CHAPTER 1

Nature, Resource and Landscape:
Evolution, Transformation and Reconstruction
1.1 The Idea of Nature

Traditionally perceived to be separate entities, ‘nature’ and ‘society’ are generally believed to have distinct ontologies, which can be studied by physical and social sciences respectively. For example, water as an element of nature is observed in its various forms such as rain, snow, river, lake, sea, and ocean and can be described or measured in terms of its quantity, quality, composition, flows, etc. It has become a common sense to think in terms of observing and understanding nature and also learning from it. Similarly, communities are studied in terms of their social attributes such as patterns of interaction, social organisation, language and culture. A close observation, however, reveals that the numerous keywords that are associated with the concept of nature are frequently used in different situations for different reasons. Attempts to define ‘nature’ as a concept thus raises the question as to whether ‘nature’ can be understood at all as an entity that is separate from ‘society’.

Nature thus can refer to physical processes universal to all living creatures – the cycle of birth, life and death as well as bodily functions. It can also be understood as external to, often in opposition to humankind. Distinctions are made between physical landscapes that are ‘wild’ or uninhabited and those that have been modified through forestation, clearing, land levelling, etc. In this case nature is seen without the presence of human agency that otherwise alters natural processes and phenomena (Castree, 2014). Thus nature could be: a) intrinsic when it refers to the essence of something, e.g. human nature; b) external when speaking of the non-human world that consists of living and non-living things; c) universal with reference to the entire material world; and d) the force that drives the world and life termed ‘inherent force’ (Williams, 1985) or ‘super-ordinate nature’ (Castree, 2014).

For some researchers, particularly from human geography and critical cultural studies, the diversity associated with nature has been a source of considerable interest. Several of them – Collingwood (1945), Glacken (1967), Williams (1980), Soper (1995), Habgood (2002), and Castree (2005) among others – have attempted to track and classify the numerous features associated with the above diversity that lends a complex meaning to
nature as a term (Braun, 2009). The significance of these endeavours for this research lies in the consequent unravelling of the changing social force that nature and its variations in meaning exert. Relationships between society and nature have been perceived over time in various ways linking to the processes that have evolved on the ground. For example Bennett, Grossberg, & Morris,(2005) highlighted on ‘social power’ to emphasise the relation between conceptualisation and related practices over time. What is therefore of interest is how and when the ideas of nature were created, through what processes.

Ideas of nature include beliefs about nature, the ontology of nature, as well as the social construction of knowledge about (epistemology of) nature. Over time, different ideas have developed regarding what constitutes nature and how natural elements such as rocks, plants, animals and water bodies have emerged. Invariably, understanding of nature has come from the identification of patterns that occur over space and time. This has ranged from patterns related to the forms of nature such as differentiation seen in colouration between male and female birds to distinctive types of vegetation at different altitudes. The realisation that rain occurs when air is cooled, built into an understanding of a cyclical process of evaporation and condensation that commonly came to be known as the water cycle. Similar ideas have emerged regarding a natural cycle of life where there is birth, maturation and death with different organisms going through phases, each with their own duration. While insects may have a relatively short cycle of life lasting one or two weeks, others have life cycles lasting for two hundred years or more as in the case of sea urchins or pine trees. The belief that each entity has its own ‘final cause’ is believed to have originated from the 4th century BCE with Aristotle’s theory of causality. Such understanding was accompanied by a moral philosophy that advocated the intrinsic value of nature where nature is valued for its own sake rather than for its utility. Nature as the essence or essential quality of things expressed the earliest meaning associated with nature as traced (Williams, 1985) to the 13th century.

A close look at the layers associated with the understanding of ‘nature’ reveals the existence of a conceptual dualism traced to the Judaeo-Christian tradition and Kant (Smith, 1984). Although the former tradition projected the idea of domination of nature, it simultaneously stressed on the responsibility of the humans to make nature perfect by
exploiting its potential to the fullest (Barry, 2007). Kant distinguished between internal nature i.e. human beings and their inborn characteristics, and external nature consisting of the social and physical environment in which human beings lived. Thus nature (Smith, 1984) was simultaneously universal, since humans are considered one among many species in the totality of nature, and external since it refers to processes and objects outside human society. This conceptual dualism gave rise to a number of binaries or dichotomies, namely, culture and nature, animal and human, wilderness and cultivated lands, urban and rural, etc. that have been unquestioningly adopted and applied in varied contexts (Castree, 2014). They have been internalised in everyday life having significant implications for the development of collective understandings on human nature, bodies and the environment.

Although posited as opposites, the dichotomous terms actually have multiple meanings that incorporate contradictions in what they signify. Raymond Williams’ analysis of ‘urban’ and ‘rural’ is pertinent here. The positive aspects of country with a ‘natural way of life’ and the city with a centre of ‘learning, communication and light’ are juxtaposed with a negative understanding of the country being a place of ‘backwardness, ignorance, limitation’ and the city being a ‘place of noise, worldliness and ambition’ (Williams, 1973/75). Despite these contradictions the urban-rural divide was seen to represent the opposition of culture and nature. All these point to the significance of the period in which the association between ‘nature’ and ‘countryside’ emerged. Despite active cultivation, livestock breeding, planting of hedgerows and, in places, even desertification, Williams found that the ‘unspoiled’ countryside got increasingly associated with purity, goodness and innocence from the 18th century onwards (Williams, 1985). The countryside was given the important role of providing redemption and renewal for the artificial, mechanical and corrupt city. The latter, being a human creation, could be cured of its ills only by learning from nature.

By the early 1800s ideas about the connection between population, resources and environment were getting linked to the ideas of Malthus. A strong advocate of empiricism, he used a system (Harvey, 1977) of arriving at deductions based on a combination of initial statements (hypotheses) and factual statements (empirical truths).
This promoted the idea that external reality can be recorded and observed to reveal the truth (Harvey, 1977). The empirical method of enquiry and population-resource thesis of Malthus were adopted and taken forward in different ways by subsequent thinkers such as David Ricardo and Charles Darwin. Building on the understanding of scarcity due to the growing gap between geometrically increasing populations and available resources, the reality that Darwin chose to highlight was that of struggle and selection in nature. This promoted the idea that nature was competitive, ruthless and violent. The sense of nature as the material world emerged decisively at this time when it became necessary to understand nature’s laws by making it an object of observation.

With the idea of natural selection, variations in nature became competing elements in which forms most suited to the conditions at that time would survive and succeed. The emphasis changed from the influence of environment on organisms to that of forms of adaptation to nature. Thus variation in colours of fruits, of plumage, and of the shape of birds’ beaks was seen as adaptations to environmental conditions. Sexual selection in which the male dominated the female species was seen to be another way in which nature ensured the propagation of the species. Human beings were now seen as one of many other species on the earth who were subject to natural laws. The theories of natural selection and evolution thus translated into a belief in Social Darwinism where people evolve from ‘primitive’ agrarian societies to ‘modern’ urban ones. Thus discourse in the nineteenth century was dominated by environmental determinism with its belief in a four-stage evolution of humanity – savage, barbarism, urban and the state (Galois, 1977). Survival of the fittest and struggle for existence laws were further extended to justify laissez faire politics and economics (Stoddart, 1966) and celebration of the pioneer spirit that facilitated the takeover of frontier areas in the Americas. Inequality and the superiority of certain races was after all a ‘natural’ phenomenon. The focus on competition as a natural process deflected attention away from the way in which nature was exploited and landscapes were transformed.

The shift from feudalism to industrial capitalism via mercantile capitalism through the growth of trade, birth of trading towns, and later manufacturing towns and industrialisation of the countryside gradually were reflected in conceptualising nature
more as a binary system. As space got differentiated to facilitate various functions such as production of food, manufacturing, administration, exchange and control over territory, strategic concentrations of population took place and urban centres evolved. While urban and rural functioned as two parts of an economic system, the city was gradually perceived as being entirely a product of human culture. Positivist ‘scientific method’ and rigorous scientific empiricism had its roots in this period that over time led to the discourse on the dichotomy of nature (Harvey, 1996).

From an understanding of causality that was inbuilt within each being, it was gradually understood that causal relations and patterns also exist in the way different organisms and phenomena interact with each other. Inquiries into the interaction between different elements led to theories about the consequences of these processes. For example, observation of the gradual shaping of rocks and stones by the flow of water in streams led to ideas about how valleys and plains have been formed (Knight, 1818/2011). Such investigations led to the creation of the science of geology, first associated with Horace Benedict de Saussure, a Swiss physicist and explorer who developed the idea that the Alpine valleys had been cut by gushes of water. Consideration of interaction between a few elements in nature extended to observation of interactions between a wider number to include interactions between plants, animals and the physical environment. This laid the foundation for the perception of nature being an ordered system with complex interactions between living – the ‘biological community’ – and non-living elements (Worster, 1982). This network of interactions subsequently came to be known as the ecosystem.

Within ecosystems, interactions are found to be shaped by the establishment of territories and boundaries in such a manner that conflict and confusion are reduced. Building on work done by naturalists such as Thoreau (1906) who studied the interrelationships between plants, animals and their environment, analogies were drawn between territoriality of animals and plants to explain the tendency for human beings to define and defend their territory. This was seen as a means of regulating access to the resources in that area, thereby maintaining a balance in the ecosystem. At the same time it was

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1The term ecosystem was coined as late as 1935 by Arthur Tansley, a British ecologist (Worster, 1982).
realised that ecosystems do not exist in isolation. They are seen to have interlinkages with and dependence on each other. Varied patterns of distribution of natural phenomena emerge from these relationships in and between ecosystems in different regions from tropical islands, to Eurasian steppes, and Siberian tundra.

Alexander Von Humboldt was one of the earliest to publish his descriptions and comparisons of the spatial arrangement and distribution of varied natural phenomena (Humboldt, 1850) based on his extensive travels through Europe, the Americas and Russia. Detailed measurement of weather, climate and seasonal patterns in different regions were used to correlate and compare variations in different ecosystems. While there was acknowledgement of the mutual impact of society and environment in the process of interaction, it was also held that the greater power lay within the forces of nature.Instances of violence in nature, slavery, poverty and misery were held to be random anomalies. Humboldt for example documented instances such as that of a swimming horse being attacked by electric eels (Worster, 1982) but saw this as a break in the harmony of nature. The slavery he saw in the colonies of America was an instance of inhuman behaviour that was an incongruity in the unity of humankind.

The sum total of the above observations about various places, processes and peoples, started raising questions about earlier beliefs that led to realisation that nature could be better understood through systematic investigation. The mystification of nature, that Humboldt called the ‘myth of imponderable nature’ (Humboldt, 1850), was effectively challenged. Additionally, direct contact with the innumerable variations in nature generated doubts about the belief in the independent destiny of each creation resulting from an intrinsic vital force. It was realised that there was an extremely complex interplay between different elements in nature. The interdependence, balance and patterns found in nature led to a perception of nature as a harmonious unified whole in which the unity of humanity was included. Just as human beings constitute a whole that is more than the sum of various body parts, regional landscapes were also seen to represent parts of a unified whole. This perspective was actively promoted by several key thinkers and scientists during the 18th century such as Rousseau, Hegel, Humboldt and Ritter who saw the earth as an organism in itself. The co-adaptations of the woodpecker and mistletoe,
the suitably adapted structures of beetles, parasites and plumed seeds that could be carried by the wind were described by Darwin as examples of the organisation of the organic world – the complex and “exquisite” ‘mutual relations of all organic beings to each other and to the physical conditions of life’ (Darwin, 1859/1997, p. 81). Since the 17th century, the organisation of all living organisms on the earth as part of an interacting whole, called ‘economy of nature’ (Worster, 1982), formed the basis for ecology as the study of interrelationships between organisms and their environment. The term ‘ecology’ was introduced in 1869 by Haeckel and it was only in 1910 that the term ‘human ecology’ was used to refer to the complex web of relationships between humans and the environment.

Subsequently, the analogy of organism was extended and used to explain geographical units such as regions and states. Harmony and interdependence were seen as hallmarks of these entities with each having constituent parts that worked together in a functional unity. The impact of evolutionary biology was seen in the explanation of growth of regions and landscapes too. Thus regions were seen to be born, grow, mature and in this process landscapes were also conceived to emerge through the reciprocal relationship between the earth and people over extended periods of time. Time became a key factor in explaining variations in landforms. Understanding of life cycles of organisms was used to also explain the evolution of landforms. This was the basis for Darwin’s idea that coral atolls evolved through the slow transformation of shallow reefs growing directly from the shoreline (fringing reefs) into barrier reefs that get disconnected from the shoreline and ultimately into ring-shaped coral reefs called atolls (Stoddart, 1966). The concept of ageing through phases in which incremental changes occur was applied simultaneously in a range of fields of study such as plant ecology, anthropology and geography.

In this light, conflicts between states and nations could be seen as struggles for territory in which the strongest would naturally survive. This idea was in fact promoted by Friedrich Ratzel, a German geographer and ethnographer, who formulated laws that governed the growth of states (Stoddart, 1966). It was for some time forgotten that Darwin had begun with the occurrence of chance variations that he was unable to explain. Ignoring this bewildering and irresolvable issue, focus shifted instead to descent and
natural selection that could be empirically verified. In this way the course of evolution was privileged rather than the way in which evolution came about, thereby encouraging deterministic interpretations of all sorts of phenomena from evolution to species to that of landforms, distribution of economic activities, regions, and states (Stoddart, 1966). Changes and transformations taking place were seen as the progress of an evolving civilisation. Much of the explorations and empirical studies undertaken in the 18th and 19th centuries sought to validate these deterministic accounts. Environmental determinism could not however explain the variation in choices made regarding the use of environmental resources, at times similar, at times dissimilar, by different people for different purposes. Regions with similarities in physical features and natural resource distribution were found to have different economies and cultures. Such variation in ways of living based on human-nature interaction was emphasized by scholars such as Paul Vidal de la Blache, a French geographer of the 19th century, based on his regional studies in France and other countries. Ratzel’s 1898 comparison of the Vosage mountain region of France and Scharzwald in Germany supported this thesis.

Challenging the notion that fixed environmental conditions determined human actions, Comte de Buffon (Buffon, 1785) had already put forward the theory that removal of forests and drainage of marshes could lead to climatic changes by raising temperatures. Innovations, creativity, and the development of technology suggested that while nature may set certain limits, the opportunities provided by the physical environment are responded to in numerous ways. Interactions between communities through migration and trade facilitated exchange of ideas, technology and even natural resources that fostered creativity and innovation. Such exchange conversely led to cultural unity over regions that are completely diverse in their natural endowments. Nature makes suggestions, and at times restricts possibilities but is never more than an advisor according to Blache (Martin & James, 1993). This philosophy of possibilism was used to explain the success of domesticated crops and higher crop yields in regions where they were introduced rather than in the regions from where they originated, as seen in the case of corn and wheat. The opportunities of nature vary from place to place and from time to time in terms of different historical periods. Thus perception of nature is inevitably
framed by practices that again reframe the perspectives (Haraway, 1991) by one’s interests, capacities and spatio-temporal location.

Another important question that came up was whether nature is only location specific or also relative in a temporal sense. Studies of the range of choices made were therefore seen as significant in understanding the range of interactions between society and nature and their implications on the making of the landscape. Landscape constituted the space that expresses the human and non-human interaction that is subject to perpetual change. Gradually, besides its physical form, it also included the material, cultural and conceptual aspects of nature-society interactions, reiterated by the activists of the possibilist movement, most notably Carl Sauer (Hinchcliffe, 2003). Combining ecology, anthropology and history, processes that led to changes in the landscape became significant areas of enquiry.

Over time, exchanges that took place inevitably led to the transformation of nature and environment, some gradual, some rapid and some even drastic. Transformations that occurred due to processes such as commercial agriculture, forestry, urbanisation and other projects of development became important. The following section looks into the broad historical changes and processes that have led to the transformations of nature, the subsequent evolution of landscapes of different types, depending on human-nature interaction and leading to diverse livelihood patterns. The history and future of nature was found to be figured by the consequences of human work. This led to the idea that nature is socially produced and constructed.

1.2 Production of Nature and Evolution of Landscape

The evolution of relationships between people and nature has taken place over several millennia. This evolution involved a dynamic interaction between changed dealings with the environment and related accumulation of knowledge regarding nature. Adaptation, creativity and innovation have been integral to the journey. As people organised themselves and their labour to meet the requirements of changed relationships, the variety
of choices made resulted in formation of different types of societies ranging from the horticultural to the industrial. Each of these societies included a diverse range of interactions that challenge one’s notion of typology (Richerson, Mulder, & Vila, 1996). Hunter-gatherer societies for example were known for their wide knowledge of biodiversity in addition to a thorough acquaintance with patterns of plant growth and animal behaviour. However the specific knowledge, technology and skill sets varied tremendously from Eskimo communities of the Arctic regions to the bushmen of Australia and the forest hunters of South America. In this diversity, in each setting one sees a reciprocal relationship between people and their habitat, leading to ongoing changes in the environment.

The earliest landscapes were characterised by hunter-gatherers, small bands of people who moved in search of food and shelter. These communities were relatively small in size, with little or no hierarchy and specialisation of labour. Society was then considerably fluid with no notions of territory or ownership. As people discovered areas with an abundance of food sources more sedentary ways of life developed. Water being a critical factor in the availability of animal and plant resources led to lakes, river banks and coastal areas becoming the site of such settlements. The Kwakiutl tribes of British Columbia who settled on the shores of waterways between Vancouver Island and the mainland were one such group that subsisted on hunting and fishing (Quimby, 1968). Regions with diverse resources often became a meeting point for a range of nomadic groups. This is seen in areas like North-East India (Ahmed & Biswas, 2004) where numerous migrating tribes came together from regions like Mon-Khmer, Burma, Tibet and China.

Agriculture began with an ability to distinguish between different plants followed by a deliberate selection, planting and harvesting of certain favoured species. One of the first changes in human-nature relationships occurred with the domestication of select plant species, an innovation associated with horticultural societies first seen in the 4th millennia BCE in the Middle East. This effort to increase food availability brought with it a change in the ecosystem of the forest as areas were cleared for the planting of selected varieties of plants and trees. The above process of domestication and organised production of
crops served food, medicinal and other non-food (fibres for string, netting, cloth, etc.) purposes, with shifting cultivation being one of the earliest systems developed. With the creative use of materials such as wood, bones and stones there was development of tools, as well as varied methods and systems of crop production (Spencer & Thomas, 1969). Fire was discovered to have been one of the means used by native peoples that encouraged the growth of useful plants and animals. It is now understood that abundant game and ‘virgin forest’ or ‘untouched wildernesses’ (Demeritt, 2001) were in fact products of decades if not centuries of native or settlers’ practices rather than the ‘Providential bounty of nature’.

Horticultural communities ranged from smaller clans based on kinship to larger settlements such as those of the Inca of Peru. Settlement patterns also changed with change in food production methods. From frequent shifts in location, shifting cultivation brought in the possibility of surplus and scope for communities to reside in one location for up to 25 years (Richerson, Mulder, and Vila, 1996). More permanent village settlements were possible with advances in methods of irrigation, as seen in Peru and Mexico. In upland regions there evolved various complex systems of terracing, irrigation, and manuring that produced a considerably modified terrain. Extensive clearing of forests for cultivation, discovery of tools to increase agricultural production finally led to the generation of surplus food. This primarily freed a considerable number of people from the necessity of participating or contributing directly to the cultivation process and also supported rapid increase in the population. These outcomes led to labour divisions associated with cultivation, settlement maintenance and defence. Labour freed from the production of food also gave impetus to the development of craft and more sophisticated tools and implements. Surplus food stocks also naturally brought in the possibility of exchange between different communities (Richerson, Mulder, & Vila, 1996).

Domestication of livestock constituted another innovation that ensured an adequate supply of food and other resources, particularly for communities living in regions with sparse vegetation. Depending on the availability of fodder and grazing land, communities became pure pastoralists, nomadic pastoralists or agro-pastoralists (Thapar, 2002). Although pastoral communities were known to also cultivate their own food, many
pastoralists became part of a system of exchange between themselves and settled cultivators. The most significant component of the system was the exchange of fodder from harvested crops for manure for the fields that was provided by the herds tended by the pastoralists. Pastoralists developed their own forms of social organisation as cattle breeding and herding required collective effort to fulfil the required tasks of caring for, managing and protecting the herds. Gradually, the search for new grazing grounds led to the development of pastoral circuits that enabled wider movements and exchanges between populations as the pastoralists also served as carriers of goods and information regarding the communities they met and interacted with (Thapar, 2002).

In all these, it is seen that evolution of culture and its diffusion have been a critical part of the production of nature and transformation of landscapes. Diverse ways of life suited to local conditions evolved among the thousands of communities spread in various regions. Each had a way of valuing the resources in their environment, customs, techniques and skills related to resource use, as also ways of transmitting ideas within and across communities through the development of language. Cultural patterns emerged from a complex interplay between the population, the physical-biotic environment, social organisation and technology (Spencer & Thomas, 1969). This complexity accounted for similarities between members of the same tribe with different ecological circumstances and differences between communities from similar environments as was seen in a study by Edgerton of East African tribes (Richerson, Mulder, and Vila, 1996). Variations and the extent of diffusion of cultures across regions were found to be influenced by the degree of isolation and interaction between communities. Climatic factors such as the drying up of rivers and sea level rise were found to have either pushed people to move and interact with others or into isolation as seen in the case of Tasmanian tribes. Movement of people that was seen primarily involuntary but at times, voluntary as communities felt the urge to explore new territory together created a diverse canvas of cultural divergence and convergence.

Modification of received ideas and innovative combinations gradually resulted in improvements and increasingly sophisticated adaptations across generations. Successful cultural forms led to stability and growth of certain communities. Regions where such
advances were made often attracted communities from other regions who were less successful. Concentration and stabilisation of successful cultural traditions led to the creation of regions that became the repositories and centres of diffusion of culture, known as cultural hearths (Spencer & Thomas, 1969). One of the most significant regions in this respect was Mesopotamia, the Tigris-Euphrates river valley region that became prominent in the third millennium BCE and continued to diffuse social organisation and technology into the surrounding regions for the next two to three thousand years. The relations between human beings and nature changed in the context of ‘production in general’, production for exchange and finally, as Neil Smith (1984) argues, to capitalist production. All of these ultimately led to the production of nature since production is a process by which the form of nature is altered. Basic needs could be met by direct consumption from nature or by using labour to produce consumable products. This involved production of ideas, conceptions and consciousness and the formation of social relations of production. Thus cultural expressions and practices were seen to change along with changes in interactions between society and nature.

Competition in trade escalated intensification of cultivation, enlargement of production facilities, and technological advancement to increase yields. There was a related rise in concentration of land ownership. This no doubt increased the scale and conditions of oppressive slavery. Subsequent developments were found to enhance enormous disparity in socio-economic levels within the population. In many regions the logic of accumulation is seen to have driven efforts to create village settlements, clear forests and promote settled agriculture. The scope of accumulation was enormously increased as surplus was generated through integration of animal husbandry and development of tools for ploughing, levelling and seeding in the basic cropping systems. Traditionally, diversified farming systems (FitzSimmons, 1986) and multiple livelihood options were developed to accommodate the irregular seasonal labour requirements in farming. Distinctive crop complexes developed in different regions accompanied by changes in the organisation of control over land, water, labour and technology. Discovery of mining

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2 Among the earliest crop complexes were the basic cropping systems that combined taro, yam, banana, and others in southeastern Asia; wheat, barley, and a series of minor seed crops in southwest Asia; and a primary base of squashes and bean series in Middle America. (Spencer & Thomas, 1969)
and metallurgy, textile and basket weaving influenced the development of sedentary crop systems, thereby freeing a section of the population for tasks of exploration, oration and literature. Some settlements evolved as centres of administration and culture as sedentary lifestyles encouraged establishment and defence of territory along with locations where non-agricultural commodities could be produced (Spencer & Thomas, 1969).

Evolution of central places and the ensuing process of urbanisation have thus been of critical importance in the redefinition of people-environment relationships and differentiation of landscapes into urban and rural spaces. Urban centres originated for varied reasons related to the nature and extent of specialisation of different economic activities (Carter, 1995). Apart from what may be seen as chance factors, evolution of settlements and central places or cities was influenced by population distribution, localised economic activity, and transport routes (Johnson, 1972). Locations that served as significant exchange points, meeting points of routes or where change in the mode of transport took place like the coast were typically favoured for the establishment of urban centres. The genesis of urban centres in pre-colonial India was linked to a number of functions that included tribute collection, administration, specialized craft production, gathering points for pilgrims, and exchange (Thapar, 2002). This led to wide diversity in the relationships between towns, cities and the surrounding countryside. Some urban centres developed concentrations of people with specialized skills, while others contained people who maintained links with villages or transited between the two locations. Thus economic linkages of production and exchange led to different patterns in the networks between villages, towns and cities with some forming hierarchical arrangements culminating in a central city.

Prior to 1492, the centres that achieved some prominence were those of long-distance trade by ship or caravan (Blaut, 1977). These centres went to form a world-wide network of interconnected nodes of fairly equal status. Initially, the relationship between agriculture and manufacturing had generated an integrated and harmonious relationship. Backward and forward linkages between urban and rural areas were mostly reciprocal and symbiotic. It may however be noted that the existence of a mutual relationship is not meant to convey an ideal state as various forms of exploitation, poverty and exclusion
existed within these relationships even in pre-colonial times. Until medieval times commodity production was relatively simple and city markets were entirely dependent on agricultural and mining activities in the countryside. At this time, in Europe, although the trenches, gates and walls of the medieval city gave the appearance of a clear separation between urbanity and nature, it was the city that occupied a peripheral position as landed property dominated city-countryside relations (Keil & Graham, 1998). However, with progressive urbanization there was a growing distancing from and control over nature. With each phase of urbanization people-nature relationships were restructured which in turn led to redefinition of town and countryside, centre and periphery.

The “discovery” of the Americas or New World in 1492 marked a turning point as unprecedented accumulation was used to dismantle feudalism in Europe and also gain control of Asian and African long-distance international trade. This in turn led to a world economy characterised by an intensified dialectic of development and underdevelopment. Rise of mass production processes and mass consumption within cities completely revolutionized people's relation with land (Worster, 1993) and led to new dynamics between city and hinterland. It was at this time that the opposition between culture and nature achieved prominence. Lefebvre (1996) argued that this dualism emerged from the emerging relations between town and country in which positing an opposition between culture and nature actually served to deflect attention from the relationship, thereby obscuring it from view. The unravelling of this relationship was compellingly seen in the mutual shaping of city and countryside with the evolution of commodity markets in grain, timber and meat as found in the context of Chicago and its vast hinterland (Cronon, 1991). The city, far from being opposed to nature, is seen to be integral to the production of nature. The statement ‘cities are built in nature, with nature, (and) through nature’ (Keil & Graham, 1998) is apt here.

With production for exchange, the production of nature takes place on an extended scale. Human beings not only produce the immediate nature of their existence, but produce the entire societal nature of their existence. They develop a complex differentiation in the relation with nature, a
societal nature differentiated according to sex and class, mental and manual activity, production and distribution activities, and so on (Smith, 1984, p. 44)

As the relations of exchange grew more complex the means of representing exchange values through money was created. Institutions were created to facilitate and regulate the process of exchange of commodities – the market and the state, private property and the family. In developed countries, from the period of early industrialisation in the 18th century, nature was appropriated at an unparalleled rate as extensive accumulation took place. This process attained new heights during the Fordist period of urbanization (Keil & Graham, 1998) in the 19th and 20th centuries and a new period emerged in which urban and rural areas were continuously remade through the production of second nature at a far more rapid pace.

In developing countries it was the establishment of colonialism that led to town-country relationships becoming one of exploitation as urban centres became conduits for extraction of raw materials from the hinterland. The specialised functions of pre-colonial urban centres were deprioritised and dismantled. Technological advancements contributed to the development of infrastructural facilities such as road and rail networks, improved port facilities and communication lines. The existing urban hierarchy underwent a change as select growth centres were connected to wider hinterlands where production for subsistence was replaced by commercial agriculture. The emergence of a few coastal cities as nodes in the colonial system contributed to the decline of several inland cities and towns along with their associated industries, pushing artisans and other specialized labour groups into the large cities. Cumulative growth and a rising spiral of urban development took place in large cities in the post-colonial period as already established infrastructure, availability of labour and capital attracted further investments and concentration of economic activities (Carter, 1995). These cities grew at the cost of their peripheries leading to polarised development with tremendous social, economic and political inequalities in the relationship between city and countryside.

The recognition that ‘urban’ and ‘rural’ actually represent a continuum within a single system gave rise to the concept of city-region in which the city and countryside were seen
as functionally related, and characterised by flows of goods, services and labour. The
existence of a transition zone or “peri-urban interface” immediately outside city
boundaries was first recognised in the 1930s (Mookherjee, 1963). The areas constituting
the urban fringe were however ignored and excluded from consideration when the rise of
agglomeration economies and mega-cities led to concerted efforts to decentralise and
diffuse growth over wider regions. With these changes in the wider political economy a
varied settlement and land-use pattern emerged in the regional landscape. Urban areas
were typically dense concentrations of people with non-agricultural livelihoods. Changes
in the concentration of livelihoods and social structure were seen as the city evolved in
complex ways having varied roles in the larger economy. In rural areas livelihoods were
closer to nature, largely based on agriculture and primary sector activities. Formation and
development of rural settlements were impacted by complex interactions between the
natural or physiographic conditions, technological advancement, and State interventions
(Guohua et al, 2013).

Settlement systems, units, social structure and culture evolved in complex and diverse
ways based on their level of integration in the larger economy. Urbanisation significantly
impacted rural areas and structuring of economic activities depending on infrastructure
development and their proximity to the city that governed their connectivity. Rural areas
close to the city were found to experience rapid transitions in built environments,
population and socio-cultural profile (Dupont, 2005). These relate to a combination of
city expansion and/or significant increase in non-agricultural economic activities and
urban demands for resources and labour. Such functional transitions have been seen in
city peripheries in many countries including India and China (Zhu, Zhang, Li, & Zhu,
2014). Per-urban areas were especially vulnerable to the above process often leading to
new forms of segregation, polarisation and socio-spatial fragmentation (Arabindoo,
2005).

The period from 1960s to 1980s saw the introduction of a range of planning measures
such as land use planning, zoning, and spatial developmental control (Deák & Schiffer,
2007) along with an emphasis on satellite town development. Metropolitan boundaries
were created that often appeared to be mere ‘cartographic whims’ (Arabindoo, 2005) that
nevertheless led to irreversible changes in the landscape. However, the influence of the industrial and business class that had emerged during the colonial period led to poor implementation of policies aiming at more even regional development. Hinterlands continued to stagnate and remained impoverished, and peri-urban spaces continued to be sites of unplanned growth and annexation by expanding urban centres. These were particularly acute in the peripheries of large cities or metropolises as global processes led to increasing concentrations of populations and economic activities in these cities (Dupont, 2005). This led to further fragmentation and aggravation of socio-spatial inequalities. (Banerjee-Guha, 2002).

From the 1980s many countries of the Global South saw the entry of forces of globalisation due to a combination of increasing debt burdens and weakened economies. Neo-liberal policies that favoured free markets pushed for reduced government intervention and structural adjustment policies that favoured liberalisation of the economy, privatisation and globalisation. These processes have reactivated the significance of city-regions for the location of key economic activities (Scott, Agnew, Soja, & Storper, 2001). City-regions in developing countries increasingly started functioning as essential spatial nodes of the global economy as they get connected within a global urban hierarchy strategically dominated by already established global cities (Hall, 2001). Thus mega-cities\(^3\) and their surrounding metropolitan regions have become the focus of increasing concentration of globalised economic activities and associated investments necessitating drastic restructuring of the city and vigorous expansion. The latter are oriented to serve the concentration of advanced services in high-level global cities related to command and control functions; financial and business services; leisure and business tourism; and cultural and creative industries.

A major consequence of the current restructuring processes has been the dramatic transformation of peri-urban landscapes from ‘zones of survival to zones of investment’ (Briggs & Mwamfupe, 2000). Apart from absorbing the urban poor displaced from the restructured city, peripheries of large metropolises have become sites of contradiction and conflict as they are reimagined to suit the needs of globalisation. The peri-urban areas of

\(^3\) The Census of India defines a mega-city as a city with a population of more than 5 million.
globalising cities have become the locale for establishment of specialized infrastructure aimed at enhancing information technology and transportation networks that includes the creation of special economic zones and privatized gated communities. Extensive changes in land use are accompanied by privatisation of natural resources, alteration and dilution of environmental regulations (Chattopadhyay, 2013). Emerging landscapes are marked by widening disparities, destruction and commodification of ecological resources and social relations as local populations are disconnected from their environment and lose their sources of livelihood.

A significant area of concern here has been the factors and processes that have reconstructed ownership, control and access to resources. While all ‘natural’ processes result in uneven distribution of ecological resources, human interventions are found at times to enhance the inequality of distribution in particular directions. Contemporary neoliberalisation of the urban has led to new geographies of power and injustice (Banerjee-Guha, 2009) marked by a powerful corporate centre and a de-valorised periphery. Structures of economic growth and development have got operationalised in the daily praxis of planning and governance, in resistance or opposition to these structures, in the nature of explanations presented and remedies prescribed. The following section provides an overview of empirical studies of the emerging perspectives on people-nature relationships, landscapes and their transformation based on several empirical observations.

1.3 Overview of Perspectives on Nature, Landscape and their Transformation

‘Nature’ in fact is a little like a spy’s attaché case. It contains lots of hidden compartments that you have to work hard and carefully to find; if you are not familiar with the luggage it could blow up in your face. (Smith N., 1996, pp. 42-3)

Ideas of nature and their representations are produced and disseminated by a range of ‘epistemic communities’ (Castree, 2014) with varying degrees of specialisation,
orientation, organisation and histories. These have fed into the body of collective understanding of how environments and bodies are produced at different levels, through multiple relations, by various actors and as effects of different forms of social power (Latour, 1993)(Robertson, Mash, Tickner, Bird, Curtis, & Putnam, 1996)(Castree, 2001). The actors include scientists, researchers who have struggled to comprehend nature’s essence through history, governments who control and regulate society-environment relations, businesses who have economic power to appropriate and use natural resources in various ways, media with their selective presentation of environmental issues/concerns, and the people who use the term nature and its collateral concepts in their every day interactions with environment and each other.

Ideas of nature and the relationship between nature and society have broadly been classified into dualist and non-dualist ontological domains (Braun, 2009), with the former being the most dominant till date. However, at any point in time there are a multitude of approaches and perspectives at work in people’s thinking as these are based on varied processes that act in tandem or opposition to each other. Interactions between processes result in the active and ongoing production of knowledge. The same is also enmeshed in relations of power because ‘knowledge of worldly, ―natural‖ objects is always political’ (Castree, 1995, p. 15).

The 1960s and 1970s have come to be known as a historical turning point during which resistance to various forms of domination came together while newer forms of domination evolved. Capitalism went through a crisis during this period that also marked the commencement of neoliberalism, aided by technological advancements in the sectors of communications, electronics, transport, space and biology –notably the Green Revolution technology. The economic, political and environmental consequences of several centuries of colonialism and more than a century of industrial development were exposed in this period by newer writings on uneven development and environmental crisis (Smith, 1979) (Smith, 1984) (Harvey, 1996). Emergence of neo-Malthusian environmentalism at this time positioned society against nature, advocating population control and the creation of conservation parks and reserves that would be protected against the ‘destructive’ tendencies of indigenous populations. India’s family planning
programme launched in 1965, subsequent efforts at forced sterilisation and China’s one-child policy introduced in 1980 are examples of the impact of such thinking in developing countries. Measures such as the use of ‘life boat ethics’ and deliberate ‘culling’ of populations advocated by this form of environmentalism, provoked a strong reaction to new types of racism and misanthropism (Braun, 2009).

Dualist notions were seriously contested for the first time through an upsurge in the engagement of various social science disciplines with issues related to ‘environment’, ‘nature’ and ‘ecology’ from the mid-1970s. David Harvey’s paper (1977) on population and resources put forward a strong argument regarding the ideological character of scientific methods. Despite claims of rigorous and ‘objective’ methods of scientific enquiry, deeper analysis reveals that the choice of values and the “import” of ideas prevailing in the extant state of society are apparent in the framework used to structure the enquiry and interpret the evidence gathered. Harvey (1977) compared the works of Malthus (1798/1998; 1968), Ricardo (1817/1951) and Marx (1964; 1967; 1971; 1972) to demonstrate the existence of an integral relation between the method of study adopted and the nature of result obtained with respect to the issue of population-resource relations. He showed how modelling techniques and systems theory, emerging from the tradition of logical positivism, were subsequently influential in research. These are seen (Harvey, 1977) to generate Malthusian or neo-Malthusian outcomes, that invariably translate into repressive or neo-colonial policies.

This argument was carried forward by a number of studies on the history of science in a field that has come to be known as the sociology of science or ‘science studies’. Sandbach (1980) located the use of Cost-Benefit Analysis (CBA) and Environmental Impact Assessment (EIA) in neo-classical economics with its assumption of ‘individual self-interest’ that were recognised as techniques reflecting and reinforcing capitalism and the neo-liberal order. By deconstructing the relationship between ideas of nature and material practice, the authority of scientific knowledge and its claims of ‘true knowledge’ about the world were challenged. These efforts demonstrated how preconceptions and theoretical paradigms that are socially constructed invariably bias and delimit the empirical observations made in scientific research.
…no practitioner of the high scientific arts would be caught dead acting on...the ideological doctrines of disembodied scientific objectivity enshrined in elementary textbooks and technoscience booster literature. (Haraway, 1991, p. 184)

Despite approaches demonstrated by Humboldt and Vidal de la Blache that sought to understand the deeper reality behind observed phenomena, empiricism was the most influential philosophy. Classical political economy in the tradition of Locke (1689/1988), Hume (1752), Adam Smith (1776), Ricardo (1817/1951) and Mill (1848) had adopted an instrumental view of nature. In keeping with the dominant idea of nature during the Enlightenment period, land, water, flora and fauna were viewed as resources available to humans for production. Freedom of the market was believed to be a necessary condition to increase productivity and maximise output. Thus maximum individual freedom of choice and minimal interference by state, aristocratic, royal or any other such institutions were to be facilitated. It was assumed that free and unchecked exploitation of natural resources would only take place if there was an abundance or excess supply (Locke, 1988). There was a fundamental belief that people would be prudent in their use of nature during conditions of scarcity and in this way strive for emancipation and self-realisation (Mill, 1848/1909). Amidst widening disparities and increasing numbers of people being denied their choice on nature, this line of thought continues to govern the policies of influential global institutions like the World Bank and International Monetary Fund (Harvey, 1996).

Establishment of a correlation between capitalism and nature-society dualism in the 1970s and 1980s provided the most effective challenge to dualist ontologies and epistemologies. The critique came from a set of Marxist geographers (Smith, 1984)(Harvey, 1996), as mentioned, who built on the efforts of German philosopher Alfred Schmidt of the Frankfurt School (Braun, 2009). In 1971, based on his doctoral thesis, Schmidt published the English translation of his work titled The Concept of Nature in Marx. It constituted the first attempt to put together Karl Marx’s writings on nature – essentially in Capital and Grundrisse (Schmidt, 1971) – that had not been put together by Marx himself in any systematic account (Castree, 1995). The doctoral work, done under the guidance of Horkheimer and Adorno, was heavily influenced by the critical theory of the Frankfurt School developed in the 1930s (Schmidt, 1971).
Schmidt highlighted two main areas of discussion on nature by Marx: first, his explication of how nature was represented in bourgeois society and second, a critique of this representation. Highlighting Marx’s use of the historical method, he pointed out that the history of nature and society are entwined in such a way that all ‘statements about nature relate to the particular stage reached in its appropriation by society’ (Schmidt, 1971, pp. 167-8). Thus the human-environment relationships seen at any one point in time are part of an ongoing process of change, a product of historical development that leads to evolution of landscapes (Head, 2000; Whitehead, Jones, & Jones, 2006). This implies that extant social structures, nature and related features must be historically situated (Galois, 1977) in order to grasp their full meaning and significance for future political agency.

A number of empirical studies were undertaken in the 1980s and 1990s that focussed on the production of agrarian regions (FitzSimmons, 1986; Redclift, 1987; Marsden, 1986; Marsden, 1987), transformations due to environmental and land-use regulation (Walker, Storper, & Gersh, 1979; Dove, 1992; Neumann, 1998; Katz, 1998), the production of hazards (Hewitt, 1983; Watts, 1983; Watts, 1998) and city-hinterland relationships (Cronon, 1991). Many of these studies emphasized the social aspect of society-nature interactions and emerged as a counter to the limits to growth thesis (Meadows, Meadows, Randers, & Behrens, 1972) of the Club of Rome. Contrary to the group of environmentalists who posited people as the enemy of nature, these studies underscored the impossibility of making sense of nature without reference to society, the role of the state and the capacity for capitalism to transform entire landscapes for profit on a world-scale.

Cronon’s study has been one of the most noteworthy in this respect giving equal importance to the materiality of nature and the process of social production of nature. In his work (Cronon, 1991), the terms first and second nature, borrowed from Hegel and Marx, were used to distinguish between pre-human/pristine forms of nature, and nature which has been impacted by humans. The term ‘second nature’ had been used with reference to transformation of the earth’s surface by Cicero (45 BCE) in his work titled 
*De Natura Deorum* (Nature of the Gods). In the 18th century its meaning was expanded to
include institutional, socio-economic and political aspects of society (Smith, 1984) that are an essential component of nature’s production. Marx and Engels (1845) had pointed out more than 150 years ago, however, it would be difficult to find any form of pristine first nature remaining in the world.

Post 1990s, scholars such as Latour (1993), Whatmore (2002), Bingham (2006), and Hinchliffe (2008), identified as ‘new materialists’ (Braun, 2009), have critiqued Marxist production of nature theory on several counts. Their accusations range from economic reductionism to the failure to link production of nature with relations of race, gender and sexuality; and finally being anthropocentric rather than giving equal focus to the agency of humans and nature that, according to them has led to a subject-object dichotomy. They argue that the use of dialectics is inadequate to overcome nature-society dualism that goes to reiterate Schmidt’s view (1971) that materialism and dialectics are incompatible.

1. Can there be a materialist dialectic of nature, seen as being-in-itself, in the strict sense of these terms?
2. Must not (as has been repeatedly asserted) materialism and dialectics become incompatible if nature is understood to mean what the exact sciences make of ‘nature’? (Schmidt, 1971, p. 166)

Schmidt’s answer to the questions he posed above was a definite ‘no’ to the first and ‘yes’ to the second. The new materialists evade the terms ‘nature’ and ‘society’ in their claim to univocity of being that they have borrowed from Deleuze (1968/1995) and Spinoza (1677/2002). The idea that ‘all being is one substance’ helped put forward the thesis that the world has never been divisible in terms of separate categories. All existence is manifestation of one substance and therefore ‘first nature’ becomes impossible – nature and society have never been distinct categories. In this line of thinking (Braun, 2009) emphasis is put on the lack of any transcendental cause, on individuation rather than identity indicating that there are no classes of being, only a process of ongoing differentiation and ways of distinguishing between things. An outcome of collective existence, together it can be called agencement, the ability to know the world only through practical engagements (Latour, 2013). Thus ‘facts’ discovered by
science are no more than the outcome of how scientists and non-human nature are affected by and affect each other.

Although the concept of production of nature was inherent in the understanding of human praxis, nature, and choices, the rising influence of Marxism in academia led to more explicit statements on ‘production of nature’ (Smith, 1998) in the early 1980s. Marxist political economy focused on nature’s material transformation into landscapes of capitalist production (Demeritt, 2001) where nature is seen as one made and remade as a commodity from within the specific logics of capitalist production, competition and accumulation. Smith’s Uneven Development (1984) was among the first to draw attention to the way in which landscapes get commodified, constructed and reconstructed in ways that are directed by the profit motive. Following Smith’s (1984) theorisation of uneven development several works have come to show how nature is produced in the image of capital. Emphases and fields of empirical study have differed (Castree, 2003) at different stages but that is perhaps to be expected when imagination is integrally related to mediated practice. Given the various phases of Marxist scholarship and fields of engagement with the production of nature thesis and debate, ongoing interpretations of Marx on nature are part of the evolving process of its production. More recent works such as that of Michael Redclift (2006) studied how migration and settlement gave rise to ideologies of nature that reflected not only the social and ethnic characteristics of the settlers but also the effects of market forces on the natural environment. His study traced transformations in the Spanish Pyrenees in the late 1960s, coastal Ecuador in the mid-1970s, Mexico during the 1990s, and British Canada in the mid-nineteenth century. In most of these areas the natural environment was transformed by the pressure of market, especially global markets.

How regions grow, why they develop differently with inter-regional and intra-regional disparity became central questions for economists and geographers at least five decades ago (North, 1955; Tiebout, 1956; Myrdal, 1957; Friedmann, 1972). While for them even now the questions remained vital, other disciplines such as sociology, political science, or applied areas like Regional Studies, Planning and Environmental Management have also shown subsequent concern with these issues. ‘Region’ thus has been variously conceived
and defined (Dawkins, 2003) as a spatially interdependent space, with the form of nodal region, “functional economic area”, unit of political or administrative control, planning units and in terms of the interdependencies between natural resource systems and human populations (Richardson, 1979; Fox and Kumar, 1965; Hoover and Giarratani, 1985). The concept of nodal regions is one of the more popular ones among researchers and theorists (Hoover & Giarratani, 1985) in which the region is characterised by internal functional integration in the sense that labour, capital, or commodity flows are more common within the region than between regions. Within a nodal region, activities are oriented toward a single point or node where there is presumption of dominance of the node over the surrounding peripheral area. A modification of the nodal region concept is that of polycentric regions where there may be several nodes and several peripheries yet displaying high degrees of internal functional integration (Richardson, 1979).

Concern for growing disparities between regions emerged in the post-World War II period in recognition of the vast inequality between industrialised countries and the less developed countries that are located in the global south. Belief in interregional convergence where wages and per capita incomes would equalise as a result of interregional trade and regional investment was challenged by empirical evidence of widening disparity. Alternative theories explained regional divergence as a result of cumulative causation and making of growth poles. Uneven industrialisation and core-periphery dichotomy was discussed by Gunnar Myrdal (1957) in the 1950s while explaining uneven development due to cumulative clustering of economic activity in core areas. Advantages of low-wage labour in underdeveloped regions fail to attract industrialisation as they are offset by the benefits from the creation of agglomeration economies. Although underdeveloped regions may also benefit from the diffusion of innovations and expanding export markets for products from these regions, these are often negated by the directions of flow of labour, capital/investment and trade at the behest of forces operating out the core. Thus, centrifugal “spread effects” of the core and centripetal “backwash effects” operating at the periphery cause stagnation in the latter until any intervention created by external forces (e.g. planning) are set in (Chapman, 1979). Free play of market forces only serves to reinforce this process of cumulative
causation by further accelerating growth in developed core regions at the expense of underdeveloped ones. Based on the cumulative causation observed during his study of black peoples in America where “White prejudice” and the Blacks’ “low plane of living” mutually ‘caused’ each other, Myrdal illustrated his formulation at regional level using data on regional development and underdevelopment in Europe. In the latter study, he found that wider interregional disparity was found in poorer countries compared to the richer ones (Chapman, 1979). Several other studies (Latzko, 2010; Brülhart & Traeger, 2003; Fujita, Krugman, & Venables, 2001) have brought out instances of concentration of economic activities rather than its dispersal.

During the same time, Albert Hirschman (1958) suggested that backward\textsuperscript{4} and forward linkages between firms and industries in polarized development could benefit both developed nodes and the surrounding hinterland. He too visualised positive and negative consequences of polarized developed but reversed Myrdal’s reasons for them. Negative “polarisation effects” due to competition and trade barriers erected by the developed region, Hirschman felt, were likely to be outweighed by the “trickle-down effects” in the underdeveloped regions from where goods and labour would be required by the developed region. Despite the overwhelming failure of trickle-down effects in the 1970s it is remarkable that his proposition is still in vogue in popular planning parlance to justify skewed investments within and across regions for the purpose of promoting nodes as ‘engines of economic growth’.

A contrasting theory of polarized development was proposed by John Friedmann (1973) that actually was a revision of his original centre-periphery model. Based on his study of Venezuela (1966), where he assisted the government in its planning endeavours, Friedmann identified the possibility of externally induced growth and convergence of incomes across regions due to interregional labour migration. The quality of economic entrepreneurship and local leadership – linked to the region’s development history – along with supply-side constraints were seen as important in facilitating economic growth.

\textsuperscript{4}For a given firm, backward linkages refer to the connection between the firm and the source (farmers/producers) of inputs or raw materials that feed into the production process, whereas forward linkages refer to the distribution of output of the firm that may be marketed for consumption or is then used by other local producers as an intermediate good for the production of other products.
Since human activities and interactions were considered ‘space-forming’ as well as ‘space-contingent’, he originally posited a two-way process between core and periphery in which development of society would result in transformation of their spatial structure finally leading to spatial integration in an expanded region (Friedmann, 1973, p. 42).

In the theory of polarised development Friedmann admitted that the development process would finally lead to accentuated regional inequality. Already established cores would become centres of innovation where social and political forces worked to weaken the periphery in various manners. He identified “dominance effect”, "information effect", "psychological effect", "modernization effect", "linkage effect", and "production effect" as the six important outcomes of the above. These forces then lead to conflict between the elites of the core and the people of the periphery. The outcome of this conflict would depend on the relative status of the peripheral region elites. He posited that disparity between the elites of the core regions and the peripheral ones were wider in developing countries and advocated decentralisation of decision making power to counter the dominance of core elite forces (Friedmann, 1973).

The above works went to establish a link between uneven development and market forces. Neil Smith (1984) proffered the view that the reasons for unevenness in pre-capitalist development were quite different from that of the capitalist one which produced a distinct geography that is ‘systematically and completely an integral part of the mode of production’. Development of the means of transportation and technology led to the concentration and centralization of capital according to the social logic inherent in the process of capital accumulation. Within this process the separation of core and periphery or town and country served as foundational premise.

Dependency theories also contributed to the furthering of the above understanding. Located at macro level, these works (Baran, 1952; Baran and Sweezy, 1966; Amin, 1976; Cardoso and Faletto, 1979) examined the interactions between centres where economic and political power were concentrated and peripheries with deepening patterns of inequality and dependence. Frank’s (1966) formulation of satellite-metropolis model offered explanation for unevenness at regional level expressing inequalities in
metropolitan centres and peripheral satellites. Thus, the structural conditions for the “continuity and ubiquity” of economic development and underdevelopment were understood as created on the basis of the direction that the power structure in the core operated. Formation of a chain of exploitative relationships between metropolis and satellite was identified at various spatial scales (Frank, 1966).

Researches on the relationship between the city and the hinterland, or urban and rural, got deeply associated with the above understanding of core and periphery leading to researches on various regions. William Cronon’s history of the relationship between the city of Chicago and the Great West (Cronon, 1991) became one of the landmark studies that depicted the impact of the shifting relationship on the growth of the city as well as the transformation of the hinterland and the resulting geography of capital. Several researches have subsequently shown (Savage & Warde, 1993) that it is when hinterlands or peripheries are placed in the context of their relationship with cities, the transformation of the former is better understood (Banerjee-Guha, 2013).

Distinct approaches have evolved since the 1990s in the understanding of environment and environmental crisis, each presenting a range of political possibilities (Table 1.1). Various approaches have emerged from trajectories of choices related to the valuation of nature while ‘the choice of values lies within us and not in nature’ (Harvey, 1996, p. 163). Several researches have shown how important it is to build ‘critical perspectives’ that focus attention on transformation of nature and landscape and the actors for whose benefit transformation occurs. It is necessary to identify and detail the new and emerging sites of transformation and contest, while attending to the social, economic and ecological consequences of each. Political ecology has been considered by many as a suitable perspective to deal with the above complexity. It aims to examine the decisions made at various levels from that of the local producers/communities to that of transnational finance in order to evaluate the impact at multiple scales from the micro to the macro.
### TABLE 1.1
CLASSIFICATION OF APPROACHES TO ENVIRONMENT AND ENVIRONMENTAL CRISIS

<table>
<thead>
<tr>
<th>ECOPHILOSOPHY</th>
<th>POSITION ON ENVIRONMENTAL CRISIS</th>
<th>EVIDENCE</th>
<th>REMEDY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cornucopia</strong></td>
<td>Dangers are illusory or exaggerated</td>
<td>Human welfare (e.g. life expectancy) has increased along with population, economic growth and technological progress</td>
<td>Dynamism of capitalist economies will generate solutions through economic and demographic growth and ‘resource substitution’</td>
</tr>
<tr>
<td></td>
<td>Scarcity is an economic phenomenon</td>
<td></td>
<td></td>
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<tr>
<td><strong>Environmentalism</strong></td>
<td>Crisis caused by overpopulation in developing countries and the improper or poor functioning of society’s institutions</td>
<td>Successes on specific issues such as CFC emissions, waste recycling, organic cultivation, etc.</td>
<td>Active management through reformist programme of science, technology and government policy change</td>
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<tr>
<td><strong>Deep Ecology</strong></td>
<td>Origin lies in the dualistic separation of humans from nature and failure to recognise intrinsic value of nature</td>
<td>Destruction of non-human life and extinction of species</td>
<td>Long-term population reduction throughout the world                                                                                              Shift from a human-centred to a nature-centred system of values based on intuition and spirituality</td>
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<tr>
<td><strong>Ecofeminism</strong></td>
<td>Origin due to humanity/nature dualism combined with androcentric man/woman dualism that share the ‘logic of domination’</td>
<td>Discrimination and oppression on grounds of race, sexual orientation, class, species and gender; homogenisation of social and natural life</td>
<td>Emphasis on environmental justice and opposition to domination through celebration of diversity, nature, irrationality, emotion and the human or non-human body</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Social Ecology and Eco-Marxism</strong></td>
<td>Problems follow from systems of domination or exploitation of humans by other humans; class conflict ‘Scarcity’ is a function of the will and means of capital: purposes that guide production and the technologies that facilitate it</td>
<td>The accumulation of wealth and class formation through manipulation of the dynamic of supply and demand; Rising inequality in distribution of resources</td>
<td>Emphasis on environmental justice through: Decentralized society of non-hierarchical affiliations built on the formation of cooperative institutions in all areas of social life; Centrally planned socialist society that addresses structural conflict and adopts a dialectical perspective on the evolution of society-environment relationships</td>
</tr>
</tbody>
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(Garrard, 2007, pp. 16-32)

It is generally found that decisions made at the local community level are invariably influenced by regional policies, which are in turn directed by global considerations. Thus
the decision made by the local farmer as to whether he should grow groundnuts or sugarcane is influenced by more than the soil, climate and local ecological conditions. The value of his produce is determined by a complex interplay of interests at various levels and thus may lead to dire consequences for environment and people. Franke and Chasin (1979) showed that the introduction of peanut in Niger during the late colonial period set in motion a chain of processes that resulted in drought, famine and bloody conflict. Thus, people are connected to wider political economies and ecologies that may influence their decisions and interactions with nature. The processes at work are part of the system of power that operates within the global web of human-environment linkages. ‘The precise distribution of sources of need satisfaction in any part of the world is an outcome of specific historic and cultural circumstances as well as of broader forces making for inequality.’ (Smith, 1979) (Smith 1979: 310) The ecology of each locality or region is created by ‘political actors’ (Robbins, 2004). Several studies in the Third World have emphasized the need to locate struggles of the people within the history of their access to environmental resources that is related in turn to the social construction of production processes (Moore, 1993).

Political ecological researches in India (Table 1.2) have raised several significant issues concerning social justice and the material interest of a large majority of the society and the significance of the role of the state as a key actor (Williams & Mawdsley, 2006).

<table>
<thead>
<tr>
<th>TABLE 1.2</th>
<th>POLITICAL ECOLOGY RESEARCHES IN INDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>STUDIES</td>
<td>FOCUS OF ENQUIRY</td>
</tr>
<tr>
<td>Agrawal &amp; Sivaramakrishnan 2001; Esteva and Suri-Prakash 1992; Guha 1999; McCully 1996; Shiva 1989; Sundar et al 2001</td>
<td>People for whom direct use of natural resources is a source of livelihood</td>
</tr>
<tr>
<td>Kumar et al. 2004 (forest); Shiva 1993 (agriculture); Saberwal et al. 2001 (wildlife and protected areas); Baviskar 1997 (state-led development); Corbridge 1993; Jayal 1999; Routledge 1997; Roy 1999</td>
<td>Environment as a site of resistance and social conflict</td>
</tr>
</tbody>
</table>
Many studies have focussed on issues of livelihood for the people who are in direct relation with the environment for their sustenance while others have identified the State as the key player in the generation of conflicts. Environment as a site of resistance and struggle have often been the focus of study. A group of researchers have also focussed on issues of gender inequality where women’s access to land and traditional resources such as seeds is denied (Shiva, 1988). It has been, however, argued that many of the studies tend to romanticise the village community (Guha, 1989) without taking into account the wider question of political economy along with the ecological concern.

Human-environment relationships are increasingly becoming sites of conflict and polarisation in terms of unequal access and availability. Widening disparity characterises the relationships between people and resources that are fraught with conflicts, contradictions and struggles. These are in turn influenced, mediated and constructed by various institutions arising from the immediate physical and social environments within which they are located and also beyond, connected to wider political economies and ecologies. The power of capital to shape and control institutions, production processes at various levels has been examined by several researchers (Gagnon, 2007). Individuals, communities and institutions are enriched by their knowledge generated from respective lived experiences. At the same time they are constrained by controlling mechanisms of several power structures. On the other hand, it is also true that majority of researches in India on political ecology are found to have problems in terms of their empirical focus and conceptualization of environmental issues (Williams & Mawdsley, 2006). The empirical focus of most of these studies is on marginalised groups and their livelihoods, that has led to a ‘Standard Environmental Narrative’. The tendency of this narrative to
position state and community as protagonists with the former cast in the role of villain and ‘an idealized vision of the community as its only political alternative’ needs critical examination (Williams & Mawdsley, 2006, p. 262).

While academic and political practice have responded to a number of ‘long-standing and valuable political concerns’, need arises to widen the empirical frame beyond the rural poor that can include inequalities and conflicts over more ‘diffused resources’ generated from the current development practices in a wider region impacting cross sections of society with diverse livelihood patterns. The ‘new politics’ of the environment and the new role of ‘the state’ in the current development process, then emerge as significant agencies contributing to transformation of landscapes (Williams & Mawdsley, 2006) through control and intervention. In India and many other countries, the culmination of the above process is currently seen in aggressive land acquisition practices facilitated by the State and corporate groups.

David Harvey’s work in the 1970s highlighted the importance of landed property and commodification of land in the process of capital accumulation, where capital investment shifts from commodity production to built environment leading to transformation of the city as well as its expansion into the hinterland. While Harvey’s work was based on his study of Paris, such transformations are now seen in cities and their hinterlands in the global south also. Impact on the hinterland or the peri-urban space is actually found to be alarming. A shift of capital with its increasing focus on ‘hyper forms and mega construction activities, increased speculation and expanded investment in land and real estate, service sector, signature project...impinging on the livelihood and economic activities of these areas’(Banerjee-Guha, 2009, p. 106) point to a newer colonisation of the peri-urban space. Various studies (Dupont, 2005) are bringing out the consequential patterns in several such regions in the country. After several decades of interest in cities, studies on peri-urban spaces have become significant in several regions of Africa, Indonesia, India, etc.

In many regions expansion of commercial logging, pharmaceutical bioprospecting, export-oriented cash cropping, megafauna preservation and elite eco-tourism have
replaced community-managed resources. Expansion of commercial land markets, auction of publicly owned natural resources and industries to transnational companies have led to drastic transformations in landscapes. In his book *Imperial Nature* Michael Goldman (2005) exposes the role of the World Bank in facilitating these transformations. In response to criticism of social and environmental fallouts of their programmes the Bank evolved a definition of sustainability in the 1990s in which export-led capitalist growth appears entirely compatible with promotion of ecological sustainability. Using this definition he notes that World Bank interventions have led to the restructuring and capitalization of nature-society relations that exist as ‘uncommodified or underutilized by capital markets’ (Goldman, 2005). In more recent times, scientific forestry which emerged in the mid-eighteenth century in Europe is seen to be a tool used by the industrial foresters in the Mekong Region of South-East Asia (Lang & Pye, 2000) to separate nature from rural livelihoods and to organise society to meet the demands of a global timber economy.

Sustainability has long been a core issue of environmentalists and those concerned with the seemingly headlong race towards reaching the limits of the earth’s carrying capacity. Yet, analysis of the Brundtland Commission’s conceptualisation of sustainable development which has dominated the discourse is done in the context of its ideological position of promoting trade liberalisation and the subsequent track record of its ‘official’ use in national policies around the world that shows a ‘strengthened commitment to a globally scoped open-access and free-trade regime’ (Hay, 2009, p. 212). The translation of this commitment in terms of the extent of neo-liberal reforms has varied from country to country depending on the context in which they have been undertaken, resulting in a complex canvas of uneven development. This complexity makes tracking of the changing forces of uneven development an imperative to understand transformations at various scales, from cities to peripheral regions.
1.4 Statement of the Problem

In colonial times, city and countryside relations were shaped by the shifts (Friedmann, 1979) from a ‘politically and culturally fragmented’ space with no unifying urban hierarchy to a national consolidation of political power which brought cities into an intricate network of larger financial relations. Rural areas were linked to the urban centres based on their relative instrumental value for production and accumulation. The hinterland was reorganized to generate a steady supply of resources needed by the urban centres. Cities functioned as nodes connected to first a colonial export sector and a global economy characterised increasingly by financialisation. Instead of forming a functionally symbiotic relationship, urban and rural spaces went to form exploitative relationships. Urban and industrial demands started competing with rural needs leading to a large scale transformation of the hinterland.

By the end of colonial rule India emerged as a country characterised by metropolitan economies with uneven regional development related to the nature of the placement and integration of regions within the larger economy (Banerjee-Guha, 1997). The nature of land settlement and extent of commercialisation of agriculture during the colonial rule had differed from region to region and were important factors in this process. The level of irrigation, industrialisation and infrastructure development were regionally skewed. With poor backward and forward linkages, the economy was characterised by rural-urban disparity and lack of integration between manufacturing and agricultural areas. The postcolonial mixed economy formula only aggravated and enhanced existing inequality. Concentration and centralisation marked the process of industrialisation and investment in agriculture from the very first decade after Independence. The few metropolitan cities dominated the scene and despite recognition of uneven regional development in the 1980s, inter-state and intra-state disparities continued to widen. The hinterlands including the metropolitan regions remained largely neglected, impoverished and marginal. Capital continued to flow to core metropolitan cities at the cost of surrounding regions (Banerjee-Guha, 1999).
In current times, peri-urban regions are experiencing a newer form of transformation characterised by alienation of local communities from their environment, making them disempowered. With the development of global networks a new form of functional integration is evolving where point locations are connected for the flow of commodities, information and finance (Friedmann, 1979). The previously existing organic links between the city and the country are getting eroded with the latter being taken over for city expansion as newer sites for speculation and land grab. Resultantly, peri-urban areas are emerging as sites of colonisation and distortion (Banerjee-Guha, 2009). With India’s evolving integration within the transnational economic system, the bulk of financial resources are being channelled to six mega cities of the country with Mumbai being the largest along with its metropolitan region. The wider social, political and economic arrangements that have governed these processes historically are now getting connected with the resource extraction-related crisis that is drastically transforming community-environment relationships in peri-urban areas in the present time.

The process of integration of cities, towns and rural areas in the ongoing globalisation process is leading to a rising importance of selected large urban agglomerations in India. The Economic Atlas of India Project, for instance, maps and analyzes the pattern of distribution of these agglomerations, the organisation of the networks they constitute and the regions they control during the period of globalisation from 1990 to 2004 (Cadene, 1990). The results point to a fragmented and polarised process of up-gradation and down-gradation of specific cities and tracts. The process of current urban development is characterised by huge transformations of cities and their hinterlands reflecting an increasingly contradictory relationship between the local resource and cultural base (Dupont, 2005). Drastic revision of the development plan of the Mumbai Metropolitan Region (MMR) from the idea of decentralisation to a policy of concentration marks the logic of this development. Initiating structural changes in the economy and related land use (Banerjee-Guha, 2002), it is shifting focus from the larger section of the society to the potential of market. The dominant process in the region is one of ‘loss of arable land, open spaces, and resource-based economic vitality’ characterised by increasing polarisation with the creation of enclosures of prosperity and poverty/scarcity and
disruption of the ‘organic and traditional spatial economic arrangements’ (Banerjee-Guha, 2009).

1.5 Introducing the Study Area

The present study focuses on the southern border area of MMR, both within and outside the planned city of New Mumbai. The boundaries of the MMR as originally defined in 1967 were marked by natural features such as Vaitarna Creek and Tansa River in the north, Patalganga River in the south and the foothills of Sahyadri in the east. On the west is the Arabian Sea. With the enactment of the MMRDA Act, 1974, and setting up of MMRDA on 1st March, 1975, the southern boundaries of the region were extended to include part of Pen and Alibag talukas of Raigad District, adding thereby two urban centres and 159 villages. In the north, 12 villages from Vasai taluka, covering an area of 9.04 sq km were deleted and the boundaries were made co-terminus with Tansa River (MMRDA, 1996). Considering the shrinking of northern borders and extension of southern borders it would appear that the direction of growing urbanization and rapid change is moving towards the southern part of the region. Figure 1.1 introduces the study region along with the details of planned interventions.

The study intends to examine the given idea that, by transforming the existing landscape, a planned urban project should produce more equitable benefits to its populace, and stand out in contrast to the settlements excluded from such projects. The study region comprising eleven villages, located in Uran taluka, is one of the actively transforming sites within the MMR with large scale corporate investment, have been selected accordingly. While focussing on the intricacies of the above dichotomy, the study also attempts at understanding the implications of the transformation process for communities living there.
1.6 Research Objectives

1. To examine briefly the process of transformation of nature and evolution of landscape.
2. To historically examine society-environment interactions and growth of economic landscape in the broader regional space with a special focus on the study region.
3. To analyse the trajectory of interventions in the region that have led to transformation of the social, economic, physical and political landscape over time.
4. To briefly study the changing responses of the community to the above process over time.
5. To analyse the implications of the transforming landscape and develop a critique.
1.7 Data Sources and Methodology

Both primary and secondary data were felt necessary to understand the pattern of people-environment interactions in the region and the history of its evolution. Primary data was collected from families whose livelihoods had depended on their close relationship with the environment, community leaders, and government officials who have been involved in implementing development projects in the study region. Government records, archival material, personal records, writings and libraries of families living in the region were sourced for secondary data. Changing land-use and the resultant redistribution of natural resources and communities over time were traced to understand the key shifts and phases in which the relationship between communities and their environment were reshaped. These changes were located within the wider development trajectory to identify the processes, interventions and associated discourse that drove these changes and reshaped the way communities were organised socially, economically and politically.

A multiple case study design was used with the selection of eight case study villages located in Uran taluka keeping in mind the different patterns of land use and sources of livelihood. At the time of conducting this research (2011-13), Uran taluka consisted of 62 revenue villages that fell within the jurisdiction of 34 individual and group gram panchayats. The eastern and western halves of Uran taluka, divided by the Karanja Creek, consisted of 31 villages each. Four villages are from within the New Mumbai area – one of which is a relocated village – based on the premise that one of the most significant factors impacting community-nature relationships was the appropriation of land for the development of New Mumbai. Four study villages were identified from outside the planned city, in the eastern part of the taluka, where private acquisitions and developments have begun for a range of current development projects. A questionnaire survey was undertaken and selected life histories and narratives were collected to understand the dynamics of relations between people and the environment over time. An additional three villages were taken up for specific issue-based enquiries. Printed, published and unpublished materials written by people from the study area have been collected to identify people’s ideas and responses to the ongoing transformations.
Extensive archival work was also undertaken to understand the conditions created by the specific history of the study region.

Field work was conducted over a period of one year, including a period of six months when the researcher resided in the study area. The researcher availed of a range of opportunities presented by the field to connect with the dynamics of local communities and their environment. These included festivals, family occasions, and *andolans* organised by villagers whose lands were acquired by the State. Located in the designated ‘no development’ or ‘green’ zone, the village is currently facing the consequences of being on the fringe of an expanding Uran town and its location *vis a vis* current infrastructure development projects. A total of 269 households were interviewed to understand social and livelihood patterns in the region, as well as changes across different generations. The set of interview questions used was arrived at over a period of two months through identification of questions relating to the objectives of the study, discussion of the same with key respondents in the study region, a study of questionnaires used in other surveys, and a period of testing the questionnaire in the field. The questions covered house and family profiles, genealogy, occupational history, land use and the impact of development interventions, related compensation, outcomes and resistance. Despite such preparation for field work, variations were introduced at different phases in field work as the researcher’s engagement and understanding of the field progressed.

Information was collected for currently living members of the family as well as deceased members of previous generations. Of the latter, the oldest member was estimated to be born in the year 1890. In a few cases households were combined where kinship ties led to an overlap of information. In such cases the concerned households were treated as one family. Some were discarded where information was found to be incomplete or contradictory. The final number of households after this process amounted to 260 and these together constituted a population of 3,419. Additionally, life histories (oral and written), unstructured interviews with key respondents and group discussions were used for elaboration of issues and processes arising from the household survey. Secondary data sourced from registered unions and government offices have been used to supplement the discussion. A stratified random sample was attempted for the questionnaire survey in
order to adequately cover different livelihoods and social groups. However, marked hostility from all communities – given the increasingly unfair and unequal relationships between people in the study area – necessitated the establishment of a personal network. A stratified sample was evolved with the assistance of personal contacts that snowballed into a network spanning most political and social groups in the study region.

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