



ORIGINAL RESEARCH PAPER

History

CLIMATE AND HISTORY: THE LITTLE ICE AGE AND ITS IMPACT ON SPAIN'S HISTORY

KEY WORDS:

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We, the citizens of today's world are no strangers to the vagaries of climate change. Climate is omnipotent and has the ability to change the course of our lives; either humans change their ways or the climate might change everything for humanity.

Floods, droughts, crop failures, epidemics: Is global warming responsible for all of them? And is the extreme climate a recent phenomenon? This, certainly, is not the first nor the last of the extreme climate events.

Through History, the human race has suffered bad climatic situations which were either natural or may have been anthropogenic. The world, not long ago, was dealing with the climatic adversities that were the inverse of what we face today; it wasn't global warming, it was global cooling. The Paleo-climatologists called it 'The Little Ice Age'. This phenomenon covers the period between the 15th and the 19th centuries of approximately 400 years and is considered as a disrupting period for the mankind. Though the impact was not felt everywhere and not to the same extent.

For those times when no mereological records were kept, it is difficult to establish a connection about the impact of the climate on History and people of a place. Historical studies seldom find mention of the impact of climatic factors.

It is important that while we face the severe impact of global warming, we go back into the past and draw lessons. There have been several studies and there are historical documentary evidence and geological records of climate variability from which the climatologists have gathered information and reconstructed the climatic models of those times with a reasonable certainty. The available paleoclimatic evidences, are the ice cores, tree rings, stalactites and stalagmites etc. Moreover, there are records of droughts, floods, poor harvests; resulting in famines, epidemics and deaths. All these records and studies in various fields help in corroborating or refuting any hypothesis or inference.

"Scientists call it the Little Ice Age--but its impact was anything but small. From 15th to the 19th century, a period of cataclysmic cold caused havoc. It froze Viking colonies in Greenland, accelerated the Black Death in Europe, decimated the Spanish Armada, and helped trigger the French Revolution." (Little Ice Age: Big Chill, 2005)

Climate has the potential to reconfigure societies, impact cultures, economies and the politics of a region. A study of the ramifications of these climate changes in the form of human adaptations, social and cultural adjustments, political upheavals can serve us as credible indicators.

At the outset, it is imperative that we have basic idea on the "Little Ice Age", hereafter referred to as "LIA". To begin with, let's ask: What led to many regions, specially in the northern hemisphere, experience a period of relatively cooler conditions between the 15th and 19th centuries.

Below are Enumerated 4 of the Possible Causes:

1. Within a relatively short period there were 4 volcanic eruptions. Volcanoes emit copious amounts of ash high into the atmosphere impeding sufficient sunlight reaching the earth, which can lead to the reduction in

general temperatures.

"A series of large volcanic events that took place during the LIA seems to have triggered the summer cooling that characterized this period, which was enhanced by sea ice/ocean positive feedback" (Miller et al., 2012). "The cool summers resulted in an increase in the extent of sea ice in the Arctic, with the cold subsequently expanding to mid-latitude environments (Wanner et al., 2011)." (M Olivo et.al.2018)

2. Sunspots serve as the markers of heat emitted by sun; there are period of lesser or greater sun activity. The less active period is known as 'the Maunder minimum', which may affect the temperatures on earth.

"Several phases within the LIA have been detected, including (a) 1300-1480: increasing cooling with moderate climate oscillations; (b) 1480-1570: relatively warmer conditions; (c) 1570-1620: gradual cooling; (d) 1620-1715: coldest climate period of the LIA, particularly during the Maunder Minimum." (M Olivo et.al.2018)

3. The North Atlantic Oscillation (NAO) refers to a variation in atmospheric pressure on Iceland and the Azores in the Atlantic. There were changes in NAO that may have generated tropical storms and drop in temperatures during LIA.

4. The anthropologists postulate that the initial colonization of the Americas by Spain and Portugal brought drastic reduction in the indigenous population which impacted the environment in a significant way.

"They estimate that the resulting abandonment of agricultural land allowed approximately 55.8 million hectares to undergo forest/vegetation regrowth. This absorbed approximately 7.4 petagrams of carbon, corresponding to about 3.5 ppm of atmospheric CO₂. Importantly, they argue that when carbon-cycle feedback and other land-use changes are included, this process could account for approximately 47-67% of the 7-10 ppm decline in atmospheric CO₂ between about 1520 and 1610." (Koch et al.2019)

Additionally, the reduction in population also led to a reduction in the agricultural activity, which in turn led to the forests reclaiming the land previously cleared for agriculture, and this led to absorption of more carbon dioxide by the trees.

The scientists don't attribute too much significance solely to the above-mentioned causes to have influenced the global temperature. However, the simultaneity and the confluence of the events are said to have had a marked impact.

Let us try to understand 'How' the historic, social, political and the climatic conditions amalgamated and unfolded for Spain of that period.

To understand the people of a place, it is important to understand the formation of those people in shaping their historic identity. Spain had fought for almost 800 years to reclaim their land from the Muslims. This turned Spain into a state that dedicated and directed all its energies in defending the religion. Spain ended up developing a conservative character in comparison to the rest of the Europe; which was already thinking of religious reforms while Spain was staunchly siding with counter-reformation. The monarchy itself was established on the foundations of religion; the kings were called 'Catholic Kings'. Furthermore, who is unfamiliar

with the Spanish Inquisition.

For all the aforementioned reasons, Spain in an attempt to preserve Habsburg authority got involved in the 80-year (1568-1648) war also known as the Dutch Revolt which led to their independence and formation of Dutch Republic

With the small introduction about the Spain's past let us examine the historical developments in Spain, where both the Spanish Character and the climatic conditions played a significant role in shaping the course of events.

During the period of LIA Spain which was at its pinnacle, and was experiencing all the adversities to a greater degree because Spanish empire had a vast territorial presence across Europe and the Americas, together with the Portugal and its colonies (from 1580 – 1640).

To comprehend the impact of the climatic change on the Spanish History, let us take one case in point is from the 16th century, when Holland or the low-lying countries were also a part of the Spanish Habsburg crown. It was Holland that had to face the brunt of the climate change largely due to its geographical proximity to north where the impact was more pronounced.

Spain's King, Carlos I, born and brought up in Holland, had inherited the Spanish crown together with its 17 Dutch provinces. Later king's own son Felipe II, born and brought up in Spain, was seen as an outsider in Holland for not being well versed with Dutch language.

Felipe II's religious persecutions against the protestant Holland provoked a revolt during the 80 years' war (d.C. 1568-1648) which ended with the independence of Holland: an irreparable loss for Spain.

Now it's time to check how LIA could have played an indirect but decisive role the way the war unfolded. How could the Dutch defeat the then imperial power? We need to examine the reasons of this debacle for Spain.

In October of 1573, the Spaniards laid siege to the city of Leiden. The Dutch rebels were about to face a defeat when the rebel leader, Prince of Orange, implored the people to not consider themselves defeated and to sustain for a little more time: till he broke the dikes of the Meuse River and let the river enter the city to later bring the boats with supplies, but the unfavourable winds didn't conform to the plans of the Dutch.

Eventually, on 1st of October 1574, when the rebels were on the verge of giving up, the weather changed, the sea became turbulent, there was a downpour and the storm brought large quantities of water inland through the broken dikes and filled the area with ice cold water and as a result the boats full of supplies could reach the famished rebels. Thus, changing the course of the event from unfavourable to favourable for the rebels. The Spanish troops had to make a hasty retreat on October 3rd 1574.

Dagomar Degroot, an environment scientist says, "The siege coincided with the so called 'Grindelwald Fluctuation', one of the chilliest periods of the Little Ice Age."

Let's take one more example which had serious repercussions and was another blow for Spain. It happens in the same century, 16th, this time it results in the defeat of the famous Spanish Armada, the so called "Invincible Armada".

Protestant England was providing support to the Dutch rebels against Spain. The Spanish king Felipe II, with the aim of avenging the England's support to the rebels and to bring England under Catholicism, responded by sending the 'Spanish Armada', a fleet of 130 ships to accomplish the task.

The Armada set sail from Lisbon in May 1588 under the command of Duke Medina Sidonia: a man without any naval experience. The fleet anchored in the port of Calais to escort the troops across the English Channel, with the goal of defeating the protestant English queen, Elizabeth I. Besides being a religious enterprise, it had one more objective: To put an end to the harassment by the English and Dutch corsairs to the Spanish trade in the Atlantic Ocean.

When the ships of the Armada were anchored in Calais, England let 8 of the ships sail adrift in the direction of the Armada. A few of the ships of the Armada had to cut their anchor to avoid collision with the English ships. Winds, favourable for England and, shallow Waters helped the light English fleet to inflict damage to the 11 heavy ships of the Armada. The Armada was forced to move northwards due to sudden changes in the wind direction.

Amid diminishing resources and dire circumstances, Duke Sidonia decided to return to Spain taking the western route across Scotland and Ireland, to make matters worse: the storms were moving in from the west, something unusual for this time of the year. The Armada was struck by a severe storm. Some of the ships swerved and collided with the rocky coasts of Ireland. Finally, out of the 130 ships only 67 managed to return to Spain. This defeat may very well be attributed to the inexperience of Duke Sidonia, but the sudden and severe weather changes dealt the ultimate blow to the Spanish fleet.

These two cases demonstrate that the LIA had far reaching consequences. It impacted the political, military, economic and social developments of Spain.

Europe at the time was predominantly composed of agrarian societies. A predictable, understandable and reliable climate was and is the biggest ally of the farmers, the hostile change, due to LIA, brought a collapse of that agricultural system. The crops were failing and there was collapse of the social and the economic order. The humanity was bewildered by the sufferings, scarcity, epidemics and, war and to top it all; the difficult climatic conditions. Philip Blom in his book *Nature's Mutiny*, says "People lamented that God had abandoned them."

With the precarious conditions of life, the religious man reoriented himself from a theocentric to anthropocentric vision of the world. The world had become incongruous with the faith and religion. The inclemency of the climate made a dent in the man's faith, who till now had based his faith on an ever-benevolent God, on the machinations of the nature that always followed a rhythm. Now the realisation was that any event or happening could be explained through reason, logic, and science: The logic and reason were the new gods.

Philip Blom in his book, *Nature's Mutiny* says, "The period of particularly disturbed climatic patterns and events that stretches from the late 16th to the late 17th century also was an age of tremendous social, economic, and philosophical upheaval in Europe. At its beginning, we see a feudal world centred on castles and churches; at its end, we encounter a world of cities and markets, of nascent capitalism and the vigorous early stirrings of the Enlightenment."

The total collapse of the socioeconomic systems due to LIA together with increase in the taxes by the monarchies gave rise to popular revolts and social unrest. The villagers were compelled to move to the cities to earn a living in the nascent industries. It was a huge transformation of an estate-based, rural, and feudal society to an urban and capitalist society of classes based on the socioeconomic system. An evolution towards a modern world where a significant role was played by the climate change.

The lessons are there for everyone to see, in the current climatic crisis things have gone beyond control, and none will

escape unscathed. Everything depends on: Are we all willing to assume the responsibility or simply pass the blame? Our attitude will be the decisive factor in what kind of environment we leave for the coming generations.

There is still time to take corrective and meaningful measures, it is still not impossible. However potent the nature maybe, mankind too is part of nature. We must do everything in our capacity to mitigate the effects of the current climate crisis, even if reversing its course may seem impossible.

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