



2024. Image captured by the GEOSAT-2 mission on 31 October 2024 at 09:01 UTC over the Horta-Sur region of Valencia (Spain) revealing the areas most impacted by the devastating floods resulting from the Dana, including Paiporta, Benetússer, Alfafar and Sedaví. Processed using a mix of near-infrared, red, and green multispectral bands, the image highlights the full extent of the flooded areas © GEOSATLicence ESA Standard Licence

## This Dana must mark a turning point

We should remember what we call «geo-ethical principles», because a catastrophe like that seen in the Valencia and in other Spanish regions last month happens because these principles are not applied: there is no appropriate ethical basis for decision making. There are our principles: caution, sustainability, geo-conservation and human safety. I will highlight the three I consider most important while analysing this catastrophic situation.

The principle of caution, linked to an awareness of the importance of scientific and technical advances for humanity, because while they open up the possibility of making great progress, they can also carry risks and ethical dilemmas which need to be considered.

Secondly, the principle of sustainability, which aims to provide a global and integral view of the solutions to the problems affecting our planet, bearing in mind a rational use of natural resources and the environmental demands of society, avoiding the transfer of undesirable products to the natural environment.

Finally, the principle of human safety, which is vital and develops in several ways: the first, to provide all the knowledge and skills for reducing risks in nature, prioritising strategies of prevention; the second, to ensure the safety of people and goods and the protection of the environment; the third, to cooperate responsibly and diligently with the relevant public authorities in risk situations and to help transmit information to the public, using scientific data in a rigorous, objective and serious way; and the fourth and final one, to evaluate the decisive role of geological factors in the fight against poverty, and, where appropriate, to contribute knowledge for the sustainable improvement to the living conditions of the most vulnerable social groups.

We find ourselves in a reality where these ethical principles have not been taken into account. Therefore, changes are needed which, beyond the management of the disaster which we are now dealing with, mean a review of how we understand our relationship with nature.

Geological knowledge is essential for this. It is a rather unknown science in our country, but without it, it is impossible to apply the principles above. If we don't act while considering the prevention of risks of geological origin, we will not gain resilience but rather become increasingly vulnerable. And this Dana is a geological phenomenon. Yes, geological because the meteorology may be very adverse, but it is the water which reaches the land which creates the catastrophe. It is that superficial runoff laden with matter which erodes the land and produces the disaster.

Geological knowledge –ignored by most public administrations- is one of the oldest in the history of humanity. Making flint axes, extracting water from rivers and wells, finding shelter, etc, have been fundamental in human evolution. However, in addition, the role of prevention has allowed the human race to achieve greater reproductive efficiency as fewer descendants have produced more offspring. Nevertheless, we can see how nowadays our public administration pay no attention to prevention and building is haphazard and without adequate technical criteria.

But climate change is knocking at the door and presenting a dilemma: either we change or our species will disappear due to ineptitude, incompetence or a lack of intelligence. That which brought us here will lead us into our worst nightmare.

To change this situation to some extent, I put forward specific measures to help make this change:

- a) Local administrations must work by joining forces rather than compartmentalising. What is done in one place affects other places. What is more, joining forces will allow them to undertake risk analysis with the help of professional geologists.
- b) It is very important to prepare rebuilding programmes in the affected areas which take into account such risks right now.
- c) The Instituto Geológico y Minero (Geology and Mining Institute) should have a Senior Body of State geologists to help in the creation of methodologies for risk assessment and to work continuously with all local administrations.
- d) The most highly detailed geological maps must be available to public administration and serve as a basis for risk maps. These should be part of all urban planning decisions. And when building, the design of the building must take into account all existing risks.

- e) Insurance management must contribute to considering such risks when making decisions. Data about existing risks must appear on the deeds of buildings and be considered when calculating the cost of insuring them, to avoid promoting building in high-risk areas.
  
- f) The general public must be informed of the risks in their surrounding areas (the local council should do this), of what to do in certain situations (schools can create a culture of safety) and do periodic safety drills to assimilate the safety steps. It is surprising to see that children want to learn these things but are not taught them because many people have adopted the attitude “it won’t happen to me”.

We have the chance to change our social and economic drift. If we only invest in the recovery of the affected areas without introducing long-term variables we will again lose out socially and economically. Geological science is at society’s disposal and we must use it if we really want to improve our resilience. Investing in Geology is investing in the future.

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