee"
In 1961, members of the British Insurance Association, the forerunner of the Association of British Insurers, reached a so-called "gentleman's agreement" with government. (Despite the references to Britain this also applied to N. Ireland). The agreement was that they would offer flood cover to any domestic residence or small shop in Britain at an additional premium not exceeding 10 shillings (50p) per cent on the sum insured. For many years, the insurance industry readily granted cover to properties even in flood hazard areas at little or no extra cost, as part of a household insurance package policy. (One insurer even found itself covering a house on a sandbank in the middle of a river estuary!) Increasingly this was seen as unsustainable and unfair to those living in safer areas. Not only that, but by enabling people to obtain mortgages in hazardous areas, it could be seen as encouraging flood plain development.

The UK is unique in offering flood cover as a standard feature of household and most business policies. Unlike much of Europe and the rest of the world, cover is widely available to the UK's 23.5m householders. Less than 1% of all household properties currently fall into the unacceptably high-risk flooding category (although 1% of 23.5m is a lot of households) and this may more than double after 2007.

Average household premium currently stands at £250, with a typical flood claim coming in at £15,000-£30,000 according to the National Flood Insurance Claims Database[5].

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[3] Nick Raynsford, MP, the then Minister for Planning, emphasised this point in his evidence to the House of Commons Select Committee Inquiry into the autumn 2000 floods. See *"The Environment Transport and Regional Affairs Select Committee Report on the Autumn floods in 2000"*. Published on 20th December 2000. HMSO, London.
[4] Clark, M., Priest, S. J., Treby, E. J., Crichton, D., 2002 *"Insurance and UK Floods: a strategic reassessment."* A Research Report for TSUNAMI. University of Southampton, Southampton.
[5] Black, A and Evans, S (1999) *"Flood damage in the UK: New insights for the insurance industry."* University of Dundee. ISBN 0 903674 37 8. Dundee, Scotland.

Since 1 January 2003, the issue of insurance cover for properties at risk of flooding has been covered by the Association of British Insurers' (ABI) "Statement of Principles".[6] The statement sets out the intention of the insurance industry to provide until 2007 a fully operational competitive insurance market to all properties currently protected to at least a 1-in-75-year standard or where defences to this standard or greater will be completed by 2007. Premiums and other policy terms and conditions offered such as excesses remain competitive issues for individual insurers to set and reflect the actual risk property owners' face. (Since then premiums in flood hazard areas have increased by around 250% with excesses of £20,000 becoming common.)

This commitment from the ABI will be reviewed annually, and is contingent on some key actions from the government in Whitehall with respect to England, including:

- sustained spending commitments on flood management;
- changes to the administration of flood defence spending;
- improvements to the development planning system;
- introduction of legislation similar to Scotland[7];
- availability of high-quality risk data;
- development of integrated drainage management systems.

Strangely, availability of flood insurance in Scotland, Wales, and Northern Ireland is to be entirely dependent on actions taken in England, dealing only with English flood hazards. When the ABI announced this policy it caused strong resentment against the insurance industry from outside England, especially from Scottish local authorities, most of which had already implemented the conditions set out above[8].

SUDS practitioners seem to be particularly guilty of taking insurance for granted. Just because cheap flood insurance has been available to all households, regardless of risk, since 1961, they seem to assume it will always be there. Perhaps this is why they do not appear to think of the insurance implications when designing a SUDS scheme.

But this is perhaps not really a problem for insurers, indeed SUDS will help insurers to avoid claims for two reasons:

1. Not all types of floods are insurable. Young v Sun Alliance[9] held that flood does not include seepage of water from an underground watercourse. To make matters clear, both personal and commercial property policies now usually specifically exclude rising groundwater. SUDS will change the flood hazard from sewage backup which is covered to rising groundwater which is not covered.
2. Most of the SUDS drainage infrastructure is now on the surface where insurers can see it, and where they can map it with their airborne synthetic aperture radar instruments (SAR) and satellite PS InSAR technology. This will allow them to increase

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[6] ABI, September 2002. For details, see: www.abi.org.uk/Display/File/78/Statement_of_Principles.doc

[7] Namely the Flood Prevention and Land Drainage (Scotland) Act 1997

[8] Crichton, D., March 2005 "*Flood risk and insurance in England and Wales: are there lessons to be learnt from Scotland?"* Technical Paper Number 1, Benfield Hazard Research Centre, University College London. Available for free downloading from www.benfieldhrc.org

[9] Young v Sun Alliance [1977] 1 WLR 104; [1976] 3 All ER 561; [1976] 2 Lloyd's Rep 189; 120 SJ 469

premiums in such areas or withdraw cover altogether after 2007. After 2007, we could well have an insurance "underclass" of people whose drainage is exposed and mapped by insurers with their radar survey aircraft, compared with those whose drainage problems are safely hidden away from insurers' "eyes in the skies".

This begs the question of what will people do if they cannot afford insurance, or if they are flooded by rising groundwater and find that their flood claim is turned down? The obvious answer in this litigation conscious world could be legal action against the local planning authority and the designers of the SUDS scheme. Officials' Indemnity insurance in Scotland where councils have a statutory duty to maintain watercourses,[10] could become more expensive, as could Professional Indemnity insurance for those responsible for designing and maintaining SUDS schemes anywhere in the UK.

There may be particular problems for "affordable housing" where there might not be enough land for adequate SUDS provision and where residents may not be able to afford insurance.

Of course it might not be like that: the writer is an optimist and hopes that SUDS practitioners might some day think about talking to the insurance industry and seeking to ensure that schemes are properly designed to take climate change into account . Some of the problems of concern to insurers are outlined below. SUDS can look very attractive and ecologically friendly, but will residents care about that after 2007 if their insurance is cancelled and their mortgage is foreclosed? Wouldn't it be wiser if SUDS practitioners were to start to talk to the insurance industry before that happens?

Insurance companies after all do have some knowledge and experience of flooding. A survey published in November 2002 by the Federation of Small Businesses[11] in the South East of England shows that most small businesses that survived the Autumn 2000 floods have had significant increases in premium. But it also shows that 42% had losses in excess of £50,000 after taking business interruption costs into account. The majority (63%) felt that their insurance settlement was fair, but 21% suffered from the imposition of big excesses, or withdrawal of flood cover afterwards.
The most commonly used sources of advice during the floods were the insurance companies (24%), the Environment Agency (17%) and the local authority (13%). The highest levels of satisfaction were from advice from insurance companies. The highest levels of dissatisfaction related to advice from the Environment Agency and local authorities.

It should be borne in mind that if the flood hazard exceeds the return periods shown in the "Insurance Template" (see annex) then flood insurance is going to be much more expensive in the future and in many cases unavailable. A drainage impact assessment based on a 200 year return period plus climate change is the absolute minimum precaution that should be required in every case if residents and businesses are to be safe.

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[10] Flood Prevention and Land Drainage (Scotland) Act 1997.
[11] Barter, A.,2002 "*Autumn 2000 Flood Survey*" Federation of Small Businesses (South East). Polegate, England.

Issues which could affect insurance

Awareness
SUDS practitioners seem to have made few efforts to keep the insurance and mortgage lending industry informed about SUDS developments, and many insurers have never heard of SUDS.

The position is rather different in Scotland where there is insurance representation on all 18 Flood Liaison and Advice Groups (FLAGs). These groups have been in operation since 1995 and now provide advice to 28 out of 32 of the Scottish local planning authorities on insurance aspects of flooding and SUDS. Councils with FLAGs no longer allow any building in flood hazard areas, have an active flood defence programme with no problems in obtaining grant aid, and increasingly try to ensure that SUDS schemes are properly designed and maintained to minimise flood hazards. The author is, however concerned that the many questions and misconceptions which have been resolved in Scotland through FLAG discussions may still exist in England and Wales, where planners do not have the benefit of such regular meetings with experts who can give advice and spread best practice.

Household insurance proposals
Most insurers when considering a proposal for new household insurance now ask questions such as: "Is your property within 100metres of a pond or watercourse?" Insurers do not discriminate between a retention pond, detention basin and a natural pond, and after 2007 they may simply just refuse to quote for houses near ponds. Pricing for commodity business like household insurance is under great competitive pressure and insurers prefer standard risks on a "fit or forget" principle.
In this litigation conscious society they may also be concerned about the risk of legal action if a child was to drown in such a pond. While such legal action is unlikely to be successful if the pond is properly designed, insurers are not to know if the design is satisfactory and without some sort of independent certification scheme drawn up in close consultation with insurers their approach will tend to be "if in doubt throw it out".

Flooding
Many gardens with SUDS are now regularly waterlogged whenever it rains. Very young children can drown in only two inches of water. Apart from that, new houses no longer have doorsteps due to disability discrimination regulations and some builders are lowering the ground floor level to save on the cost of ramps. (Building Control Officers check roof heights but rarely ground floor heights.)

If a householder makes a flood claim and the insurer realises there is no doorstep and that the garden is often waterlogged, it is not going to understand that some SUDS designer has designed it to be this way, they will simply see a property at risk of flooding and will be likely to apply a substantial flood claim excess for future claims, perhaps as high as £20,000 plus a premium loading. They may well refuse to renew after 2007.

Many councils regard SUDS as a cheap alternative to flood defences and even as an excuse to allow building in floodplains. They do not seem to realise that SUDS can actually increase the flood hazard for properties built on floodplains.
Councils which do not have FLAGs to guide them are quite likely to see SUDS as a way to allow more new building in floodplains and at the same time appear environmentally friendly.
Local planning is part of our democratic tradition, and where there is a shortage of land and a high demand for housing, the use of floodplains for housing may well be justified on the grounds of economic efficiency, so long as public safety is not compromised.
What does seem unfair, however, is that while property developers make multi million profits…

- frequently the purchasers of these properties are not aware of the flood hazard,
- when they do become aware of it, they expect the EA to fund flood defences to protect them, even if the EA has advised against the development in the first place.
- often flood plain land, being cheap, is used for social housing, where the residents may not be able to afford to buy insurance.
- After 2007, many may not be able to get insurance at any price, leading to their mortgage being foreclosed and the house repossessed.

The general public should have a right to expect that experts, such as the planning authorities and designers of SUDS schemes, will take all reasonable steps to protect the interests of the people who are affected by their decisions, namely those who buy new homes built with the consent of the local planners. Indeed this sort of duty is enshrined in the case of Hedley Byrne & Co v Heller & Partners [1964] A.C. 465, and breach of it can lead to legal action.

Rising Groundwater
SUDS was originally intended to have a neutral impact on a site, that is that no more surface water would run off than if the site was “greenfield”. The object therefore is to compensate for impermeable surfaces such as roofs and roads, but directing as much run off as possible into the groundwater. This means that groundwater levels will fluctuate depending on the weather and while this is not a problem in a greenfield site, it can be a problem for buildings where rising groundwater can cause flooding and “heave”. While groundwater flooding is excluded from household policies, “heave” is covered.

Many SUDS designs do not adequately take into account the fact that when a new housing estate is occupied, residents will start to change the amount of rainfall run off, for example by building extensions, conservatories, patios and driveways. Also in most new housing estates there is very little land to spare for adequately sized SUDS ponds and soakaways.

Most SUDS designs do not seem to fully take into account the increase in severe rainfall events predicted from climate change[12], although in Scotland it is now common practice for local authorities to insist on a drainage impact assessment for a 200 year return period event taking climate change into account, using award winning methodology developed by the NE Scotland FLAG[13].
If a SUDS scheme is not well designed at the outset, SUDS ponds can easily become overloaded with this additional surface water and flood.

"Grey water"
Recent changes in Building Regulations will allow SUDS to be used not only for rainwater but also for "Grey water", that is water from sinks, basins and washing machines (but not toilets). This means that SUDS will have to cope not only with rainwater but also with increased volumes of drainage from water brought onto the site by the mains supply and then poured down the drain along with pollutants.

While infiltration measures will be required in such cases, insurers are likely to be concerned about possible liability for pollution from detergents, bleach, nitrates or other chemicals being disposed off into the groundwater, especially where houses are close together.

Petrol and oil contamination
SUDS are also required for roads and car parks. Oil filters are being used for surface water drainage, but only for areas of heavy traffic such as filling stations and motorway service areas. They are not required for most car parks or roads.

Insurers are very reluctant to cover pollution liability, especially oil contamination of groundwater which might leach into rivers from roads and car parks and cause expensive liability claims for loss of fishing rights or pollution of drinking water extraction wells. They are likely to only cover sudden and accidental pollution, not gradually operating causes. Clean up can only be covered under an Environmental Impairment Liability insurance policy, which is subject to a high premium and detailed survey with all recommendations being implemented. Businesses which are subject to compulsory pollution liability insurance under the EU Environmental Liability Directive might have to close down or relocate.

Subsidence risks
SUDS are designed to allow rainwater to soak into groundwater. In times of drought this is increasingly having the effect in some areas of starving watercourses of water and causing them to dry up. This could lead to the spread of tree roots and possible subsidence in shrinkable clay areas.

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[12] Lang I (2003) *Climate Change and the Hydraulic Design of Sewer Systems, in Extended Abstracts of the 'Floods in Scotland' Seminar,* Scottish Hydrologic Group/Scottish Centre of the Royal Meteorological Society, pp. 20-21. This detailed study on short duration storms in the 2080s suggest that the two-hour duration (1 in 30 year) rainfall could increase by 60% in Edinburgh, overwhelming the capacity of the current urban drainage systems.
[13] North East Scotland Flood Appraisal Group (2002) *"Drainage Impact Assessment: Guidance for Developers and Regulators."* Aberdeenshire Council, Stonehaven.

Subsidence currently costs the insurance industry an average of nearly £1m per day in incurred claims, and they are very careful about taking on risks with a history of subsidence. New satellite technology called PS InSAR will enable insurers to monitor and map sub millimetre subsidence and heave and avoid taking on risks in such areas.

Maintenance

Arrangements have still not been properly established for the maintenance of SUDS ponds and soakaways. Local authorities appear to be unwilling to commit to the costs of adopting such installations, similarly water companies. As time goes on, many of these installations will not work properly if not regularly maintained. For example if SUDS ponds or overflow channels become clogged with rubbish and weeds, they will be more likely to cause flooding.

Local authorities in Scotland have a statutory duty and funding to maintain watercourses to prevent flooding and this has significantly reduced flood events in Scotland. Already local authorities in Scotland are being sued by householders and property developers for flood events caused by blocked watercourses. At the same time, Scottish local authorities are working hard to find ways to fund maintenance: for example using a planning gain levy. Fife Council has recently persuaded Tesco to adopt a detention basin next to one of their stores in Dunfermline, which is appropriate because it was already being used by the public as a depository for shopping trolleys.

In the longer term there are going to be pressures to make SUDS ponds smaller; one SUDS pond in Scotland would now be worth well over a million pounds as building land.

A major worry about maintenance arises from the way the EU Water Framework Directive(WFD)[14] has been transposed. In many cases maintenance will actually be prevented by recent legislation for England, Wales[15] and N. Ireland[16]. The Scottish WFD legislation is very different[17], thanks to successful lobbying by insurance and environmental interests, and gives priority to sustainable flood management. Scottish local authorities also have powers to prevent landowners from allowing surface water run off to flood roads[18], which can often lead to flooding of houses.

Scottish Water will have a statutory obligation[19] to adopt and maintain SUDS provided the scheme complies with specifications which Scottish Water is currently preparing. Will insurers be consulted about this?

One can envisage a situation where a SUDS scheme is not adopted, no maintenance is carried out, and ultimately this results in flooding. Will insurance still be available for properties close to such a scheme, or will these properties no longer be able to obtain insurance? In a worst case scenario, what if a complete housing estate can no longer be

[14] European Union (2000). Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (Water Framework Directive).
[15] The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003
[16] Water Environment (Water Framework Directive 2000/60/EC) Regulations (Northern Ireland) 2003.
[17] Water Environment and Water Services (Scotland) Act, 2003
[18] section 99 of the Roads (Scotland) Act 1984
[19] Water Environment and Water Services (Scotland) Act, 2003

insured because of a defective SUDS scheme? Mortgages will be foreclosed, property values will fall and blight will result, not to mention litigation against the designers.

There are also cross boundary issues to consider: without the liaison available through FLAGs, there is nothing to stop a council allowing lucrative housing development on its borders, but putting the SUDS scheme into the neighbouring council area, thus avoiding the maintenance problem, and this has indeed happened.

Coastal SUDS

Many councils insist on SUDS in coastal areas even when rainwater could more easily and quickly be drained into the sea. In places like Los Angeles, Houston, Singapore, or Madeira their solution to storm water drainage is to build huge concrete channels to let the water run away to the sea. This is unlikely to happen in the UK, where the "Green" lobby is strong, but climate change will bring significant increases in surface water from rainfall and coastal storms and if we are not to somehow prepare our coastal infrastructure for these then we should cease to build in such areas at all.
Insurers recognise the problems and are increasingly reluctant to provide cover to buildings situated below the 5 metre contour.

Conclusions

FLAGS have had a great impact in reducing flooding in Scotland by involving all stakeholders including insurers in SUDS issues and floods generally. A recent report published by ODPM[20] states *"On the particular issues raised by flood risk, authorities in England and Wales can consider establishing Flood Appraisal Groups or Flood Advisory Groups similar to those in Scotland, where adjoining local authorities, representatives of different local stakeholders, SEPA and the Water Authority are represented*." The writer would endorse this recommendation, so long as the important role of insurers is recognised as stakeholders, but wonders why Northern Ireland (where SUDS policies are currently being prepared) is not mentioned?

Indeed depending on the interpretation of the statutory duties for the involvement of stakeholders under the Civil Contingencies Act 2004 and the Water Framework Directive, such stakeholder groups will be compulsory, and local authorities outside Scotland may have to follow the Scottish example whether they want to or not.

Further Information

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[20] CAG Consultants and Oxford Brookes university (2004) *"The planning response to climate change – overview and best practice."* ODPM, Scottish Executive and Welsh Assembly Government, 15 October 2004. ISBN 1 85 1127 15 1. Price £20 or can be downloaded free from http://www.odpm.gov.uk/stellent/groups/odpm_planning/documents/page/odpm_plan_032088.pdf

A. Szöllösi-Nagy (UNESCO) and C. Zevenbergen. ISBN 04 1535 998 8, 2004, 160 pp. A.A. Balkema Publishers, Leiden, Netherlands. Available from www.balkema.nl or www.tandf.co.uk .

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Annex: The Insurance Template

(© Crichton, 1998)

The prime consideration in any proposed development must be possible risks to the health and safety of the public. Where rivers are "flashy", floodwaters can rise very quickly, and in hilly areas, the velocity of the floodwater can wash vehicles and buildings away, and cause fatalities. Sometimes, however, there may be compelling commercial, practical, and political reasons for locating certain types of development in a hazardous area. The author has therefore proposed three different categories of development. The precise definitions are obviously up to each planning authority, but the following "Insurance Template" has been adopted by the insurance industry as guidance for planning authorities. Almost all planning authorities in Scotland now base their strategies on some or all of this template, and the "Risk Framework" in the recent Scottish Planning Policy SPP7 is consistent with the template.

Category One - Strategic Sites

Facilities which must continue to function in times of flooding, for example, emergency services, hospitals, electricity supplies, telephone exchanges, mobile telephone and broadcasting transmitters, and emergency control centres.
Such developments should not be permitted in flood hazard areas unless very high standards of local defences can be guaranteed.

Category Two - Residential

Facilities where the public sector is prepared to provide a high standard of flood defences where necessary. The minimum level of protection which would enable insurers to offer cover at normal terms for residential properties is at least a 200 year return period up to the year 2050, after taking climate change into account. For details see the table below.

Category Three - Commercial and Industrial

Developments where the owners would be responsible for providing their own defences, or where the flood hazard is considered to be less important than other considerations, such as the need to be close to a river. Some developments in this category may need special treatment, however, for example:
Where the site will attract the public, especially young children and old people (such as health centres and leisure centres),
Where large numbers of the public are likely to gather, and where evacuation routes are limited,
Refuse tips or areas where hazardous materials are to be stored or processed,
Waste water and sewage treatment plant. (Sewage could escape onto adjoining land.)
Health and safety must always be the prime consideration. It should be remembered that flooding could often occur very quickly without warning, leaving little time for evacuation.

Residential standards required if insurance is to be offered at normal terms are as follows;

The Insurance Template

Type of housing	Standard of protection	
	Return period	Annual probability
Sheltered housing, and homes for the disabled and elderly	1,000 year	0.10%
Children's homes, boarding schools, hotels, hostels	750 year	0.15%
Basements used for accommodation	750 year	0.15%
Bungalows without escape skylights	500 year	0.20%
Ground floor flats	500 year	0.20%
"Flashy" catchments (little or no flood warning available)	500 year	0.20%
Bungalows with escape skylights	300 year	0.33%
Caravans for seasonal occupancy only, provided adequate warning notices and evacuation systems are in place	50 year	2.00%
All other residential property	200 year	0.50%
In each case up to the year 2050, taking climate change into account.		

Climate Change

The climate change adjustment is very important, it should take into account that in general, the100 year return period flood now will, by 2050, become:

- 10 to 20 year for coastal flood (ignoring increasing wave heights)
- 60 to 65 year for fluvial flood

Source: Scottish Executive Central Research Unit Report, May 2001