

## EVALUATION OF THE MAIN ENVIRONMENTAL PROBLEMS AND THE IMPACT OF CLIMATE CHANGE

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**ABSTRACT:** Our objective is to assess the environmental issue based on the percentages of the main biophysical and ecological phenomena in question released by the group of French researchers. Among the main environmental problems are particularly climate change, air pollution, scarcity of water, deforestation, pollution of water, waste management, biodiversity loss, population growth, population movements, deterioration of soil ecosystem-equilibrium, chemical Pollution, Urbanization, thinning of the ozone layer, energy, consumption, new diseases, degradation of natural resources etc...

The study we noted that climate change is at the top of the main environmental problems of a percentage of 51%, the scarcity of fresh water by 29%, deforestation 28%, biodiversity loss 23% , waste management 20%, urban 23% and decrease in ozone 15%...

And last comes the increased sea level Therefore one might conclude that climate change is closely correlated with urban policies in industrial energy and transportation.

In a context dominated by the struggle against the emission of greenhouse gases, problems of air quality should not be underestimated and policies relating to climate protection must be taken into account.

**KEYWORDS:** Environmental Management, Climate Change, Kyoto Protocol, ISO 14001.

### 1 INTRODUCTION

This introduction summarizes the major IPCC (International Panel on Climate Change) results reported in the second assessment report approved in 1995. Some results are established with a high level of confidence: radioactive equilibrium which determines the temperature of any planet implies that the Earth's temperature must increase with increased atmospheric concentration of gases absorbing infrared emissions; the atmospheric content of carbon dioxide, methane and other infrared absorbing gases is observed as continuously increasing. Recent observations show that the surface temperature mean value, but more significantly its variations with geographical location and altitude follow the predictions of model. Climatic palaeo records show a significant correlation between variations in the carbon dioxide concentration and temperature. As the large climatic cycles are associated with a change in the Earth's orbit parameters, this correlation should be interpreted as evidence of positive feedback: the carbon dioxide concentration should be further increased by the temperature enhancement caused by an initial anthropogenic CO<sub>2</sub> increase [1].

The impact of climate change is reflected in many areas: climate, ecosystems, energy, food and santé. Countries party to the United Nations Framework Convention on Climate Change have set a target to contain the rise in temperatures to less than 2°C compared to pre-industrial era. To achieve this goal global emission must be halved by 2050 compared to 1990. Collectively reduce their emissions by at least 5% over the period 2008-2014 compared to 1990. The objective is

differentiated by country. The emissions considered include six anthropogenic Greenhouses gasses (GHG): CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFC, PFCs, SF<sub>6</sub> [2].

To enter into force, the Kyoto Protocol aimed at reducing greenhouse gas emissions must quorum of 55 states representing at least 55% of Annex B emissions in 1990.

This threshold has been reached after the ratification of Russia, to the Protocol to be formally launched in 2005. In order to facilitate the achievement of the commitments of developed countries, three so-called flexible mechanisms established by the Kyoto Protocol. However an international market for carbon quotas. Each country receives as many Assigned Amount Units (AAUs) as its GHG emissions target set by the Protocol.

**2 MATERIAL AND METHODS**

**2.1 COUNTRIES THAT HAVE SIGNED AND RATIFIED THE KYOTO PROTOCOL**

Participation in the Kyoto Protocol (Figure1), green indicates countries that have signed and ratified the treaty (dark green, countries in Annexes I and II); in orange-brown not wanting ratify it; gray without position; red ratified, but intends to retire.

In 2011, 191 states have signed and ratified the Kyoto Protocol to the United Nations Framework Convention on Climate Change. This ratification includes three parts extras:

- Niue and the Cook Islands are counted separately. Well as States independent, they have reached an agreement in free association with New Zealand.
- In addition to these Member States, the European Union is counted as part of the protocol.
- Each industrial site must annually publish a report of its CO<sub>2</sub> emissions, which must be less than or equal to the quotas allocated to them
- To date 191 countries have ratified the treaty signed on 11 December 1997 in Kyoto. Is it, however, respected?



*Figure 1: Participation of 191 states to the Kyoto Protocol*

**2.2 GHG EMISSIONS BY MAJOR EMITTER IN 2010 (MtCO<sub>2</sub>-Eq)**

the easiest and most common way to compare countries emissions is to add up all the fossil fuels burned in every nation, by central, cars, industries or buildings and convert them into CO<sub>2</sub>.from this point of view, china is the largest emitter in the world with 7 billion tons of CO<sub>2</sub>, followed by the us (5.4 billion), India and Russia (Figure 2).

France is the 17th class with 350 million tons. Note that other types of emissions are not included.

If deforestation, responsible for a quarter of global emissions, had been taken in account, for example, Brazil and Indonesia hoist up the list.

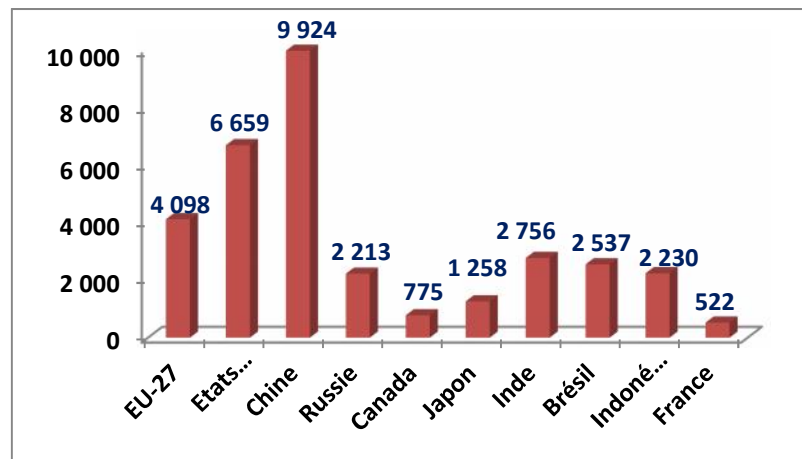


Figure 2: European Commission (2013) and MEDDE (2013)

### 2.3 KEY ENVIRONMENTAL PHENOMENA

The percentages of key biophysical and ecological processes disclosed by the French researcher group. SCOPE survey 2000 is indicated following figure 3. Graphical representation of the main environmental problems.

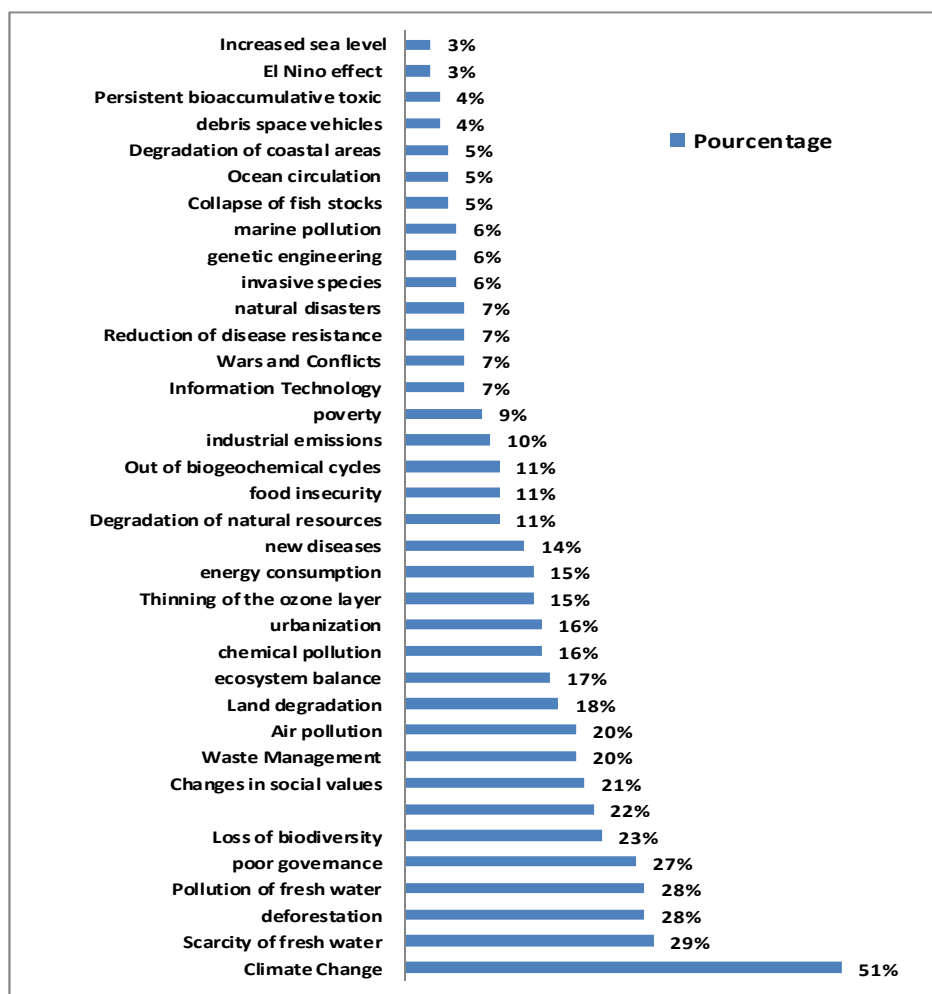


Figure 3: Percentages of key environmental issues

### 3 RESULTATS AND DISCUSSION

#### 3.1 DESCRIPTIVE STATISTICS

Table 1 shows the descriptive analysis of the main environmental problems.

*Table 1. descriptive analysis*

Variable	Observations	Minimum	Maximum	Mean	Standard-deviation
Pourcentage %	35	3	51	0,144	0,101

Climate change will reach a peak of 51% (figure 3). This increase could be explained by the chemical composition of the ambient air that is a result of natural processes and these can also issue "polluting" substances such as sulfur dioxide and fine particles (volcanism, ocean biological activity and sea spray, desert dust, etc...) nitrogen oxides (soil biological activity, production during storms, etc.), hydrocarbons (emissions by vegetation, oceans, etc.), ozone (air intake from the stratosphere and photochemical reactions between nitrogen oxides and hydrocarbons of natural origin) [3].

Forests cover 28% of the surface area emerged, the phenomenon of deforestation is closely linked to that of the loss of biodiversity, which reached 23% in ecosystems, species and intra-specific variability. The disappearance of forests and filling of wetlands that naturally absorb water contribute to the formation of system disaster-causing landslides and flooding during intense rainfall events Nicaragua, Devastated by Hurricane Mitch in November 1998. However, one could say that there is a strong correlation between developing countries and deforestation caused by industrialization, population growth and expansion of agricultural activities, as well as the trade of forest products 22% [4].

Global energy demand is still strong growth of 15%. Two aspects are particularly important: fuel and electricity. The transport fuels are subject to strong demand, both in industrialized countries than in developing countries [5,6]. There has little hope of mass substitution of short or medium term fossil fuels in this field. Proposed alternatives are still very limited.

Waste management is 20%, since the publication of Decree No. 2002-540 of 18 april2002 (RFL 362, april 2004, page 51).

The laboratories are in 1'obligation sort their hazardous waste according to certain criteria, including calculate the concentration of product (s) dangerous (danger threshold) of chemical waste, whether it is mandatory to evacuate and to restate a provider or if it is possible to evacuate in the common network water treatment [7].

The thinning of the ozone layer has reached 15% due to problems CFC (chlorofluorocarbons) to the extent that they affect the air conditioning and refrigeration industry. The past, the present and the future will be studied from the perspective of the regulations and industry standards for cleanliness of refrigerants.

Ozone also contributes to the greenhouse effect and, together with the particles, one of the priorities of CAFE (Clean Air For Europe) in the preservation of air quality in Europe, it is harmful to human health but also to the vegetation [8,9].

Two ad hoc committees of the Air Conditioning and Refrigeration Institute (ARI) were formed in January 1987: one to deal with the regulation of CFCs and the other to handle the acceptable level of contaminants in refrigerants. This communication will summarize the work of the Second Committee [10].

The reduction of infectious diseases has reached 7%, climatic factors (temperature, wind, humidity) and changes play a major role in the epidemiology of infectious maladies, especially vector-borne and water. Regarding respiratory infections, the role of the cold, evident in popular belief, remains controversial: winter peak is multifactorial but exposure to cold causes vasoconstriction of the nasal mucous membranes and upper airways, which reduces local defenses and allows latent viral infections to become patent. Preventing hand transmission remains paramount [9].

The elevation of sea level was 3%, which is explained by the gradual melting of the ice, the sea level will continue to grow for centuries after stabilization of the average temperature. The models calculated for 2100 have an elevation of 20 to 90 cm, due largely to the thermal expansion of the sea water. In 2500, the elevation could reach 3 to 4 m [11].

#### 3.2 GLOBAL ISSUES: ENVIRONMENTAL PROTECTION

Further to oil crises of the twentieth century, the Brundtland Report and the Kyoto Protocol formalize the questions facing the challenges to the environment and future generations.

Considerable effort and sustained scientific research can only move back the limits of conventional reserves [12, 13, 14, 15]:

- Renewable energy sources appear to meet the expectations independence from fossil fuels, low production of greenhouse gases.
- Anaerobic digestion generates interest either for digestate, organic matter degraded anaerobically by bacteria, or biogas. This natural process leads to the formation of two products:
- Renewable energy: biogas (predominantly methane) that can be recovered in the form of heat and power (co-generation) and only heat, fuel or biomethane injected into the natural gas grid after purification.
- A fertilizer: the digestate from the undigested material as fertilizer for agricultural land.

The biogas enables the production of electricity but also the production of thermal energy, or both.

Methane (CH<sub>4</sub>) which is produced from anaerobic digestion represents 55-85% of the volume of biogas. It is usable as an energy source, and 1 m<sup>3</sup> of methane (or 8570 kcal) is the equivalent of a liter of oil.

This treatment method provides for our territory local and ecological waste management, development of energy independence of the territories to maintain and create jobs which contribute to the identity and image of our territory.

#### 4 CONCLUSION

The environmental context is marked by the issue of climate change 51%, it is also necessary to ensure the risk of toxic pollutant emissions that can produce certain technologies or practices (agrofuels), wood heating) booming because of their strengths in releases of greenhouse gases.

However, there is a strong correlation between the main environmental problems, environmental management certification according to the standard must be adopted ISO.14001 for many businesses to preserve biodiversity, assessing the vulnerability of natural ecosystems and their ability to adapt to major global concern. A ist waste sorting, it is necessary to minimize the spread and accumulation of products harmful to the environment. We must take responsibility to professional practices and go collect information from competent persons.

Furthermore, although the quality of air in cities is generally better than it was 10 or 20 years, , Urbanization and the growth of automobile traffic and certain industrial activities still cause locally or episodically high exposure situations to air pollutants.

It is also necessary be vigilant vis-à-vis risk, for example, to changes in certain activities (chemical industry, agriculture, air traffic ...) likely to lead to new pollutants or risks of high exposure to certain pollutants traces. In addition, the degradation of air quality can cover areas and populations already affected by other nuisances (soil pollution, noise pollution, slums, etc.) aggravating environmental inequalities.

#### TO REMEMBER

- There are primary pollutants (pollutants emitted directly into the air) and secondary pollutants (pollutants chemically formed in the air).
- The air pollution in enclosed spaces is becoming increasingly important.
- Air pollution is down overall, by improving techniques and processes in many sectors (industry, automobiles, etc.) but vigilance is required vis-à-vis risks still observed, and those related to new compounds.
- There are national and European regulations setting ambient concentrations do not exceed for various pollutants.
- The main pollutants are sulfur dioxide, nitrogen oxides, particulates, heavy metals, hydrocarbons and volatile organic compounds, polycyclic aromatic hydrocarbons, carbon monoxide, ammonia, ozone and photochemical pollutants.
- Associative structures assess compliance with these regulations.
- The law on air and the rational use of energy provides a right of access to data on air quality (compliance with the protocol Kiyo and ISO 14001.

**REFERENCES**

- [1] B. Tissot, Rev. IFP, 48 (2) (1993) 91–103.
- [2] <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm-fr.pdf>.
- [3] GIEC Bilan 2007 des changements climatiques, rapport de synthèse. Contribution des groupes de travail I, II et III au quatrième rapport d'évaluation du groupe d'experts intergouvernemental sur l'évolution du climat [équipe de rédaction principale, Pachaur, R.K. et Reisinger, A. (publié sous la direction de)] GIEC, Genève, Suisse, 2007, 103 p.
- [4] G. Martin-Herran. Deforestation and foreign transfers: a differential games approach. Montpellier: Faculté des sciences économiques, 2002, 22 p.
- [5] J. M. Charpin., B. Dessus., R. Pellat. Étude économique prospective de l'énergie nucléaire. Rapport au Premier ministre La Documentation Française, Paris (2000).
- [6] Conseil mondial de l'énergie Perspectives énergétiques mondiales 2020–2050, Houston (septembre 1998).
- [7] F. Roussille. Gestion des déchets dans un laboratoire de biologie médicale Immuno-analyse & Biologie Spécialisée, V( 25), Issues 5–6, October–December 2010, P. 276-280.
- [8] K.R. Briffa., P.D. Jones, F.H. Schweingruber. Osborn Influence of volcanic eruptions on Northern Hemisphere summer temperature, over the past 600 years, Nature 1998, 393, 450–455. ences.
- [9] [http://www.nancy.inra.fr/la\\_science\\_et\\_vous/dossiers\\_scientifiques/rechauffement\\_climatique\\_et\\_forets\\_francaises/modelisation\\_des\\_aires\\_](http://www.nancy.inra.fr/la_science_et_vous/dossiers_scientifiques/rechauffement_climatique_et_forets_francaises/modelisation_des_aires_)
- [10] Society for Heating, Refrigeration & Air Conditioning Engineers American Moisture and Other Contaminant Control in Refrigeration Systems ASHRAE Handbook Systems (106th Edn) ASHRAE, Atlanta, 1984, pp. 28.1–28.10 Ch 28.
- [11] B. Djahida., D.M. Malika. Reconstitution de données climatiques pour l'Algérie du Nord : application des réseaux neuronaux C. R. Geoscience ; 2010, 342, 815–822.
- [12] Académie des sciences, CADAS, Rapport commun n°8, La recherche scientifique et technique dans le domaine de l'énergie, 1997.
- [13] B. Tissot, D. H. Welte, The role of geochemistry in exploration risk evaluation and decision making, in: 12th World Petroleum Congress, Houston, Vol. 2, John Wiley and Sons Ltd, Chichester, 1987, pp. 99–112.
- [14] B. Tissot , Pétrole, gaz, environnement : Quelle approche de la R & D en exploration–production pour la fin du siècle ?, Rev. IFP 1993, 48 (2) 91–103.
- [15] B. Tissot , L. Montadert , V. Richard , Recent changes and future directions in R&D for Exploration–Production, Am. Assoc. Petrol. Geol. Int. Conf. Nice, septembre 1995.