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Techno-environmental risks and ecological modernisation in ‘double-risk’ societies: reconceptualising Ulrich Beck’s risk society thesis

By utilising a relatively underused framework developed by Maurie J. Cohen (Futures, Vol. 29, No. 2, 1997), this theoretical paper joins two of the most debated theories of environmental politics—ecological modernisation and Ulrich Beck’s risk society thesis—into a unified framework and problematizes some of their implicit assumptions to theoretically introduce the notion of a ‘double-risk’ society. In addition, it explains the differences between the traditional ‘Risk Society’ theorised by German sociologist Ulrich Beck and the newly introduced concept of a ‘double-risk’ society. The arguments put forward in this paper provide some fresh perspectives facilitating the study of the techno-environmental risks and other ecological problems faced by ‘double-risk’ societies. Theoretically, this paper adds to both ecological modernisation theory and the risk society thesis as the generalizability of their existing versions is limited precisely because they fail to address some important social changes at the global structural level.

Keywords: ‘double-risk’ society; ecological modernisation; Risk Society; techno-environmental risks; Bangladesh

1. Introduction

Over the past three decades, the discourse of environmental politics has been a battleground fraught with many conflicting perspectives. Notable among these are: neo-liberal economics (inspired by the Promethean philosophy), environmental economics, ecological modernisation (EM), sustainable development, ecological economics, the risk society thesis, the treadmill of production, and green environmentalism. All of these can be fitted within a continuum spanning from a purely ‘limits to growth’ ideology to a ‘growth unlimited’ school of thought (Dryzek 2013). Interestingly, adherents to each perspective use very different arguments to support their main claims, meaning that there is no one objective reality in environmental politics. Thus, how an author interprets the contemporary ecological problems facing the world depends on which

perspective of that continuum supports his/her worldview. For example, proponents of the 'growth unlimited' perspective argue that the world is facing fewer ecological problems today than ever before and that the only way to deal with any future ecological crisis is to encourage even more growth (see e.g. Bradley 2003; Beckerman 1995). On the other hand, supporters of the 'limits to growth' perspective see an apocalyptic future before us and call for an urgent ecological restructuring of capitalism (Dobson 2004; Foreman 2000).

All these differing perspectives notwithstanding, only two sociological theories have dominated environmental debates so far. One is EM theory and the other is the risk society thesis (Weiland 2007). While differing in many respects, both approaches claim to capture the complex environmental problems of late modern society. In the risk society thesis, German sociologist Ulrich Beck takes a stand opposite to that adopted by regulatory institutions and policymakers in their dependence on scientists and experts in determining environmental risks; conversely, EM theory assign key importance to science and technology, and mainstream political actors in solving environmental problems.

In this paper, by utilising a relatively underused framework developed by Cohen (1997), I introduce a typology that merges these seemingly opposite theories into a unified framework. I argue that a country's transition from pre- to reflexive modernity (i.e. Risk Society) or from an industrial to an ecologically-modern society is not as obvious as depicted in these two theories. That is to say that, due to globalisation and its inherent characteristics, the poorer countries in the global South are faced with all the dangers of the Risk Society long before achieving post-industrial status. I propose that

such countries actually face a situation of ‘double-risk’¹—first, continuous struggles for fulfilling material needs; second, increasing social anxiety about high-consequence techno-environmental risks, such as those associated with industrial pollution, coal-based power generation or mining, and the inability of political institutions to cope with such risks. Techno-environmental risks refer to the potential for harm to human health and the natural environment presented by technological and industrial products and production systems (Shrivastava 1995a).

By introducing the notion of a ‘double-risk’ society, this paper enhances our understanding of contemporary environmental politics in a number of ways. First, it draws our attention to the fact that, if there are (or were) risk societies (as Beck argued in his seminal risk society thesis), then there are also ‘double-risk’ societies that are being exposed to all the dangers of traditional risk societies long before gaining post-industrial status. Second, the ecological problems found in ‘double-risk’ societies, which are more painful and complex compared to those in risk societies (i.e. industrialised nations), also tend to occur in an interdependent manner (rather than sequentially), whereby the social distribution of ‘goods’ gives way to the emergence and distribution of ‘bads’. Finally, it has been argued that, as Western risk societies increasingly move towards becoming ‘self-correcting’ risk societies, global periphery countries are ever more exposed to ‘double-risk’ problems (as explained in detail in Section 5). This, I argue, happens partly due to global capitalism and to the relocation of polluting and resource intensive industries to countries in the global periphery.

I believe that the arguments put forward in this paper provide some fresh perspectives facilitating the study of the techno-environmental risks and other

¹ The term ‘double-risk’ society has previously been used by Rinkevicius (2000) to explain nuclear risks in Lithuania. However, my use of the term in this paper is significantly different from the way Rinkevicius (2000) used it.

ecological problems faced by ‘double-risk’ societies. Theoretically, this paper adds to both EM theory and the risk society thesis as the generalizability of their existing versions is limited precisely because they fail to address some important social changes at the global structural level. However, two cautionary remarks are warranted before proceeding to main sections of the paper. First, the idea of ‘double-risk’ society is introduced in a speculative manner, is short of empirical support, conceptually experimental and abstract, and vast in its assumptions and assertions. Second, the theoretical basis of ‘double-risk’ society is not verified and requires empirical confirmation.

The remaining sections of the paper are organised in five interconnected parts. In the first two, I provide a brief commentary on EM theory and the risk society thesis. The third introduces a schematic typology that is aimed at shedding greater conceptual light on how these two theories relate to each other on environmental issues. The notion of a ‘double-risk’ society is then introduced theoretically. Using arguments from Wallerstein’s world-system theory and globalisation theory, I explain the differences between the traditional ‘Risk Society’ theorised by German sociologist Ulrich Beck and the newly introduced concept of a ‘double-risk’ society in the fourth part. In the final part, I provide some examples of the peculiarities of ‘double-risk’ societies in the context of Bangladesh and argue that future research must take these into account when studying the techno-environmental risks and ecological issues found in such societies.

2. Ecological modernisation theory

EM theory refers to a group of optimistic theories based on the idea that economic growth can continue whilst ensuring environmental protection via long-term changes in the structure of production and consumption. These changes must emphasise the need for society, market actors, and the state to proactively manage the environment. The

idea of EM was first introduced in the early 1980s in a study for the 'Berlin Science Centre' and adopted by the small community of Berlin social scientists that are sometimes referred to as the 'Berlin School' of environmental policy research (Jänicke 2008). In the aftermath, the concept came to exert a strong influence on the environmental debate in Germany and soon gained popularity in other Western European countries.

Based on evidence gathered from some affluent European countries, EM proponents argued that economic growth can be decoupled from raw material throughput, energy use, and waste generation through the application of environmentally benign technology and the redesign of institutions. Needless to say, such promising ideas are immensely influential in present-day discourses of development. For example, the UN Commission on Sustainable Development, the Brundtland Report, and various environmental action programmes in Europe, with their environmentally sustainable development rhetoric, which are designed to reorient fiscal and economic instruments towards technologies for resource efficiency, the internalisation of costs, waste minimisation strategies, longer product life cycles, etc., are resonant of EM principles (Selim 2011).

In order to gain a better understanding of EM theory, it is important to summarise the key stages of its development and maturation. The first contributors of the theory (Huber 1982, 1985; Simonis 1989) emphasised heavily on the role of science and technology in bringing environmental reform, especially in the sphere of industrial production. Other important issues like social transformation and the role played by the state in bringing positive environmental change were largely ignored. Because of this narrow and techno-centric approach, some of the more critical remarks on EM theory still refer to this initial phase [e.g. see Christoff (1996), who termed this version of EM

as 'weak' and 'techno-corporatist']. Contributors in the second phase (from the late 1980s to the mid-1990s) placed less emphasis on technological innovation and took a more balanced view of the respective roles played by states and 'the market' in ecological transformation (Weale 1992; Jänicke 1991). They devoted more attention to the institutional and cultural dynamics of EM. However, the empirical focus was still limited to a few industries and policy cases in selected Western European countries.

Starting from the mid-1990s, the third phase has involved broader horizons in terms of both geography (most significantly, East Asia and a few other transitional countries in Central and Eastern Europe) and theoretical scope (including studies of the ecological transformation of consumption and global processes involving export-based firms) (Mol and Sonnenfeld 2000). Studies of the EM processes and dynamics found outside of Europe, especially in developing countries, yielded very confusing results: some found EM to be useful for analysing specific environmental reform patterns (Sonnenfeld 2000); others provided evidence of its limited explanatory value (Frijns et al. 2000); others still hoped for EM inspired reforms, but viewed these unrealistic and over-ambitious in the short-term (Phuong 2002; Frijns et al. 2000). Such confusing results perhaps indicate that EM, in its current form, is not entirely transferable to developing countries, the business, political, economic, and social environments of which differs considerably from those found in their developed counterparts.

Notwithstanding their temporal, national and theoretical differences, the key arguments of EM theory can still be brought under one umbrella. First, EM reconstructs the view of science and technology as both causes of and solutions for environmental problems. The key focus is placed on encouraging such technological innovation that will make industry sustainable by both preventing and remedying environmental damage. Innovative technologies are intended to be incorporated at the source of

production rather than to be used as an end-of-pipe solution (Mol and Sonnenfeld 2000). Second, EM regards market economy as the most effective way to secure the flexibility, innovation, and responsiveness needed to promote the ecological adaptation of industry (Blowers 1997). Economic actors—such as producers, customers, consumers, financial institutions, and insurance companies—are considered as agents of change in the pursuit of an ecologically modernised economy. In other words, EM argues that market structure can be changed in an environmentally friendly way by creating market opportunities (or ‘business cases’ for environmental sustainability) for all those who take environmental issues into consideration in conventional (business) decision making (Gouldson and Murphy 1997).

Lastly, EM asks for the transformation of the traditional role played by the state in bringing environmental reform. Thus, the state should move away from its traditional command-and-control (top-down) approach towards a more decentralised, flexible, and consensual style of governance. In addition, the state should provide more opportunities for non-state actors—such as the general public, and advocacy and non-governmental organisations (NGOs)—to express their concern on critical environmental issues (Mol and Sonnenfeld 2000).

3. The risk society thesis

The key argument of the risk society thesis (Beck, 1992) is that we have moved, or are in the process of moving, from first modernity (or the industrial society) to second modernity (or the Risk Society). In industrial societies, the central question involved the legitimate (albeit unequal) distribution of socially produced wealth. In the context of the Risk Society, the problematic consequences of Western technological-economic development have become a key concern, and the ‘positive’ logic of the distribution of wealth tends to be overshadowed by the ‘negative’ one of the distribution of risks (Mol

and Spaargaren 1993). As Beck asserted, “the driving force in the class [industrial] society can be summarised in the phrase: I am hungry! The collective disposition of the Risk Society, on the other hand, is expressed in the statement: I am afraid!” (Beck 1992, 44).

The risk society thesis emphasises the fact that, in the process of achieving more modernity and progress, post-industrial (Western) societies turn into risk ones; societies in which people are exposed to a whole range of new risks that are beyond the coverage of any kind of insurance. Beck called this condition one of ‘reflexive modernisation’. By this, he meant that Western modernisation has led to a transition from an industrial society (simple modernity) to a Risk one (reflexive modernity) and that, with it, comes the confrontation with self-destructive consequences that cannot be overcome by the systems of industrial society (Blowers 1997).

Beck also projected science and technology as the single most important and, at the same time, most problematic foundations in his risk society thesis. In the simple modernisation (or industrial society) phase, science and technology formed the key which opened the door to material prosperity, and derived their social legitimisation by alleviating material needs (Marshall 1999). For Beck, this legitimisation comes under pressure at the end of the simple modernisation period (at the beginning of the ‘reflexive modernisation’ one), firstly because most of the urgent material needs in the West have been fulfilled and, secondly, because science and technology themselves have contributed significantly to the creation of ecological risks. In the transition to reflexive modernity, science and technology appear to be semi-modern institutions because they employ old, obsolete ideas to answer new questions. This persistent use of old ideas (e.g. treating societies like laboratories, setting acceptable levels of pollution, considering the lay public as irrational and unscientific and not valuing its anxieties

about environmental issues) and the over-reliance on experts and scientists in relation to ecologically sensitive issues has led to science and technology themselves becoming a significant part of the modernisation problem. Under the condition of reflexive modernity, such situation is what Beck calls a condition of ‘industrial fatalism’ or ‘organised irresponsibility’ (Beck 1992).

Organised irresponsibility is an unavoidable consequence of the Risk Society. It occurs when the political institutions of modern societies fail to cope with new types of environmental risks (Matten 2004; Bronner 1995). Beck contends that this leads to a situation in which the power holders are determining levels of pollution using risk assessment methods that have long been defunct. Thus, in a way, risk generators become privileged in the law. As political institutions have failed to deal with the (seemingly) unavoidable consequences of modernity and environmental problems, Beck suggests a whole range of sub-political actors—or ‘sub-politics’—that he believes have the potential to fundamentally challenge the institutions and agents that generate environmental risks in the Risk Society (Beck 1992).

Such actors would function separately from the traditional political ones and would have the ability to reorganise societies from the bottom against the politicisation of techno-environmental risks in favour of the power holders. In addition, ‘sub-politics’ would have the power to communicate the public understandings of techno-environmental risks to the mainstream political actors and, in doing so, could challenge the monopolistic position of scientific experts and their objective interpretation of environmental risk. ‘Sub-politics’ represent an alternative means of influencing and participating in the once exclusionary political arena controlled by orthodox political institutions (Marshall 1999). These sub-political actors may include environmental NGOs, print and online media, advocacy organisations, environmental law agencies,

student organisations, or any other institutions that operate outside the mainstream political arena.

The second and final part of the risk society thesis introduces the concept of ‘individualisation’, a condition of increasing personal insecurity in which the individual is increasingly exposed to personal risks that are, partly, a consequence of wider (sometimes global) economic, social, and ecological ones. This concept is introduced in a separate section of Beck’s (1992) seminal work, with very few links being drawn with the core elements of risk society thesis. Later on, the idea was further refined in his book ‘Individualisation: Institutionalised individualism and its social and political consequences’ co-authored by Beck-Gernsheim (see Beck and Beck-Gernsheim 2002).

Beck’s idea of individualisation does not mean individualism (in the atomistic sense of increasing isolation) and it does not mean individuation either (in the psychological sense of developing into an autonomous person) (e.g. see Beck 2009). Individualisation is a concept that describes the structural, sociological transformation of social institutions and the relationship of the individual to society and economy (Beck and Beck-Gernsheim 2002). In Beck’s words:

Individualisation means that each person’s biography is removed from given determinations and placed in his or her hands, open and dependent upon decisions ... Individualisation of life situations and processes thus means that biographies become self-reflexive; socially prescribed biography is transformed into biography that is self-produced and continues to be produced (Beck 1992, 135).

4. The marriage between EM theory and the risk society thesis

The previous two sections provide a basic outline of EM theory and the risk society thesis. Next, to set the stage for the unified framework presented in Section 4.1., I discuss the contrasting assumptions of these two theories.

Both EM theory and the risk society thesis came to the fore during the 1980s, when Industrialised Europe had witnessed major transformations in the institutional web of modernity. Proponents of both theories seem to be in agreement in regard to the time of the transformation. However, this is the only similarity between them. In almost every other aspect, Beck's transition from 'simple modernity' to 'reflexive modernity', or from 'industrial/class society' to 'Risk Society', seems to stand diametrically opposite to EM theory.

The optimistic approach of EM theory emphasises the important contribution of modern technology and acknowledges the role played by science in bringing about an ecological switchover; conversely, the risk society thesis takes a very sceptical and even negative stand regarding the possible contribution of science and technology to mastering contemporary ecological problems (see Mol and Spaargaren 1993). On the one hand, the proponents of EM theory offer what appears to be a celebration of modernity and of its ability to adjust to the ecological problems created by the industrial society. On the other hand, Beck's risk society thesis holds that the extension and continuation of industrial progress (or of the typical modernisation route to progress) inevitably spells disaster for the environment and, with it, for humanity itself. The hope, here, lies in the process of reflexive modernisation whereby (as I mentioned earlier) society confronts the crisis it has created and a transformation ensues at the levels of production and institutions, and, consequently, values and life-styles (Beck 1992).

Unlike EM theory (which has many proponents), the risk society thesis is the sole product of Beck and portrays his personal projections of the great scientific and environmental challenges that are about to be faced by post-industrial societies. In a way, the two theories can be termed as idealised models, combining various strains of thought and posing a dichotomy which offers analytical clarity at the expense of

empirical validity (Blowers 1997). EM focuses mainly on the technical and economic aspects of environmental change and, even here, draws its evidence from a few Western European countries. Its earlier proponents (e.g. Joseph Huber, Albert Weale, and Udo Simmonis) deliberately ignored issues like the relocation of resource intensive and polluting industries to poorer countries due to globalisation. The risk society thesis, on the other hand, exaggerates the importance of innovative technologies whilst underestimating the significant changes in the direction of environmental protection either already occurring or potentially available. Moreover, Beck failed to clearly distinguish between global risks—as a specific category of risks (e.g. the ozone layer depletion and the greenhouse effect)—and the objective deterioration of the environment (e.g. industrial pollution) that can and should be analysed against the backdrop of the industrial organisation of production and consumption.

4.1. A unified framework joining the two theories

The proposition that the risk society thesis and EM theory are diametrically opposed to one another provides the foundation for the two-dimensional typology depicted in Figure 1. This was originally developed by Cohen (1997) and is utilised in this paper as a reference point to establish the notion of a ‘double-risk’ society. In particular, the quadrant showing the ‘double-risk’ society is newly added to the original typology. The horizontal axis in this schematic diagram measures, in conceptual terms, environmental/technological and economic security, ranging from ‘insecure’ to ‘secure’ in the upper half of the diagram and from ‘insecure’ to ‘more insecure’ in the lower half. The vertical axis delineates development stages, and ranges from typically Third World, pre-modern (undeveloped or semi-developed) societies to advanced industrial and post-industrial (developed) nations. The juxtaposition of these two variables produces a four-quadrant diagram over which a fifth, sixth and seventh cell have been

superimposed.

[INSERT FIGURE 1 HERE]

Located in the lower left-hand quadrant of this typology are those societies or countries that are still in their pre-modern stage, characterised by extreme hunger, low economic development and high insecurity. Lack of technological advancement, material comfort and education consign them to extreme exposure to the forces of the natural environment and all sorts of other risks. To contend with the unpredictability and inevitability of events such as tsunamis, earthquakes, hurricanes, and floods, pre-modern societies have historically developed complex non-empirical belief systems based on mysticism and superstition to impose a knowledge structure around these phenomena (Malinowski 1948; Douglas 1966). EM or inclination for environmental protection is a distant reality for such societies. It is impossible to specify countries that still fall within this category but—following mainstream modernisation/development theories (e.g. Inglehart and Welzel 2005; Giddens 1990; Sklair 1995a)—it would be safe to say that most countries in Africa, Latin America, and a large part of South Asia during the colonial era were considered as pre-modern. In fact, a few countries in Africa—namely Congo, Malawi, and Burundi—may still fall in the category of pre-modern societies.

The diagram's central cell represents the second major stage of the conventional development trajectory in which societies become modern. At this stage, risk is characterised by a critical trade-off in which societies experience an increase in their ability to manage natural hazards, but are forced to side-line other issues like ecological degradation and social inequalities. Ecological deterioration in modern societies mounts

as a by-product of industrialisation, and this is considered an unavoidable danger in the process of material acquisition. According to the proponents of EM theory, once a society has attained a threshold level of economic progress in which marginal increases in material accumulation cease to bring commensurate returns, the transition from an acquisitive modernity to an era of EM is presumed to commence (Cohen 1997). The opportunity for EM occurs when a society reaches switching zone 2. This zone is marked by an increasing consciousness of rapid industrialisation and its resultant risks, such as industrial pollution and other technological hazards.

However, in order to achieve 'real' EM and sustain it or move from path A to path B in Figure 1, a society must substantially modify its institutional structures, develop innovative policy tools, and adapt its lifestyles to accommodate environmental limits. I argue that moving from path A to path B is not as automatic as proponents of EM would like us to believe, and failing to make the necessary changes required will cause a society to assume an alternative trajectory, labelled as path C. This is the route to the Risk Society, which also becomes accessible from switching zone 2. After World War II, many countries in the West had to go through a period of rapid industrialisation until the late 1970s/early 1980s. At the end of three decades of unprecedented industrial growth, most of them failed to make the necessary changes required for creating an ecologically-modern society and eventually ended up as Risk Societies (see Beck 1992).

As postulated by Beck (1992) in his risk society thesis, societies, at this stage, are confronted with the very challenges of modernity and face all sorts of risks that are very different from those of industrial societies. The main focus here is on the distribution of the threats and ecological risks associated with the disposal of toxic substances, instead of on the reduction of waste streams and the modification of consumption practices through the adoption of more ecologically-efficient processes

(Cohen 1997). Amongst individuals living in such societies, a growing trend of individualisation is also noticeable. Unlike those in an industrial society, individuals in a Risk Society are left alone to create their own biographies and deal with risks that are created by everyone within the society itself. That is to say that, although risks are created collectively, the process of dealing with them becomes individualised.

However, at the outset of the 21st century, I argue that many countries in the West are recognising the dangers of Risk Society and beginning to take alternative (and positive) trajectories to a 'self-correcting Risk Society' or reflexive modernity, which becomes accessible from switching zone 3 and is depicted by path D. By recognising the fallibility of scientific inquiry, spotting cases of organised irresponsibility, and emphasising on the sub-politics' opinions on techno-environmental risks, these countries are striving to overcome the pervasive insecurity of the Risk Society. Germany, the Netherlands, France and the Scandinavian countries are a few examples of such self-correcting risk societies. The precautionary principle in EU policies, a growing consumer demand for organic food and green products, and growing practices to reduce the carbon footprint of both individuals and products are all indicative of a movement towards this alternative development trajectory.

Interestingly, like most modernisation theories, the journey from pre-modern to Risk Society or ecologically-modern society is shown as a linear (or sequential) process in both EM theory and the risk society thesis. Proponents of EM hope that, when a society reaches an adequate level of material affluence, it can pay attention to environmental issues and delink any further economic growth from environmental degradation. On the other hand, Beck (1992) saw Risk Society as a particular stage of modernity which comes after the success of industrial society. I argue that the journey from a pre-modern to an ecologically-modern society or from an industrial to a Risk

Society is not the same for all countries. Globalisation and the continuous relocation of resource intensive and polluting industries to poorer countries have placed many societies in the global South in a paradoxical situation. In contrast to the post-industrial affluent nations of Western Europe and North America, they face socio-political instability and economic uncertainty on the one hand, and greater ecological risks (e.g. health hazards due to industrial pollution) on the other.

It is my contention that, on their way to ecological modernity, such societies (i.e. countries) get stuck in switching zone 0, which takes them to path X (see Figure 1). This is the route of what I define 'double-risk' societies, which face all the dangers of traditional Risk Societies, but with a double process, as they continue to face some of the difficulties and uncertainties associated with pre-modern and modern societies. The ecological problems found in 'double-risk' societies are more painful and complex compared to those of risk societies (i.e. industrialised nations). They also tend to occur interdependently (rather than sequentially), whereby the social distribution of 'goods' gives way to the emergence and distribution of 'bads'. Moving from path X to path Y (Figure 1) is a real challenge for such societies.

It is worth mentioning that my unit of analysis in the concept of 'double-risk' societies is the nation-state, not the region within a nation-state, rural or urban population, or indigenous community. By 'double-risk' societies, I do not simply mean Third World ones. The latter category is determined on the basis of economic conditions, whilst the former is identified on the basis of risk exposure; in this case, on the basis of exposure to techno-environmental risks (as defined earlier). In a way, all 'double-risk' societies are Third World ones, but not all Third World societies are necessarily 'double-risk' ones. What are the characteristics of such societies then? What has exposed them to all the hazards of the traditional Risk Society even before reaching

the post-industrial stage? How can they cope with such hazards? These are the questions that will be discussed next.

5. The peculiarities of ‘double-risk’ societies

In order to explain the notion of a ‘double-risk’ society, I first need to borrow some arguments from world-system theory and globalisation theory. World-system theory, from a Euro-centric perspective, defines three structural positions in world economy: core, periphery, and semi-periphery (Wallerstein 1976). These are more or less similar to what modernisation theorists, Beck (1992), and the proponents of EM call pre-modern (class), modern (industrial), and post-modern (risk/classless/ecologically-modern) societies. The structure of the world system is defined by the underlying organising principle of the world economy, and in particular of the international division of labour, which consists of three spatially-bound economic roles—core, semi-periphery, periphery. These, in turn, are occupied by different nation-states. Thus, nation-states are categorised/differentiated by their structural position in the world-economy (Marshall 1999; Wallerstein 1976).

The core roles are held by dominant, capitalist countries (e.g. the US, Germany, and Japan) characterised by high levels of industrialisation. These countries tend to specialise in sophisticated manufacturing, have a high organic composition of capital (i.e. a high capital/labour ratio), and relatively high wage levels. By using their military, political, and trade power, core countries extract an economic surplus from the subordinated periphery ones. Periphery countries (e.g. Bangladesh and Nigeria) are relegated to the production of raw materials, are characterised by a low organic composition of capital (i.e. a low capital/labour ratio) and low wage levels. They usually receive a disproportionately small share of the global wealth, have weak state institutions and are dependent on—or, according to some, exploited by—more

developed countries. These countries are usually less developed because of obstacles such as lack of technology, unstable governments, and poor education and health systems (Wallerstein 2004). In some instances, the exploitation of the periphery countries' agriculture, cheap labour and natural resources aid core countries in remaining dominant (Kirana et al. 1992; Shiva 1993; Sachs 1993).

Wallerstein's (1976) specification of semi-periphery countries is crucial in explaining the stability of the modern world-system since its origin. Semi-periphery countries (e.g. India, China, and Brazil) serve as a buffer between core and periphery ones: they exploit the latter, yet are exploited by the former. As an example, a fairly recent trade agreement between the government of the Indian state of Tripura and the Bangladesh Ministry of Commerce can be mentioned here. In 2009, the Tripura government decided to close down all the brick kilns there to protect its agricultural land. As an alternative source, they had taken the initiative to import bricks from Bangladesh and had subsequently signed a contract with the India-Bangladesh Chamber of Commerce and Industries (IBCCI) that seemed to provide a win-win situation for both countries. However, later on, it was found that the new brick kilns set up in the northern districts Bangladesh to meet the growing export demands were destroying large areas of local cultivable land through the erosion of the topsoil, which is the prime raw material for brick making (Huq and Shoaib 2013). Thus, despite increasing export earnings, this trade agreement had caused additional problems to the domestic agricultural sector of Bangladesh (the periphery country) while providing benefits to India (the semi-periphery country).

Two caveats together could point to the inadequacy of world-system theory in explaining the current structural configuration of the globe. First, when Wallerstein (1976) argued that the world-system is the appropriate 'unit of analysis', he must have

meant 'object of analysis', because his thesis is centred on the structural relations of the core, periphery and semi-periphery operationalized by nation-states as discrete units. Therefore, those social phenomena that do not fit readily into a nation-state framework are forced into the model a priori. Second, although the specification of the world-system as being made up of three distinct structural positions is functional for the reproduction of capitalism or in a (previously) capitalist world economy, I argue that it is not properly functional in a contemporary global economy characterised by the globalisation of capitalism itself (see Robinson 1998). Further, this specification does not explain why and how the system developed that particular structure, nor does it guarantee that that structure will endure. With these caveats in mind, I will now turn to the impact of globalisation on world-system theory and discuss how it transforms some periphery nation-states into 'double-risk' societies.

The theoretical approaches addressing the different aspects of globalisation are quite varied and at the same time problematic (Sklair 1995b). My purpose in this paper is not to explain these variations in globalisation theory; rather, I intend to use the term in its simplest form—global capitalism and free market economy—which I argue to be most directly and forcibly linked to the proliferation of techno-environmental risks around the globe.

Apparently, globalisation has done two things. First, it has reduced the physical distance between the core and the periphery and provided enormous opportunities for some (previously) peripheral countries to leapfrog economically by shifting from a labour-intensive, import substitution industrialisation to a capital-intensive, export-oriented one. Newly Industrialising Countries (NIC) such as China, India, Taiwan, Singapore and Mexico are a few examples of such leapfrogging. However, such change

in status is not obvious for all current peripheral countries². Whether a country can move from a periphery to a semi-periphery position depends on many factors, such as the role of state intervention, the structure of industrial and corporate networks, the strategy for industrialisation, and the level of state autonomy (Ho 2005). Nevertheless, globalisation has also provided some opportunities for rapid industrialisation (or quantitative development) in countries that failed to upgrade their economy to semi-periphery status. For example, countries such as Cambodia, Bangladesh, and Nigeria—with their inclusion into the global economy as suppliers of labour-intensive low-cost commodities—have improved their Gross Domestic Product (GDP), local employment rate and overall socio-economic condition enormously over the past two decades. Quantitative improvements, as such, are viewed as a sign of ‘development’ and ‘progress’ by the local ruling elites.

Second, I would say that globalisation has brought with it several unintended consequences, particularly the proliferation of techno-environmental risks throughout those peripheral countries in which the flow of FDI is predominantly propelled by a corporate quest to find havens of low environmental standards, weak pollution control enforcement, and cheap labour costs (Utting 2002). On top of that, the domestic manufacturing sectors in those countries consist of small and medium-sized enterprises (SMEs) that are generally short of capital and have low environmental awareness, and therefore operate with out-dated and polluting machinery (Ho 2005). As a combined result of these factors, the techno-environmental risks and disasters faced by these countries have risen and have become more frequent and more devastating (Islam 2013). Furthermore, in such countries, the thrust of economic policies has been directed

² See Leichenko and O’Brien (2008) for an extended discussion on this topic.

towards building industrial productive capacities. Little attention has been paid to dealing with the risks that such productive capacities present (see Daly and Cobb 1994).

I argue that this state of development in many peripheral (and, in some cases, transitional) countries is an unintended consequence of globalisation and can be conceptualised as that of a ‘double-risk’ society. ‘Double-risk’ societies are experiencing all the uncontrollable techno-environmental risks of traditional Risk Societies long before the urgent issues of the social distribution of ‘goods’ are resolved. In the affluent West or the traditional Risk Society (where both EM theory and the risk society thesis were conceptualised), interest in and knowledge about environmental affairs is inextricably tied to education, income and life chances. Branching out, the luxury of green choices does not extend into the vast tracts of Africa, South Asia, and South America. For countries facing ‘double-risk’ problems in those areas, attention to long-term planetary effects and the adverse effect of pollution may not be high in a wish list topped by nourishing the population and creating employment through rapid industrialisation (see e.g. Mythen, 2007).

5.1. Proliferation of techno-environmental risks in ‘double-risk’ societies

In the past two decades, there has been an impressive increase in industrialisation in many countries facing ‘double-risk’ problems, partly due to their quota free access to profitable foreign markets in Europe and the US. This rapid industrialisation has brought new technologies, new products, new jobs, and better health, transportation, and communications to these countries. Today, many of these countries occupy large shares of the world market with regard to complex and hazardous products such as textiles (e.g. Bangladesh is the second largest exporter of textile and related products), consumer electronics, pharmaceuticals, pulp and paper, ship-breaking, and leather and leather goods (Frey 2015).

However, such progress has been accompanied by the continuous degradation of the natural environment and by a rise in techno-environmental risks throughout the agricultural, manufacturing, and waste disposal sectors in these countries (Shrivastava 1995b). Agriculture has become more dependent on chemical fertilisers and vulnerable solutions such as Formaldehyde (which is being used to preserve fruit, fish, and other food items). Manufacturing has also expanded enormously to meet growing export demands, and many of these manufacturing industries use inherently hazardous technologies and generate increasing quantities of untreated waste. Governments, in most cases, do not have the treatment and recycling facilities needed to deal with this waste, which causes serious health problems for the local communities. I argue that all these problems are akin to the modernisation risk defined by Beck (1992); it is just the effect which is more severe in ‘double-risk’ societies. Clearly, providing a full description of such risks is beyond the scope of this paper. More complete descriptions of ‘double-risk’ problems may be gleaned from local publications in countries facing such problems. However, the following examples may help us understand the severity of such risks.

A recent study estimated that there are around 1.6 million disabled people in Bangladesh, which is approximately 1.3% of the total population (UNESCO 2011). Sirajganj, a district 110km northwest of Dhaka—the capital city of Bangladesh—is found to have the highest number of disabled people among all 64 districts in the country. The most grievous statistic is that one in every 15 children in Sirajganj is disabled, and most of them were not born so. For a considerable length of time, the central government and municipality officials ignored this issue. Then, in 2015, a group

of television reporters interviewed local people about drinking water problems³.

Responding to local pressure, the reporters then gathered some water samples from the tube wells of four nearby villages. The samples were taken to the Bangladesh Council of Scientific and Industrial Research (BCSIR) where, through a series of laboratory tests, researchers found excessive amounts of mercury, zinc, iron, lead, arsenic, and other by-products of textile effluents in all the samples. According to them, the presence of such pollutants in the drinking water is one of the key reasons for the child disability and mental health issues found in Sirajganj.

It is worth mentioning that Sirajganj is surrounded by many textile dyeing factories that started their operation under British rule in the 1930s. With time, the scope of production expanded and the number of factories increased enormously. With this, increasing numbers of factories started dumping their untreated effluents in the area on a regular basis. As a result, the pollutants percolated to the underground aquifers. According to the TV reporters who covered the story, some of the factory owners' children were also exposed to disability. This echoes one of Beck's core arguments: risk producers can no longer escape from the severity of modernisation risks (Beck 1992, 23). Although no one can be certain that the child disability levels found in Sirajganj are caused by exposure to toxins, a considerable number of similar cases and the scientific validity provided by the BCSIR suggest that the possibility cannot be ruled out completely.

Shipbreaking is another industry that flourished in Bangladesh over the past two decades due to globalisation. The industry is concentrated along the elongated sea beach of Sitakunda in Chittagong. The local people there are mostly poor and uneducated,

³ These reporters worked for a private Bangladeshi TV channel called Jamuna Television.

therefore despite the frequent deaths and injuries (mostly due to oil tanker explosions), they are attracted to the working opportunities in the shipbreaking factories for their livelihood (Kutub et al., 2017).

The shipbreaking industry severely threatens the surrounding natural environment as hazardous wastes are released from the broken ships and dumped into the adjacent area without following any proper waste management system (Mahr, 2010). The soil, air and water of the ship breaking areas are therefore severely polluted and the biodiversity of the terrestrial and marine habitat are threatened. Furthermore, trees are cut down to provide space for more recycling projects, which augments the negative impact of this industry on the environment (Kutub et al., 2017; Mahr, 2010).

The growth of the shipbreaking industry in Bangladesh illustrates the simultaneous proliferation of techno-environmental risks and economic growth in ‘double-risk’ societies. Further, it illustrates the differences between individualisation in traditional risk societies and ‘double-risk’ societies. Although people in ‘double-risk’ societies are going through the process of individualisation, it is not offering the same benefits to everyone as the class contrast is still high in such societies. Therefore, the individualisation of *owners of the shipbreaking factories* is inviting more techno-environmental risks for the *workers and local people* who belong to a lower social class. In other words, the factory owners are reaping most of the benefits of globalisation whilst the workers and local people are having to deal with all techno-environmental risks resulting from the shipbreaking industry.

This is what I refer to as an *ill-equipped version of individualisation* in ‘double-risk’ societies, which is mainly driven by globalisation and is significantly different from that of traditional risk societies (Table 1). O’Brien and Leichenko (2003) define a similar situation using the metaphor of “winners” and “losers” whereby winners are

getting most of the benefits of globalisation while losers are only getting a small share of such benefits at the expense of their health and social security. Interestingly, both winners and losers are acting in their own self-interest in the above example, i.e. the losers (shipbreaking workers and local people) are living in Sitakunda due to their dependence (for income) on those risk producing factories (it is their individualisation) and the winners are investing money in shipbreaking business due to the opportunity to make quick profits by exploiting the losers (it is their individualisation).

5.2. 'Double-risk' society vs traditional Risk Society

The notion of a 'double-risk' society, as I argue below, is contradictory to the central arguments of the risk society thesis (Beck 1992) in two critical ways. First, it questions the distributional logic of the industrial (distribution of 'goods') and the Risk (distribution of 'bads') Society; second, it questions whether a society increasingly organised around the distribution of techno-environmental risks (i.e. 'bads') is classless, as argued by Beck (1992).

For Beck (1992), the purpose of wealth distribution (or the distribution of 'goods') is to meet the material needs of industrial society, which, in turn, serves a legitimising function of techno-scientific development. This is vital in Beck's theory because it is the initial step in the process of reflexive modernisation from which the Risk Society emerges. Material needs must be met before the logic of risk distribution (distribution of 'bads') supplants that of wealth distribution and thus restructures society (see e.g. Marshall, 1999). Put differently, the Risk Society emerges after the fulfilment of material needs of the industrial/class society. It is a sequential, rather than a parallel, process (Beck 1992).

By contrast, I argue that the current state of many 'double-risk' societies is characterised by the mixed importance of both issues: the distribution of 'goods' and

that of 'bads'. I propose that, in 'double-risk' societies, the concurrent distribution of 'goods' and 'bads' implies a double process and tends to occur in an interdependent manner (rather than sequentially, as Beck would have us believe), whereby the social distribution of 'goods' gives way to the emergence and distribution of 'bads'. This is evidenced by the examples provided in the previous section. The establishment of textile and shipbreaking factories has created job opportunities and brought economic prosperity (i.e. 'goods') in Sirajganj and Sitakunda; however, at the same time, it has created ecological risks in the area (i.e. 'bads') that are ultimately harming the local residents.

After arguing that 'double-risk' societies do exist, my second critique of Beck relates to whether or not such societies are 'classless' like traditional risk societies. For me, the answer is a simple 'no'. On the one hand, complex social issues such as extreme poverty, inequalities and unemployment make 'double-risk' societies similar to the pre-modern ones defined by modernisation theorists (Figure 1). On the other hand, the ad hoc economic growth of these societies has led to the 'co-existence of the First and Third Worlds'⁴ with their ensuing social cleavages and economic frictions (Ho 2005). People of low socioeconomic status are systematically and disproportionately exposed to the hazardous by-products of modernisation while receiving only a fraction of the benefits, whereas the upper-class people reap all the benefits brought by globalisation and free trade. I argue that Beck (1992) omitted the theoretical treatment of these class-specific differences.

The explanatory power of Beck's risk society thesis is therefore strongest when applied to 'welfare states' in which the material needs of most citizens are met via the

⁴ This coexistence is similar to what Schmidt (2006, 78) called 'multiple modernities' in his criticism of mainstream modernisation theories for oversimplifying the understanding of the modernisation process undergone by different societies.

redistribution of wealth through taxation and social security (Marshall 1999). To me, when analysing techno-environmental risks and EM in peripheral countries, it is extremely important to consider the mismatches between traditional risk societies and ‘double-risk’ ones. For more conceptual clarity, I summarise the key differences between ‘double-risk’ societies and traditional Risk ones in Table 1.

[INSERT TABLE 1 HERE]

Why do ‘double-risk’ societies experience more risk than traditional risk ones? As I argued earlier, the globalisation of capitalism and the unequal distribution of risk worldwide are two of the main reasons, but not the only two. If we see globalisation as the main culprit for laying the foundations of techno-environmental risks in ‘double-risk’ societies, then there must be other culprits that are equally responsible for the continuous proliferation of such risks in those societies.

In contrast to the perceptions of anti-globalisation scholars (e.g. Shiva 1992; Sachs 1993), I would argue that the pernicious ecological problems found in ‘double-risk’ societies do not proliferate only because of the redistribution of ‘environmental bads’ (such as the relocation of toxic and hazardous industries to the global South) through international trade. For me, the failure to establish stable (democratic) political systems after the colonial era, reliance on overambitious and symbolic (Newig 2007) environmental policies to solve ecological problems, continuous corruption in law enforcing agencies, lack of domestic demand for environment friendly products, the design of one-dimensional development policies to support industrial elites, growing pressures of increasing populations, weak or non-existent civil societies, the rise of urban consumer classes, and the reluctance of business communities to adopt cleaner

technologies are all equally responsible for the increase in techno-environmental risks in ‘double-risk’ societies.

I would say that the idea of individualisation is also problematic for so-called sustainable development in ‘double-risk’ societies. In traditional risk societies, people from virtually all professions can reap the benefits of modernisation. So, although individuals are going through a process of what Beck and Beck-Gernsheim (2002) called increasing individualisation, this does not cause any problems for other fellow individuals. In contrast, individuals in a ‘double-risk’ society do not profit equally from modernisation and rapid industrialisation. Poorer communities living near smoking chimneys, and polluted rivers and wetlands in cities such as Dhaka, Karachi, Lagos, Hanoi, and Phnom Penh are a perfect depiction of an ill-equipped version of individualisation, which is almost similar to selfishness.

That is to say that globalisation and free trade have not only provided opportunities for ‘double-risk’ societies to develop quantitatively but have also created a strange paradox within (previously) collectivist societies. Societies that once cared for others and concentrated on distributing whatever limited ‘goods’ they had, suddenly become societies that concentrate on distributing ecological risks. As, in such societies, the gap between social classes is so marked, businesses can get away with polluting and transferring ecological risks to the poorer communities. Ironically, as mentioned, the same individualisation is forcing poorer communities to stay closer to those risk producing (polluting) factories where most of them work (Omanga et al. 2014). In other words, individualisation affects people in different social classes in ‘double-risk’ societies in different ways (see Table 1).

However, on the positive side, we are witnessing an increase in bottom-up pressure from environmental groups in ‘double-risk’ societies. For example, the oil spill

that occurred in December 2014 at the Shela River in Sundarbans (a UNESCO World Heritage site), Bangladesh, generated serious anger amongst the environmental activists there. With the support of green activists, student volunteers, celebrities, and international NGOs, the local people managed to force the government to take precautionary measures, which ultimately led to the temporary closure of the waterway surrounding Sundarbans (BBC Asia News 2014).

Such environmental movements in 'double-risk' societies often stem from the belief that the state does not have the will or ability to govern for the benefit of the 'have nots'. One of the most important—although least tangible—forces destabilising governments is the 'bubbling diversity of change' taking place within numerous Third World (or 'double-risk') societies as a consequence of modernisation (Giddens 1995). As I mentioned earlier, the governments in these countries often endorse a one-dimensional modernisation ideology. In such worldviews— in which growth and consumption at virtually any cost often seem paramount—the protection of the environment is seen as a luxury that only rich Western governments, pressured by predominantly middle-class electorates, can seriously afford to entertain (Miller 1995). The outcome is that environmental concerns are often regarded as dissidence, evidence of the environmentalists' alleged 'anti-development', 'anti-nation' or 'anti-people' bias (Haynes 1999).

Needless to say, 'double-risk' societies do not share a common development path. They face environmental problems that may not be similar to each other. However, despite such differences, it is roughly possible to summarise the key nature of 'sub-politics' in 'double-risk' societies. First, they strive to protect the rights of marginal people and help them fight against the politics of uncertainty regarding environmental risks (Phuong and Mol 2004). Second, a large proportion of sub-political

groups operates informally and is dominated by women and young students for their ability to get closer to root level marginalised communities (Haynes 1999). Third, while the sub-political groups in traditional Risk Societies focus narrowly on environmental issues, those in ‘double-risk’ societies’ often have wider socio-economic and political concerns (Table 1). Fourth, sub-political movements are more likely to be successful in democratic environments in which strong civil societies have leverage vis-à-vis the state. Finally, and most importantly, ‘sub-politics’ in ‘double risk’ societies often do not reap the fruit of their endeavours, as their failures outweigh their successes (see e.g. Islam 2013).

Whilst different in many respects such as scope, theoretical focus and risks considered, my conceptualisation of a ‘double-risk’ society still shares some similarities with the ‘double exposure’ framework developed by Leichenko and O'Brien (2008). The double exposure framework provides a conceptual tool for investigating the interactions between global environmental change and globalization. (Hidayat and Stuhl 2009). Double exposure consists of five components—feedbacks, exposure units, contexts, responses, and outcomes, and it is possible to draw parallels between some of the characteristics of ‘double-risk’ societies and the components of the double exposure framework.

Feedbacks are characterized as collective sets of activities that continually produce largescale transformations in different geographical areas. In ‘double-risk’ societies, as mentioned, the proliferation of techno-environmental risks is caused not only by global capitalism and/or globalisation activity but also by other factors within the periphery countries such as the design of one-dimensional development policies to support industrial elites, growing pressures of increasing populations, weak or non-existent civil societies and the rise of urban consumer classes. *Exposure units* ‘may be

individuals, households, social groups, administrative units, communities, ecosystems, or species' (Leichenko and O'Brien 2008, 35). In 'double-risk' societies, exposure units are the people who suffer the most because of the proliferation of techno-environmental risks due to globalisation and rapid industrialisation. *Contexts* are understood as an integrated set of conditions that can dampen or amplify the degree of exposure to some variable of global change. As demonstrated by the 'India-Bangladesh' example above, 'double-risk' societies are often powerless when it comes to dampen the degree of exposure to techno-environmental risks as such societies have less power compared to the 'semi-periphery' and the 'core'.

A *response* may be 'defined as an action taken by an individual, household, group, firm, or institution, either in anticipation of or following from exposure to some type of global change' (Leichenko and O'Brien 2008, 36). In 'double-risk' societies, responses to the proliferation of techno-environmental risks is limited as the policies are designed to support rapid industrialisation and powerful stakeholders, though a positive change is noticeable due to a rise in 'sub-politics' in recent times that started to oppose decisions that could threaten ecological safety at the national level (see the 'oil spill' example above).

6. Final remarks

The preceding discussion on 'double-risk' societies might lead to a critical question, and legitimately so. That is, can current peripheral countries with 'double-risk' problems not advance to semi-periphery status by following the development path of NICs such as China, Mexico, India, and Malaysia? In seeking an answer to this question, one could argue that 'double-risk' societies are, in fact, standing at a unique juncture: they have an unparalleled opportunity to find different development paths and, in so doing, to provide models for other countries to follow. In other words, with the right policy mix,

they might achieve rapid economic development while avoiding environmental degradation on the scale of that created by the NICs and other industrialised nations. My position, in this case, is more on the pessimistic side. To me, 'double-risk' societies are faced with some unique problems that are very different from those typically found in semi-periphery countries (e.g. China, Brazil, and Turkey) or NICs. I would argue that, due to the inherent characteristics of capitalism and to the 'race to the bottom' principle, these societies are locked in vicious circles which totally preclude them from transferring their ecological risks to other countries. That is to say that 'double-risk' societies have no way to move to a cheaper place or to relocate polluting and resource intensive industries to poorer nations in the name of development.

In 'double-risk' societies, as radical environmental activists (e.g. Shiva 1993) have argued, ideas of EM, such as the use of voluntary, consensual approaches in the greening of industries, run the danger of sanctioning 'business-as-usual'. Due to the institutionalisation of an ill-equipped version of individualisation and to their profit-oriented nature, businesses tend to avoid the implementation of costly environmental measures. Asking them to minimise techno-environmental risks voluntarily, rather than as a result of governmental or civil society pressures, is merely leaving the fox to watch the geese, and will lead to the application of a veneer of greenwash, rather than to a fundamental greening. Thus, before applying the optimistic ideas of EM theory, we need to first understand the peculiar paradoxes faced by such societies. Otherwise, thinking about sustainable development and the creation of an ecologically-modern society in the global periphery would be like trying to play golf with a tennis racket: the tool just would not suit the reality.

In this paper, I have, only in a fragmented manner, challenged some of the core assumptions of the risk society thesis (Beck 1992) and EM theory and argued that,

rather than as separate units, they should be seen as inter-dependent. I would say that joining these two seemingly opposite theories into a unified network can provide us with a powerful lens through which the techno-environmental risks and other related issues in the global periphery can be investigated. As mentioned at the beginning, the theoretical basis of the typology used in this paper needs to be verified and that the issue of whether the Risk Society and EM are indeed mutually exclusive options requires empirical confirmation. The empirical verification of both these theories, as I mentioned briefly earlier, is still mostly limited to developed nations. Issues such as the exposure of Third World countries to 'double-risk' problems stemming from globalisation and the unintended consequences of techno-environmental risks affecting marginal people living in 'double-risk' societies need further attention from environmental sociologists.

I believe that the arguments put forward in this paper can serve as a reference point to address some key questions. For example, how the rising trend of individualisation relates to people's experiences of toxic exposure and other critical environmental issues in 'double-risk' societies? What role do 'sub-politics' play in uniting lay-citizens on issues related to industrial pollution and in shaping environmental policies in 'double-risk' societies? To what extent are they successful in preventing cases of organised irresponsibility? How does reflexive modernisation take place in societies affected by 'double-risk' problems? To what extent does the win-win philosophy of EM theory address the peculiar environmental crisis in 'double-risk' societies? In my view, giving careful consideration to these questions will benefit both these theories, as their existing versions are of limited generalizability precisely because they fail to address a few important social changes at the global structural level.

Finally, it is impossible to make generalisations about 'double-risk' societies; each country is unique in its historical, social and economic experiences. Moreover, the

extent to which a society will be exposed to 'double-risk' principles depends on many factors including its exposure to natural hazards, burden of population, cultural mechanisms, presence of polluting industries, geographical position, and so on. I would be overstating if I claimed that the binary representation of different societies I offer in this paper reflected the complexities and inequitable nature of development even in so called developing countries. India, for example, is classified as a 'low income developing' country, but is ranked 6th in terms of the numbers of billionaires (The Hindu 2016). My intention, with this paper, was to reconceptualise some of the core assumptions of the first version of the risk society thesis and to show how globalisation has exposed some peripheral societies to uncontrollable techno-environmental risks even long before they could reach a post-industrial stage. Many of the arguments I put forward here are purely abstract ideas and must be intended for conceptual clarity rather than as obvious facts.

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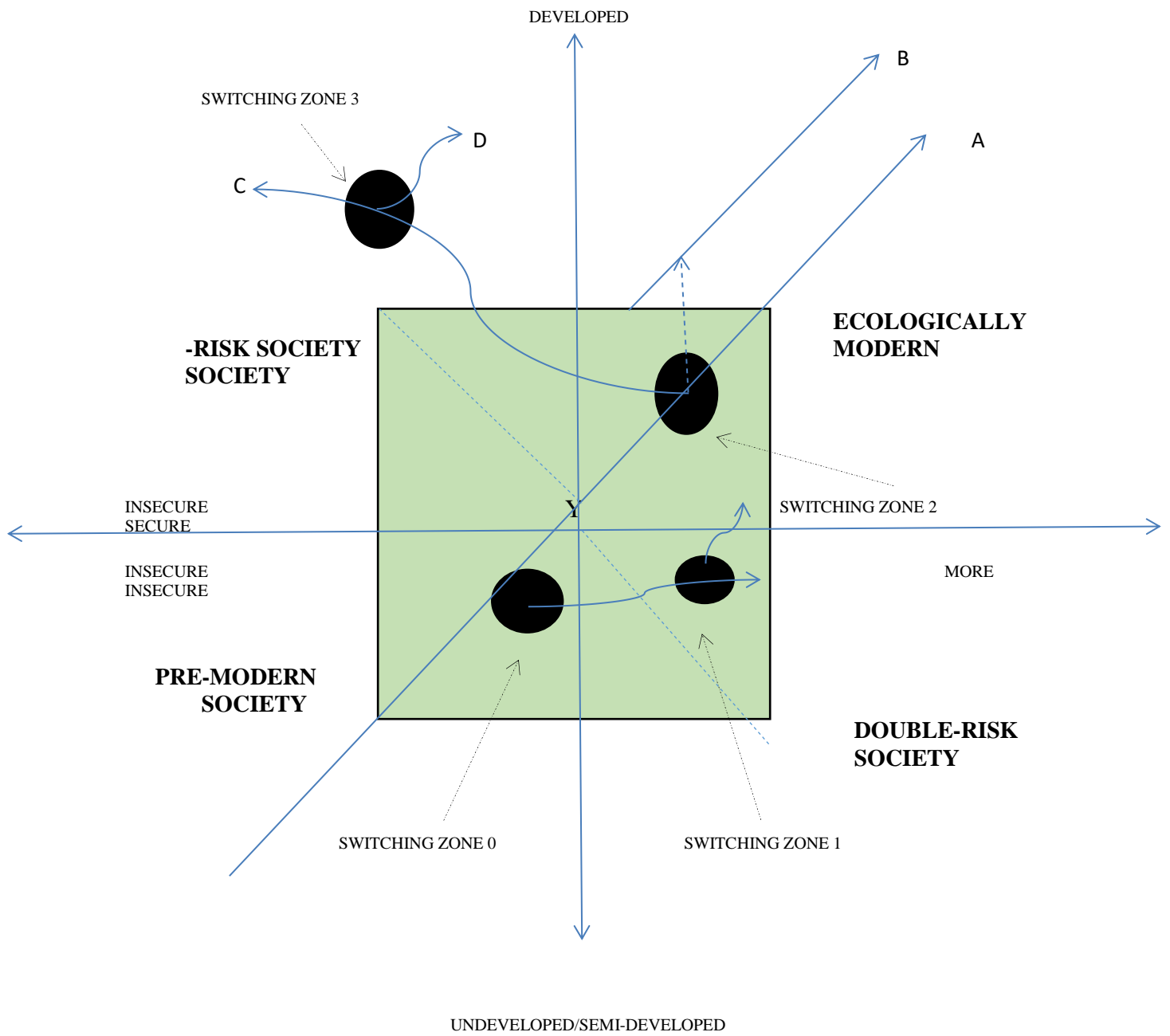



Figure 1: Techno-environmental risks and development stages (adapted from Cohen 1997)

Increasing risks and vulnerabilities 

	Traditional Risk Society	'Double-risk' Society
Applicability	Welfare states	Third World countries that have not yet moved to the semi-periphery.
Existence of social class	Hypothesised as 'classless' society	Still a class society, where the gap between social classes is more marked than in Western societies.
Type of risk experienced	Risk associated with science and technology, and scientific and technological rationality dominating industrial and economic decisions.	More than traditional risk societies due to the global distribution of risks and the lack of institutional resources to resolve, improve and manage them.
'Sub-politics'	Operating in more formal ways; e.g. registered NGOs, which have more freedom of voice and ability to influence government decisions and deterring cases of 'organised irresponsibility'.	Depends on factors such as the presence of an active civil society. Operating in more informal ways, and dealing with a wide range of social issues, rather than focusing only on techno-environmental risks.
Reflexive modernity	Most societies are now in a stage at which social institutions are beginning to challenge the rationality of science and technology in defining/dealing with techno-environmental risks.	These societies are still in the initial phase of reflexive modernity, in which growing concern is shown in regard to techno-environmental risks, but appropriate actions are still not taken.
Individualisation	Going through a process of individualisation, but with less negative effects on society as class contrast is not high.	Individuals in 'double-risk' societies are going through an ill-equipped version of individualisation (which is almost similar to selfishness) in which the individualisation of one's life means more risk for others.

Table 1: Differences between 'double-risk' and traditional Risk Society.