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COST OF RENTING THE EARTH

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Abstract

For many decades scientists have been warning that life on earth will not be sustainable for long the way we treat the earth. The collusion between humans and the earth has outpaced to a degree that it no longer can be left to blind chance. Complacency in tempering with the nature at the same pace could run out of control at any time. In those circumstances, the harms outdone to the environment could be irreversible. Stratospheric ozone depletion, pollution of air and water, soil erosion, deforestation, warming of the earth, and exploitation of depletable natural resources are not sustainable at this rate of decline. Conventional economics has played a significant role in vindicating the existing state of affairs. As already implied, the mainstream economics has not only paid no heed to ecological degradation but has been the principal propellant of this creed. We rarely find a textbook in economics that does not begin with factors of production as the fundamental fabric of the economy. Land, labor, capital and entrepreneurship are purported to be the core components, the base elements, the building blocks of every economy. These constituents account for the blueprint of contemporary economic systems. The refraction of this doctrine through a prism of a critical eye unlocks the sophistry concealed in this way of thinking. In conventional economics, land is detached from the earth and downgraded to a basic factor of production. It is presumed that land as a factor of production delivers a service. For this, it is paid a rent. In short, the price of the earth amounts to the market rent. Adhering to such an outlook has many implications, one of which is turning a blind eye to the anthropomorphic impacts of climate change. The cost of such a conduct is more than economic. It is existential. The failure to come to grips with this trial and failing to restore land to its due place in economic reasoning is beyond measure. This is an erroneous outlook that we shall examine critically in this paper.

Keywords: Factors of Production, Economic Cost, Existential Cost, Mainstream Economics, Ecological Degradation, Climate Change

1. Introduction

Economics textbooks refer on a regular basis to the factors of production such as land, labor, capital, and entrepreneurship. The four factors of production are presupposed as a self-evident truth. There are two implied inferences in this sequence. The first one places land at the top of the list, and unwittingly leaves the impression that land is the most crucial factor of production. Synchronously, the second inference conveys the impression that the four constituents of factors of production carry comparable weight. Not only that but they are equally important. If we dig a bit deeper into the matter, we can discern the falsity of both implied assumptions. Entrenched in

these implied presuppositions is an impassable barrier that separates land from the planet earth. In consequence, the planet earth in the first instance is reduced to land and lastly to the rank of labor, capital, and entrepreneurship.

In this paper, we shall argue that this pseudo rift between land and the planet earth is deeply flawed. It will be argued that land is much more than a basic factor of production. Land encapsulates everything the planet earth is. To conceive land short of that is a grievous error. It takes no stretch of the imagination to assert that this conjecture is devoid of content as it stands. If we probe more deeply into the role of land in the economy, we can see that everything in the economy is part of the land in its broad sense. Land in its entirety is the planet earth. We would have no labor, no entrepreneurs, no capital, no society, no economy, and no life without land in its existing conditions. One of the paramount pitfalls of dominant economics, despite its myriad sects, is the exclusion of land from the planet earth. The earth is taken as given and will be here forever. In fact, this stand is counterintuitive. It entails a logical fallacy. At one level land is stack with inexhaustible resources but at same time it is a scarce factor. Due to its scarcity, it is paid a price in a form of rent.

In this paper we take a close look at four far-reaching implications of standpoint held by conventional economics about land. In the first stand adopted; land is considered merely as factor of production. Thereby, it is disconnected from the planet earth. In the second place, despite land being the first on the list of factors of production, over time in particular after the physiocratic school it has been moved down into a periphery factor. Thirdly, there are far-reaching implications from this perspective. That is the relentless exploitation of the earth and many other unimaginable harms done to the environment. The last implication is that land as a simple fact, like many other simple facts, is overlooked. In other words, economists only see the trees, not the forest. They see the land but not the earth.

As already stated, the primary objective of this study is a critical examination of one of the key building blocks of economic orthodoxy. The paper challenges the deep-seated misconception of the place of land in economics solely as a factor of production. To this end, the paper contextualizes a markedly different perspective about the place of land to that of the prevailing economic theory. In this study, contrary to standard economic orthodoxy, it is argued that land is inextricably linked with planet earth. In addition, the arbitrary rift between land and the planet earth has been a primary propellant in much of ecosystem degradation and habitat losses. The methodology adopted in this paper is an evaluative approach. It is a critical inquiry and survey of the standard view about land in economics. The critical reflection presented in this paper is intended to be a steppingstone for a more detailed critical study of the theory of land in economics.

This paper is in six sections. In Section 1, pressing concerns of the early time addresses the main concerns of the thinkers of the early times. Systematic consideration of factors of production was among the least urgent challenges of this period. In Section 2, economics at the age of modernity looks at scholarly advances made during this period and the impact of age of enlightenment on the genesis of modern economics. In Section 3, untenable convoluted taxonomies deal with the eventual classification of factors of production and the ranking's pitfalls. In Section 4, life, the economy and the earth centers on the pivotal role of the earth in preservation of life and for the survival of humankind. In Section 5, the enigma of progress and survival probes into the paradoxical precedence that is given to progress by any manner of means over long-term means of existence. In Section 6, two tasks are devoted to this part. The object of the first task is to outline heretical views of a few scholars who contended the mainstream economics classification of factors of production. The second task reflects on how the most ordinary truths can be overlooked.

2. Pressing concerns of the early times

Needless to say, that all living species' source of survival is from the planet earth in its existing conditions. The earth in its current state is the caterer of the essential sources of food, shelter, drink, oxygen and the favorable climate to metabolize. The earth is the only provider and the sustainer of living species. The full realization of this fact has not yet dawned in the field of economics. It has to be said, in startling contrast, that the early humans who lived as nomadic

hunter-gatherer groups had closer ties and affinity with the earth. By necessity, their entire preoccupation was staying in tune with the earth. The hunter-gatherer people were roaming, foraging, hunting, scavenging, or fishing to stay alive. They were hard at work gathering edible plants, grains, fruits, nuts, roots, and berries and hunting animals and fishing just to get by. With the agriculture and farming mode of existence, land reinforced its ordinance over different human dwellers.

For our present purpose, it is enough to mention that in antiquity, the study of factors of production was not a pressing concern. Most people then were struggling to survive. Life was harsh and people lived in constant fear. In the main, fatalism ruled the roost. The historical transition from the age of fatalism to the age of wisdom emerged with the rise of Greek philosophy. The ancient Greek thinkers broke this deadlock and created a conducive environment for serious critical thinking and objective analysis of facts. The ancient Greek society accommodated a more enlightened culture that triggered a new methodological upheaval in the human quest for knowledge. An intellectual revolution that used the faculty of human reason not only in pursuit of truth for an end unto itself but to explain the world and for good life. Yet, this pathbreaking cognitive expansion was not advanced far enough to address the factors of production in detail. Neither careful study of factor of production was the main concern of medieval times.

Economics, as a scientific discipline, was an offshoot of the age of enlightenment. This is not to downplay the contributions of the antiquity writers on economic matters. In the body of ancient works, we find sporadic references, casual remarks and undernotes about inputs of production such as land, labor and interest. But the costs of production were not the main worry of scholars then. Similarly, neither was identifying, marking, and defining factors of production. Economics reached its maturity when factors of production warranted serious investigation. It was in the seventeenth century that modern economics took its early shape and it disentangled itself from some of the mediaeval constraints. However, real advances in economics as an independent subject of inquiry came into effect over the course of the eighteenth and nineteenth centuries. The designation of factors of production into land, labor, and capital is also a heritage of this period.

People in early times venerated the earth. In the ancient scriptures, the earth is among one of the most revered Deities. In *Atharva Veda*, which dates back about 1200 BC, it is referred to as 'Mother Earth'. A self-generating guardian that gives and sustains life. Besides the earth, many Gods and Goddesses in ancient Indians were associated with the earth. The list of these Deities consisted of animals, insects, trees, lakes, rivers, mountains, and so on. But the earth was the cradle and sustainer of life.

In ancient China, the earth was also pivotal to good conduct and harmony. Within this frame of reference, the best of all possible worlds would not be achievable unless there is harmony between 'heaven, earth, people, things,' and oneself. So, the earth is indispensable to this grand balance. The earth plays a key role in orienting everything, including Yin and Yang, in their right course (Bodde and Leblanc, 2014). Until fifteenth century, Chinese Emperors, held the yearly ceremonies at the Temple of Earth in Beijing - thanking mother earth for the harvest in that year.

To almost all indigenous people, the earth is held sacred as the essence of life. In those communities, the earth defines life. Kunapi is the term used by Yolugu, the aborigines of Australia. It is synonymous with the earth or the mother Goddess (Leeming, 2010). Only in the referred order, harmony is possible - granted that "human beings are united with land and with the other forms of life on the land" (Kelbessa, 2011, p. 576). In sub-Saharan, the earth was revered as 'mother' or 'womb,' the one that conceives and nurtures life (Chinweze *et al.* 2013). Equally, the native Americans venerated the earth as the mother of all things and believed it should be treated as a living thing that requires particular care and attention (Redekop 2000; Booth and Jacobs, 1988). Likewise, in Pagan Europe, life was interlocked with the earth. Many Prussians worshiped Occopirinus, the God of heaven and the earth. For the Baltic Pagans, it was the earth that was most respected (Jones and Pennick, 2013). If it was not the earth in its entirety, then it was one thing or another from the earth that was singled out as the source of worship such as water, fire, rivers and mountains. For instance, the Zoroastrians revered the fire and water. The

four fundamental elements of ancient Greek philosophers, the earth, air, fire and water are also derived from the earth.

Land was sacred in Ancient Egypt. Pharaohs were among other 1,400 Egyptians Gods. But even for the pharaoh, the land occupied a superior position to them. The relationship between the pharaoh and the land was not reciprocal. Pharaoh depended on land. In the biblical texts land belongs to the God. One of the most revered Gods in Ancient China was the God of land (Zhuo, 2018). In other ancient societies, in the ancient Greece and Rome, land was a scale of social standing. Xenophon (430-350 BC) in his dialogue, *Oikonomikos*, describes land as the barometer of economic activities (Gray, 1957, p. 30).

Humans cannot live in isolation. But for the sake of argument, let us imagine the first person who landed on the earth. This person's first contact would be with the earth. Everything to sustain this individual comes from the earth. Now imagine two individuals have landed on the earth. For the first individual, the concept of possession of land is meaningless. In the second case, the scenario would change. Wherever each person is settled, that location would be defended against the intruder. Jean-Jacques Rousseau (1712-78) saw the root of human troubles in the first person who claimed to own the first piece of land. He wrote the first person "who, having enclosed a piece of ground, to whom it occurred to say this is mine" launched "many crimes, wars, murders ... many miseries and horrors." He continued to say, humankind "would have been spared" all these calamities and misfortunes if someone had told the people that they are lost if they 'forget that the fruits [of the earth] are everyone's and the Earth no-one's' (Rousseau, 1997, p. 164).

The fundamental question to consider here is what does land represent in economic theory? In the entire corpus of economic theory, despite its rich variety, land is treated as a factor of production, as an input used in production. To an untheoretical eye it is appealing truism but peering it through the ambit of reason this premise is groundless and devoid of rational foundation. The chief misconception lies in detaching land from the planet earth and diminishing it to one of the inputs used in production for profit. Modern science of economics is guilty as charged from its very inception in this respect. This fallacy has been repeated by all prevailing schools of thought in economics. The critical error is rooted in the very implicit assumption that land is solely a factor of production. This oversight leads to another that muddles up the earth with wealth. Planet earth is not a human construction, but wealth is. The earth has no determinable economic value, and wealth has.

3. Economics at the age of modernity

Mercantilist writers covered a considerable length of time, starting in the sixteenth century and enduring into the eighteenth century. These writers adhered to the view that only the precious metals i.e., gold and silver constitute real wealth. In view of this, a nation's wealth can be expanded or depleted with foreign trade. In trade, one nation gains at the expense of the other trading nation. Thus, mercantilists advocated a policy of favorable balance of trade. By restricting exports of precious metals, they aimed to boost export of manufactured goods and by doing so to stimulate domestic production. The mercantilist writers were concerned with exchange (Hunt, 2002). Their primary target was international trade. Hence, wrestling with the pandemonium of factors of production was not on their list of priorities.

The end in mercantilists' teaching is to acquire more wealth and the means to achieve this end is by increasing import of stocks of precious metals. In subsequent schools of economics, wealth has kept its position as an end but forms and means of acquiring wealth have changed. The contention against the mercantilists has not been the lust for wealth in the form of gold in itself but the sources from which wealth can be created. Hobbes (1976) was one of the very first of the early modern philosophers who addressed the sources of wealth. In Hobbes' (1976) view, wealth is congealed and objectified. There are two elements to this. The first primary element is a joint by-product of 'land and sea'. Both of these factors come out of 'the two breasts of our common mother'. His second source of wealth is labor (Hobbes, 1976). Petty (1899, p. 68) also entertained an identical idea that labor 'is the Father and active principle of Wealth, as Lands are the Mother'.

Cantillon (2001, p. 5) was one of the first exponents of the Physiocratic school and coined the term entrepreneur and contended that land is the chief source 'from whence all Wealth is produced'. Quesnay echoed the same line (Gray, 1957, p. 102). The Physiocratic school's influence was for a brief period. Smith (1776) interrupted their progress and halted their subsequent influence. Nonetheless, physiocrats were the first system builders in economics. In their economic system land is the principal source of wealth. Other sectors of the economy are said to live off the surplus of the land. Strictly speaking, industry solely reshapes the products and commerce only exchanges commodities of equal value. It is land and only land that is the source of wealth (Fusfeld 2002). Both Smith (2008) and Marx (2020) credited them as pioneering economists. Smith (2008, p. 642) described their ideas as the closest 'to the truth' on 'the subject of political economy'. Marx (2020, p. 7) called Quesnay the true father of modern political economy.

As we have already indicated, the physiocratic school fell out of fashion and the wisdom of the market conquered the standard analysis in economics. To this end, land was subordinated to the will of the market. An astute observer, George (1879) tried to revive public interest in land not as a source of wealth but as a principal source of social power. Accordingly, he cursed the landlords for abusing their social power. By willful act of holding on their lands, George (1879) lamented, landlords are responsible for the rapid rise in price of land. This is because land is fixed and permanent and we cannot produce and reproduce land at will. By reiterating this sentiment, George (1879) was echoing Malthusian theory of population and Ricardian theory of rent (Malthus, 1959, pp. 8-9 and Ricardo, 1819, p. 52).

George (1879) put into question the incomes of landlords from the land. Arguing that the unconstrained rise in the value of land, either in form of an increase in rent or appreciation of value of land, are unearned investment (Lackman, 1976). On those grounds, he insisted that these benefits are procured solely by virtue of owning land. To escape from this perilous social structure, he maintained, such incomes should be taxed in total. More imperative, he thought, the price of land should not be decided by the private sector. In spite of bringing land to the public attention, George (1879) did not work out a consistent theory of land. In his final analysis, he put land as one of 'the three factors of production' (George, 1879, p. 162). With all its faults, his reading of land merits serious consideration. Land in his belief system is the soil, the air, the water and the rest of the bounty of nature. It "includes, not merely the surface of the earth as distinguished from the water and the air, but the whole material universe outside of man himself" (George 1879, p. 37).

4. Untenable convoluted taxonomy

Hesiod (1988) said life has a cost and labor is that cost. Humans need to eat. They cannot eat unless they work. This is because "Gods keep men's food concealed" (Hesiod, 1988, p. 38). The necessity of food requires no second thought. It comes with the territory of existence. But this is not the end of the story. Side by side with the high density of human population we have a greater escalation of need for food. The change is rule-bound. The increase in population goes along with greater division of employment and specialization of labor. The more advanced an economy is, the more individuals become interdependent with each other for their survival. The greater dependency means more pressure for deciphering costs of supplying the required goods and services. Elucidating what it costs to live and how goods and services are produced and supplied induces people to embrace such matters more attentively.

As noted in the previous section, the quest for revealing the source of wealth was a hotly debated subject for mercantilist writers. It also remained a central question of interest for the classical and Marxian schools. Broadly speaking, in these schools the source of wealth is production. As far as the source of wealth is concerned, Smith (2007) provides two accounts of sources of wealth in two different stages of economic development. These are in the primitive and in the developed commercial societies. In primitive societies, Smith (2007, p. 31) wrote: "If among a nation of hunters, for example, it usually costs twice the labor to kill a beaver which it does to kill a deer, one beaver should naturally exchange for or be worth two deer. It is natural that what is usually the produce of two days' or two hours' labor, should be worth double of what is usually

the produce of one day's or one hour's labor.”

However, the same arrangement exists no longer in a developed commercial society. For this reason, labor alone is not in command of the creation of wealth in commercial societies. In this circumstance, as claimed by Smith (2007), labor along with land and capital fulfils the task of creation of wealth.

Likewise, Ricardo (2006, p. 1), the second most prominent member of the classical school, remarked that ‘all that is derived from [earth's] surface by the united application of labor, machinery, and capital, is divided among the three classes’ of landlords, laborers, and money lenders. Marshall (1890, p. 614) also found the source of wealth in the magic composition of ‘land, labor, and the sacrifice involved in waiting.’

Jean-Baptiste Say (1767–1832) was not the first economist who came up with the term entrepreneurship, but it was he who crowned it as the fourth factor of production (Say, 1971, p. 78). That said, it was Schumpeter (1966) who has given entrepreneurship the most salient description. Entrepreneur, said Schumpeter (1966, p. 132), is someone who reforms or revolutionizes: the pattern of production by exploiting an invention or, more generally, an untried technological possibility for producing a new commodity or producing an old one in a new way, by opening a new source of supply of material or a new outlet for products, by reorganizing an industry and so on.

In adding entrepreneur alongside other three factors, the faith in four factors of production hardened over time. In the contest among these four factors, the relative standing of land has been diminishing while the position of capital and entrepreneurship has been ascending down the line.

5. Life, the economy, and the earth

The material and atmospheric composition of terrestrial planets and Jovian planets are not the same. The terrestrial planets are made out of rocky materials whereas the Jovian planets are made out of dense gases. For example, the earth and Mercury are terrestrial planets and Jupiter and Neptune are Jovian planets. The terrestrial planets have solid land whereas the Jovian planets have solid core but lack a solid land. The key question at issue here is what is the difference between the land on the Mercury or in a similar planet and that of land on the earth? In standard economics, there is no fundamental difference between the two. From this angle we do not see any distinction between the land on the Moon and the land on the earth. Here lies the obvious chasm that is unaccounted for in economics.

The conventional taxonomy of factors of production and bracketing land merely as one of the factors of production is deeply flawed. From this classification land on the earth and land on Mercury are alike. Both lands, if used for their service should receive rent. Downgrading land to a capricious claim of a feudal master for letting it and receiving rent for leasing his land is a fatal mistake. Based on this view, it means that planet earth has monetary value. Of far greater oversight is the follow-up potential implication that the earth can be cut into pieces and the pieces can be bought and sold at the market price. Less discerningly, it means the planet earth has got an owner and humans are the ultimate masters of the earth. By implication, the earth can be bought and leased, albeit in pieces, and be used in the way that the market dictates. From this strikingly credulous perspective, one can buy planet earth like the rest of other factors of production if one can afford to pay the market price for it.

If we push this logic to its conclusion, we can bring down the earth to the value of a meagre rent. More unperceptively, each piece of the earth would not materially be different from any piece of land on the Mercury. This is a highly myopic position. But this is what we learn from the inherent wisdom of leading economics. In sharp contrast to this teaching, the earth worth is more than money. Besides, land on the earth is unlike the land on any other known planets. It is the only land that hosts life on the known planets. The land on the earth is tied to the natural conditions of life. The implications of this realization in its true sense go a long way.

When we look at the bare facts, we find that there is hardly any part of the planet earth that is free of human vandalism. One primary cause of this malpractice is the belittling of the land to a factor of production. The exact position of land is planet earth in its entirety. It is no less than

the whole earth with all its constituents and conditions. It is on the uptake of this impending fact that we will then have a more objective view of the role of land in the economy. This is an obvious truth that the land on the earth is unique, not like land on any other known planet. More than that, land on the earth is the origin and sustainer of life.

Due to its unique conditions, the earth is not like any other planet in the solar system for its size, its distance from the Sun and for the orbit that it is rotating. All these conditions created the right gravity, not too intense or too weak, to support an atmosphere that can sustain life on the earth. All necessary requirements such as water and gases - carbon, oxygen, nitrogen, hydrogen, and phosphorus - are found on the earth. Over 70% of earth's surface is covered by water, most of which are in the great oceans. The earth's atmosphere consists of gases in balanced proportion to sustain life, and it is the place of forests and plants, which are responsible for the production of oxygen.

The earth is formed from many layers. Its core is about 7,100 km wide. The 2,250 km of the outmost of the core is liquid but the inner core itself is solid. The earth's mantle is 2,900 km and it is situated above the core. The next layer is the earth's crust. The earth's magnetic field is in its core. The earth's crust consists of the earth's plates. Both the earth's magnetic poles and its plate tectonics are constantly on the move. The magnetic field is responsible for deflecting harmful particles and the movement and collision of the plate tectonics are causing a shifting of the continents and the formation of mountains, volcanoes, and earthquakes.

The earth orbits the Sun within the Goldilocks zone. This is the zone where it has the required temperature for liquid water. More important is the distance of the earth from the Sun, which is a perfect distance for life. The earth rotates on its own axis and orbits the Sun. The earth rotation on its own axis takes 23.934 hours and going around the Sun it takes the earth 365.26 days. In connection with the ecliptic plane, the earth's axis of rotation is tilted. This is the reason for the Northern and Southern Hemisphere to get closer or away from the Sun in the course of the year causing the seasons to change.

Among many other necessary elements for life on the earth we have Oxygen (47%), Silicon (27%), Aluminum (8%), Iron (5%), Calcium (4%) and Sodium, Potassium and Magnesium at lower percentage. The last three elements each make up 2% of rocks in earth's crust. The earth's atmosphere consists of about 78% Nitrogen, 21% Oxygen and a touch of many other gases such as Argon, Carbon Dioxide and water. The atmosphere spreads as far as 600 km from the earth's surface. It is also made of several layers. The closest layer to the earth is the troposphere, which stretches to 12 km, and 50 km above it is the stratosphere. The troposphere is constantly changing and causing the weather to change. Above the stratosphere is the mesosphere, which ranges up to 80 km and above mesosphere is the thermosphere that extends up to 600 km. The ozone layer is located in the stratosphere atmospheric region of the earth. It covers 15 to 30 kms atmosphere above the earth's surface.

The ozone layer has played a critical role in the development of life on earth. Most of the ozone layer (about ninety per cent) is its lower part. It is about twenty to twenty five kilometers above sea level. The ozone layer is a result of chemical reaction between sunlight heat with NO_x (nitrogen oxides) and VOC (volatile organic compounds). There is life on earth because of the Sun. Without the Sun, the earth's temperature would plummet so low that everything would freeze solid. The Sun's energy reaches the earth through the medium of ultraviolet rays, which have different wavelengths. The UVA rays have a wavelength of between 320 and 400 nm and cause no harm to the health. The UVB wavelength is between 280 and 400 nm, which are harmful to health, but the ozone layer absorb most of these rays. The ultraviolet rays that cause most harm are UVC with the wavelength of between 200 and 280 nm.

The Sun not only emits heat but also radiation. If the deleterious radiation reaches the earth, life will be destroyed. The ozone layer is the protection layer that filters out the eco-friendly rays from harmful rays. Destruction of this protective shield or even partial depletion of it unblocks the harmful ultraviolet radiation researching the earth causing skin burns, DNA molecules destruction, cancer, and the greenhouse effects. The discovery of a hole in the ozone layer by Jonathan Shanklin in 1985 gave rise to an ever more important debate about the anthropogenic impacts on the earth. The discovery of the ozone holes was a historic turning point in the realization of the fragility of life on the earth as we know it. More important is the fact that the

ozone holes are direct results of human activities. The holes are caused due to the emission of chlorofluorocarbons (CFCs) into the atmosphere. Chlorine atoms (C1) damage the ozone. The CFCs gases are found in agricultural spraying, in aerosol sprays, in cleaning products and refrigerators. These gases last for a long time in the atmosphere.

Even more crucial is the symbiotic relationship between the earth's ecosystems with ozone layer. The depletion of the ozone layer destroys the balance of the ecosystems, causing the greenhouse effect. If the Sun's ultraviolet (UV) radiation is not filtered, life on the earth ceases to exist. The ozone layer is a defensive sponge that absorbs ultraviolet-B (UV-B) radiation and prevents the lethal ultraviolet rays from reaching the earth's surface. The atmospheric zone is vital for the earth to be habitable and stay in good working order. It regulates the temperature on the surface of the earth by absorbing the excess heat, which is generated from the solar ultraviolet radiation and from infrared radiation from the earth's surface.

The earth is habitable because of the right balance of gases, its magnetic field, and its eco-friendly environment. The earth has got all necessary conditions for life, but these conditions did not exist in the early stages of formation of the earth. Life on earth, by no means, was as it is in these present times. The earth has always been subject to many drastic changes, experiencing extreme cycles of cold and hot weather, catastrophic attacks from space, earthquakes and volcanic eruptions. When we study the earth in all its details, it is then we understand the indivisibility of land and the earth. It is not far short of truth to say that life is inextricably linked with the earth's atmosphere. Life is not independent from the earth's oceans, tectonic plates, the magnetic field, the rocks, the mountains, rivers, lakes, plants, forests, insects, and the rest of living species. The magical fusions of all these elements help maintain balance in the natural environment.

The key to understanding the role of land in the economy is to understand the link between land and all the elements cited above. Treating land as a separate factor as something that exists independently and has nothing to do with the rest of the earth's conditions is patently false. One of the biggest pitfalls in economics analysis is this oversimplification of land and its separation from the rest of the earth's constituent parts. The land is far more than a factor of production. Unless we adopt a holistic approach in our study of land, we would not find the actual place of land in the grand scheme of life and the economy.

The targeted objective of this article is not the cosmic and geologic timescale. For such natural changes, it takes many millions and billions of years to take place. We cannot control such changes. Drastic natural changes will take their own natural course. Here we are concerned with the anthropomorphic timeline i.e., the impact of human species on the environment. Most specifically, that is relegating land to a factor of production. Buried in this belief is a fatal error. That is the planet earth is being taken for granted and we have made ourselves the masters who can do with it whatever we desire.

All activities of animate or inanimate leave their mark on the land and environment. Many of our activities, for example, add to greenhouse gases. The emission of gases such as CO₂, CH₄, N₂O and others prevent the energy from the Sun from reaching the earth. The satellites' observation of the earth reveals the increasing atmospheric pollution, deforestation, melting of polar ice caps and the rise in sea level. These changes are attributed to human activities. Any disruption of the greenhouse effect from its happy medium can trigger extreme weather events that potentially could get out of human control. With no greenhouse effect, the earth would be too cold or too hot. Either way, the earth would be inhabitable.

Thus, land is economically viable while the earth is viable. That is as long as the ozone layer prevents the harmful ultraviolet rays from reaching the earth surface. In assessing costs of production in economics this link is uncounted. The contested question is about the cost of depletion of the ozone layer. In the late 1970s the size of the hole in the ozone layer was one million km², by the late 1990s this size increased to 22 million km² (Rastogi, 1997). In September 2000 it went to 28.4 million km². The fact is we simply cannot put a value on depletion of ozone layer or the cost of non-biodegradable waste. A reality that is hard to dispute. Economic calculations lose sight of this vital factor. In the event of no ozone layer, there would be no life and life is irreplaceable and there is not a price for life.

6. The enigma of progress and survival

The industrial revolution was a historical landmark. Industrialization, whilst part progressive, has also led to some undesirable outcomes. Air and water pollution are only two of such adverse effects. The air is polluted by smog and waterways, rivers and sea from residential and industrial sewage, oil spills and plastic. Referring to a few examples should be sufficient to back up this claim. These examples are not, however, exhaustive but are plain enough to show the scale of the calamity in hand. According to Aizarani (2023), in 1970s there were about 20 large oil spills every year. Just in one decade, 2010 – 2019, 1.8 large oil spills from tanker on average per year was reported. As a result of four oil spills in 2022, about 700 metric tons of oil spilled into coastal waters. The largest oil spill reported was in the Gulf of Mexico. It was from the BP's Deepwater Horizon/Macondo that was reported on 20 April 2010. In the course of 95 days, about 62,000 barrels of oil and gas were spilled into the Gulf. The cost of the spill is estimated to be about \$80 billion (Brooks and Dunn 2020).

The hazardous industrial waste is estimated to be about 338 million tons each year (Burawoy *et al.* 2000). If we take 2020 as the base year to demonstrate the amount of sewage sludge being produced, we can have a firmer understanding of the scale of the problem. For the year 2020 it was estimated to be about 7 million cubic meters of sewage sludge (Doh *et al.* 2018). The inescapable fact of life is, there is not any human activity that is not directly or indirectly connected with the planet earth. Once we are catapulted to the land, we have no other way but to conform and submit to the primacy of the laws of the land in its broadest sense. That is to the laws of nature. Otherwise, we are condemned to self-annihilation. Giving in and coming to terms with such laws is not conceding defeat but living in harmony with the ground rules of the earth.

Dropping land down to a simple factor of production has its serious adverse implications. The depletion of the ozone layer, the depletion of marine life, the acidification of the ocean waters, deforestation, desertification and the extinction of many species, global warming, pollution, greenhouse effect, dumping of hazardous wastes, expansion of hypoxic zones, melting of ice caps and many other deleterious effects are for the most part are due to perceiving land as a basic factor of production. To make matters worse, over time, the conventional economics has reduced land to a subsidiary of other factors such as capital and entrepreneurship. Destruction of ecosystems and biodiversity are closely linked to land. The critical point, which is overlooked in the teaching of conventional economics, is that the place of land as the only source of life is not duly taken into consideration.

The expansion of ocean dead zones (hypoxic zone) is as a consequence of emissions of greenhouse gasses. These zones appear in the oceans when oxygen concentration gets below two milligrams per liter. Four hundred zones have been reported so far. Collectively, these zones cover an area of 250,000 km². Since 1950, the hypoxic zones have increased by four-fold (Pinet, 2021). According to Friend (2022), 75% of terrestrial and 66% of marine environments are 'severely altered' as a direct result of human activities. From the onset of the industrial revolution to the present day, ocean acidification has increased by about 30%. The situation is more serious if we add other sources of contamination of the earth and the environment. Let us just take plastic contamination as an example. It is estimated that about 8 million plastics are dropped into the oceans each year (Uhl and Anderson 2020). Land is a complex network of ecosystems, atmosphere, water, gases, nutrition, plants, animals, elements, insects, and so on. There is a balance between internal surface and the external anatomic structure of the earth. Land on the earth is a by-product of this delicate balance of the earth's anatomic structure with the rest of the universe.

Water is critical for life, and it cannot be parted from land. It is argued that since 1900, fifty to seventy percent of the earth's wetlands have been disappearing (Gates, 2023). Only in the course of one year, in 2017, 15.8 million hectares of tropical forest were destroyed (Brinkmann 2023). Something like 75% of the global landmass has already been degraded, and it is also estimated that about 4.18 million is degraded each year. The size of desertification globally is estimated to be about 20 to 32 million km². Each year about 75 thousand km² is added to this landmass (Leonard, 2013). Biodiversity is fundamental to sustaining the right balance in the natural ecosystem. Indeed, there have been several mass extinctions in the past but the chief

cause of current loss of biodiversity, deforestation, pollution, depletion of ozone layer, desertification and ocean acidification are as a result of anthropogenic activities. From the beginning of industrial revolution to the present time, it is estimated that 128 different birds and 95 different mammals have become extinct. The rate of extinction of species is now about 1,000 to 10,000 more than what is the natural rate (Linzey, 2012).

7. Exonerated forsaken voices

In most religious scriptures there are two opposing views about land. On the one hand, land belongs to God (Timm, 1994), and on the other hand, private ownership of land is held sacred. The most outspoken school of thought on the question of land, in all likelihood, is the anarchist school. One of their grand tenets is about ownership of land. From this perspective, owning land is unnatural. Proudhon (1970) has summed up the anarchists' core tenet about land by saying that property is theft.

Two other distinguished critics who considered land to be more than a factor of production were Soddy (1943) and Polanyi (1957). Soddy (1943, p. 6) argued that we are at the mercy of nature and insisted that 'sunshine' is the source of real wealth. The earth would not be the earth as we know it without the sunshine. The real wealth, he maintained, is 'the humanly useful forms of matter and energy'. Polanyi (1957, p. 187), the other critic, stressed that the 'economic function' of land is only 'one of the many vital functions of land ... [land] ... invests man's life with stability, it is the site of his habitation: it is a condition of his physical safety; it is the landscape and seasons'.

Land as the source of life is a basic fact. But simple truths are often more than they appear. The same holds for land. For example, how stones fall was passed over unnoticed for millennia. Newton unveiled this simple truth (Newton, 1962, pp. 546-47). Along with the same theme, there is no more vital reality than planet earth for living species. These facts are comparable for being plain as the basic fact of the unity of land and the earth. But this necessary condition has escaped from the view of the prevailing economics. We shall critically reflect here on the pretexts in which such mundane facts can all too often be un-noted.

Ideas, right or wrong, can be held devotedly and can be defended fervently. Keynes (1967, p. 383) reminded us about the power of ideas: We were told that ideas 'both when they are right and when they are wrong are more powerful than is commonly understood'. In addition, humans die for or kill over right or wrong ideas (Karimzadi, 2023). Inquiring deeper into what is commonly accepted can also be a risky business. Two examples from the interim period to the modern age suffice to clarify our point. Empedocles, a fifth century Greek philosopher and poet, divided the most basic elements of matter into earth, water, air, and fire (Kingsley, 1994, p. 236). It was believed that all matters in the universe are made up of these basic particles. Aristotle, (2018, p. xvi) embraced the idea and for about two millennia the learned and uninformed alike defended this assertion as a hard fact.

In the Aristotelian grand scheme, there are three worlds, the world of humans, the earth and the heavenly bodies. Humans are the pinnacle of creation, and the earth is assumed to be fixed at the center of the universe. In this grand order of things, the terrestrial spheres are mutable and corruptible, and each element in the terrestrial spheres is directed by a natural motion. The earth and water would fall, and air and fire would rise. The celestial bodies, quite the reverse, are made of a different substance. They are made of a fifth element, which is pure and eternal. These bodies can be explained by mathematical laws because they are perfect bodies. In this order of things, rest is the natural course, but planets are moving constantly. Nothing can move unless it is nudged by a foreign body to move. The motion, however, will only be short-lived. The objects that are subjected to an external force will soon find their natural place and will soon be brought to their natural resting position. In this worldview vacuum does not exist. The uninformed, the indifferent, and the laid-back masses all subscribe to this picture of the world since it corresponds with empirical realities.

Proving a fact to those who are ignorant of their own folly can be fatal. This is what happened to Giordano Bruno. The Roman Inquisition sentenced him to death for expressing that the universe is infinite, and the earth revolves around the Sun. On 19 February 1600, while Bruno

was stripped of his clothes, he was burnt alive at the stake in Rome. It is said that Nicolas Copernicus, out of fear of he might be facing the same fate, did not let his book, *On the Revolutions of the Heavenly Spheres*, to be printed in his lifetime (Sinclair, 2007, p. 235). Galileo Galilei followed the footsteps of Copernicus. His discoveries through a telescope led him to new insights that were contrary to the biblical teaching. He saw the Moon much like the earth imperfect, which contradicted the church's long held belief. For that, Galileo was tried in 1633 and kept in house arrest until his death.

Kepler in his book (1997) described his three laws of planetary motion with the aid of Tycho Brahe's extensive data that Tycho had gathered from his close observation of planetary motions. Kepler's attempt to decode the inner topography of the universe was attacked from different quarters. Putting on trial his mother, Katharina, accused of witchcraft in 1615 always reminded him of the danger of expressing a heretical view.

Another crowning scientific accomplishment, on a par with Newton's seminal work, was Darwin's book *On the Origins of Species* (1859). Most people initiated and uninitiated, before discovery of this basic fact believed in a uniformitarian world. In this world, humans are the masters of everything. Darwin challenged this worldview. Diversity of life was his first clue to cast doubt on the theistic belief of creation. With that in mind, Darwin questioned the antiquated view that all animals and plants were created in their full form. Darwin was mindful of his discovery. However, there was one piece missing in the jigsaw before he reached his final conclusion. The missing element was the question of 'how selection could be applied to organisms living in the state of nature' (Darwin, 1989).

Darwin took part in a scientific expedition in H.M.S. Beagle, sailing around the world for about five years. The Beagle voyage, Darwin wrote, 'has been by far the most important event in my life' (Darwin, 1987, p. xi). During his Beagle findings, Darwin became convinced about the inexorable law of natural selection. That is the evolution of species and their descendance from a common ancestor. Darwin (1989, p. 144) reported that in species struggle for survival 'favorable variations would tend to be preserved, unfavorable ones to be destroyed. The result of this would be the formation of new species.

According to this theory, organisms evolve and adapt to the changing environments. Species that are suited to the new conditions survive and pass their genes to their offspring and those species that lack such characteristics would perish over time. In this way, Darwin (1989) discovered that all living species had a common origin. Darwin (1989) had no intention to publish his book in the year he did. But on 18 June 1858, he received an essay from Malay by A. R. Wallace (1823-1913). In the essay, Wallace outlined a similar theory of evolution by means of natural selection that Darwin had been entertaining for a while. Eventually, on 1 July 1858, Darwin presented his and Wallace's findings in a joint paper before the Linnaean Society.

Seven months after the publication of the *Origin of Species*, a debate took place between Thomas H. Huxley and Bishop Samuel Wilberforce in Oxford. The debate was held at the Oxford University Museum on 30 June 1860. The debate was reported by the press on 7 July 1860. It was reported that the bishop mocked Huxley and scornfully asked him 'would' he 'rather have had an ape for' his 'grandfather or grandmother?' To which Huxley replied that he 'would rather have had apes on both sides for my ancestors than human beings' who are afraid of truth (Reading Mercury, 1860).

It may be well worthwhile, before concluding this article, to say a few words about necessary prerequisites that acted as the key catalysts that laid the groundwork for the breakaway from an absolutist and the theist world. At the heart of this profound shift was the idea that each individual has got the capacity to reason, to learn and follow an upright moral path. That is the destiny of each individual is not sealed and predetermined. Given that people are free to utilize their capacity to reason, they do good and well. Implanted in this outlook is the rejection of the presumption that the universe has a goal. Discarding the belief that the world has been created to serve a purpose. In other words, sand and dust have no goal. Another factor that was instrumental in this radical departure was Cartesian Skepticism. Descartes (1988) in the search of 'true and certain knowledge' contended that whatever he knew up to that point came through his senses. But his senses deceived him. So, Descartes (1988, p. 96) concluded that 'it is prudent never to trust entirely those who have once deceived us'. The central question of inquiry was also

changed. For Aristotle the question was why rocks do fall whereas for Galileo and Newton it was how they do fall.

Modern science brought both worlds, the perfect and imperfect worlds, to be under the spell of the same natural laws. The earth lost its status as the center of the universe and humans as the master of other species. Nature became the book from which we acquire our knowledge. Bacon (1960, p. 39) wrote: 'Man, being the servant and interpreter of Nature, can do and understand so much and so much only as he has observed in fact or in thought of the course of nature. Beyond this he neither knows anything nor can do anything'.

Galileo maintained that the language in which the book of nature is written is the language of mathematics (Marshall, 2015, p. 172). Because real knowledge is about 'the measure of quantity, in which no terms exist for good or bad, kind or cruel' (Gillispie, 1960, p. 43). Newton in his first rule of the rules of reasoning points out that 'nature is pleased with simplicity' (Newton, 1962, p. 398).

8. Conclusion

When we glance back to the division of factors of production into land, labor, capital, and entrepreneurship with a keen eye, we find it to be untenable. The division is inconclusive and lacks scientific rigor. Yet, it is subscribed as a truism. Economists, by and large, have paid no heed to this erroneous presupposition. The idea is farfetched, and the taxonomy at its best goes no further than the bounds of pseudoscience. In this article, we have tried to show that the role of land in economics has not been fully grasped. Indeed, the land is detached from the earth. In doing so, it has been reduced to a basic factor of production that has a price that is determined by market forces of supply and demand.

This view of land is misguided and unfounded. Land and the earth with all its aspects are one integral whole. From this perspective, land is more than a factor of production. Everything that holds for the earth, the same will hold for land. Thus, the land is as dynamic as the earth, and as indispensable as the earth. Land just like the earth is the soil, the sand, the stone, the water, the ocean, the gases, the minerals, plants, insects, the atmosphere, and the life. Land exists on other planets but the land on the earth is not the same as land, for example in Mars. In this sense, land is inseparable from the earth. Much of the adverse anthropogenic impacts on the environment are due to this arbitrary separation of land from the earth. Land in its very broad sense is an end in itself just like the earth. Land is the most vital precondition for life. It is the protector and the provider for all species. The idea is simple, as simple as the stones falling down the ground. The fact that land cannot be detached from the earth is not a mystery. It is too obvious. However, it is one of those mundane facts that can be ignored effortlessly.

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