

Air Pollution: Preservation Strategy and Responsibility of Actors

Doctor Fatma-Zohra HARIDI¹, Prof. Djamel ALKAMA², Ali Boulemaradj³, Amira Ouled-DIAF⁴

Department of Architecture, University 08 Mai 1945 Guelma, Algeria.

Abstract

Preserving the environment to make it healthy is a strategic process in city policy in Algeria. This process is the responsibility of institutional actors and the participation of civil society. In this sense, our essay serves to see if the involvement of civil society and its contribution in the fight against environmental pollution is defined. Likewise, this essay also seeks to determine on the one hand the responsibility of each actor concerned through the analysis of the national environmental action plan in relation to the principles of development, public debate and participatory consultation. Is the involvement of civil society as an essential basis for environmental assessment to ensure environmental management in a regular and rigorous manner? Finally, the ambition of this essay is to think about thought and framework for analyzing the means of action put in place to combat industrial pollution.

Key words: Pollution, atmosphere, means of action, healthy is a strategic process, Algeria.

INTRODUCTION

The fight against air pollution is indeed a strategic process by which Algerian civil society is committed to changing the conditions for preserving and controlling air quality. In addition, according to the National Report (RN, 2014) [1], the function of combating air pollution is involved in crystallizing good environmental governance in relation to the regulatory conditions adopted in the field of environmental management.

State of the Observable Facts

In Algeria, the environmental context are very degraded, especially by the effects of air pollution. This detrimental fact requires a very effective environmental assessment. Indeed, in recent years, the environmental assessment function has undergone considerable development, due to the emergence and development of information technologies, awareness raising and training on preservation and surveillance of the environment. These intervention tools have strengthened the methods of environmental assessment.

Questions

As a strategic piloting process, environmental assessment is undergoing profound changes, which influence its functional structure and its action plans. To this end:

- Should we first know whether environmental assessment as a strategic process of determination and control complies with the responsibility of the actors (civil society, polluting companies and environmental managers)?
- Should we still know if it is possible to take into account the expectations of civil society while respecting the objectives of atmospheric preservation through the functions and principles of environmental assessment?
- Should we finally know whether the air quality monitoring system whose main tasks are the establishment of a system that would allow even a significant recovery of this disastrous situation.

Objectives of Atmospheric Depollution

First, the fight against air pollution seeks to comply with the directives of the Environmental Action Plan and Sustainable Development (PANE-DD, 2005) [2]. To this extent, manage to enlighten decision-makers on the importance of clean air.

Second, the fight against air pollution seeks to provide a daily monitoring plan through innovative control systems and thereby strengthen the contribution of environmental assessment.

Third, the fight against air pollution seeks to predict from various hazards, including the extent of environmental degradation induced by air pollution. Hence, the achievement of these objectives requires a development project, a development program supported by measurement actions.

The effects of pollution on the public health and on the resilience of sustainability have made the air of the cities Algiers, Annaba, Oran and Constantine unbearable. Air pollution is mainly composed of dust of sulfur dioxides (SO₂) and nitrogen oxides (NO_x).

It is noting that on certain industrial sites, the dust concentrations can be 10 times higher than the reference values (international, national and local). Therefore, to meet the expectations of Civil Society and in order to reduce the pollution generated by industrial activities, environmental assessment is an operational, efficient and effective tool for measuring the extent of the environmental impact of pollution time limit. In addition, industrial air pollution calls for several measures to strengthen surveillance and monitoring capacities.

RESEARCH METHODOLOGY

The method used is exercising in two phases, that of the analysis of the National Priority Action Plan in relation to the instructions of the environmental regulations to ensure that it is establishing in compliance with legal and normative measures.

The second phase analyzes the reports of the actions put in place and the means used for monitoring and controlling the air quality of the areas declared polluted. With a view to consensual validation of the responsibility of all the stakeholders concerned as taken awareness of the effects of air pollution (Board I-5, Tab. Illus.).



Board I. Algeria: Causes of air pollution

ANALYSIS

The National Plan of Action for Preservation and Surveillance (PNAPS) [3] of city air quality launched in 2006, on two levels of intervention, that of communication and that of participatory consultation and public debate. The PNAPS is piloting by the Ministry of Regional Development for a period of 4 years. The implemented PNAPS takes The PNAP into account public consultation, the importance of the means put in place, the responsibility of each actor and the commitments recommended in the fight against industrial atmospheric pollution.

Management and Organization

Public consultation is the component of the strategic process for the management and organization of environmental actions. Indeed, by their opinions, their vision on possible or actually experienced constraints, civil society actors can have a preponderant role at the level of air quality expertise centers. In addition, if the responsibility of civil society has been included in the prerogatives of sustainable development, the result achieved is still unsatisfactory.

The management of public consultation has proved difficult to achieve by personnel poorly trained in new technologies for environmental preservation, especially in terms of air pollution. According to data from the World Health Organization (WHO) [4], the threshold for fine particles dangerous to the respiratory system (PM10) is much higher than the recommendations in force (20 micrograms per cubic meter “ $\mu\text{g}/\text{m}^3$ ” on average per year) in all Algerian cities. Air pollution in urban areas therefore varies between 8 and 73 grams with an average of 27 grams.

These are urban areas located in particular near cement factories, refineries and steel complexes, particularly the Arcelor Mittal El Hadjar unit in Annaba, the Fertial units in Annaba and Arzew, as well as the Alzinc unit in Ghazaouet. There are also units responsible for toxic smoke emissions from the petrochemical sector with the Skikda complex and the Algiers refinery. These sites are today the main polluters with major health risks. In the context of the fight against pollution, it required accompanying procedures such as the evaluation sheets proposed by the Regional Activity Center (RAC) for the Priority Action Program (PAP).

Means of Action

According to the System Global Environmental Information Development Project (SEIS-DP) [5] launched in 2010 by the National Observatory for the Environment and Sustainable Development (ONEDD) aimed to interconnect all socio-economic sectors. The SGIE project was planned as part of a national environmental information network for a coherent organization of environmental data and adequate monitoring of the performance of actions associated with environmental action.

The SGIE project also required the determination of the following stages:

- Definition of data needs relating to environmental information.
- Identification of regular sources of information, covering all areas of environmental preservation.
- Digital analysis of the results obtained from studies carried out in order to set up a Database Management System (S.G.B.D) by using GIS software (MapInfo, ArcGis, ArcView, etc.).
- Management and organization of survey results obtained from evaluation operations carried out by the World Health Organization (WHO) and those obtained from environmental impact studies (EIA).

Recommended Commitments

The commitments of national and local managers for air pollution control stem from the numerous programs launched in the fields of environmental education, awareness raising and training. There has been a strengthening of the legislative and institutional framework and these commitments are integrated into three-dimensional international, national and local action.

In addition, the late engagement of the implication of the responsibility of all the actors concerned to implement the National Environment Strategy and the National Action Plan for the Environment and Sustainable Development (PNAE-DD), posed a major problem in the fight against air pollution.

On the international level to establish the Clean Development Mechanism (CDM) defined by the Kyoto Protocol (1997), it is the realization of the POP's [6] project for the financing of a project of elimination of polychloroterphenyls (PCB) which asked for international cooperation. It was after the United Nations International Conferences on the Environment and Sustainable Development (CINUE-DD) [7] that the contribution to the fight against pollution began in Algeria.

International Cooperation

International cooperation is a remedy for national shortcomings in the fight against air pollution. Furthermore, from the outset this fact was implemented in the agreements of the Technical Assistance Program for the Protection of the Mediterranean Environment (METAP). It is a program jointly assisted by the United Nations Development Program (UNDP), the World Bank (WB), the European Union and the European Investment Bank (EIB) for the fight against pollution and National Observatory for the Environment and Sustainable Development (ONEDD). However, whatever the bilateral and multilateral agreements, the UN and UNEP have taken steps to fight against air pollution.

In this context, there is also the assistance of the GIZ organization for the technical support program concerning the environment sector in Algeria. The European Union and the World Bank fund this project [8]. This project has been given priority by the German Technical Cooperation Office (GTZ) [9] for air pollution control. We also cite the study

carried out by the BC-Berlin design office organized on the theme “Assessment of hazardous waste in Algeria” [10]. There is also that of the Tebodin design office, based on the environmental audit for the preparation of the project “Control of Industrial Pollution in Algeria” (CPI) [11].

It was through this exchange that the transfer of knowledge, expertise and experience was timidly initiating. This is about initiating, participating in or integrating the technological and scientific means necessary to combat the polluting effects of air. Some development projects in the context of international cooperation were in synergy between sectors such as UNEP, the World Bank and Mediterranean organizations.

At the national level, inter-wilaya cooperation remains marginalized, especially with regard to the supervision of university research work, where it is sometimes found reduced to its simplest expression. Very or too few initiatives are taken in this direction, whether in the form of conferences, workshops, training cycles, or even conventions.

Environmental actors are committed to the search for performance developed around the methods of environmental assessment accompanied by legal frameworks, but omitting participatory consultation to raise awareness among industrial players to opt for internationally recognized environmental management methods respecting the National Program for Depollution (PND).

Monitoring Institutions

It should be noted that since 1990, there have been the creation of several institutions including the National Observatory for the Environment and Sustainable Development (ONED), the Coastal Commission (CL), the National Waste Agency (AND), the National Center for Cleaner Production Technologies (CNTPP), the Center for Biological Resources Development (CDRB) and the National Agency (ANDE) responsible for monitoring and implementing the recommendations of experts from the pollution level assessment.

This agency has a technical steering committee made up of various actors (technicians, administrative and financial representatives, associations, etc.). In addition, this committee is responsible for implementing the GIS while ensuring the protection and preservation of the environment.

Relatively this institution, as a responsible actor, aimed to achieve air quality objectives by encouraging environmental managers to develop technical and scientific expertise in order to reduce risks to public health. Other structures carried out support missions in the fight against the deterioration of the environmental context such as the Conservatory of Training in Environmental Professions (CFME), the School of Water Professions (EME), the National Urban Planning Agency (ANURB) and the General Directorate of the Environment (DGE) replacing the State Secretariat for the Environment (SEE) since 2002.

All of these programs have strengthened the capacity of the National Conservatory of Environmental Trades (CME), the National Observatory of the Environment and Sustainable Development (ONE-DD). Also, there was the strengthening of intersectoral cooperation for the establishment of the Environmental Information System (EIS).

Responsibility of Actors

At local level, city policy aims to take charge of the environmental assessment process, with the mobilization of civil society. Given that the awareness and participation of residents in environmental management can force the polluting company to become aware of the poor competence of its environmental services. Participatory consultation can lead to greater awareness of industrial operators of environmental problems.

Furthermore, the responsibility of institutional actors lies in the commitment to create technical performances. We cite the Environmental and Depollution Fund (FEDEP) [12], which assists companies, in particular SMEs and SMIs, in their technical improvement operations while managing private expenditure to reduce pollution.

The financial endowment of the FEDEP was essential to test depollution operations of industrial units in the Algiers agglomeration using incentive models. The study on the mechanisms for using FEDEP resources planned as part of the Industrial Pollution Control (CPI) project quickly provided financial assistance. As for the responsibility of environmental assessment experts, it was distributed according to a set of performer’s interveners. This is the project leader; it is also the applicant for authorization of an environmental impact study, the design office for the formulation of the impact study, the steering committee for assistance in the fight against pollution atmospheric.

The steering committee is responsible for the initial evaluation of impact study programs and projects, the development of financial arrangements, the monitoring of execution and the evaluation of results according to execution deadlines and progress reports on project implementation. Finally, he is a decision-making member with the Project Execution Unit (UEP) [14], the High Council for the Environment and Sustainable Development (HCEDD) and the Regional Activity Center (RAC) for Specially Protected Areas (RAC / SPA) for Mediterranean countries.

Responsibility of the Polluting Company

The polluting company is socially responsible to environmental stakeholders by ethical values, concerning (employees, suppliers, customers, shareholders, etc.) in relation to the requirements of civil society in terms of air quality. Moreover, the attributions of responsibility of the National Environmental Plan to the polluting company are firm in order to respond to the vast program of air pollution control.

It is noted from the National Environmental Report (RNE) that education and awareness programs have reinforced the National Environmental Strategy (NES)

. Indeed, environmental training is a powerful tool for learning about environmental protection. Thus, capacity building for environmental management has implemented through municipal environmental charters. These latter now ensure the improvement of environmental management at all levels (central and local).

The development of awareness campaigns through public debates has been at work since 2006. Environmental monitoring surveillance company such as the National Agency accompanied the strengthening of the framework for the Protection of the Environment (ANPE). This gave very commendable evidence of effectiveness, but it was dissolved in 1990. There are also other organizations that have facilitated the management of environmental pollution, in particular, priority investments and environmental taxation. These two structures are established by the implementation of action programs both long-term (10 years) and shorter-term (3-5 years).

Regulations and Legislative Measures

Even if Algeria has ratified the international conventions on environmental protection and gradually adjusted its legislative framework to meet the commitments made, we can see that the legal provisions have not integrated the control of industrial pollution and its regulatory management in the priority actions only at the beginning of 2000. These measures were insufficient to protect themselves and ensure the effective exercise of depollution in relation to the damage caused.

Industrial Air Pollution

What is observed in this context is above all its limited application with regard to environmental laws, given the promulgation of the framework law [13] for the environment in 1983. Similarly, the inter municipal structures, regulated proved to be insufficient and inoperative.

In addition, the application of Law relating to environmental protection in the context of sustainable development has made it possible to launch procedures for controlling and monitoring air pollution and managing impact studies more rigorously. In this regard, a vast legislative program has been promulgated, including:

- Law N_o 06-06 of February 20, 2006, for the promotion of the city.
- Law No. 05-12 of July 04, 2005 relating to water.
- Law N_o 04-20 of December 24, 2004 for the prevention of risks
- Law N_o 04-09 of July 14, 2004 for to the promotion of renewable energies,
- Law N_o 01-19 of December 12, 2001 relating to the management, control and limitation of waste,
- Law N_o 90-29 of December 1, 1990 relating to town and country planning,
- Executive Decree No. 06-02 of January 7, 2006 defining limit values, alert thresholds and air quality objectives in the event of air pollution,
- Executive Decree No. 06-138 of April 15, 2006 regulating the emission into the atmosphere of gases, fumes, vapors, liquid or solid particles, as well as the conditions under which they are controlled,

- Executive Decree No. 06-141 of April 19, 2006 defining the limit values for discharges of industrial liquid effluents,
- Executive Decree N° 06-198 of May 31, 2006 defining the regulations applicable to establishments classified for the protection of the environment,
- Executive Decree N_o 07-144 of May 19, 2007 setting the nomenclature of installations classified for the protection of the environment,
- Executive Decree N_o 07-145 of May 19, 2007 determining the scope, content and terms of approval of studies and impact notices on the environment,
- Executive Decree N_o 07-207 of June 30, 2007 regulating the use of ozone-depleting substances, their mixtures and products thereof contain,
- Executive Decree N_o 07-299 and n ° 07-300 of September 27, 2007 setting respectively the modalities of application of the additional tax on atmospheric pollution of industrial origin and on industrial wastewater,
- Executive Decree No. 06-161 of May 17, 2006 declaring the industrial area of Skikda a major risk area,
- Executive Decree No. 06-162 corresponding to May 17, 2006 declaring the industrial area of Arzew a major risk area.
- Executive decree N_o 06-163 of May 17, 2006 declaring the pole in-Amenas, zone at major risk,

The application of these laws has not yet made it possible to meet the requirements of sustainable development and the provisions relating to decreed polluted areas.

Presentation of an Experimental Approach

The Sama Safia (clean sky) network with its monitoring stations and air quality controls has been effective since its launch in 2002. This network, the program of which has been managed by the National Environmental Observatory and of sustainable development (ONE-DD), shows that sensors with physicochemical characteristics measure the concentrations of different atmospheric pollutants because they meet the environmental standards currently in force.

The Sama Safia network was designed to monitor the quality of ambient air in urban and peri-urban areas in accordance with Executive Decree No. 06-02 of January 7, 2006 defining limit values, alert thresholds and quality objectives for the air in the event of air pollution. There have currently been two functional surveillance networks since May 2002 located in the cities of Algiers, Annaba, Oran and Skikda. An extension of this network has been planned for (06) other cities with more than 200,000 inhabitants.

The Mission of the Sama Safia Network

This network has a multiple mission, it must therefore allow:

- know constantly, thanks to daily monitoring,
- arrive at a forecast of atmospheric pollution levels,
- collect the data necessary for the complete forecasting procedure,
- continuously monitor air pollution levels in the main centers urban areas and determine the air quality index.
- analyze and explain the atmospheric pollution phenomena.
- detect peaks of pollution and the periods during which the thresholds are exceeded.
- alert public services during critical situations and inform them of the measures to follow to minimize the impacts on air quality.
- provide information on all pollutants regulated by the values given by the WHO.
- make the results accessible to researchers.
- respond to any request for air quality measurement included in the regional policy for monitoring air pollution.




All of this activities did little to promote information and public consultation, self-monitoring and environmental self-monitoring.

DISCUSSION



The actions planned by environmental managers have done little to promote information and public consultation, self-monitoring and environmental self-monitoring. The application of these laws has not yet made it possible to meet the requirements of sustainable development and the provisions relating to decreed polluted areas.

It is in this perspective that inquiries, consultations, debates and public meetings began to emerge. However, until then, no specific results of industrial air pollution rates have been identified, notably concerning the companies of the electrical industry (ENIEM) in Algiers. The steel unit (Arcel-metal) in Annaba (east -Algerian) (Board II, Tab. Illus.), the production unit for construction materials such as the Algiers cement plant (capital city) and the Ouargla cement plant (South Algerian); without forgetting the petrochemical unit of Arzew (west of Algeria) (Board IV-V, Tab. Illus.), and that of Skikda (east of Algeria) (Board III, Tab. Illus.).

Annaba: Polluting complex industrial

Annaba, Unit Fertil and rail transport
www.liberte-Algerie.com/




El Hadjar (Annaba), Toxic smoke, complex steel Arcelor Mittal
<http://www.annabacity.net/>

El Hadjar (Annaba), Complex steel Arcelor Mittal
www.vitamine.dz.org/

Map 2: Annaba, Localization of Polluting Sites :
- complex : Arcelor Mittal & Fertil
www.viamichelin.fr/web/Cartes-plans/-Annaba-Algerie



Board II. Annaba, city exposed to air pollution

Skikda: Polluting atmospheric petrochemical site

Skikda, Flared gas
<http://www.made-in-algeria.com/>

Skikda: General view of the petrochemical pole
<https://www.alg24.net/>

Skikda, Oil refinery
<https://www.algerie360.com/>

Skikda, Combined cycle power plant
www.snclavalin.com/fr/projects/

Map 3 : Skikda, Polluting Petrochemical site
<https://www.viamichelin.fr/web/Cartes-plans/Carte-plan-skikda-Skikda-Algerie>

Board III. Skikda: Air pollution on a daily basis

Moreover, the municipal provisions for combating pollution urgently require sufficient resources for the management, organization and protection of the environment locally. As for the monitoring stations of the Sama Safia network, these consist of a set of sensor-analyzers and a device for sampling the ambient air for sampling. The measuring chain operates continuously, 24h / 24 throughout the year, allowed to obtain concentrations of each pollutant in the form of quarter-hour averages (15mn).



Board IV. Arzew (Oran): Polluting sites



Board V. Beni-saf, Ain Temouchent&Ghazaouet: Atmospheric pollution

Pollutant concentrations are analyzed on daily samples and then the data is automatically distributed to the central network station. After digital processing, there is the development of a daily bulletin on the state of air quality as well as monthly and annual reports. The Sama Safia network disseminates information in real time to the public through either the press or illuminated billboards located at busy intersections.

It can be said that industrial smoke is an important source of pollution in Algerian cities. To this end, monitoring of the Sama Safia network has enabled us to find out, above all, the burden of industrial pollution with toxic gas, smoke

and vapor in several cities. This control is exercised at two levels, internal control, the responsibility of which is the responsibility of the polluting company, and external control provided by the environmental services.

CONCLUSION

Interpreting the responsibility of stakeholders is fundamental to questioning the current effectiveness of environmental assessment through the control and monitoring of air quality. But what if the forecasting capacity is very limited and the emission of industrial smoke remains a reckless weighting. This is why, to reduce this nuisance, we must take note in the guiding principles of sustainable development, environmental policy guidelines, the integration of impact studies supported by environmental assessment experts.

In another sense, air pollution control practices are developed based on standardizations such as eco-label, environmental audit or eco-audit. There are also public consultation techniques such as the confrontation of parameters and advice, direct or subject to public inquiry. For the coordination of public consultations, it is organized at the national level in interministerial committees and project execution, monitoring and evaluation units. These practices constitute an accompanying measure for the PNAE-DD.

So to speak, the responsibility of Civil Society can allow the maturing of environmental assessment projects and the preparation of operating strategies to purify the air of Algerian cities.

LIST OF ABBREVIATIONS

Algerian National Report	ANR
Biological Resource Development Center	BRDC
Centre Regional Activity	CRA
Clean Development Mechanism	CDM
Commissionership Coastline	CC
Effective Impact Assessment	EIA
Environmental Information System	EIS
Fund of Environment and Cleanup	FEDEP
General Directorate of Environment	DGE
Geographic information system	GIS
German Agency for Technical Cooperation	DATC-GIZ
High Council for Environment and Sustainable Development	HCEDD
Industrial Pollution Control	IPC
Industrial Pollution Control Project	IPCP
Mediterranean Environmental Technical Assistance Program	METAP
Ministry of the environment and renewable energies	MEER
Ministry of Territory Planning	MTPE
National Action Plan for Environment and Sustainable Development	PNAE-DD
National Agency for Environmental Protection	ANEP
National Agency for Urban Planning	NAUP NCCTP
National Centre for Cleaner Production Technologies	CNTE
National Conservatory of Training environment	NEDAP
National Environment and Development Action Plan	NES
National Environment Strategy	NOESD
National Observatory of Environment and Sustainable Development	NAWA
National Report on State Future Environment RNE	PAP
National Waste Agency	CAR/ASP
Priority Actions Program	SWP
Regional Activities Centre for Specially Protected Areas	SEE
School of water professionals	UNDP
State Secretariat for Environment	SSE
United Nations Development Programmed	UNDP

THANKS

I thank Professor Djamel ALKAMA, Head of doctoral training at the Department of Architecture, University 8 mai 1945, Guelma Algeria. My thanks also go to all the members of the International Journal of Inovatives studies in Sociology and Humnities.

REFERENCES

1. Ministry of Spatial Planning and the Environment, 2014. The application of the convention of biological diversity at the national level, National Report N^o 5, 40p. <https://www.cbd.int/doc/world/dz/dz-nr-05-fr.pdf> Accessed 02/05/2022.
2. Ministry of Spatial Planning and the Environment, 2002. National Action Plan for the Environment and Sustainable Development (PNAE-DD), document, 140p. URL : <http://www.algerianembassy.hu/images/stories/algerie-paned.pdf> Accessed 02/05/2022
3. Chalal, H., 2006. Interview with on the Industrial Pollution Control Project in Algeria according to the Regulations and recommendations of the World Health Organization (WHO). The group's newsletter the World Bank in the Maghreb, n^o 3. URL : <http://siteresources.worldbank.org/intmoroccoin french/2234310-Dossier6.pdf?cid=extfr> Accessed 31/04/2022
4. World Bank, 2010. For an industrial pollution control project, Report No. 34512, 46p. URL : <http://documents.banquemondiale.org/curated/fr/187901468202431910/Algerie-Projet-de-Controle-de-la-Pollution-Industrielle> Accessed 12/04/2022.
5. European Neighborhood and Partnership Instrument (ENPI) 2012. Towards a system for sharing information on the environment, Report: Algeria strategy document 2007 - 2013 & national indicative program 2007 - 2010, 53p. https://eeas.europa.eu/delegations/algeria/8698/node/8698_en country Algeria. Accessed 12/31/2019.
6. National Implementation Plan (PNM), 2006. POP's Project - Algeria, Contract GF / ALG / 02/001 Algeria - Stockholm Convention, 137p. C: /Users/Haridi/Downloads/UNEP-POPS-NIP-Algeria-1.French%20 (1) .pdf. Accessed 12/04/2022.
7. Ministry of Foreign Affairs, 2011., 19th Session of the United Nations Commission for Sustainable Development (CDD-19), Agency of Algeria affiliated to the United Nations Conference on Sustainable Development (UNCSD) and the Directorate of Environment and Sustainable Development, National Report of Algeria, 42p. https://socialprotection.org/sites/default/files/publications_files/Rapport%20National%20de%20l%27Algerie.pdf Accessed 31/12/2021.
8. European Union-Algeria 2016. Regional projects approved by program agreements for the development of Algerian participatory strategy in the international partnership: Findings and perspectives. URL : https://eeas.europa.eu/sites/eeas/files/evaluation_de_laccord_dassociation_ue-algerie.docx Accessed 31/12/2021.
9. Die Deutsche Gesellestchaft für Technische Zusammenarbeit (GTZ), 2017. Portfolio of activities in Environment Management & Developpment in Algeria, 8p. URL: https://www.giz.de/en/downloads/giz052019_fr_giz_algerien_portefeuille.pdf Accessed 12/04//2022.
10. BC Berlin, 2014. Industrial waste in Algeria. German design office Report, 89p. URL: http://www.naturevivante.org/documents/com_nat.pdf Accessed 31/12/202.
11. Tebodine Peters Engineering France, 2005. Algeria - Industrial pollution control project, Report N^o 34512, 30p. URL : <http://documents.banquemondiale.org/curated/fr/187901468202431910/Algerie-Projet-de-Controle-de-la-Pollution-Industrielle>. Accessed 12/31/2019
12. Legal-Doctrine platform, 2018. Projects: environmental taxation in Algeria, URL : <https://legal-doctrine.com/portoflio/la-fiscalite-environnementale-en-algerie>. Accessed 12/31/2021.
13. Law No. 2003-10 of July 19, 2003 relating to the protection of the environment in the context of sustainable development, p. 6. J.O.R.A N^o 43 of July 20, 2003. URL : <http://www.mtp.gov.dz/GUIDE%20JURIDIQUE/textes-de-portee-generale/4-Loi-n2003-10.pdf>. Accessed 12/04/2022.

14. Regional Activity Center for Specially: Protected Areas (RAC / SPA), 2004, Strategic Action Plan for the Conservation of Biological Diversity in the Mediterranean Region (PAS BIO). National report in United Nations environment programs, 43p. URL : <http://www.rac-spa.org/fr/node/1619>. Accessed 31/12/2021

Citation: Doctor Fatma-Zohra HARIDI, Djamel ALKAMA. et al. *Air Pollution: Preservation Strategy and Responsibility of Actors*. *Int J Innov Stud Sociol Humanities*. 2022;7(6):12-22. DOI: <https://doi.org/10.20431/2456-4931.0706002>.

Copyright: © 2022 The Author(s). This open access article is distributed under a Creative Commons Attribution (CC-BY) 4.0 license.