

# **National Disaster Insurance Review – Submission by Angus D Gordon**

## **1.0 Foreword**

The following submission is a brief summary of the principles that should be considered in undertaking a review of the possible use of insurance to manage natural disasters. The fundamental approach to examination of this topic should be based on a risk/consequence matrix which, among other factors, considers who created the risk, who manages the risk, who takes the risk, is sufficient information available regarding the risk, is the available information sufficiently available to all parties involved, what are the consequences likely to eventuate, who will suffer those consequences and did they adequately understand the risk and consequences when taking the risk. In short, what is the chain/matrix of responsibility and accountability?

## **2.0 Introduction**

There is an important difference between natural phenomenon and so-called “natural disasters”. Natural phenomenon are natural events, often weather related (but not always; eg. Earthquakes), that occur to varying degrees and at varying frequencies; they are part of the natural processes that shape, and continue to modify landforms.

“Natural disasters” occur when people and assets are placed in harms way and/or the assets are not adequately designed to cope with the natural events that can occur in a particular region/location. It is important to full appreciate this fact as it has a significant relevance to any discussion on concepts of insurance for what are often avoidable and unnecessary risks, and the resulting consequences.

The recent Queensland issues with cyclones and flooding are a case in point. The natural phenomena that occurred were predictable and in fact, more serious examples of both these types of phenomena have occurred, in the same locations, in living memory with repeat examples in the historical record. However, because of the lack of responsible planning by the Queensland Government and the Councils (also applies in other States due to a lack of leadership at Federal level) historical problems were not addressed and instead the realized potential for an increased disaster was promoted by increasing intensity of inappropriate development in harms way.

To hold the Australian public and the insurance industry responsible for funding the recovery from the disasters experienced recently in Queensland should be a wake-up call to the Nation and any associated failure to sheet home the problem to those who created it means that it will undoubtedly reoccur. To try to cover up the real problem by addressing it as insurance issue is both inappropriate and unhelpful. It is a planning, building and approval matter that, unless addressed at its source, will condemn future generations to a growing legacy of contingent liability with an associated potentially adverse impact on the Australian economy.

To seek to solve the management of the adverse impacts of natural disasters as an insurance matter is simply, and demonstrably, irresponsible. Insurance should not be a panacea for negligent planning.

### **3.0 When is Insurance Appropriate?**

The current review raises the matter of the 1 in 100 annual return interval that is often misunderstood to mean once in one hundred years whereas it actually means a 1% probability of occurrence each year. Given that in a notional commercial asset life of say 30 years this translates to a 26% probability of occurrence and in the actual life of dwelling assets, often exceeding 100 years, it is not a matter of probability but rather one of certainty, or near certainty, it is difficult to argue that an insurance type approach is appropriate. It is not a question of whether the so-called “risk” (actually event, rather than “risk” ) will eventuate but rather when?

This argument is accentuated in situations where known and on-going riverbank or coastline erosion is taking place and not only the built asset but also the land itself will be lost at some point of time in the future and it cannot be practically replaced. The point being that where it is known that flooding or erosion will occur, or is reasonably likely to occur in the life of an asset then what is required is a “sinking fund” rather than an “insurance” approach. Further, it is vital that the likelihood of flooding or erosion be clearly factored in to the value (and selling price) of property.

An insurance type scheme tends to mask the problem and a subsidized insurance scheme can actually promote the problem.

Insurance is appropriate where the natural phenomenon is poorly defined or not well known and/or understood and where the likelihood of occurrence is rare and the consequences are small (for example a poorly defined flood plain in an area where even a “perfect storm” would only result in a small rise in water level and the buildings are all higher than this top level however subsequently a previously not understood factor results in nuisance flooding).

### **4.0 Our knowledge of the Climate/natural phenomena**

It has been a convenient construct to believe there is sufficient data to describe climate variability and hence the probability of occurrence of events. Clearly this is statistically invalid as there is less than 200 years of record and arguably only about 100 years of reliable (or semi-reliable) record.

While the debate on whether the world is experiencing anthropogenic climate change versus natural long term variations (possibly of the order of hundreds of years, or more) or a combination of both, the fact is that there is little scientific basis to believe that the data presently available is adequate to define a statistically stationary series; if indeed this is at all relevant or representative of the physics of natural phenomena.

Hence reliance on concepts of probability of occurrence of natural events is clearly a flawed approach. That is, the traditional approach to actuarial assessment is invalid and hence a traditional insurance approach is similarly inappropriate. In future reliance should be on scenario testing and consequence mapping.

## **5.0 Way Forward**

Rather than specious arguments about the details of an insurance scheme and debates about possible subsidization it would be more productive and responsible to deal with the actual problem; insurance, as will be demonstrated, then becomes a minor but important part of the solution.

### **5.1 New Developments/infrastructure**

All new development/infrastructure should be designed to cope with the known natural events for the particular location and/or restricted to areas/designs that, to the best of current knowledge, will result in a situation where the likely risk of death or damage is within the societally accepted limits. Further, all persons who chose to live/build/invest in areas with defined potential impacts from natural events are made aware of the issue at the time of purchase and agree to fully accept the risk without any recourse to compensation. This can be achieved by a declaration on the front page of all sales contracts that the potential purchaser has been made aware of the issues and accepts the consequences.

The known potential outcomes of weather events should be fully documented and available to the purchaser at the time. This will require effort at Federal level with buy-in by all States. It should be presented in such a manner that it is directly linked to the price of the land. That is, the “risk” and consequences of taking that risk should be expressed in such a way that it fairly impacts on the purchase price. The fundamental principle being that if someone is fully aware of the potential for damage and loss and is prepared to accept that there will be no right of claim. However they should be free to “enjoy” the property/asset for as long as it exists, regardless of whether the duration of existence can be well defined or is simply a best estimate.

### **5.2 Appropriate and/or Adaptable Development**

There needs to be a clear distinction between land affected by flooding and dwellings/commercial/industrial premises affected by flooding. In many locations, particularly in inland Australia and near the coast where the depth of flooding of properties is relatively low (ie less than say 2m) and that this depth is not exceeded even by the best estimates of extreme events (in conventional terms, not much difference between the 1 in 100 and the 1 in 10,000 events...though those terms are of questionable meaning), and the velocities associated with inundation can be readily coped with by sound engineering design, then it is possible to elevate the built asset. This means that while the property is flood affected, the asset, and its contents are not.

Any insurance scheme should encourage this outcome whether for new or for adaption of existing development. That is, the buildings and their contents should only be insurable if constructed above the “low risk” levels established to the best of current knowledge. Hence insurance is against the risk of the knowledge, not the certainty of flooding.

The alternate of levee bank protection for a community rather than elevation of individually owned assets raises significant risk management issues in regard to the responsibility for maintenance and the determination of crest levels. Levee banks have been traditional solutions however if utilized then the risk must be born by the constructor/maintainer of the structure and hence that Authority should be the insured party, with individual house holds having the right to recover damages against the Authority. Insurance premiums would be based on the level of risk accepted by the Authority along with the excesses if risk levels exceeded and the consequences if this occurs.

New buildings (and their contents) in areas where the best available knowledge is that they will be lost over time to the ravages of either river or coastal erosion should not be insurable. This should be clear on the Contract of Sale and the Land Title. The situation should also be clearly conveyed to both lending Authorities and insurers by instruments maintained in a readily publically accessible form through local councils, in accordance with State Regulations and in keeping with Federal Standards.

The value of the land, and the associate assets, destined to be lost to erosion should reflect an owner’s preparedness to enjoy the land and the asset, while it is there and write it off over the best available estimate of time of the continuance of the asset. There may be some room for insurance to cover this gamble in regard to timing.... however that is what it should be confined to. The responsibility for removing contents from harms way during an event which may/will result in the loss of the asset should be that of the owner/resident and not be insurable; in keeping with a risk matrix approach.

Given the uncertainty that exists regarding future climate and even the present relatively short climate record it is essential that all development and infrastructure in areas where there is the potential for adverse impacts from natural phenomena should be designed and constructed to be adaptable. The degree of adaptability should depend on the potential consequences and the design life. For example, a walking path in a riverside park would require a very different approach to a nuclear power plant in the same location; obviously more subtle examples exist!

### 5.3 Existing Development

In dealing with the dilemma of existing development the fundamental principle should be to provide incentive to move out of harms way or to make floodproof/stormproof (eg elevating) or to progressively adapt buildings and infrastructure so that the risk and consequences are appropriately managed.

It is argued that an insurance based approach to managing existing development in areas of potential/known threat is inappropriate as it may encourage continuation of an existing and repeatable problem situation and may even provide a vehicle for exacerbation of the problem through apparent support for intensification. Rather than an insurance-based approach it is proposed that a sinking fund scheme be utilized. The concept of the sinking fund would be to, over time, build up the necessary pool of funds to enable the progressive relocation of people/industries to places not exposed to known threats or to make existing development adaptable and flood proof. As mentioned previously, land may be flood prone or subject to erosion but the development on it and the infrastructure servicing it can, in many cases, be flood proofed (eg raised or other appropriate actions), or made otherwise adaptable (eg transportable buildings in areas threatened by erosion).

In some cases there is little option but to remove dwellings, commercial or industrial development from harms way. The traditional approach has been a re-purchase scheme with the immediate removal of the asset. Such an approach can require the expenditure of substantial public funds with no return other than to reduce future calls on disaster relief funding.

In many cases however the traditional draconian approach is unnecessary. It is often possible to re-purchase threatened property and then either lease back to existing owners or rent to new occupiers, ensuring that the risks are well understood and the necessary evacuation procedures and support are in place. The funds generated by the rental income then become part of a revolving fund to progress the final outcome of, some time in the future, turning the land to parkland, sports fields or farmland. This approach allows for the recovery of some or all funds, depending on the lease arrangements and the time over which the property remains viable. Interestingly, the earlier the properties are purchased, the greater the probability they will pay for themselves and even tip excess funds into the "pool".

An interesting variation on this can be in the situation pertaining to Strata and Company title Units. While initially it may seem financially prohibitive and socially difficult to resolve issues related to Strata and Company Title Units the approach of progressive re-purchase and then renting out the purchased stock allows a "buy-back over time" scheme to be implemented. It also means that such unit blocks do not progressively become "wastelands". In flood prone areas where the likely flood level only impacts on say the ground floor it may be possible to manage the situation by progressive re-purchase of the ground floor units, funding this from rental returns and a sinking fund levee on the remaining units. A point of time the ground floor units can be converted into common property and utilized in such a way that flood threat is insignificant.

Where people purchase property in known threatened areas the levee for the sinking fund should be set according to the risk and the best estimate of when that risk will yield consequences. There should be no subsidization of the sinking fund levee for those who purchased when knowledge of the potential threat was available. Hence market forces regarding the impost of the sinking

fund levee will assist in determining the price people are prepared to pay to use the land/asset for as long as it is viable or unaffected.

It must be recognized however that there are people in flood and erosion prone areas that were not aware, and could not have been aware, of the threat at the time of purchase and indeed the information may not have been available to the authorities, at the time, either. Further, there are locations where the data and information/understanding is not currently available or there may be unforeseen consequences of climatic uncertainties. In such situations an argument can be mounted for a subsidized sinking fund.

There are many innovative ways to manage existing development; an insurance-based scheme is the least innovative and most inappropriate.

## **6.0 Standard Setting and Regulation**

Investigation, mapping, criteria setting and design and construction standards must be established and adopted at National level for storm/flood proofing/erosion response and any asset that fails to meet/maintain these standards automatically loses any opportunity for insurance cover or any other form of assistance.

Whereas in the past the setting of standards was undertaken by Standards Australia, unfortunately its current mode of operation precludes this as an effective resource.

Given the traditional engineering nature of flood/coastal studies and structural analysis the required standards for these studies and analysis methodologies would be best established by Engineers Australia based on criteria jointly developed in consultation with the insurance industry and lending authorities. The criteria would focus on acceptable levels of risk (including sensitivity testing limits) and would be based on an assessment of potential natural events, not recurrence based events. That is, events of record or maximum likely events based on realistic physical/hydrological strictures. For example, the best estimate of the maximum possible precipitation considered against the storm(s) of record and scaled according to the likely consequences....or a similar technique; not a specious statistical relationship. Any statistical analysis would be supplementary in order to best estimate actuarial risk.

Having determined the required criteria, standards and procedures uniformity of application would require them to be promulgated at a Federal level, adopted at State level and undertaken/administered at local government level. Industry protection for lenders and insurers would be dependent on them adhering to their requirements being locked into the Standards and Regulations.

## **Summary**

Natural disasters reflect bad planning and administration or lack of knowledge/data regarding naturally occurring phenomena. The latter is

arguably justified in being considered an insurable risk, the formed is simply negligence and should be seen as such; it does not constitute a risk that should be insurable.

If persons wish to take the risk of being adversely affected by natural phenomena they should be full accountable for their actions. If government agencies/politicians “invite” people to “unknowingly” take risks that are in fact known to the agency/politician then those responsible should be held full accountable and should not seek to cover-up their actions by relying/invoking insurance as a safety net.

Subsidization of insurance will logically encourage unwise development.

Existing problem areas would be best dealt with by sinking fund type schemes (which may be subsidized in certain circumstances) but which aim at re-locating or reconstructing the asset at risk to adequately manage the potential future threat.

### **The Author.**

Angus D Gordon, B.E., M. Eng Sc., FIE Aust. Obtained his degree in Civil Engineering in 1970 and a Masters degree in Water and Coastal Engineering in 1973. Over the past 40 years he has undertaken projects in all States of Australia and in a number of overseas countries in the fields of coastal engineering, coastal zone management and flood management and engineering. He has served as a UN expert. He was tasked with the development of the NSW Coastal Protection Act in 1979 and has been involved, in the ensuing years, in the production of various policies and manuals.

For the 9 years prior to retirement he was CEO of Pittwater Council on Sydney's Northern Beaches. Pittwater has over 58,000 residents who live in 20,000 dwellings, most of which are subjected to one or more natural disaster risks including flooding, coastal erosion, bushfire and landslide.

In the early 1980s he first became involved in considerations of risk insurance for natural disasters and had the opportunity of a study tour of the U.S. that included examination of their National Flood Insurance Scheme. He has remained interested in the dilemma surrounding the issue ever since.

In 1976 he was seconded to the Antarctic Division of the Department of Science to study the potential for climate change and has published a number of papers on the subject and was lead author of the Institution of Engineers first publication on adaption to climate change in the coastal zone in 1991.