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A Modern View of Marx's Ecological Philosophy

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Karl Marx's analysis of capitalism encompasses significant ecological perspectives that foreshadow contemporary environmentalism. While without expressly focusing on ecology, Marx acknowledged that capitalism disturbs the metabolic connection between humans and nature, leading to environmental problems. This article explores Marx's ecological theory and its current significance. The text commences by presenting Marx's dialectical perspective on the interaction between humans and nature. The essay primarily focuses on Marx's ecological criticisms of capitalism, which encompass the commodification of nature, ecological imperialism, metabolic rift, ecological unequal trade, and the ecological conundrum of capitalism. The text explores Marx's proposed solutions for achieving sustainable human growth, which involve transforming systems of production and establishing common ownership. The paper asserts that by incorporating current scientific knowledge, Marx's ecological ideas offer a robust foundation for comprehending and addressing the present environmental predicament. Marx's theory, while not flawless, aims to create a fair and environmentally-friendly society.

INTRODUCTION

The escalating environmental catastrophe worldwide has sparked a renewed interest among researchers and activists in the ecological aspect of Karl Marx's ideology. Although Marx did not explicitly discuss current environmental concerns such as climate change and mass extinction, his analysis of capitalism offers significant ecological perspectives, positioning him as a significant intellectual forerunner to contemporary environmentalism (Foster, 2000). Marx emphasised that environmental disruption arises from the basic difficulties of the capitalist mode of production by placing the human-nature relationship within a dialectical social framework.

Marx envisioned a close connection between people and environment, where they are constantly engaged in the interchange of matter, energy, and social interactions. Simultaneously, he acknowledged the uniqueness of human civilization and the natural world. Marx's dialectical viewpoint reconciles the inclination to merge mankind with nature with the belief that society is distinct from nature (Foster, 2000). Marx's nuanced ecological critique of capitalism is founded on this dialectical insight.

Marx argues that capitalism's pursuit of profit through the exploitation of workers and the private ownership of resources leads to various contradictions, one of which is the disruption of the essential relationship between humans and nature, as described by Foster (1999). Pre-capitalist agricultural cultures predominantly relied on recycling nutrients within local ecosystems, but industrial capitalism production is heavily reliant on the linear extraction and consumption of natural resources from more distant locations.

Capitalism aggressively prioritises financial gains and expansion, while disregarding the environmental consequences and disturbing the intricate balance between human civilization and nature. Consequently, there is a significant occurrence of widespread contamination, soil exhaustion, deforestation, and overall ecological deterioration. Marx summarised this paradox in his notable concept of "metabolic rift" (Foster, 1999).

Marx additionally criticised the inclination of capitalism to devalue nature by assigning it a monetary worth and making it private property. Capitalism commodifies nature by attributing an exchange-worth to natural resources such as land, trees, and minerals. This approach prioritises profit over acknowledging the inherent importance of nature in maintaining both human and non-human existence (Burkett, 2006). This establishes the intellectual basis for the relentless exploitation of the environment, which has led the globe to the verge of a climate crisis and widespread extinction in the present day.

In addition, Marx emphasised the way capitalism addresses its recurring limitations in resources and energy by engaging in aggressive primitive accumulation and ecological imperialism. This involves forcefully seizing land, raw materials, and labor-power from indigenous populations and periphery nations (Henderson, 2000). The global North continues to accumulate unsustainable capital through the widening of the metabolic rift worldwide, mostly facilitated by colonialism and neo-colonialism.

Marx also acknowledged that the environmental expenses of capitalist production are unevenly allocated, with the advantages being accumulated by dominating states. Ecological unequal exchange occurs when poorer, peripheral nations face a disproportionate amount of pollution and resource extraction impacts from global commodity production, while gaining minimal ecological advantages (Foster & Holleman, 2014). The same rationale of exploitation is applicable within capitalist nations, Marx offered a comprehensive theory of environmental injustice based on social classes much before it became popular among contemporary environmentalists.

Although Marx did not personally witness the current global environmental crisis, his insightful analysis of the inherent conflicts between capitalism and nature remains very pertinent and increasingly significant. Marx emphasised the underlying tension between capitalism's pursuit of profits and growth and the long-term ecological viability. His theories on metabolic rift, ecological imperialism, and ecological unequal trade are derived from his insightful examination of capitalism as an environmentally unsustainable system.

Marx advocated for the alteration of the social relationships involved in production as the sole method to truly address the division between human activity and the environment. This entails the substitution of capitalist class relationships with communal ownership of productive resources, collective democratic planning that prioritises human needs over profits, and the cultivation of human potential through creative and meaningful work that promotes the well-being of both humanity and nature (Burkett, 1999). Marx criticised the environmentally harmful aspects of capitalism and imagined a future society that is fair and sustainable, where social and environmental aspects are in harmony.

Marx's ecological observations do not offer immediate remedies to the current specific environmental challenges. His dialectical analysis necessitates revision to incorporate contemporary scientific knowledge, while his conception of sustainable human growth remains unfinished. However, Marx's framework is still crucial for comprehending the causes of ecological crisis within the capitalist system. It forms the foundation of the modern ecosocialist movement, connecting environmental sustainability with social justice, criticising capitalist technology and progress, and emphasising the worldwide significance of ecological contradictions within capitalist political economy today (Angus, 2016; Foster, 2012; Burkett, 2006; Löwy, 2018).

This essay elucidates Marx's fundamental ecological criticism of capitalism and explores its current relevance in comprehending and resolving the current worldwide environmental crisis. The following section provides a more in-depth exploration of the fundamental principles and political economic connections that form the basis of Marx's ecological philosophy.

2. THE MAIN IDEAS OF MARX'S ECOLOGICAL PHILOSOPHY

2.1 Marx's perspective on the interrelation between humans and nature

Marx's ecological philosophy centres around a dialectical understanding of the connection between humans and the natural world. Marx opposed the idea of rigidly separating or equating society and nature, instead emphasising their dynamic interconnection. Human beings coexist within the natural environment and rely on the essential resources of the planet for their life. However, humans also intentionally modify the natural environment through organised manufacturing processes to fulfil their requirements (Burkett, 2014). Marx's dialectical comprehension encompasses the concepts of unity and difference, reciprocal influence, and relative autonomy in the relationship between humanity and nature.

Unlike naturalist viewpoints that merge humanity with the surrounding environment, Marx acknowledged human society as fundamentally different from the natural world. This distinction arises from our ability to engage in conscious and innovative production, as well as our social interactions that are facilitated by language, values, and technology (Burkett, 2014). Humans exert deliberate influence over both our historical trajectory and our surroundings, with the potential for positive or negative outcomes. Simultaneously, Marx dismissed the idea of human exemptionalism, which depicts mankind as apart from and superior to the rest of nature. As humans, we are inherently natural creatures who rely on intact ecosystems for essential resources such as food, water, and climate regulation, as well as other vital processes that support life. Humanity can be understood as a dialectical synthesis between changing social connections and conditions, and changing environmental conditions and restrictions (Foster, 2000).

Marx argues that modes of production, which encompass the technological, property, and social relations that govern material production in civilizations, have a profound influence on the interaction between human societies and the natural world. Various kinds of production include unique methods of engaging with the natural environment. For instance, in ancient times, agriculture that relied on slaves involved extensive irrigation projects and broad clearing of forests. On the other hand, agricultural practices of feudal peasants were more varied and localised, tailored to specific regional environments and nutrient cycles. The implementation of capitalist industrial agriculture has significantly altered natural processes worldwide through the utilisation of mechanisation, monocultures, genetically modified species, and pesticide inputs (Foster, 1999). The alteration of production methods has a profound impact on both the way people interact with each other and the way humankind interacts with the environment.

Marx acknowledged that, particularly in the context of capitalism, social systems and productive forces have the potential to evolve in a manner that contradicts and undermines the necessary natural conditions for their long-term survival. Marx, unlike previous opponents, viewed the conflict between society and environment not as a general issue, but as something that is special to capitalism. He believed that this conflict arises from capitalism's reliance on competitive and profit-oriented exploitation of wage labour and privately owned means of production (Foster, 2012). The paradox arises from the social ties inherent in capitalism, rather than from mankind or society per se. Marx argues that it is essential and possible to change these social relationships by having cooperative and democratic control over production. This will allow us to meet human needs and potentials while also preserving the environment. According to Burkett (1999), this is the only way to address the imbalance between humanity and nature caused by capitalism.

Marx's dialectical comprehension of underlying social conflicts that propel maladaptive growth offers a more dynamic framework for examining environmental catastrophes compared to mainstream viewpoints that concentrate on population, technology, or human nature. His focus on the influence of social structures that change over time on humanity's connection to nature is in opposition to the Malthusian-style predictions that assume unending exponential growth in human needs that would eventually clash with environmental constraints (Foster, Burkett & Clark, 2011). Simultaneously, dialectical naturalism circumvents ecological determinism by emphasising the potential for sustainable and equitable development through the transformation of production methods.

Marx's dialectical approach sought to combine the aspects of unity and difference, continuity and discontinuity, dependency and autonomy between mankind and nature, while also overcoming narrow and non-dialectical viewpoints (Burkett, 2014). Marx's perspective focuses on how capitalism's drive for profit, accumulation, private property, and alienation of labour disrupts the relationship between human society and nature. This concept is based on dialectical thinking and goes beyond simple explanations based on technology, population, or arrogance. The unsustainable production for profit is driven by exploitative class and imperial relations, rather than being based on genuine human needs. Marx emphasised the connection between capitalism and the negative impact on nature's balance. He suggested that society can be transformed in a sustainable way by reorganising production to meet genuine human needs, promoting collective democratic control, and maintaining a balanced relationship between human society and nature's renewal cycles.

2.2 Analysis of capitalism's transformation of nature into commodities

Marx's ecological critique centres on capitalism's inclination to transform natural resources into commodities, hence reducing complex ecosystems to monetary worth and marketable goods. Capitalism justifies the unlimited exploitation of natural resources for profit by evaluating them based on their economic value rather than their practical use (Foster, 2000). Marx examined the way in which capitalism's transformation of nature into commodities significantly disrupts the interaction between human civilization and the environment.

Marx argues that capitalism incorporates both human labour power and the natural environment in order to prioritise the growth of wealth (Burkett, 2006). Workers receive a salary in exchange for producing goods that generate more value, which is then claimed by capitalists as profit. The system also includes raw resources and land as commodified means of production. Capitalism, through the assignment of monetary values to natural resources such as forests, minerals, and bodies of water, views nature primarily as a commodity for trade and private possession, disregarding its inherent value in supporting both human and nonhuman populations.

The act of turning nature into a commodity goes against the principles of ecological sustainability. Feudal peasants and indigenous societies developed methods of production that were suited to their specific regions and recycled nutrients within the limits of their local ecosystems. In contrast, capitalism aims to extract resources without limits and maximise profits by assigning monetary values to natural substances (Foster, Clark & York, 2010). The process of commodification conceals the inherent value of woods in terms of climate management, wetlands in terms of water filtering, and soil in terms of food cultivation. Capitalist enterprises are motivated to continuously acquire, transform, and market natural resources without considering their ecological consequences.

Marx emphasised the presence of a capitalist belief system that views nature as a product to benefit business pursuits, which was already apparent in European agricultural practices throughout the 17th century. These practices included extensive deforestation and the cultivation of single crops for the sake of generating profit (Foster & Clark, 2020). In Adam Smith's envisioned capitalist economy, landowners diligently pursue the highest possible rent for their estates, without regard for preserving soil fertility. Within this system, animals are reduced to mere commodities, valued solely for the purpose of trading. The inherent rationale of capitalism obscures the ecological considerations for producers, as it reduces land, organisms, and resources to monetary values and tools for extracting profits.

The process of commodification not only facilitates the deterioration of the environment, but also exacerbates disparities in social class. The communal land management practices of indigenous peoples are replaced by the concentrated private ownership of natural resources. Peasants are deprived of their subsistence farming due to the pursuit of commercial gain by wealthy landlords and industrial capitalists (Henderson, 2000). The process of commodifying nature facilitates the direct exploitation of labour by consolidating control over productive resources. Society can only manage production in harmony with

natural cycles and prioritise ecosystem health over commercial gain by implementing democratic control to renaturalize property relations.

Marx's argument elucidates the reasons why market processes are insufficient in addressing environmental degradation under a capitalist system. Implementing a pricing mechanism for pollution or limited resources is insufficient to address the inherent flaws in the logic of commodification. Neoliberal economists propose the extension of capitalist principles of valuation and efficiency to manage resources. However, this approach overlooks the underlying social relationships that contribute to unsustainable production in the first instance (Foster, 2012). The effectiveness of compensating landowners for rainforest conservation diminishes as the profitability of selling timber or engaging in cow grazing surpasses it. Capitalist enterprises are inherently driven to exploit nature in order to maximise profits, without considering the social and ecological consequences. Mere superficial adjustments cannot harmonise capitalism with the boundaries imposed by the environment.

Marx advocated for surpassing capitalism's transformation of nature into commodities by establishing collective democratic authority over the methods of production and deliberate social planning focused on substantial human progress and the preservation of natural cycles. This entails implementing a systematic approach to manage production in order to meet the requirements of the community, preserve ecosystems, and distribute natural resources and responsibilities fairly. To address the issues of alienation and inequality caused by private property, it is necessary to establish communal ownership. Marx, long before the emergence of modern ecosocialists, foresaw the need to transcend capitalism's environmentally harmful system of trading goods by advocating for a democratic restructuring of labour and distribution based on the practical usefulness of products rather than their market worth (Löwy, 2020). Despite the scarcity of untouched natural areas in the present time, it is crucial to prioritise the preservation of mankind by fostering an appreciation for the intrinsic worth of nature that goes beyond financial profit.

Marx's criticism of capitalism's transformation of nature into commodities and his advocacy for establishing a society based on fair and non-exploitative interactions between human societies and the environment continue to be highly pertinent in the era of climate change and widespread extinction of species. Polanyi (1944) demonstrated the emergence of present-day "fictitious commodities" such as environmental contamination, through the unthinking expansion of market dynamics into the ecological resources necessary for human well-being. Accounting for the depletion of natural resources in a systematic manner does not address the social irrationality of making sacrifices driven by the capitalist goal of maximising profit (Burkett, 2006). Marx emphasises the importance of taking back control and authority over nature from wealthy capitalists in order to effectively and responsibly manage production to meet societal demands while maintaining a harmonious relationship with ecosystems. Both mankind and environment necessitate transcending the commercialization of capitalism.

2.3 Metabolic rift refers to a disruption or imbalance in the metabolic processes of a system

Marx's fundamental ecological criticism of capitalism is summarised in his notion of "metabolic rift" - the disturbance of the inherent metabolic exchange between human society and the environment resulting from contemporary extensive industrial production and agriculture (Foster, 1999). Marx contended that capitalism's pursuit of competitive accumulation, desire for profit maximisation, and the alienation of labour significantly disrupt crucial ecological processes, while previous models of production also had an impact on nature. The metabolic rift creates ecological catastrophes that capitalism is structurally unable to solve because of its constant desire to grow production and circulation.

Marx emphasised the preservation of soil nutrients within local ecosystems in pre-capitalist agricultural systems, such as traditional peasant farming, through recycling. Food crops grown on a family farm were consumed in the local area, and any waste products were used as manure to replenish the soil, ensuring a balanced nutrient cycle. Agriculture was primarily focused on utilising resources for self-sufficiency rather than on commercial transactions. Although facing technical constraints, traditional agriculture

acknowledged the existence of natural boundaries and the potential for mutually beneficial interactions (Moore, 2015).

The emergence of capitalist agriculture caused a significant disruption to these nutrient cycles, as the focus shifted towards producing food and fibre for distant urban markets and exports, rather than for immediate community consumption. Due to agricultural specialisation, soil nutrients ceased to be replenished and instead followed a linear "robbery system" from rural areas to urban areas (Foster, 1999). Urban centres experienced a significant buildup of garbage, while the countryside lost its nutrients. To restore production, unsustainable amounts of guano fertiliser from Latin America and other imperial peripheries had to be used. Capitalist agriculture, with its large scale, focus on specialisation, and desire for competitive accumulation, has interrupted the natural cycles of nutrient recirculation. This disruption serves as an example of Marx's concept of metabolic rift (Schneider & McMichael, 2010).

The metabolic breach was significantly worsened by industrial capitalist production. The prevailing system of intensive labour exploitation in factories, concentration of industrial activities in urban areas, and worldwide trade exhausts natural resources and accumulates excessive waste, hence contravening ecological thresholds. The dynamics of capitalism prioritise the swift expansion and movement of goods and financial resources, disregarding the natural processes of renewal. Technological advancement under capitalism primarily emphasises enhancing labour efficiency and obtaining more affordable natural resources to reduce manufacturing expenses, rather than prioritising environmental sustainability (Burkett, 2014). The metabolic rift originated alongside capitalism and its relentless pursuit of perpetual accumulation.

Marx's thesis elucidates that environmental crises arise from inherent conflicts within the capitalist method of production, rather than being simply attributed to moral or policy shortcomings. Bourgeois ideological approaches prioritise governance reforms, technological solutions, and appeals to producer responsibility as means of addressing ecological issues. Marx demonstrates that the competitive character of capitalism forces companies to shift the burden of environmental expenses onto others, regardless of ethical appeals or accusations of "violating nature" (Foster, Clark & York, 2010). The metabolic rift arises from the capitalist drive for expansion, maximising profits, and accumulating capital, rather than only due to relaxed restrictions or mismatched prices and incentives. A fundamental reconfiguration of social relationships is necessary.

The metabolic rift exacerbates inequality in conjunction with the ecological crises. Capitalism addresses the issue of decreasing soil fertility on farms by taking use of wage labour. Likewise, the adverse effects of industrial pollution and resource depletion primarily impact disadvantaged communities that lack influence and financial flexibility. The concepts of ecological unequal exchange and environmental load displacement in Marxism highlight the correlation between environmental degradation and the exploitation of marginalised social groups inside both developed and developing nations by capitalist centres (Jorgenson, 2016). To address the metabolic rift, it is necessary to foster international cooperation and promote awareness of environmental justice.

Marx foresaw that capitalism's social structure will clash with natural processes on a worldwide level, as imperialism forcefully extends the metabolic gap to periphery nations (Foster & Holleman, 2014). The ecologically imbalanced interchange of resources, energy, and waste fluxes is indicative of hierarchical relationships. Currently, the build-up of greenhouse gases that are causing climate change is the most significant manifestation of the separation between capital and the environment. Regrettably, negative emissions technologies adhere to the same principle of depending on peripheral ecological sacrifice zones instead of pursuing systemic transformation (Asiyanbi, 2022).

Marx contended that reconciling the division between mankind and the environment necessitates altering the method of manufacturing in order to deliberately control the interaction between society and ecological. This entails substituting capitalist class relations with communal ownership and democratic planned production focused on fulfilling substantive human needs rather than engaging in competitive accumulation

of wealth. Ecologically balanced and just conditions can only be achieved beyond the realm of capitalism (Burkett, 1999). The notion of metabolic rift encompasses how Marx's profound criticism offered the fundamental structure for comprehending capitalism's disturbance of nature as a fundamental aspect of social turmoil - a vital viewpoint that is gaining renewed strength in our era of climate change, widespread extinction, and worldwide ecological deterioration.

2.4 Ecological expansionism

Marx extensively focused on processes of primitive accumulation and colonialist expansion in his critique of capitalism. He saw these processes as crucial for overcoming limitations on natural resources and gaining access to new sources of labour, markets, and productive areas. He emphasised the crucial historical requirement of forcefully destabilising non-capitalist societies as a means of accumulating wealth, which occurs periodically through various methods of enclosure and imperial conquest. Marx explained the importance of ecological imperialism and ongoing primitive accumulation in creating capitalism's worldwide metabolic gap.

Marx elucidated the process by which the emergence of industrial capitalism in England resulted in the extensive deprivation of peasants from communal lands through enclosures, as well as the complete appropriation of shared resources such as woods and waterways. Consequently, rural residents were forced to assume the role of wage workers for the emerging capitalist elite. However, even this process of internal colonisation of previously non-commercialized domains was not enough. In *The Communist Manifesto*, Marx and Engels noted that the bourgeoisie is driven to seek new markets for its products on a global scale. "It must permeate all areas, take root in all areas, and form alliances in all areas" (Marx and Engels, 1848/1967, p. 9). The relentless pursuit of growth driven by capitalism principles perpetuates the global metabolic rift.

Expanding upon Marx's observations, subsequent theorists such as Rosa Luxemburg contended that capitalism inherently depends on non-capitalist domains of nature and labour as enduring external economies to exploit (Luxemburg, 1913/2003). According to Jason Moore (2015), this refers to capitalism's persistent acquisition of unpaid labour from humans and the environment. Through the forceful acquisition of alternative energy sources, forests, minerals, and arable lands from external sources, capital manages to momentarily surpass its inherent constraints, only to encounter new obstacles that must once again be surmounted. The non-capitalist periphery plays a crucial role in providing capitalism with essential use values that it is unable to generate on its own.

Marx emphasised that colonialism served as a violent means to overcome the ecological conflicts inherent in European capitalism. Imperial powers implemented coercive measures to reorganise the economies of colonised territories with the aim of meeting the needs of the capitalist world market. This involved the extraction of various resources such as cotton, sugar, tobacco, spices, tea, opium, palm oil, diamonds, coal, minerals, and other commodities (Patnaik & Patnaik, 2016). Colonies were also utilised as repositories for industrial waste and provided obstacles to sustainable growth, such as the imposition of monocultures. Colonial plantations demonstrated the lack of ecological sustainability in producing cash crops for faraway markets. Marx (1853/1979) observed that the soil nutrients become depleted after a few years of sugarcane cultivation and were then exported to Europe in the form of sugar (p. 328). The social fragmentation and environmental deterioration of colonised communities had no bearing on imperial financial gains.

Marx's theory of ecological imperialism acknowledges that colonial expansion is not accidental, but rather a deliberate strategy to create new chances for capitalist profit generation in response to internal conflicts such as diminishing land productivity. The persistent presence of peripheral non-capitalist areas, where unpaid labour can be extracted, becomes crucial as capitalism inevitably destroys the metabolic relationships in established centres of economic accumulation. Therefore, in the late 19th century, the competition among European powers for colonies reached its most intense and brutal point, known as the "Scramble for Africa," where the continent was divided up for imperial exploitation. Lenin later proposed

that the growing dependence of monopoly capitalism on unfair trade with colonised countries was a result of the restricted buying power and resources in industrialised economies (Lenin, 1917/1975).

Ecologically imbalanced trade continues to exist as a result of neocolonialism, even after the formal process of decolonization. Currently, the less developed regions of the world still experience the most significant environmental consequences of extracting resources and disposing of trash, which is done to meet the demands of affluent countries (Jorgenson, 2016). The finite fossil fuel energy that fuels the global capitalist system is maintained through military control over places that produce oil. The ecological aspects of the inequalities between the North and the South are closely connected to the geopolitical dynamics of imperialism.

Marx's criticism of ecological imperialism remains pertinent in a time when capitalism exploits ever distant boundaries of untouched nature to resolve its inherent conflicts. The practices of deep seabed mining, hydrofracking, tar sands exploitation, and the proposal to inject aerosols into the stratosphere to mitigate climate change all exemplify the ecological boundaries that capitalism consistently endeavours to surpass. Currently considering the implementation of geoengineering on a global scale, techno-capitalism is expanding its efforts to control nature to encompass the entire world. However, the metabolic rift cannot be permanently resolved through imperial expansion. Marx argued that the conflicts inherent in capitalism can only be resolved by implementing a system of communal democratic governance over production, with the aim of fostering human capabilities and preserving ecological balance. The notion of ecological imperialism serves as a reminder that addressing environmental issues necessitates solutions that encompass social systems. Carbon markets and environmental certification programmes, albeit partial changes, do not address the fundamental requirement of capitalism accumulation to have unexplained ecological sacrifice zones. It is crucial to adopt a global justice perspective in order to address and repair the metabolic rift.

2.5 Ecological disparity in trade

Marx's view of the environment under capitalism acknowledges the imbalanced distribution of environmental burdens and advantages, occurring both within and within countries due to the uneven structure of capitalist development. Similar to how workers are systematically subjected to exploitation through the extraction of surplus value from their labour, the countries in the global South experience ecological exploitation as they disproportionately incur the environmental costs of production while reaping few benefits.

Marx emphasised that the process of accumulating capital leads to inequality by creating unequal access to resources and the tools needed for production. Capital owners accumulate wealth by exploiting the surplus value generated by wage labour. Capital further consolidates its power by displacing and impoverishing small-scale producers, labourers, and farmers. The same pattern may be observed in the interchange between colonial powers and periphery economies throughout the colonial era, as well as in the later period of neocolonial globalisation. Marxist dependence theory posits that developing nations are inherently limited to extracting raw materials and engaging in low-wage production to serve the economies of capitalist core nations. Consequently, the profits generated from these activities primarily benefit transnational firms based in the Northern countries (Frank, 1967; Wallerstein, 1974).

This asymmetrical relationship also applies to ecological interchange (Hornborg, 2009). The countries in the global South provide raw resources, energy, and food, while also dealing with the disposal of trash generated by industry and consumption, which contributes to the accumulation of capital in the Northern countries. However, the advantages of this ecosystem contribution are primarily enjoyed by affluent nations, while the South faces the burden of resource depletion and pollution. The concept of nominal national ownership of resources only serves to conceal the unequal control exerted by transnational capital, as stated by Prebisch in 1950.

As an illustration, the Niger Delta region in Nigeria has experienced significant deforestation, contamination of water and air, and deterioration of soil quality due to the production of oil, which has primarily benefited Shell and other international corporations. However, the destitute indigenous community resides amidst persistent occurrences of oil spills and gas flaring. The parallel trends observed in mining activities in Africa and Latin America illustrate how multinational corporations generate substantial profits by shifting the burden of environmental damage onto impoverished areas. The Global North achieves ecologically uneven trade by exploiting its economic and political dominance over less powerful states and populations (Jorgenson, 2016).

Ecologically unequal exchange occurs inside nations as a result of environmental racism and disparities in class, leading to differential exposure to pollutants, poisons, and ecological risks. Marxian sociologists emphasise the fact that marginalised groups, such as working class individuals belonging to racial minorities, are more likely to reside in close proximity to hazardous waste dumps, incinerators, chemical plants, and other sources of danger (Bullard, 1990). The occurrence of labour exploitation is contingent upon asymmetrical property relations, while ecological exploitation arises from social inequalities that facilitate the concentration of power and the displacement of environmental harm.

The ecological aspect of unequal exchange arises directly from the fundamental principles of capital accumulation and the ensuing social imbalances, both among and within nations. Marx contended that achieving ecological sustainability necessitates surpassing capitalism's competitive framework, which creates conflicts between global regions and social classes over resources, employment, and influence. Additionally, this framework allows concentrated corporate power to exert dominance over the interconnections between humanity and nature.

Marx envisioned association as a replacement for global competition. Implementing communal ownership of the means of production would enable the coordination of extraction, production, distribution, and waste disposal through democratic planning that prioritises substantial human growth rather than the accumulation of capital. The prioritisation of the needs of the global commons may supersede the pursuit of profits. Eliminating the dominance of powerful corporations and top-down political control over resources would promote equitable and non-imperial relationships amongst human communities, leading to sustainable practices within ecological boundaries (Burkett, 2006).

Marx's thesis of ecological unequal exchange is currently being tragically confirmed by the severe environmental consequences and social exclusion experienced by indigenous peoples, inhabitants of developing countries, and underprivileged minorities in affluent nations. The conditions have become increasingly threatening due to climate change, disproportionately affecting people who bear the least responsibility for past emissions. However, there is a rise in environmental justice movements that are fostering solidarity against ecological imperialism in both the global South and North (Martinez-Alier et al., 2014). The fight for climate justice and ecologically fair trade, which goes beyond the uneven social relations of capitalism, persists in various locations such as Standing Rock, Afro-Colombian forest communities, and South Asian peasant resistance against land seizures.

2.6 The ecological contradiction of capitalism

Marx's ecological criticism of capitalism results in the clear deduction that this system is fundamentally incapable of resolving its conflicts with nature in the long run. The inherent need for ceaseless accumulation and commercialization that propels capitalism unavoidably clashes with the principles of ecological sustainability. This systemic ecological dilemma cannot be resolved through technological advancements or changes in price.

Marx noted that capitalism has a tendency to relentlessly seek unlimited growth, without considering natural constraints. However, it still relies on nature for resources, energy, waste disposal, and other essential tasks for sustaining life (Foster, 2012). This highlights the fundamental conflict between the natural world and the social structures of capitalism. Accumulation relies on extracting resources from

nature while also interrupting natural processes. However, capitalism has any inherent structural mechanisms to effectively address and prevent this unsustainable metabolic rift.

Competition motivates companies to use their earnings to invest in expanding production and take advantage of technologies that lower labour costs but increase the amount of materials used, energy consumed, and trash produced. Emerging technologies such as hydraulic fracturing expedite the exploitation of fossil fuels while disregarding ecological considerations. State rules have difficulties in limiting overall environmental effects due to corporate influence (Foster, 2002). The intricacies of ecosystems cannot be fully captured by prices and pollution levies. The mechanics of capitalism inexorably undermine reforms that endanger the process of accumulating wealth. The system enforces ongoing ecological exploitation.

According to James O'Connor, an ecological Marxist, capitalism tries to address its economic problems such as excessive production and accumulation by spreading into the natural environment. However, this action just shifts such crises onto the ecological system, while simultaneously creating new environmental disturbances that ultimately hinder the accumulation of capital. This phenomenon is known as the "second contradiction of capitalism," which highlights the conflict between the economy and nature (O'Connor, 1988). However, the system is compelled to persistently transfer crises between civilization and ecology.

The concept that capitalism can achieve a balance between long-term prosperity and environmental sustainability through enlightened self-interest is fundamentally incorrect from an ideological standpoint. Companies may only safeguard ecosystems if they are able to make a profit, but the overall interconnected relationships within the economy are neither organised or sustainable (Foster, 2012). The concept of a "green capitalist" paradise, characterised by complete resource efficiency and zero-waste manufacturing, is an unattainable ideal within a system of competitive accumulation (Smith, 2010).

Even extreme situations such as implementing a worldwide carbon tax or reducing economic activity by focusing on knowledge, information, and service industries are unable to avoid the demands of capitalism. Taxes impose limitations on certain industries while enabling others to take use of incentives for environmentally friendly innovation in order to increase their market share, perpetuating cycles of innovative disruption and increased production. Dematerialization effectively shifts resource requirements and waste generation to concealed ecological boundaries via global asymmetrical trade. Financialization exacerbates economic volatility, further solidifying the unsustainable cycle of production and ecological sacrifice zones (Malm, 2018).

The ecological paradox of capitalism also undermines cosmetic corporate sustainability programmes such as carbon offsets, organic certification, and "green" marketing. These factors are unable to significantly alter the profit-driven incentives that push companies to shift environmental costs onto others. These programmes, at most, impede the metabolic fissure of capitalism. Genuine advancement necessitates replacing capitalist social relations, rather than relying on appeals to conscience within companies (Foster, 2012).

Marx described the inherent contradiction of capitalism, which depends on nature for resources but also disrupts natural processes, as an irresolvable and dialectical conflict. It is crucial to change the very way in which goods are produced. This would entail the collective regulation of society's metabolic interaction with nature through democratic planning, ensuring the fulfilment of human developmental needs while preserving ecological integrity and ensuring a fair distribution of benefits and responsibilities. To solve the metabolic rift, it is necessary to go beyond the competitive logic of capitalism (Burkett, 2006).

Currently, there is a rising recognition that mankind is nearing the natural boundaries of our planet, which cannot be resolved by capitalism. Instead, capitalism will disregard these limits and consequently harm itself through climate change, mass extinction, and overexploitation. Ecosocialist movements, influenced by Marx's ecological analysis, are striving to shift away from capitalism in order to prevent the world economy's delicate stability from being overwhelmed by simultaneous environmental and social

catastrophes (Löwy, 2020; Angus, 2016). To prevent a disaster, it is necessary to reorganise the functioning of society by prioritising the practical benefits of goods and services, promoting collaboration, and making decisions based on environmental knowledge. In the coming decades, it is imperative for the majority of the world to regain control over nature, which has been turned into a commodity by capitalist systems. This may be achieved by a fundamental transformation in the system itself. Failure to do so would result in a series of interconnected and widespread collapses. Considering the escalating climate crisis, Marx's analysis of the inherent conflict between capitalism and the environment becomes increasingly pressing. Only by surpassing the commodity form can we repair the metabolic rift.

2.7 Achieving sustainable human development

Marx's criticism of capitalism from an ecological perspective contains the revolutionary elements of a different vision for repairing the separation between humans and nature and achieving sustainable development that fulfils authentic human needs and capabilities while maintaining a harmonious balance in natural processes. Marx advocated for overcoming the environmentally harmful aspects of capitalism by implementing collective democratic governance over productive assets, deliberate organisation of economic operations focused on utility rather than financial gains, and converting alienating labour into self-directed creative work that promotes the well-being of both humans and the environment.

Marx argues that in order to address the ecological crises caused by capitalism, it is crucial to restructure the technological and social aspects of production (Angus, 2016). This entails substituting the competitive accumulation of capital and private ownership of nature and industry with deliberate social regulation of humanity's interaction with the rest of the biosphere. Production would prioritise meeting human developmental needs while maintaining ecological balance, rather than pursuing limitless profit growth by commodifying labour and nature (Burkett, 1999).

At the core of this concept is the expansion of collective ownership of productive assets such as factories, farms, and mineral reserves to encompass society as a whole, rather than being controlled by a small group of elites (Burkett, 2006). By collectively sharing the means of production and natural wealth, we may create opportunities to regulate production in a democratic manner through bottom-up planning that takes into consideration ecological and social sustainability. Workers' and community councils have the potential to combine scientific expertise with local experiential knowledge in order to effectively manage area ecosystems. Efforts can be made to synchronise economic activity across various sectors and regions in order to preserve the environment while also ensuring fair and equal satisfaction of human needs.

By prioritising use value and authentic human development over exchange value and capital accumulation as the deliberate guiding principle of production, societies have the potential to ensure sufficient provision of food, clean energy, transportation, housing, healthcare, and other essential needs, while also preserving harmonious natural cycles (Löwy, 2020). Advanced technologies such as renewable energy and agroecology have the potential to be used for the purpose of eliminating material poverty and hard labour, rather than prioritising the pursuit of profits without considering the social and ecological consequences. The emphasis may transition from individualistic possessiveness to the promotion of group welfare.

Marx argued that it is crucial to change work itself from being controlled labour to becoming a satisfying and creative activity. This transformation is necessary for human liberation and for overcoming the subjective culture of dominance and manipulation of nature that is promoted by capitalism (Burkett, 2014). Enabling the democratisation of workplaces permits individuals to discover significance and respect through diverse, skilled endeavours that tap into potentials that are suppressed by societal class divisions. Engaging in creative activity that fulfils resonates with the idea of serving the public as a whole, rather than focusing just on individualised personal benefits. The cultural foundations enhance ecological principles in opposition to the capitalist ideology that is opposed to nature and society (Magdoff & Williams, 2017).

Although traditional socialist states have their limitations, various experiments in workers' control, participatory planning, and common ownership during the 20th century, ranging from anarchists in the

Spanish Civil War to Polish cooperatives to Venezuelan communes, have showcased potential avenues for democratising production, enhancing human capabilities, and establishing new cultural connections with nature that go beyond the alienation caused by capitalism (Lebowitz, 2015). However, there are significant disparities between Marx's ambitious objectives and the intricate institutional obstacles that must be overcome in order to achieve sustainable post-capitalist communities that prioritise human growth and ecological equilibrium (Saito, 2017).

Green socialist intellectuals are utilising contemporary ecological knowledge to build upon Marx's ideas, incorporating indigenous wisdom and other cultural traditions. They are formulating specific policies and reforms that serve as intermediate measures towards achieving systemic transformation (Löwy, 2020; Angus & Butler, 2011). It is crucial in this critical century to reclaim the communal ethic from the restricted boundaries of capitalism by developing new post-capitalist relationships between humans and nature. The ecosocialist perspectives inspired by Marx emphasise that in order to effectively address the metabolic rift, it is necessary to dismantle capitalism's socially unsustainable focus on accumulation, regain collective control over production, and establish an economy that promotes the well-being of humans while being in harmony with the biosphere.

3. THE CONTEMPORARY VALUE OF MARX'S ECOLOGICAL CRITIQUE

3.1 Ecological systems framework

Marx's ecological criticism makes a significant contribution by offering a comprehensive framework for examining the factors that cause environmental crises within the capitalist social structure. Conventional environmental strategies typically prioritise technology solutions or modifying consumer habits, without addressing the underlying foundations of capitalism. Marx's dialectical, socio-ecological perspective reveals that ecological disturbances originate primarily from capitalism's intrinsic drive for growth, profit-oriented motivations, exploitation of labour, and transformation of nature into commodities. This perspective allows for the connection of environmental challenges to the crisis tendencies inside the capitalist political economy.

Marx emphasised that the ecological problem is a result of inherent conflicts within the capitalist system of production, rather than being only attributed to policy shortcomings or ethical violations of specific corporations. The concepts of metabolic rift, ecological unequal exchange, and the paradox of capital's dependency yet disruption of natural cycles, as proposed by Foster (2012), provide a critical analysis of the underlying structural dynamics that drive corporations to increase production and shift environmental costs onto society, without consideration for sustainability. These systemic imperatives cannot be addressed by technocratic policy reforms or incentive tweaks. To effectively prevent catastrophic climate change, it is necessary to move beyond the economic system of capitalism.

Marx additionally placed natural resource concerns within the context of capitalism's constant need to turn new areas into commodities, overcome obstacles to accumulating wealth, and discover avenues for excess capital and goods. The imperial conquests, agribusiness monocultures, planned obsolescence, and the fossil fuel treadmill that fuels climate change are all manifestations of the inherent contradictions inside capitalism. This perspective on systems establishes a connection between ecological damage and the competitive nature of capital, without attributing blame to technology or population in general.

Conventional environmental thinking often fails to connect ecological with political economy, so concealing the inherent unsustainability of capitalism (Foster, Clark & York, 2010). Neoclassical economics disregards social ties entirely and presents the market as a benign, self-contained system that efficiently allocates limited resources, rather than a system prone to crises that requires constant expansion. The objective of technocratic reforms is to determine the value of nature, modify incentives and regulations, or rely on the moral values of the elite, all while avoiding the need to address the drive of accumulating wealth. Corporate greenwashing perpetuates surface-level sustainability activities while keeping fundamental systems intact.

Marx's ecological critique examines environmental challenges by analysing the historical development of different methods of production and the conflicts within capitalist society. This framework establishes a connection between natural resource problems and crisis tendencies in the economy, such as economic stagnation, inequality, surplus capital and labour, and the process of financialization, which arises from the exploitation of wage labour and competitive accumulation. From an ecological Marxist systems viewpoint, it becomes evident that environmental degradation is a symptom of the crisis dynamics inherent in capitalism, rather than simply being the result of policy failures.

Marx's dialectical and materialist approach uncovers the socio-ecological links that are often ignored in popular thinking. It offers methods to examine the causes of environmental damage within capitalism, which is a system ruled by specific social relations and imperatives. His study can provide valuable insights to mass movements advocating for climate justice and envisioning post-capitalist futures by demonstrating that achieving ecological sustainability necessitates surpassing capitalism as a social structure. Reforms should focus on addressing the underlying causes of the system rather than merely treating the surface-level symptoms.

According to the Marxist systems approach, technology is not inherently problematic. Instead, it is influenced by the social relations of production and the drive for maximising profits that guide it within a capitalist system (Foster, 2010). Agroecology and renewable energy possess liberating potential when divorced from profit-driven goals and prioritised for societal requirements. Similarly, the issue at hand is not solely the act of expansion, but rather the unsustainable drive for growth inherent in capitalism. An analysis based on Marxist principles reveals how uncoordinated and competitive accumulation undermines the natural order, and emphasises the need for democratic planning focused on human progress rather than financial gains in order to regulate the interaction between society and environment.

Marx's systemic critique is still crucial today for comprehending the causes of environmental disaster and establishing a link between ecological sustainability and anti-capitalist politics. It sheds light on the ecologically damaging and socially alienating mechanisms of capitalism. The approach of this systems perspective focuses on addressing the underlying causes, which is different from implementing technocratic reforms that aim to disguise the negative environmental impacts of capitalism. However, these reforms are bound to be unsuccessful due to the inherent drive of capital to accumulate through competition. Marx's ecological ideas serve as the basis for constructing movements that aim to address the fundamental separation between humans and the natural world by means of social change.

3.2 Foundational Work for the Ecosocialist Movement

Marx's groundbreaking ecological analysis of capitalism has laid the necessary theoretical foundation for the contemporary ecosocialist movement. This movement seeks to address the fundamental conflict between capitalism and nature by advocating for communal democratic control and deliberate planning of economic activity.

Marx's analysis reveals the illogicality of market competition, the transformation of nature into commodities, and the excessive exploitation of human and natural resources driven by profit. This highlights the need for social ownership, economic democracy, and production focused on usefulness in order to achieve sustainable development (Angus, 2016). His vision of repairing the disconnect between human beings and nature by transcending capitalist political economy through socialism is still highly relevant for the goal of building an ecologically sustainable and socially fair post-capitalist society that prioritises human growth.

Marx's perspective goes beyond proposing incremental changes to environmental policies. Instead, he presents a profound analysis of capitalism, arguing that its exploitative and growth-focused class structure makes it inherently unsustainable (Löwy, 2018). His dialectical perspective reveals how the ceaseless accumulation of capital disturbs the natural cycles, necessitating a revolutionary restructuring of social relations to achieve transcendence. This stands in stark contrast to the conventional liberal

environmentalism that seeks to camouflage capitalism by implementing taxes, laws, and technological solutions, while allowing concentrated corporate power and the profit motive to remain unchanged.

Marx's ideology highlights the ecological problem as a result of capitalism's fundamental principles of commodification, unlimited expansion, and accumulation. This leads us to the conclusion that ecosocialism is the one solution to maintain society within the limits of our planet. If Unilever shareholders are unwilling to sacrifice earnings for the sake of environmental preservation, it is necessary to address class relations by establishing collective ownership and control over production. The means of production must undergo a dramatic reorientation in order to meet the needs of the community and restore a balanced relationship between humans and nature, rather than pursuing endless capital growth.

Marx's focus on historical materialism forms the basis for ecosocialist examination of creating new production relations, technologies, and cultural systems that are suited to contemporary circumstances. These changes aim to move society beyond the environmental problems caused by capitalism (Saito, 2017). Marxism is still essential for understanding the material and social foundations of ideological systems, the conflict between social classes, and the dominance within ecosocialist initiatives.

The indigenous notion of *buen vivir*, which refers to achieving a state of balanced and harmonious living within the community and nature, offers a promising framework for integrating Marx's ecological theories with non-Western wisdom. This integration can pave the way for post-capitalist futures that go beyond the harmful effects of ecological imperialism (Löwy, 2020). The integration of historical materialism with indigenous worldviews enhances the practical application of ecosocialism.

Marxist intellectuals have expanded upon Marx's ecological foundation in order to develop comprehensive ecosocialist strategies and transitional initiatives. These include the establishment of public renewable energy systems, implementation of green public works, reduction of work hours to ensure sustainable livelihoods, and the process of decarbonisation (Angus & Butler, 2011). The initiative benefits from the foundational insights of Marxist political ecology, which reveal the underlying mechanisms of capitalism that contribute to the environmental crisis.

Marx's ecological theories are being organised and expressed globally, from the Green Bans of Australian construction workers in the 1970s to current climate justice movements led by indigenous, peasant, and marginalised populations (Dawson, 2016). The undeniable truth highlights the pressing necessity to resolve the inherent conflict between capitalism and the natural world. Marx's ideas are crucial in establishing a theoretical basis for opposing capitalism and inspiring the creation of environmentally conscious and socially liberating societies worldwide. The ongoing effort to achieve a fair transition beyond capitalism remains a challenge, with Marx's ecological analysis criticising the current state of affairs while shedding light on possible future scenarios.

3.3 Establishing a connection between social justice and environmentalism

Marx's ecological criticism makes a significant modern contribution by establishing a conceptual framework that strongly connects social justice and environmental sustainability. Marx's theory focused on the dynamic social relationships of production throughout history, revealing the intrinsic connection between the exploitation of human labour and the exploitation of the natural environment under the capitalist system. The inclusion of a class-based perspective in environmentalism is essential since it offers a valuable analytical tool that is often absent in conventional environmental discourse.

While liberal environmentalism tends to view natural circumstances and social relations as different entities, Marx's analysis demonstrates that environmental crises arise from the specific class relations inside capitalist society. In this system, workers are exploited to generate surplus value, while nature is commodified for the sake of profit (Burkett, 2006). The economic system's inclination to take value from nature in unsustainable ways is reflected in poverty wages and uneven development. To put a stop to ecological deterioration, it is necessary to go beyond both social inequality based on economic class and the unrestricted exploitation of environment solely for the sake of accumulating money.

Marx's criticism of capitalism in terms of value theory reveals how profits are generated through the exploitation of unpaid excess labour time. This analysis provides a deeper understanding of the relationship between the exploitation of labour and the utilisation of nature's reproductive power without proper compensation or at minimal expense. The release of greenhouse gases, which is causing climate change, illustrates how capitalism relies on the exploitation of both wage labourers and fossilised carbon as integral components of the capital cycle (Malm, 2018).

The inherent link between the exploitation of society and the environment is elucidated in Marx's notion of metabolic rift. The process of competitive capitalism production disturbs natural cycles, hence causing a degradation of human life due to the interconnectedness of our destinies. Sustainability is inherently dependent on justice. The class struggle and ecological struggle are interconnected in their opposition to the capitalist system as a whole.

Marx also proposed the concept of uneven ecological exchange, which refers to the idea that environmental damages have a greater impact on marginalised social groups in exploited nations and territories that were subjected to colonialism and imperialism (Jorgenson, 2016). Once again, environmental and social oppressions intersect. Climate justice necessitates global cooperation in the face of multinational corporations.

Conventional environmentalism typically fails to incorporate a comprehensive study of social class, often attributing environmental issues to population increase or broad consumption, while disregarding the social conflicts inherent in capitalism that contribute to ecological unsustainability, regardless of population numbers or advertising. The objective of technocratic reforms is to camouflage capitalism by assigning a monetary value to nature and making slight adjustments to incentives, all while keeping the fundamental power dynamics and profit-driven motivations of the capitalist system unchanged (Smith, 2010). This statement highlights the avoidance of acknowledging the direct correlation between the continuous exploitation of natural resources and the exploitation of labour. These two aspects are integral components of capitalism's alienated system of controlling resources and capturing value.

Marxism, on the other hand, focuses on the inherent exploitative nature of capitalism as the main reason for its unsustainability. Marx's ecological criticisms highlight the systematic correlation between social inequality and the deterioration of nature within a capitalist economy. To address the metabolic rift, it is essential to go beyond both the exploitation of social classes and the commodification of environment. This can be achieved through collective ownership, democratic planning that prioritises community needs, and labour that is not alienated and promotes sustainable ideals (Burkett, 1999). To achieve a just transition, it is necessary to integrate the fights for labour rights and environmental rights within an ecosocialist agenda that seeks to surpass capitalism.

Around the world, there is a growing movement of grassroots coalitions that are forming in both the northern and southern regions. These coalitions are bringing together indigenous water protectors, environmental justice activists, and labour campaigners to fight against issues such as oil pipelines, petrochemical pollution, and mountaintop removal mining. Their goal is to connect social justice, environmental sustainability, and advocate for a change in the capitalist system (Dawson, 2016; Martinez-Alier et al., 2014). Marxist political ecology offers a crucial framework that helps these social movements combine liberating ecological goals with an awareness of social class.

In our current era characterised by a worsening environmental crisis, Marx's pioneering observations on how capitalism exploits both humanity and nature are still crucial for revealing the interconnected social and ecological harm. Furthermore, they serve as a source of inspiration for fostering unity between sustainability and justice movements that seek to repair the damage caused by the separation between human society and the natural world. As capitalism reaches its final stage in history, it is crucial for us to create a new system that is both environmentally sustainable and socially liberating, supporting the well-being of both humans and the natural world. Marx's ecological philosophy remains a crucial source of theoretical tools to steer this pressing ecosocialist endeavour.

3.4 Analysis of capitalist technology and progress

Marx's ecological criticism presented a revolutionary challenge to the capitalist belief that technical advancement and economic expansion inherently result in societal and environmental betterment. Marx demonstrated how technology and increases in productivity within a capitalist system frequently lead to the growth of production and accumulation of capital in ways that are not sustainable, while failing to significantly promote genuine human development. This insightful observation challenges the notion that capitalism can be made more environmentally friendly just through innovation, without considering the need for fundamental systemic changes.

Marx remarked that under capitalism, productive technologies are primarily used to exploit labour and reduce costs in order to acquire a competitive edge, rather than to enhance the well-being of people or develop a harmonious relationship with nature. Companies that automate their production processes strive to improve the amount of output they can achieve for each hour of labour. Their goal is to outperform their competitors and direct the resulting gain in productivity towards capital accumulation, rather than allowing it to translate into more leisure time for human development (Burkett, 2014).

Marx emphasised that capitalism has a built-in inclination to create technologies that need a lot of resources and harm the environment. This is because such technologies provide the possibility of greater profits and the accumulation of capital, unlike more environmentally friendly advancements. Instances of environmental disruption encompass nitrogen fertilisers causing disturbances in soil ecologies, fossil fuel extraction techniques such as fracking, and the promotion of planned obsolescence that perpetuates consumerism without concern for sustainability (Foster, Clark & York, 2010).

Renewable technologies, even within a capitalist system, tend to promote increased material consumption and the accumulation of wealth, rather than solely replacing fossil fuels. Capital utilises technology to maximise profits through the exploitation of labour. Technological solutions are incapable of resolving capitalism's inherent need for growth, which is based on the subjugation of nature and labour (Smith, 2010).

In contrast, the ideology of techno-capitalism offers the prospect of boundless advancement through technological advancements and market forces (Morozov, 2013). However, as Marx was aware, short-term benefits inevitably encounter constraints. New technology such as artificial intelligence are often utilised by the elite to exert control and power, rather than being used for the improvement of humanity, without altering the existing social structures.

Conventional environmental thinking commonly associates ecological sustainability with the use of appropriate technology and incentives through changes in management. The technocratic viewpoint disregards Marx's observation that technologies assume specific shapes influenced by the social relationships in which they are integrated inside systems of production. Technology in itself is insufficient to salvage an unsustainable system that relies on the exploitation, ceaseless expansion, and commercialization of both nature and labour (Foster, 2010).

However, Marx did not oppose technological progress. He acknowledged that technologies possess liberating possibilities when created through a sustainable and egalitarian method of production that prioritises human needs over profit. Microelectronics, agroecology, renewable energy, and automation possess the potential to decrease laborious work and ecological harm if utilised for democratic purposes that go beyond the exploitation of workers, control by the elite, and the commodification of both humans and environment (Burkett, 2006).

Marx's intricate criticism of capitalist technology and progress remains crucial in today's scepticism towards technological solutions such as carbon trading, geoengineering, and the belief that green capitalism will automatically solve environmental crises through innovation and sustainability certification schemes (Foster, 2012). Marx emphasises the necessity of changing social connections and development priorities towards an ecologically reasonable socialist orientation, in opposition to technocratic illusions. Technology

can only contribute to universal well-being instead of focusing on accumulating capital if there is a complete transformation of the relationship between humans and nature.

3.5 Global significance

Marx's insightful ecological criticism of capitalism as an unsustainable global system has even more strength and significance in the present day, as the escalating worldwide environmental catastrophes validate his forecasts regarding the growing conflict between nature and bourgeois social relationships. The concepts of metabolic rift, ecological imperialism, and ecological unequal trade shed light on the underlying causes of climate change, mass extinctions, pollution, and environmental injustice.

Marx's analysis highlights that the current climatic problem is a direct result of capitalism's insatiable drive for growth, the transformation of nature into commodities, and the exploitation of world resources through the use of fossil fuels, which have been formed over millions of years from the labour of plants and animals. (Angus, 2016; Malm, 2018). The system lacks a self-correcting mechanism but will persist in its normal operations until it reaches a catastrophic state. The unsustainable trend of capital accumulation immediately leads to the global temperature rise.

Similarly, the mass extinction of species and the loss of biodiversity are caused by the capitalist system's increasing commodification of many aspects of nature, the displacement of animals by monocultures, and the continuous acquisition of land for the sake of agribusiness profits, rather than prioritising ecological balance or food justice (Löwy, 2020). Corporate greenwashing strategies overshadow even the efforts of conservation. The exploitation of nature for immediate financial gain is becoming more prevalent worldwide.

Marx's understanding of capitalism's worldwide expansion and unequal ecological trade is crucial in explaining the dominance of climate finance by the Global North, conflicts over climate debt, debates about carbon offsets displacing sustainability burdens, and the ongoing extraction of excessive ecological advantages by transnational capital from exploited regions and populations worldwide (Jorgenson, 2016; Dawson, 2016). The current state of our planet, which is experiencing severe environmental issues, supports Marx's theory that global crises arise from the tensions inside the imperialist world order.

In general, the global fulfilment of Marx's prophecies regarding the unsustainability of capitalism enhances the significance of his ecological philosophical legacy. The evidence of climate change, mass extinctions, deforestation, collapsing fisheries, and the contamination of water and air all demonstrate the increasing disconnect between humanity's interaction with environment caused by capitalist social relationships, which validates Marx's most concerning predictions. Transitional systemic change is an essential prerequisite for any viable solutions.

The theory and critique developed by Marx offer crucial resources for comprehending the underlying causes of current crises and guiding social movements that strive for climate justice and ecosocialist alternatives that prioritise sustainability, fairness, and the global common resources (Saito, 2017; Angus & Butler, 2011). If capitalism proves incapable of resolving the crises it has inevitably generated, our only option is to transcend this unsustainable system by establishing participatory, egalitarian, and ecologically prudent post-capitalist connections between humanity and the natural world, in order to prevent ecological collapse and the rise of authoritarianism from engulfing civilization. To prevent savagery, it is imperative to implement ecological socialism.

Today, it would be beneficial for the current generation of climate activists, thinkers who combine ecological concerns with Marxist ideology, defenders of indigenous environmental rights, and other movements focused on sustainability and justice to examine Marx's insightful criticism of capitalism's impact on the environment. Marx argued that capitalism is an unsustainable system that goes against the well-being of both humans and nature. His observations continue to be crucial for charting a different ecosocialist route that aligns more closely with the limits of the planet and the multitude of life forms. We must pay close attention to Marx's radical caution and develop systemic alternatives in order to choose our destiny.

4. CONCLUSION AND DISCUSSION

Karl Marx's works from the 19th century remarkably predicted numerous significant environmental disasters that are currently occurring. These writings also provide crucial understanding of the unsustainable connection between capitalism and the natural world. Marx exposed the intrinsic tendency of capitalism to turn nature into commodities, exploit labour, and aggressively prioritise profits and growth, which ultimately destroys ecological sustainability. His intricate and dialectical understanding of the relationship between humanity and nature, innovative ideas such as metabolic rift and ecological imperialism, and comprehensive analysis of the ecological contradictions of capitalism continue to be highly applicable in comprehending the underlying causes of issues such as climate change, mass extinctions, pollution, and environmental injustice as consequences of capitalist political economy. Marx emphasised the need for a profound societal change that involves shared ownership, democratic planning focused on human growth rather than profit, and labour that is not disconnected from individuals, in order to address the fundamental disconnect between people and nature.

However, Marxism by itself is insufficient to address the specific environmental issues we face in the present day. Marx did not have firsthand knowledge of the current global ecological crisis, and his writings have notable omissions when it comes to the necessary institutions and technologies for constructing enduring post-capitalist civilizations. Several Marxist states and intellectuals in the 20th century did not adequately prioritise ecological concerns (Burkett, 1999). It is crucial to update Marx's ideas in a non-dogmatic manner by incorporating modern science and wisdom from non-Western cultures. Specifically, his concepts need to be redirected towards environmental justice for indigenous communities and the Global South, which are experiencing the most severe effects of ecological imperialism and climate change (Saito, 2017).

Marx's philosophy should be seen as a starting point rather than an unquestionable belief system. The essential framework of Marxism includes key principles such as historical materialism, class analysis, and a rigorous criticism of capitalism. However, there is a need for new theoretical advancements in ecosocialism that are based on Marx's ideas. These advancements should provide more detailed policies for transitioning to a just society and establishing alternative socio-ecological relationships that are suitable for the complexities of the modern world, diverse human aspirations, and the long-term sustainability of the planet, while moving away from imperialism (Löwy, 2020; Angus & Butler, 2011). The endeavour to develop post-capitalist futures that align more closely with the well-being of humanity and the environment is still incomplete.

However, the increasing combination of social and environmental catastrophes in the present era demonstrates that Marx was possibly the first intellectual to accurately grasp the inherently unsustainable character of capitalism. This system relies on the continuous expansion of turning human and non-human elements into commodities. His ecological observations can provide valuable information to social movements advocating for climate justice and systemic transformation by exposing capitalism's inability to rectify itself, despite the growing urgency of global environmental warnings. The future of our society may depend on embracing Marx's ecological criticisms and formulating viable, democratic ecosocialist alternatives that no longer rely on perpetual expansion, accumulation, and ecological domination. The primary objectives are to internationalise the fight, establish links between labour and environmental movements, and significantly reduce the length of the workweek in order to humanise and de-commercialize society's connection to the environment before it becomes too late. Marx's ecological perspective remains valuable for understanding and overcoming the disruption caused by capitalism in the interconnected relationship between humans and the environment.

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