Seminars within the national plan for adaptation to climate change: impacts and adaptation in relation to climate change within the insurance industry

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The effects of climate change are already plain to see, and current models envisage major changes in the climate scenario which translate into new climate-related risks. These now affect not only companies and individuals with coastal infrastructures, in productive activities that depend on the weather or who have investments in fossil assets, which, under the Paris accords, should disappear. The impact also extends to companies that provide insurance coverage for such risks and obviously the banks and institutions that finance activities of this kind.

In the last year, the Spanish Office for Climate Change (OECC) and the Fundación Biodiversidad (Biodiversity Foundation) in conjunction with the State Meteorological Agency (AEMET), the National Centre for Environmental Education (CENEAM-OAPN) and the Portuguese Environment Agency have set in train the LIFE-SHARA project, the principal aim of which is to collaborate on building a society that is better-adapted to climate change by cooperating with all of the stakeholders involved and both generating technical knowledge and increasing social awareness. Here, and within the project, various different actions have been scheduled that are aimed at strengthening and coordinating public-private partnership among the key players in policies geared to adapting to climate change. Thus in November 2017 a notably popular seminar was held on the impacts and adaptation in relation to climate change within the insurance industry in Spain,

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This seminar was conceived with the intention of establishing contact between those in the technico-scientific community who work in the field of extreme weather phenomena and those from the insurance and financial world, and connecting them with the intention of finding synergies and identifying mutual challenges and problems, such as the climate information needs of the insurance industry, identifying deficiencies and recommendations for decision-making to be based on a firmer footing, or the potential of insurance as a tool for adaptation to climate change and the management of its associated risks.

which was identified by the PNACC (the National Plan for Adaptation to Climate Change) as a sector particularly vulnerable to climate change. The seminar was welcomed with great interest by several experts from the world of science and insurance professionals with a strong commitment to participating and involvement in discussions and proposals.

The main aim of the seminar was to present an up-to-date picture of the relationship between extreme weather phenomena and climate change in Spain to analyse the potential effects of changes in the frequency and severity of extreme weather phenomena on the insurance industry and to reflect on its role in strategies to adapt to climate change.

In this article we present the main aims pursued at it and the most significant contributions and conclusions arising from the experience and proposals of attendees. We should point out that, by way of an innovative idea, the seminar was conceived with the intention of establishing contact between those in the technico-scientific community who work in the field of extreme weather phenomena and those from the insurance and financial world, and connecting them with the intention of finding synergies and identifying mutual challenges and problems, such as the climate information needs of the insurance industry, identifying deficiencies and recommendations for decision-making to be based on a firmer footing, or the potential of insurance as a tool for adaptation to climate change and the management of its associated risks.

With all this the intention is for the OECC to prepare proposed content for a sector report to analyse the impact of climate change on the insurance industry in Spain and possible measures to adapt to it.

On behalf of the technico-scientific world specialist speakers were present from various different bodies such as the Spanish National Research Council (Consejo Superior de Investigaciones Científicas, CSIC), the Centre for Hydrographical Studies (Centro de Estudios Hidrográficos, CEH-CEDEX), AEMET, the Cantabria Institute of Physics (Instituto de Física de Cantabria-CSIC and the University of Cantabria's Environmental Hydraulics Institute (Instituto de Hidráulica Ambiental).

From the insurance industry there were specialist speakers from the Consorcio de Compensación de Seguros (CCS), while the agricultural sector was represented by the State Organisation for Agricultural Insurance (Entidad Estatal de Seguros Agrarios, ENESA) and the financial and private insurance sectors were represented by BBVA, Nacional de Reaseguros and Mapfre Global Risks.

1. Scientific knowledge of extreme weather events associated with climate change in Spain

Known facts and uncertainty in relation to flooding. The data on the economic loss has exhibited an upward trend since the 1970s, although this may be explained by an increase in exposure and vulnerability. There is currently no evidence in observed readings of an increase in floods in Spain, although extreme rains have been on the rise in certain regions and changes have actually been observed in seasonal factors. All forecasts point to an upturn in the frequency of episodes and a major escalation in river floods. **Assessment of the impact of climate change on water resources and droughts in Spain** suggests a generally falling trend for such resources as the 21st century progresses. Most weather forecasts also indicate more frequent droughts going forward and this effect becoming more pronounced as we advance further into the 21st century.

Future trends and forecasts concerning storms and extreme winds feature among the fields with the least information to work off, given that there are no general forecasts and neither is there a historical global record, such as might be the case with temperature or rainfall. There is a lack of studies that offer any detailed analysis of trends in cyclonic disruption that venture beyond occasional data output on wind force. In other words the models provide results for wind extremes for grid reference points which offer data, but these have to be included in the context of an

analysis of how certain situations are expected to develop (anti-cyclones, depressions, etc.) that explains such results and endows them with qualitative information. At the moment the University of Cantabria is conducting a project in conjunction with the CCS and backed by the Fundación Biodiversidad to provide "Regional climate change forecasts for extreme winds in Spain for the 21st century". Work on this is expected to conclude in summer 2018.

The coastal systems are particularly vulnerable to rises in the average sea level and changes in the strength and frequency of floods. In the case of coastal flooding, this will depend on different factors, such as sea-swells, wind, atmospheric pressure and the average sea level. The latter aspect is particularly dependent upon global warming. The two most worrying effects of climate change are permanent flooding in the low-lying areas and erosion on beaches. In this regard the Environmental Hydraulics Institute "IHCantabria" is analysing the effect of climate change on coastal flooding by calculating flood probability charts based on simulations for each specific case and drawing up maps of coastal flood hazard levels.

2. Diagnosis of the situation in the insurance industry. Trends in losses associated with extreme events and the problem of insurability

Within the sphere of activities of the CCS the question arises of the need to evaluate the changes that occur as a result of climate change in terms of the risks it assumes and to find solutions that enable it to continue to take them on. To this end the CCS is, on the one hand, cooperating with several technico-scientific institutions, most of which were present at the seminar, to gain a better understanding of how hazardousness is evolving (in particular as regards flooding and strong winds) as a result of climate change and, on the other hand, from the standpoint of insurance technical bases, it is studying the sustainability of the current extraordinary risk insurance which the CCS handles and weighing up the long term options and, if the situation calls for it, those for adjusting surcharges or coverage. Moreover, one aim of extraordinary risk insurance is to reduce loss and build up the resilience of society. Continuing along the path of improving early warning systems and handling emergencies better, both on the part of administrative bodies (civil protection, land planning, etc.) and in terms of the behavioural patterns of the insured themselves (risk awareness, self-protection measures), means generally reducing risk and offsetting the potential increase in hazardousness with a fall in exposure or vulnerability.

Together with the rest of the insurance industry, the CCS is also attentive to developments regarding other risks, such as heatwaves or pandemics, which are not at present included within extraordinary risk insurance.

For its part **agricultural insurance** is an ideal instrument to mitigate the adverse effects of climate change on a sector which is the most exposed to and dependent on the behaviour of natural phenomena, mainly as far as droughts, frosts/heatwaves and phenomena such as hail, and snow etc. are concerned. The sum assured has steadily risen over time, as well as the penetration of such insurance, although taking it out is very variable from sector to sector, with fruit trees presenting the highest percentage. For example, over the 2012-2016 five-year period the percentage of pay-outs for risks was divided proportionally thus: hail 41%, drought 19% and frosts 17%. All the risks that could be affected by climate change are currently covered under the agricultural insurance system, although it will continue to adapt to any needs that might arise. The high loss ratio entails high premiums and therefore the need for government subsidies.

Given that **climate change** could make loss ratios even worse, it is almost certain that there will still be such a need for government subsidisation of premiums.

With respect to **financial risks** associated with climate change, these vary in nature: there are physical risks (compensation for loss that relates directly to the increase in hazardousness deriving from climate change); transition risks (from the impact of regulation on the business model); from changes in market trends (fossil energy/fuels), and liability risks (from possible prosecution for liability in causing such loss), etc. A better understanding of financial risk among markets, banks and financial regulation is key. There is a need to anticipate what sectors will be the most affected and which companies will emerge stronger and which stand to lose out. The European Central Bank has issued some suggestions for including carbon risk in credit risk models and the intention is to develop a strategy for managing carbon risk and reflecting the externalities of climate change. One option for the financial sector could be to draw inspiration from the insurance system or try to come up with official mapping of risks.

Nacional de Reaseguros confirmed the situation regarding the risks and opportunities faced by the reinsurance industry in relation to climate change. Disaster risks insured are continually on the rise and economic loss is far above losses insured. By way of example, the figures on disaster damage in 2017 were the highest on record.

3. Climate information needs for the insurance industry: shortcomings and recommendations to base decision-making on a firmer footing

The need has arisen to strengthen the nexus between the worlds of scientific climate information and the insurance industry when the conclusions from **scientific work** can **lead to major conclusions** for the industry. In this regard a raft of serious deficiencies were highlighted at the seminar within the sphere of the question of climate and others that were not to do with the climate per se and more general but which affect risk analysis.

In the area of providing climate data, the following were cited as needs::

- Defining future **climate scenarios** and becoming familiar with them, as well as understanding the climate in each zone as well as **how it varies and its tendencies**. There is a lot of **uncertainty** in this area. There is interest in having a specific climate map available.
- Becoming familiar with **cycles of phenomena** such as droughts (as well as the risk of drought itself).
- Knowing and having available the frequency and magnitude of extreme phenomena in long datasets: **winds, floods and droughts. Data on extreme winds**. There is a need to know about gusts of wind of over 120 km/h for very short time-periods.
- **Maximum floods**: there must be better knowledge about their different return periods, both for river and coastal flooding.
- It would be useful to have detailed statistics on **damage and degree of exposure**. Although there is good data on loss, particularly the risks covered by the extraordinary risk insurance which is managed by the CCS, there is quite a lot of room for improving statistics on losses covered by private insurers (for example hail, landslides, winds of under 120 Km/h...) and, most especially, as regards descriptions of exposure.
- A need to distinguish properly between indicators that relate to climate change and those which do not and are instead more to do with patterns of climactic variability.

On this point mention was made of the importance of the climate services offered by the Copernicus project[1] (observations, re-analysis, seasonal and long term projections for global and regional models) and how these are expected to yield a series of improvements that will benefit the insurance industry, including an increase in spatial and

(1) http://consorsegurosdigital.es/en/numero-07/front-page/the-copernicus-climate-change-service-perspective-from-the-insurance-industry

temporal resolution and new tools for downscaling, improvement of available radar data and an increase in the type of files to be shared.

Although the focus is on the climate, non-climactic indices are also useful. Among the most significant suggestions within the sector are the idea that it would be better for the message regarding climate change to be less alarmist, the need for more feasibility studies, and the need to have data on the land, such as quality geological information.

4. Insurance as a tool for risk management and adapting to climate change

Transferring risk via insurance is in itself an adaptive measure. Thus existing instruments can be of assistance in adapting to climate change. The following suggestions were mentioned among the various different instruments:

- Countries such as Spain have natural disaster insurance mechanisms, in terms of both assets and people, and agricultural property, that have a high level of penetration and which are also adaptable. They therefore stress this role of insurance as a mechanism of adaptation. This flexibility can, if necessary, be manifested through making adjustments using the various different mechanisms available: forms of coverage, insurable limits, deductibles, rating, etc. It is important to persevere in promoting insurance and making it increasingly accessible so that it can perform its function effectively.
- Although they are currently not very widely used, thought could be given to developing *green insurance policies* which reward sustainable measures in promoting mitigation and adaptation.
- The role of insurance brokers in their capacity as advisers on specific products tailored to individual needs could be enhanced.
- In the specific case of agricultural insurance, this function of brokers as advisers on specific risks associated with each kind of crop is key. Similarly an option as regards a means of adaptation is changing the location of crops, particularly annual ones, to other zones with better climactic conditions (kinder temperatures, lower frequencies of adverse phenomena, and better water availability, on both unirrigated and irrigated land, etc.).
- Likewise as regards agricultural insurance, uprooting the damage-affected crop in the early stages could allow farmers to replant so that the annual yield is not lost completely. This is a practice that is already being applied. Moreover, prompt payment of compensation which is done where possible provides the insured with greater financial solvency and allows them to plan their activities better.

5. Proposals going forward and new instruments

Similarly most proposals for the future and new instruments within the insurance industry related to boosting resilience and reducing vulnerability. The following featured among the most often repeated proposals for improvement::

- Parametric insurance policies (used in Africa and Latin America): studying their contribution to climate change.
- Introducing sustainability criteria in insurance incentives so as to minimise the impact of certain risks (public and private), which would increase the resilience of socio-economic systems and reduce the cost of the insurance. In certain cases carrying out actions to improve resilience or adaptation to climate change could be considered as an indispensable pre-requisite for insuring.
- Introducing '**green insurance policies**'.
- The possibility of **positively rewarding** companies/insured parties that behave in an environmentally-friendly way.
- **New types of insurance policies** could be introduced: Annuity, cost or income insurance.

Regarding **agricultural insurance**, via subsidies the following can be encouraged:

- The removal of crops from places where the weather conditions are unsuitable. Subsidising insurance only for an "acceptable" level of risk (currently set at a net basic tariff rate of 23%) as well as not subsidising loading for high loss ratios contributes towards this objective.
- Practices which reduce risk and pursue more sustainable agricultural activities (organic farming, belonging to integrated agricultural blight and pest control treatment groups (ATRIAs), plant protection groups (ADVs) or health protection groups (ADSs)). These practices also enjoy additional subsidies when taking out agricultural insurance.

On the social front, **greater awareness** on the part of the public is called for. On the one hand, a big effort is required to **encourage insurance** in zones with a greater impact from climate change so as to reduce the effects of it. Yet on the other hand **more compliance with legislation** is necessary on the part of local government (for example to avoid building taking place in zones prone to flooding).

It is important to improve the **recording of zones suffering loss** and incorporate **detailed reports** on losses and exposure.

It would be a good idea to promote a greater **galvanising role** by insurance and the CCS, specifically: via tools, information, good practices, etc. The insurer's role should be to incentivise and encourage good practices, though also to promote sustainable patterns of behaviour by favouring 'green' products in such a way as to enhance the capacity to implement adaptation mechanisms via insurance. This does not mean the insurance industry becoming a sort of green police force, but rather that it helps as much as it can in achieving a transition towards a more sustainable model. This includes the insurance industry's investment policy, which is very important and if it can be reoriented, this could have a highly significant impact from the point of view of financial sustainability.

With respect to policies and norms, these should be attendant elements in the insurance industry:

- Coordinated policies among the various different stakeholders involved (including insurers) that can be utilised in adaptation to climate change.
- Regional planning policies that can step in ahead of the more restrictive scenarios and establish sustainable models.
- Economic policies that incentivise socio-economic activities that are sustainable, circular, innovative and adapted to future scenarios.
- Local, regional and national policies, as well as at EU level, that are coordinated to address differentiated needs and demands.

Key conclusions

The role of insurance can be very important in adapting to current and future risks from climate change. Spain, where insurance has deep market penetration, is well-placed with a highly developed system where the CCS covers extraordinary risks and plays an extremely important and complementary role in private insurance.

Nonetheless, it will always be possible to make adjustments and establish reinforcing measures so that this system can make an even bigger contribution to reducing society's vulnerability, which is the aim being pursued in the context of climate change. Doing this requires making a notable impact on public awareness, though also on making government authorities (and especially councils) increasingly aware.

One of the major areas for improvement is learning more about risks and gaining a better understanding of them with a view to fine-tuning services. Scientific knowledge must be boosted and conclusions that are arrived at by those in academic circles with respect to extreme weather phenomena should be translated into other major inferences for the insurance industry, while efforts should be made to find out how to apply scientific projects and how these tie in with economic impacts.

It is essential to produce the information required for optimal decision-making on the part of all sectors: farmers and those in the livestock business, insurers, the financial sector, technical experts etc. The groundwork should be carried out and built upon, from generating information to advisory work and accompaniment, etc.

There is also consensus on the need to improve flows of information and the passing on of knowledge between the public and private sectors.

Within the insurance industry a predisposition exists to appraise new instruments and proposals to enhance their potential as tools to adapt to climate change. Even so, carefully analysing each option is also recommended before making changes or opening up new paths. The conditions in the Spanish system are very exceptional, in both extraordinary risk and agricultural insurance and do not readily compare with those in other countries. At any event, via this seminar it has been made very clear that Spain's system has the capacity to adapt effectively to climate change risks.