

The Impact of Cryptocurrency Adoption as a Legal Tender in El Salvador

Adityawardhan Gaikwad¹ and Dr. Sushil Mavale²

¹Student, Indus International School, Pune, INDIA

²CountryFirst Business Solutions, Pune, INDIA

¹Corresponding Author: adityawardhangaikwad@gmail.com

ABSTRACT

Cryptocurrency is taking the world by storm. It is certainly not a new technology anymore to the world. Countries all over the world are deciding on how they should treat the cryptocurrency as it directly impacts their existing ecosystem of fiat currency and how people use it. Different countries have adopted different approaches like considering it as a financial assets, securities, outright illegal or even legal tender in some countries. There are still a good number of countries which are yet to declare whether trading, using or mining it is legal or illegal. In such chaos, El Salvador is one such country which has adopted Bitcoin as a legal tender in 2021. It has been found that bitcoin adoption is expected to help their economy as GDP will probably increase after large scale adoption of Bitcoin. The electricity consumption for bitcoin mining has reached an all-time high. The environmental concerns are rising. However, El Salvador is keen on using 100% clean energy sources. El Salvador has been producing the largest amount of geothermal energy in all of Central America.

Keywords— El Salvador, Cryptocurrency, Legal Tender, GDP

I. INTRODUCTION

“A cryptocurrency is digital currency, which is an alternative form of payment created using digital algorithms” (The Basics about Cryptocurrency, 2021). Cryptocurrency acts as a currency as well as a virtual accounting system. Cryptocurrency wallets are used to store encryption keys which confirm the coin holder's identity and link to the crypto currency.

Just over a decade old, the market for digital currencies has grown swiftly and is very volatile. Bitcoin has been the most popular cryptocurrency with a market capitalisation of more than 800 billion dollars and millions of active bitcoin traders. People use cryptocurrencies majorly for two reasons. Firstly, to avoid hefty transaction fees that regular banks charge and most importantly as an investment-hoping the price to increase and to earn massive profits, by selling at a high price. (Commission, 2021)

Over the past decade, the major environmental concerns have been global warming and climate change. Global warming is likely to be the greatest cause of species' extinction in this century. Even if the temperature rises by 2 degree Celsius, most of the

ecosystems will struggle. For example, the global warming has led to a rise in the sea levels and an increased risk of fire in several habitats (Climate change explained, 2019).

The West Antarctic Peninsula has been one of the fastest warming places on earth. Also, air temperatures in the Arctic region has risen by 5 degree Celsius and there will be no summer sea ice cover left over in the poles in the next few decades. Oceans have already seen changes in its temperature, with temperatures rising by up to 1.5 degrees Celsius. According to the WWF, coral reefs will drop by further 70 to 90% at 1.5 degree Celsius and will be lost at 2 degrees Celsius. It will be a catastrophe for humans as well, since half a billion people rely on fish from coral reefs for their source of food and protein. Another area of concern is ocean pollution and plastics. Around 17.6 billion pounds of plastic go in the oceans from land-based sources every year. It leads to ingestion, suffocation and entanglement of hundreds of marine species. Apart from marine species, it also affects humans. Invisible plastic has been identified in tap water, beer and salt. The chemicals used in the production of plastic materials interfere with the body's endocrine system causing immune, neurological disorders (IUCN, 2021)

“Cryptocurrency mining is a process of creating a new coin that involves using computers to solve complex mathematical algorithms or puzzles.” (Kothari, 2021). The process uses large amount of electricity as powerful and huge systems are used by miners to verify transactions. As the price of the crypto currency rises, so will the amount of energy consumed by that cryptocurrency to be mined. Bitcoin is the most mind cryptocurrency. According to the University of Cambridge, “Bitcoin mining consumes more than 120 terawatt hours per year, with using more electricity annually than the countries like Malaysia, Sweden or Argentina.” (Criddle, 2021)

If this continues, cryptocurrency will produce enough carbon dioxide emissions to push global warming above 2°C within less than three decades which will have a devastating impact on the environment. “To be competitive, miners want the most efficient hardware, capable of processing the most computations per unit of energy.” This specialized hardware becomes obsolete

every 1.5 years and can't be reprogrammed to do anything else. It's estimated that the crypto network generates a few kilotons of e-waste each year, thus rapidly increasing the huge e-waste problem. Power plants consume millions of gallons of water and increases the temperature of water which is being discharged in the water bodies and endangering the wildlife and ecology. The large intake pipes also suck in and kill larvae, fish and other wildlife. (Cho, 2021).

II. OBJECTIVES

1. To study the sources of energy that El Salvador is using to mine cryptocurrency
2. To study the impact of mining on El Salvador's environment and economy

III. RESEARCH METHODOLOGY

The research is exploratory in nature. The researcher used data to analyse the significant sources of energy that El Salvador is using to mine cryptocurrency and to study the impact of mining on El Salvador's environment and economy. Secondary Data Collection technique was used to collect and analyse data.

IV. LITERATURE REVIEW

Most energy sources for doing work are non-renewable energy sources like coal, petroleum and natural gas.

Renewable sources of energy come from natural processes which are constantly replenished like solar energy, wind energy and nuclear energy. Harnessing nature's power is used for heating, transportation and lighting. Today, renewables are becoming an important source of power due to more innovative and affordable ways to retain wind and solar energy. (Shinn, 2018)

El Salvador's electricity generation sources in the market are: 22.25% hydroelectric, 21.17% geothermal, 24.77% thermal, 8.55% biomass, 3.34% solar, and 19.23% imports to help the country meet its electricity requirements. Hydroelectric, geothermal, biomass, solar and wind energy opportunities are expected to present in the next few decades as well. (Shield, 2018)

Biomass: There are five biomass plants in El Salvador which generate 500 MWh+ of electricity.

Solar: The central part of El Salvador receives high level of solar radiation. So photovoltaic systems are used to benefit from the country's vast solar resources.

Geothermal: El Salvador produces the largest amount of geothermal energy in Central America. It also has an installed capacity of 204.4 MW within two geothermal installations.

Wind: El Salvador has locations where wind is higher than 400 W/m² to 50 meters above the ground

level and they are potential sites for wind farms. The development of the first 54 MW wind farm in El Salvador was a result of the fiscal incentives and agreements.

Hydroelectric: El Salvador has a total of 20 power plants with an installed capacity of 552.6 MW and 2,258 MW of Hydroelectric energy is obtainable only during the rainy season (May- October). (Administration, 2020)

V. FACTS ABOUT CRYPTOCURRENCY MINING

- Mining Time Varies Depending on The Cryptocurrency. On an average, one bitcoin mining requires ten minutes. And the duration is much lesser compared to ethereal which can be mined within seconds using mining rigs
- Mining bitcoin was the most profitable during the end of 2021, and it became least profitable during March 2021. For mining cryptocurrencies, the mining rig or computer is trying to solve complicated mathematical puzzles to verify transactions on the blockchain. After verifying the transaction, the miner receives a reward in the form of the same cryptocurrency which he has mined. The profit that the miner will make will also depend on other factors like whether the hardware is efficient or not, electricity costs. If electricity costs are low, profits are high and when electricity costs are high mining is not profitable. (Best, 2021)
- The amount of electricity consumed for bitcoin mining reached an all time high in October 2021, and is expected to increase in the future looking at the increasing demand for cryptocurrencies. Bitcoin mining produces over 35 megatons of carbon dioxide (CO₂) annually. CO₂ is a greenhouse gas so it is estimated that in three decades Bitcoin could alone increase global temperatures 2 degrees Celsius.

An example: around 65% of all cryptocurrency mining takes place in China. China obtains most of its electricity from non-renewable sources of energy, especially coal. However, burning coal is a significant contributor to climate change as a result of the carbon dioxide that is released during the process. (Reiff, 2021)

Environmental degradation has negative impacts on the economy. A country has to borne huge cost due to environmental degradation in terms of restoration of green cover, cleaning up of landfills and protection of endangered species. The economic impact can be due to loss of the tourism industry which plays a very important role in boosting a nation's economy, as it brings positive economic outcomes; in GDP and also creates employment opportunities.

After passing the new law to make the cryptocurrency Bitcoin as a legal tender within the country, El Salvador has confirmed that it would mine bitcoin using geothermal energy of its volcanoes. The President of El Salvador- Nayib Bukele has also confirmed that “The country is already designing a mining hub that will use very cheap, 100% clean, 100% renewable energy from volcanoes to power the operation (Vahia, 2021).

El Salvador is a service based economy. services contribute to about three-fifth of the GDP. “In 2019, the tourism industry contributed to 11.4% of its GDP.” Over the years, tourism continues to be one of the largest contributors to the economy. Therefore, El Salvador’s government has also ensured that by using volcanic energy to mine bitcoin, there is minimum environmental degradation, which in turn does not affects its economy; e.g. it will not affect the industries in the service sector like the tourism industry and the economy will keep flourishing.

VI. DISCUSSION

Cryptocurrency acts as a currency as well as a virtual accounting system. Cryptocurrency wallets are used to store encryption keys which confirm the coin holder’s identity and link to the crypto currency. Since 7th September 2021, bitcoin is being accepted as a legal tender and just within a few months, more Salvadorans have bitcoin wallets than traditional bank accounts. Three million people have downloaded the Chivo bitcoin wallet, which amounts to 46% of El Salvador’s population, whereas only 29% of Salvadorans have traditional bank accounts, this shows how quickly people have adopted and moved to digital currency. (Roy, 2021)

Over the past decade, the major environmental concerns have been global warming and overall climate change. Global warming is likely to be the greatest cause of species’ extinction in this century. Even if the temperature rises by 2 degree Celsius, most ecosystems will struggle—sea level will rise and there will be an increased risk of fire in several habitats so few hundred tigers may be left after a few decades. Also, coral reefs will decline by further 70 to 90% at 1.5 degree Celsius, and will be lost at 2 degrees Celsius and it will be a concerning situation as half a billion people are dependent on fish from coral reefs for their food.

The amount of electricity consumed for bitcoin mining reached an all-time high in October 2021, and is expected to increase in the future looking at the increasing demand for cryptocurrencies. Considering these factors—and to prevent environment degradation, the government is harnessing geothermal energy for bitcoin mining; as El Salvador produces the largest amount of geothermal energy in Central America. It also has an installed capacity of 204.4 MW within two geothermal installations.

If non-renewable sources of energy are used for mining, then Bitcoin mining will produce over 35 megatons of carbon dioxide (CO₂) annually. CO₂ is a greenhouse gas so it is estimated that in three decades Bitcoin could alone increase global temperatures 2 degrees Celsius. By using geothermal energy—El Salvador can ensure that there are minimum impacts on the environment. Also, geothermal energy is renewable, the plants have long life span, no fuels are required-so it is safe, reliable and there are minimum emissions.

VII. CONCLUSION

Impact of bitcoin adoption and mining on its economy: President Nayib Bukele hopes that bitcoin adoption will solve the country’s most prominent economic problem: citizens who send money home from abroad account for 20% of the country’s GDP , but they have to pay high transaction costs, and 70 per cent of people have no bank account. Bitcoin enables quick, cheap payments across borders, and doesn’t require banks. So, bitcoin adoption will help their economy as GDP will increase. (Sparkes, 2021).

Other benefits: Financial inclusion will take place, people will get jobs and will be included in this formal economy and financial system, as today close to 70% of the population is unemployed and depends on informal economy. And since the bitcoin has gained so much popularity, El Salvador expects the investments made in the country to increase.

Present situation: The amount of electricity consumed for bitcoin mining reached an all-time high in October 2021, as mining has become profitable so more number of people are mining bitcoin. Bitcoin mining produces over 35 megatons of carbon dioxide (CO₂) annually. This will rapidly increase the greenhouse effect.

Possible impacts if they don’t use clean energy: there will be major environmental concerns like global warming. Sea levels will increase, there will be an increased risk of fire in several habitats. Even coral reefs (source of food to half a billion people) will start declining.

Geothermal energy: El Salvador produces the largest amount of geothermal energy in Central America and has an installed capacity of 204.4 MW within two geothermal installations. Also, geothermal energy is renewable, the plants have long life span, no fuels are required-so it is safe, reliable and there are minimum emissions. So, El Salvador is ensuring that Bitcoin adoption does not have adverse effects on the environment and economy as El Salvador is highly dependent on its tourism which contributes close to 11% of its GDP. If there is environmental degradation, it will negatively impact their tourism and economy. Therefore, they are using 100% clean energy sources.

REFERENCES

- [1] Administration, I. T. (2020). *El salvador country commercial guide*.
- [2] Best, R. d. (2021). *Mining profitability of Bitcoin per day from July 2015 to November 2021*. Statista.
- [3] Cho, R. (2021). *Bitcoin's impacts on climate and the environment*. columbia: Cloumbia Climate School.
- [4] *Climate change explained*. (2019, July). Available at: gov.uk: www.gov.uk.
- [5] Commission, F. T. (2021). *What to know about cryptocurrency and scams*. Washington DC.
- [6] Criddle, C. (2021, Feb). *Bitcoin consumes 'more electricity than Argentina'*. Available at: <https://www.bbc.com/news/technology-56012952>.
- [7] IUCN. (2021, Nov). *Marine plastic pollution*. Available at: <https://www.iucn.org/resources/issues-briefs/marine-plastic-pollution>.
- [8] Kothari, S. (2021). *How does bitcoin mining impact the environment?*. Mint.
- [9] Reiff, N. (2021). *What's the environmental impact of cryptocurrency?*. Investopedia.
- [10] Roy, A. (2021). *In El salvador, More people have bitcoin wallets than traditional bank accounts*. Forbes.
- [11] Shield, P. (2018). *El salvador-energy*. Available at: <https://www.privacyshield.gov/article?id=El-Salvador-Energy>.
- [12] Shinn, L. (2018, June). *Renewable energy: The clean facts*. Available at: <https://www.nrdc.org/stories/renewable-energy-clean-facts>.
- [13] Sparkes, M. (2021). *Why has El Salvador officially adopted bitcoin as its currency?* NewScientist.
- [14] *The basics about cryptocurrency*. (2021). Available at: <https://ww1.oswego.edu/about/contact-oswego>.
- [15] Vahia, S. (2021). *Here's how El Salvador's Bitcoin experiment is playing out so far — the good, the bad and the ugly*. Business Insider.