

Environmental Effects of Nuclear Explosions in The Algerian Sahara - Reggane as a Model.

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Abstract:

Algeria suffered a lot of France's crimes that targeted people and stones. Reggane, a region in the Algerian desert, is the place where France carried out its nuclear experiments targeting humans, plants, animals, water, air and the surrounding environment. The tranquility of Reggan was turned into nuclear dust that transformed its oases into a cemetery only to please the dreams of colonial France. These experiments remain a stain on France war record.

Keywords: Nuclear tests, France, Reggan, Jerboa, Foggara (system of irrigation), detonation .

Introduction :

One of the most dangerous catastrophes facing humans and the environment is the radioactive pollution caused by nuclear explosions. The contemporary world has witnessed many cases of radioactive pollution resulting from nuclear explosions, the clear examples of which are the Japanese Hiroshima and Nagasaki bombs in 1945, during World War II and the Fukuryamaru case, which resulted from the US nuclear tests on the first of March 1945 in the Marshall Islands Sea, which led to radioactive fallout on a Japanese fishing boat: "Fukur Yamaru" and the French military nuclear experiments carried out in the Pacific Ocean in 1984 AD against the objections of Australia and New Zealand On these experiences.

As such the explosion of the Chernobyl station in April 1986 led to strong reactions, especially by European countries that were affected by this incident and they held the Soviet Union responsible.

The international community was prompted to move to organize and control these incidents and tests. These moves ended in the adoption of a series of international treaties to frame such nuclear disasters and hold responsible whoever is doing them. The most important of these treaties is the Vienna Convention on Early Notification of a Nuclear Accident, adopted in 1986. This legal move was accompanied by a clear and academic movement in writing on these nuclear accidents and their implications and effects.

But the questions that needed to be asked are; what about the nuclear explosions in the Algerian desert? What is the scale of the French crime against humans and the environment in each of the underground experiments in Tamanrasset or the surface ones in the Reggan region? What is the fate of nuclear wastes resulting from nuclear explosions- whose environmental effects are still tangible- in the region? What impacts do these nuclear wastes, burials and remaining fields have on water, plants, animals and soil in the region Reggan?

Reggan: Location and Surface:

Reggan is located in the far south-west of Algeria. Its name comes from a Berber word that means “a large, lying camel”, and it was in this place that the camel that was ridden by "Tin Henan", Queen and famous Ancestress of the Tuaregs, died, and so the place was named after her.¹

Reggan is 1800 kilometers far from the capital Algiers, and 155 kilometers far from the state headquarters in Adrar, bordered to the north by: Zawyet Kunta district, to the south by Tamanrasset state, to the east by Oulef district, and to the west by the Republic of Mauritania, and it is considered one of the important municipalities in the state of Adrar, with a desert character on its surface and contains desert oases where man was able to make a life for himself centuries ago thanks to the water of the Foggara.²

Its surface is estimated at 124,298km².³ And it is characterized by high temperature in summer and low in winter, and this leads to a high temperature range in addition to the lack of rain. It is characterized by a dry, desert, continental climate and its strong winds blow in different directions according to the seasons, most of them are northeast and north, and the most dangerous type is the Sirocco winds, sometimes lasting for very long periods in the months of February and May⁴. It is located between latitudes 26 ° and 30 ° N, longitudes 4 ° and 1 ° E, and its population consists of Berber, Arab and African tribes, and according to 2008 statistics, its population reached about 27,804.⁵

The French Administrative Organization of Reggane.

The region has long been under a military regime until the issuance of the so-called Algerian constitution or the Basic Law on September 20th, 1947 AD which stipulated the abolition of the military regime in the south. This law stipulates in its fiftieth article: “The regime for the lands of the South shall be abolished. These lands are considered states defined by law, and After seeking the opinion of the Algerian Association of the conditions according to which these lands, in whole or in part, are designated distinct states or states merging with other states that exist or will be established. The decree issued on 09/30/1903 AD shall be repealed and the budget of the lands of the South shall be incorporated into the budget of Algeria from the first of January 1948 AD.”⁶

In August 1957 the approval of the establishment of two Sahrawi prefectures was completed.

1- Oases prefecture: Based in Laghouat, and it is divided into three administrative regions:

- The administrative area of Laghouat: which includes the region of Ghardaia and part of the mixed municipality of Jarfil, east of Wadi Zaquq, up to the village of Al-Kahla
- The administrative region of Ouargla: which includes the oases region and part of the mixed municipality Alwadi located south of 32 ° latitude.
- The administrative area of Toqurat, which includes a part of the Toqurat region.

2- Al-Saoura prefecture: It is based in Columbe, Bashar, and is divided into two administrative regions:

- The administrative region Colombes: includes the mixed municipality of Colombes in Bashar, Brézina, Saoura and Tindouf.
- The administrative region of Adrar, which includes the private municipalities of Guarara and Touat.⁷

On August 07th, 1957 AD, a special decision was issued for the administrative organization of the southern regions that fall under the supervision of the common region for the desert regions. According

to this decision, two prefectures were established, namely the Oases and the Saoura, and the authority became in the hands of a minister in charge of the desert.⁸

Reggane and The Nuclear Tragedy:

The selection of Reggane as a French nuclear crime field was made for several reasons:

- Because it is within the French colony.
- The area is far from to the media' reach and is difficult to access. Therefore, it guarantees the secrecy of these experiments.
- The area was within the purview of the French colonial administration and was limited by red lines.
- The area is neighboring the region of other French colonies such as Mali, Niger and Mauritania.
- The prosperity of desert farming. And so, France will know the extent of the radiation effect on humans, animals and plants.
- Having an enormous supply of water⁹

During the period of 1956-1958, France doubled its forces to more than a thousand soldiers, as well as the establishment of nuclear and missile centers in the desert. The desert was linked directly with the French Ministry of Defense and the departments of NATO, and these centers were declared an extension of NATO bases such as the Columbe region in Bashar. The French government decided to consider the Reggane region as a center for conducting nuclear tests¹⁰

From here it appears that France was in need of a wide space in the Algerian desert to carry out these experiments, which cannot be carried out in traditional training fields, large population areas, or in their small colonies, in order to be able to monitor and control missiles and to find a solution to the problems of production and storage of nuclear waste which raises problems more complex than those of live ammunition and conventional gunpowder. And the presence of targeted samples of humans, animals and plants in the Touati oases was a decisive factor of selection.

French Nuclear Explosion:

Residents of Reggane woke up on the morning of February 13, 1969, (7.04 am) on the impact of a huge, terrible explosion, announcing the beginning of the desecration of the region, its inhabitants, environment, water, animals, and everything that belongs to it, as a field for France's criminal experiments. These bombings were under the name of the Blue Jerboa, and they were followed by other explosions.

On February 13th and in the early morning hours, the first the bomb was placed on a metal tower more than a hundred meters long surrounded by twelve cameras to take pictures of the explosion. Says Francis Pardo, the recruiter in Group 620, in what his diaries recorded that day: "We woke up at 5:30 in the morning, and at exactly seven o'clock the first fire rays went off and we heard a strong explosion after only four minutes."¹¹

And so the first atomic bomb was blown up in the Reggane desert in a place called Tamango in the Hamoudia region, located sixty kilometers south of the Reggan region. It had a force of around 60 to 70 thousand tons of TNT substance. The area was where the second division of the French army, "2eme compagnie de L'Armée Fransaise" settled, and whose mission was to prepare the base for conducting experiments, where about 6,500 French scientists, technicians and soldiers, and 3,500

Algerians settled as simple workers and detainees. A large city of ready-made housing was built for them.¹²

France committed its crime in the region within the framework of its endeavor to join the club of the great countries. This bombing, which was equivalent to three times the bomb of Hiroshima in Japan in 1945 AD, was followed by the White Jerboa bomb on 01/04/1960 AD, then the Red Jerboa on 12/27/1960 AD according to the order of the colors of the French flag. Bombing continued in the Hammouda region, the fourth bomb was the Green Jerboa on 04/25/1961 AD, after which France violated the region, ignoring all its deceptive slogans of freedom, justice, equality and protection human rights.¹³

Effects of nuclear explosions

In the health field:

Four months before the bombings, the French colonial authorities carried out a census of buildings, inhabitants, villages and palaces. Tents were numbered and people, animals, trees and plants were counted, as Captain Michelo; head of the Saharan Administrative Center, distributed necklaces to the people and obliged them to hang them on their necks. The necklaces carried pens to measure radiation exposure, and it was confirmed that the people were used as samples for experiments after the visit of the First Lieutenant, "Dicho lecutonnat," the military doctor to the neighboring palaces to inspect the radiation effect and examine the people. Various animals were transported to the area, including goats, dogs, rabbits and cats, mice, reptiles, insects, birds, seeds of plants and they were placed in specific places in addition to certain devices that were brought in order to know the effect of radiation during and after detonation.¹⁴

In an interview with the doctor Osidhom, head of the cancer patient cell in Reggane, he confirmed that the hospital deals with cases of cancer in various forms such as leukemia, throat, liver, stomach, breast, lung, trachea, thyroid gland, skin and others, and that the general medicine department of the hospital counted between 1996 and 2009 about eighty-five confirmed cases of cancer, between Five to ten cases per year, and the reason is due to hospital diagnoses.¹⁵

The prognosis remains relative because the majority of the population, especially the elderly, do not visit the hospital except in extreme cases, another reason is the lack of diagnosis and lack of equipment.

In a declaration made by Professor Abdel Kadhim Al-Aboudi on 02/14/2015 to Al-Jomhoria(The republic) newspaper he said: "Cancer affected more than an entire generation of Algerians, as the number of infections in the southern regions reached very high rates to the extent that for every case in the northern states, it corresponds to twenty-five in the desert, which makes the average cancer cases in the south thirty times higher than what is found in the north, and despite these figures, they remain far from reality because not all infected cases are included in the count."¹⁶

Environmental impacts:

Reggane is still suffering from the remnants of nuclear radiation that France disposed of by digging deep pits and burying in them all kinds of tools, equipment and machinery used in heavy labour, in addition to the waste of chemical, biological, bacterial, and radioactive materials. Reggane was left a cemetery for radioactive waste. Natural goods were affected, grains and palms, were struck by an atomic "Fusarium oxysporum" disease.¹⁷

In his testimony an eyewitness “Boualali Ali”, also known as Abadidi, said: “We were - before the bomb- in a blessing, we did not know diseases or the hospitals. Our health was good. We worked hard and diligently. We used to produce our food with our own hands and we produce from our orchards everything we need. The production was plentiful and the water was sweet, but after the bomb the cultivation deteriorated, yields became low, production decreased, there was a shortage of water in Foggara and the ground is not suitable for anything, even the site of the explosion became blackened as a result of the explosion.”¹⁸

Abbasi Al-Saleh, born during 1945 confirms that "Agricultural production has witnessed a significant decline, whether dates, wheat, or tomatoes, compared to the neighboring regions, and the impact of the bombings has become evident on the level and quality of drug water." ¹⁹

As for Haj Abd al-Rahman Ammar, born during 1939, an eyewitness who used to work in an area designated for keeping animals, said: “I used to work in a place designated for animals, it included chickens, sheep and plants of every kind: beans, chickpeas, lentils, garlic ... etc. They put them in private houses so that they could be tested and show how the explosions affected them, as for the sheep that survived after the explosion, they were collected and redistributed to the population to see the extent of the effect they would have on them. But the residents rejected them because the symptoms of the disease were clear on them. As for the plants, they tried to replant them to see if they grow or not. As for the agricultural production, it all deteriorated after the bombings, especially the palms that used to produce excellent dates in terms of size, taste, they now give bad returns.” ²⁰

On water:

Water pollution is defined as a change in the basic components of water, directly or indirectly, due to human activity, so that the water becomes less suitable for use. This pollution is one of the oldest environmental problems known to man. Nuclear experiments contributed to water pollution due to radioactive atomic dust carried by the winds to water surfaces. Which led to increased pollution in different depths of the seas, oceans and rivers, in addition to the process of radiation leakage through the groundwater from nuclear reactors. It can be said that the seas and oceans today have turned into graveyards of nuclear waste and nuclear warfare due to the sinking of warships loaded with nuclear weapons or getting rid of nuclear submarines after they get old. ²¹

As for the effect of radioactive materials on water in general, and on drinking resources in particular, it's safe to say that human production through experiments and the dissolution of atomic nuclides has reached 800 nuclides, of which 200 are of special importance for drinking water. ²² It was confirmed by witnesses that there is a great shortage of water levels and a change in the nature and taste of water in Reggane region after the French nuclear explosions.²³

On climate:

France announced the results of the explosions and that they are clean and in conformity with climate predictions, as the nuclear cloud headed- according to them- towards uninhabited areas, and confirmed that the monitoring centers will give guarantees in the future that there is no area affected by the falling nuclear radiation, and the real areas that the radiation reached and the size of the bomb remained. ²⁴

Studies prove that the radioactive activities resulting from the nuclear detonation changes according to the shell used and the height and location of the detonation. So that after the detonation

the large particles lie directly next to the site and have a very high radioactivity and the other part remains in the outer space, but the very small particles remain in the air, and the part related to the 300 kilotons shell enters the stratosphere. Then it falls to the ground after a long time.²⁵

As for **the soil side**, studies have confirmed that the effects associated with the explosion are followed by storms, fires, heat, pressure, and storms. These resulted in sudden changes in sand dune movement in areas that suffered from air erosion factors due to the atomic storm.²⁶

Scientific research has proven that nuclear tests in Reggane resulted in her sudden changes in the movement of sand dunes in areas that were suffering from air erosion factors, so nuclear radiation eliminated the natural goods that were characteristic of the region. All due to the damage to the quality of palm trees and grains, water pollution, the decrease in biodiversity and livestock and the disappearance of a number of birds and reptiles. The soil was subjected to nuclear burning and became unfit for agriculture, the vegetation cover deteriorated and there was decline in the production of agricultural crops.²⁷

Experiments conducted by the International Atomic Energy Agency in 1999 also showed that the areas surrounding the zero points of the four air experiments in Hammoudiyah are still polluted.²⁸

This is a result of burying equipment, bulldozers, and the nuclear means that were put in the tunnels and underground. the French withdrew from these areas without leaving behind maps to locate the burials of these nuclear wastes despite the development in the field of backfilling of nuclear waste.²⁹

Radiations- with the passage of time- reached water reserves giving sufficient time for the radioactive isotopes to decompose before water is used. As for the long-lived radioisotopes such as cesium 137 and citrom 90, they are liable to stick to the soil after falling on it, but they are not likely to reach groundwaters.³⁰

Radioactive pollution of soil is considered one of the most dangerous types of pollution because we it can't be smelled it in the air or tasted like plants and cannot be felt. French nuclear explosions in the Algerian desert in Reggane led to soil pollution, especially the Blue Jerboa region, which experts of the International Agency of Atomic Energy recognized in their reports in March 2005.³¹

As for the French blackout on these experiences. The French colonial authorities announced that the weather conditions were suitable for the bombing, and that the Reggane and the hill area did not suffer any damage, and that there were very light damages in the Hammoudiyah area. This did not require taking measures because it quickly vanishes and that the nuclear cloud was carrying only a weak percentage of nuclear radiation, and the ministry of armies confirmed that the experiment was conducted according to predictions, and that no person was injured. France was, as usual, lying to the international community to hide its countless crimes.³²

Except that, after Forty years, the environmental effects resulting from nuclear explosions are still visible, and the diameter of the area around Point Zero around (twenty-five to thirty kilometers) is still a highly radioactive area. People are warned against entering deep into the region, and because the nuclear waste has not been cleaned in the area, the camels that graze in the area remain exposed to nuclear radiation. And leave the population and their families exposed to the same risk due to the lack of data and information about the maps and places in which the experiments were held or where the nuclear waste , contaminated with radiation, was buried.³³

Conclusion:

The French nuclear tests in the Algerian Sahara remain a complete crime where the criminal is France and the crime is the nuclear experiments in the region, the tool of the crime is its nuclear remnants that remain to this day uncovered and the victim is the man, the environment, animals, plants, water and air. Its effects remain to this day, a testament to what France did against Algeria.

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