

[연구논문]

The Mechanism of Environmental Degradation in Korea - A Regulationist Review* -

한국의 환경문제 발생 메커니즘에 대한 연구 - 조절론적 접근 -

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ABSTRACT

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한국은 지난 40년 동안 급진적인 경제발전을 해왔으나, 주기적인 경제위기를 겪었다. 경제발전과 위기는 공간과 환경에 큰 영향을 주었다. 이 논문의 목적은 공간구조화와 환경문제를 가져오는 사회 세력들 간의 연계관계를 고찰하기 위함이다. 이를 위하여, 역사적인 분석방법을 택하였으며, 특히, 국가의 경제, 공간 등의 전략을 중심으로 연구를 하였다. 한국의 경제, 사회 및 지역 발전에서 국가의 역할이 중심적 역할을 했다는 기존연구를 토대로 한 것이다. 조절론을 바탕으로 한 분석들은 경제 및 공간발전에 있어서 사회세력의 메커니즘을 분석하고, 국가의 역할의 한계를 고찰하였다. 한국의 공간은 거듭되는 축적체계의 변화에 따라 공간적 세분화라는 현상이 있었고, 환경문제는 이러한 공간적 세분화에 따라 지역적 특성이 생겨났다. 이러한 현상들은 한국의 축적전략과 사회규제의 특색에 의해서 발생했는데, 그 전략과 사회조절양식을 밝히는 것이 이 논문의 주요 내용이다.

* 이 논문은 대한국토학회 대전지부 주체 한·중·일 국제 심포지엄 searching for Urban Planning Paradigm in the 21st Century(2001.8.17-18)에서 발표한 내용을 재정리하여 제출한 것임. 또한 이 논문은 2001년 10월 25일에 출간된 저서 Political Economy of Development and Environment in Korea 의 내용 일부분을 정리하였으며, Routledge 출판사의 허가에 감사를 표한다.

** 충남대학교 건축학과 전임강사

I. Introduction

There have been many studies on the Korean economic development process and its impacts. This study examines the Korean development in the post-war period to identify the forces and mechanisms by which the spatial form and environmental conditions have been shaped. Environmental degradation is caused primarily by the economic system. But the economic system incorporates many forces and is defined by them. And how the economic system affect the environment depends upon these forces. Therefore, the forces and mechanisms within the economic system must be analysed to see how they interact with the physical environment. The examination of environmental problems is made more complicated by the spatial dimension of these forces in the accumulation system. Thus, environmental problem is very much a spatial problem, and examination of environmental degradation must be done through the analysis of space. In this paper, we propose a thesis that differentiated spatial conditions created by capitalist development bring about different environmental conditions specific to a given zone.

In order to identify the forces and analyse the mechanism of spatial and environmental transformation, a new theoretical framework had to be devised. In this paper, we adopted the

regulation theory for its historical and spatial specificity, and due to its intermediate concepts linking economic and social factors.

II. Theoretical Framework

Traditionally environmental problems were defined as those concerned with pollution and nature conservation. However, since the Brundtland Commission opened up the debate on the environment and sustainability to include equity and human conditions, the environmental problems had to be redefined and theoretically incorporated. Particularly, the North and South debate shows that regions are affected by different environmental problems from differing causes. It is essentially spatial.

It is accepted that human activities whether production or consumption affect the environment. Since beginning of time human beings have altered the state of nature to suit their needs. Cities are prime examples. However, the advent of global capitalism from the late 19 century brought new complexity. Environmental resources were not extracted for need but for profit. The rate at which environmental resources were plundered and waste deposited became ever faster.

As capitalism progressed into the 20th century, the economic systems became even more complex and the way in which national and supra-national states manage the crisis

ridden accumulation system has become more difficult. They employed various devices both economic and political to ensure continued economic growth. The state also mediated between national needs and global forces, gradually more so as interaction became more intense. The environmental problems in a country are not just due to the dynamics of national economy, but also have a global dimension. One example is the trade in agricultural goods which affect food prices, which in turn affect the method of production, often taking environmentally unfriendly options.

The theoretical discussions on the mode of environmental degradation have incorporated spatial dimensions. The capitalist mode of production is the process by which the interaction between capital, labour and the environment are brought together as essential elements in the accumulation process. Production, whether capitalist in form or not, is the process where human beings turn the environment and its resources into use values or commodities for exchange. In the capitalist mode of production, capital mobilises labour as well as raw materials from nature, producing commodities to be consumed by the society in the reproduction of labour. Thus, nature is transformed into commodities by capital, and consumed by society in the production and reproduction process. As capital tries to overcome the inherent contradictions in the

system by displacing crisis tendencies in space, a landscape of exploitation is created. The production of space in the image of capitalism is characterised by uneven development with all its problems of over- and underdevelopment. The concept of uneven development unifies environmental conditions in different places. In the era of global capitalism, uneven spatial development between and within nations is the manifestation of the interaction between capital, labour and environment in specific places which themselves are connected by a web of commodity exchanges and flow of capital.

The weakness of these theories on the causes of environmental problems lies in their universal and general approach. On the one hand, the technocentric approach theories tend to see the origins of environmental problem to exist in technical systems or in the government policies which interfere with free market mechanism. On the other hand, Marxist and ecocentric (ecologists) view environmental problems emerging from the economic and social systems such as the capitalist economy and government policies. Already within the environmental debate, the more radical theorists are gaining ground, but their theories remain at macro-level looking at general dynamics in terms of global trends. O'Connor (1989) for example discusses environmental problems emerging from uneven development between 'First World' and 'Third World'. Although this

view may be justified, each country's exploitative methods employed within their national border and between different historical period will be different. It is at this level of concrete study that is missing. Also many researches do not have a framework to analyse a specific economic system. There have been some specific country studies, but have remained at phenomenological level without revealing the underlying economic and political forces. (Johnston, R. J. 1989, Hasan, A. and Azam Ali, A. 1992)

1. The Approaches of Regulation Theory

In order to identify the causal mechanisms of environmental problems in their entire political, social and economic entirety, we need to move towards a theorisation capable of analysing the interdependent relationship of society at large. We thus come to regulation theory as an improved means of achieving this goal. The main features of this quite cogent explanatory paradigm, and its capacity to analyse the social forces which cause the environmental transformation, will now be laid out.

Capitalist society consists of various social relations, wage relations being central. In theories of regulation, the concern is with the concrete expression of these fundamental social relations. The major focus of regulation theory has been to find explanations for the

phenomena of stable and continued reproduction of the capitalist accumulation system despite the contradictions and the intermittent emergence of crisis. The regulationist position is the rejection of the functionalist idea that in the long run, the reforms of a capitalist system result from a self-regulating realm through a sort of 'long-term invisible hand', which plays a role similar to that of the market forces in the short-range regulation of the micro-economic forces, thus resolving macro-economic and social contradictions (Lipietz 1989, p.60, Aglietta 1979). Instead, the theory replaces the functionalist notion of 'capitalist reproduction' with a conjunctural analysis of 'capitalist regulation'. This regulation is seen as an ensemble of practices to adjust and modify short-term fluctuations and discontinuous evolutions in the social system through specific institutional forms, societal norms and networks of accumulation strategies (Torfinn 1991, p.72).

Regulation theory's advantage over other Marxist derived theories is that it can analyse capitalist development over time and space. On the one hand, it periodises capitalist restructuring into successive regime of accumulation, and on the other, it is concerned with the relationship between global economic forces and national accumulation systems, which makes it explicitly spatial. Its premise is that firstly, the nature of the 'coupling' between the accumulation regime and the mode of social regulation varies from

nation to nation; and secondly, for a regime of accumulation to stabilise, this coupling must be functional at the level of the nation state (Tickell and Peck 1992b). The regulationists identify for each nation state a succession of regimes of accumulation. Their approach thus overcomes the general and 'universalist' tendency of conventional Marxist discourse.

The mode of development is the primary concept for the historical transformation of the accumulation system. It is defined as 'the articulation at the national level of the structural forms of a regime of accumulation with the institutional features of a mode of regulation into a regulatory ensemble capable of generating growth, prosperity and social peace in the context of the international division of labour' (Torfing 1991, p.77). Regulation is characterised by a synthesis of up to four elements: 1) the industrial paradigm, 2) regime of accumulation, 3) mode of social regulation and 4) hegemonic structure.

2. Regime of Accumulation, Mode of Social Regulation(MSR) and Other Components

Among the four above elements, the twin conceptual pillars of regulation theory are the regime of accumulation and mode of social regulation. A regime of accumulation is a systematic organisation of production, income distribution, exchange of the social product and

consumption. With the emergence of a regime of accumulation, economic development becomes relatively stable: changes in the amount of capital invested, its distribution between sectors and departments and trends in productivity are co-ordinated with changes in the distributions of income and in the field of consumption. A regime of accumulation emerges in accordance with the conditions inherited from the past and the expectations that earlier trends in the norms of production and consumption will continue to be the foundations of a 'social mould' (Dunford, 1990).

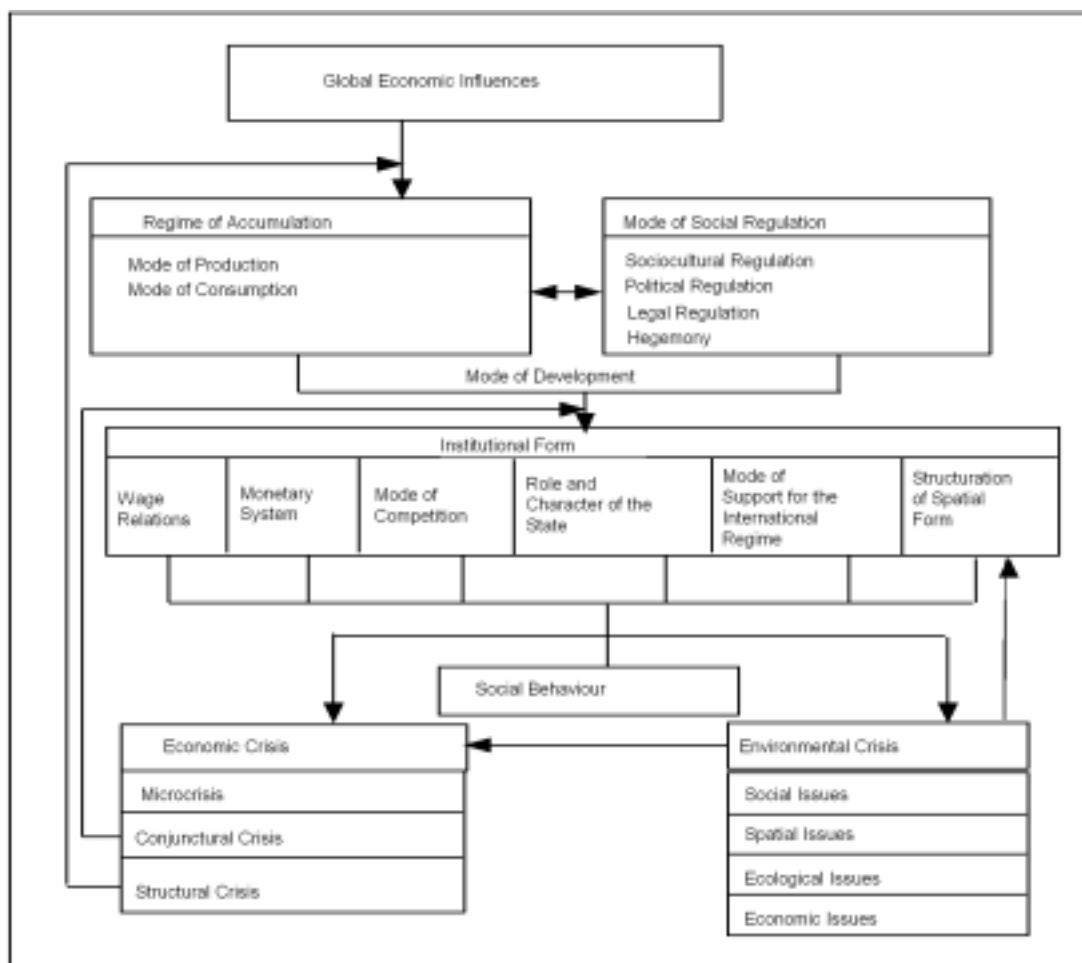
'Industrial paradigm' exists as a sub-component of the regime of accumulation. This encompasses the developments in labour processes and in the productive forces. The development of labour processes in the Western industrialised countries has been punctuated by several transformations. A phase of manufacturing was superseded by mechanisation. Mechanisation was given a new impetus by the development of scientific management of Taylorism, which divided the production into simple tasks, thus reducing the skill level of each individuals and raising productivity. In the 1920s the introduction of Ford's semi-automatic assembly line resulted in a mechanisation of transfer and a rationalisation of the flow of work. In the 1970s and 1980s, with advances in electronics, computers and communications technologies, automation or systemofacture

emerged as new principles of work organisation, bringing vertical disintegration of the Fordist production processes which hastened a new international division of labour.

The other important pillar, the mode of social regulation (MSR) is used to denote a specific local and historical collection of structural forms or institutional arrangements within which individual and collective behaviour unfolds. It enables privately made decisions to

be co-ordinated and give rise to elements of regularity in economic life. A mode of social regulation therefore allows a dynamic adaptation of production and social demands and guides and stabilises the process of accumulation (Dunford, 1990:306). The MSR, therefore, includes many social compromises between capital, state and civil society (labourer/consumer) such as the allocation of capital, wage settlements, provision of welfare

Figure 1. Diagrammatic Structure of Capitalist Mode of Development in Regulation Theory



Source: Chung, J-Y. (1997), p.47

or basic infrastructure and integration in the global economy. Two distinct types of regulation are identified: competitive and monopolistic. A competitive MSR is one in which basic welfare and amenities are the responsibility of the individual, wage bargaining is at the level of the firm, and allocation of capital is on a competitive basis. In sum, individual competition in all manner of private and collective consumption underlies competitive MSR. On the other hand, a monopolistic MSR is one in which there is social provision of welfare, collective bargaining procedures and state management of effective demand. The distinction between the two forms of regulation is important to the understanding of the particular characteristics of the regime of accumulation.

Regulationists accept the Marxist tenets of the contradictions inherent in the capitalist mode of production to produce crises as part of the normal capitalist development process. In regulationist view crises occur due to failures in the regime of accumulation and/or mode of regulation. Crises do not, in the view of most writers in this tradition, have regular causes. In 1929, a cumulative collapse was a result of the limits to accumulation in Department I and obstacles to the growth of demand in department II, whereas the crisis of the 1970s was rooted in a fall in the rate of profit and the exhaustion of an industrial paradigm. The

Asian financial crisis of the late 1990s could be seen as coming up against limits to the Taylorist work organisation, which the advanced industrial countries faced three decades, earlier as well as adjusting to the globalisation process led by 'Information Revolution'. The resolution of structural crisis can only occur when a new regime of accumulation is linked to a complementary MSR. Such linkage is of crucial importance. However, this is not to argue that a given accumulation system has but one corresponding MSR; there are a number of possible solutions to the crisis and outcomes are contingent upon the historical formation of social and spatial organisations and the dominant hegemony at the time. The particular coupling is a 'chance discovery' (Dunford, 1990; Jessop, 1990a; Lipietz, 1987; Peck and Tickell 1992a). Korea today is facing just such difficulty 'finding the appropriate MSR for the regime of accumulation it is trying construct.

In the moments of change, such as in a crisis situation, in the direction of human social development there is not one but a whole range of different possibilities: which ones succeed depend in part on the economic success of different models and in part on the strength of different strategic concepts, the influence of the social groups that support them, the construction of coalitions and the actions of the state. The hegemonic structure is a complex

political, ideological and cultural formation which is propagated by the dominant social group or institution such as the state, and whose domain is the civil society. The overall direction of social development is determined by 'hegemonic projects' of the dominant societal alliances (Jessop 1983).¹⁾ For the Fordist state, the hegemonic project was the creation of a welfare system and the link between wage increases with productivity rises (Dunford 1990). Of particular relevance to this study, the hegemonic project also aims to determine which environmental perspective wins the public consensus, for it is important to marginalize any ideological tendencies damaging to the interests of dominant capital.

The interrelationship between the regime of accumulation, the MSR and the hegemonic structure produces structural forms, which crystallise institutionalised compromises. These 'institutional forms' 'enable the transition between constraints associated with an accumulation regime and collective strategies' (Boyer 1990b, pp.332). The institutional forms are important in that they allow concrete analysis of the economic formations to shed light on the character of the regime of accumulation and the mode of social regulation (Torfing 1991; Boyer 1990a, pp.37). The institutional forms identified

are: forms of monetary constraint; configurations of the wage relation; mode of competition; position within the international regime; the character and role of the state.

The most important institutional form is the role and character of the state. The state plays a nodal role in bringing about the coherence of a mode of social regulation, and serves as the ultimate guarantor of the other institutional forms (Dunford 1988, p.355; Jessop 1990b, p.202). It ensures stabilisation of the regime of accumulation through the articulation of accumulation strategies and hegemonic projects (Jessop 1990b, p.200).

3. The Framework for Environmental Analysis

As we have already mentioned, space is the linkage between the dynamics of capital and environmental problems. Since this concept does not exist in the regulation theory, some theorisation has been conducted, Lipietz being one of the most notable.

Lipietz states that 'this structuration of space is at the same time the material base of this social stabilization: once the social places and networks are defined, the infinite plasticity of social practices, as Marx has noted, is framed

1) A hegemonic project is a political, institutional and ideological strategy which is economically conditioned but whose domain is civil society as a whole and not just the economic sphere.

or reified. In this sense, human space is already a mode of regulation' (Lipietz 1992, pp.103-4). And as space is created by social relations embedded in material condition, we can say that space itself is the manifestation of environmental condition by the activity taking place in a given space (Lipietz 1992, p.104). Thus, the economic activities are embedded in space by their physical fix in the environment, which in turn means that spatial development is a change in human and environmental conditions through the accumulation system.

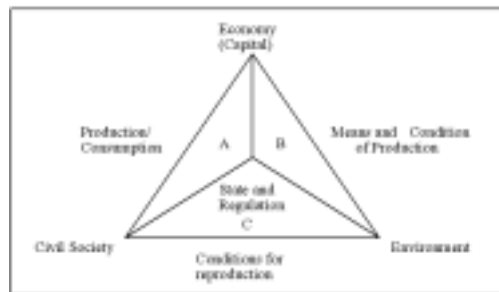
Lipietz (1992) demonstrates the spatial and environmental consequences of a changing mode of development in Western advanced countries. He claims that two paradigmatic axes emerged to resolve the crisis of Fordism, stemming from the exhaustion of Taylorist production processes and from the rigidity of the national MSR. These are identified by him as the Neo-Fordist regime, which aims to re-establish the flexibility of market relations as well as capital-labour relations, and the Post-Fordist regime, which aims to overcome the limitation of Taylorist model of mass production by job qualification, 'just in time' organisation and strategic co-operation between companies. The spatial forms of these two regimes are quite different: the Neo-Fordist model implies a return to urban concentration since proximity of social and economic interactions becomes ever more important in a

social regulation that takes direct marketing as its universal form. The result is megalopolisation, bringing with it urban diseconomies as well as widespread environmental problems. The Post-Fordist model produces a network of smaller and highly articulated production systems with 'organised mobilisation of territories' at its base.

In the above discussion, it is emphasised that spatial form is actively created and recreated through the social activities between people and their environments. Space is not simply an outcome of the current accumulation regime, but is marked by the pre-existing configuration, thus helping to form the accumulation strategies of the ensuing period. It is also seen as a mode of social regulation in that space created regulates economic activities of everyday activities of individual as well as future directions in space and environment.

Another important institutional form is the state as already explained. The state in regulation theory regulates not just capital-labour relationship, the economic and spatial development and the way in which the environment is utilised, but also mediates the interaction between national accumulation and the international pressures and changing global order. Within the political and economic constraints in which the state operates, it actively intervenes in the provision of the preconditions for capital accumulation and for the reproduction of labour. The state must

Figure 2. Economy, Civil Society, Environment and the state: A conceptual Framework



Note:

Segment A: social regulation in the production/consumption relations such as intervention in union activity, consumption behaviour, education and training, fertility, working conditions etc

Segment B: social regulation and state provision of physical infrastructure for production and the enabling of obtaining raw materials for production, and the protection of nature from overuse and abuse; spatial regulation.

Segment C: social regulation of consumption of nature and environmental goods, the state regulation in the provision of public consumption goods such as clean water, roads, low cost housing and general living conditions.

Source: Chung J. Y. (1997), p.48

balance the three spheres of regulation to obtain the best possible conditions for the continued reproduction of the accumulation regime (see Fig 2). The emphasis has long been upon the production and reproduction of capital (and to a lesser extent, labour) at the expense of 'environment'. With environmental consciousness awakened in the last two decades of the century, the management of environmental sphere has become increasing political.

The theoretical framework, under regulation theory to examine the causal mechanisms of environment has following features:

① Examines economic development in a

historical perspective and categorises each succinct phases of differing mode of development;

② The periodisation of economic development allows for the examination of spatial and environmental impact of each phase of development;

③ By examining the institutional forms such as the state and its role in economic and spatial development and environmental management, one is able to identify the way social forces interact, i.e. the mechanism of accumulation and environmental degradation.

Thus, structural features of Korean development can be identified and how they work to overcome crisis tendencies in the regime of accumulation.

The changing interaction of accumulation regimes and the physical environment lies at the basis of spatial transformation. Changing spatial configurations bring about changing environmental conditions. As new industrial space is formed and old ones go into decline, there is a qualitative change in the environmental conditions of both. Uneven spatial development results in differentiated environmental qualities. Environmental degradation stems not only from the economic system, that is, the mode of production and consumption and capital concentration, but also from its spatial configuration.

The analytical framework devised here views the dynamics of environmental degradation as arising from the sustaining the crisis ridden capitalist mode of production by economic and spatial strategies to restructure the regime of accumulation and industrial space under a dominant mode of social regulation. Using this framework, the Korean economic, spatial and environmental development process has been analysed.

III. Economic Development, Crisis and Environmental Problems

As already explained, economic development necessarily brings about changes in environmental conditions. The way in which this change occurs and how negative this impact is depend upon the regime of accumulation and the mode of social regulation. In general terms, the regimes of accumulation since the industrial revolution had the capability and the necessity to transform the environment on a global scale. More importantly, the Mode of Social Regulation controlled the way in which how much environmental goods and 'bads' were produced and how they were distributed in space and between classes.

The economic crisis and environmental problems are inherent in all societies, whether they are capitalist or socialist or otherwise. However, each country will have specific

features and causes. Therefore, each country must be separately and specifically analysed. In this paper we examine the case of Korea, which has had one of world's fastest growing economy and has been well known for its labour exploitation. This paper intends to show that environmental exploitation has also been severe due to its competitive MSR.

1. The Korean Economic Miracle Revisited: A Crisis Ridden System

The post-war accumulation regimes in Korea were as much influenced by domestic political economic conditions as by global economic circumstances. The extensive accumulation regime based on the Import Substitution Industrialisation (ISI) was established soon after the Korean War. National reconstruction was the driving force of the ISI regime, which took advantage of American aid through the processing of primary resources such as sugar, cotton and flour as well as timber and minerals. The autocratic state, which rested on the monopolistic activities of capital, soon faced a legitimization crisis, as the ISI regime of accumulation came to its limits. This structural crisis not only resulted in the restructuring of the mode of development but also in the transformation of the state and political alliances.

In the early 1960s, an extensive accumulation

regime based on labour intensive Export Oriented Industrialisation (EOI) was established in conjunction with a competitive MSR, which took advantage of the growing malfunction of the Fordist economies of the West. As an export-oriented economy, the Korean accumulation regime has been very sensitive to the economic conditions of the major international markets and the changes in the global economic structure. Much of Korea's manufacturing was geared to own-name export manufacturing (OEM) for American and Japanese companies. This extensive accumulation regime coupled with a competitive MSR was based on labour intensive industrialisation with export orientation. It was able to stimulate the economy and provide mass employment, but the regime was highly dependent upon external market conditions, and required the exploitation of the Korean labour force.

The next major economic restructuring came in the early 1970s, coinciding with the growing political disenchantment of those alienated from the EOI development process within Korea, as well as with the collapse of Fordist regimes in the Western industrialised countries. With tougher export market conditions for labour intensive low value added products, the

corporatist regime²⁾ based on heavy and chemical industrialisation sought to raise the technological and industrial structure to escape from dependency upon the rising cost of intermediate imports from advanced industrialised countries. Heavy and chemical industrialisation was not a return to an ISI regime, but aimed to promote EOI development by substituting imported intermediate goods with domestic products. Also, the development of the chemical industry coincided with the introduction of intensive farming methods to raise the productivity of the agricultural sector in order to assure self-sufficiency in food supply.

The main problem of the heavy and chemical industrialisation phase was its mode of regulation. On the one hand, this regime brought about a culture of heavy dependence on state subsidy and manipulation of the financial system by monopoly capital (see table 2); on the other hand, competitive regulation was enforced on other industrial sectors. This resulted in over-capacity and uncompetitiveness of the heavy and chemical industrial sector, while other sectors suffered from a shortage of credit and higher interest rates. The unbalanced economic structure was sustained by oppressive political regulation, which rested upon nationalism,

2) The Korean regime in the 1970s was labelled corporatist due to the government policy to entice chaebol groups into heavy and chemical industrial programme by providing incentives and low interest rate loans, while the chaebol companies treated its skilled workers with preferential wages. The period was characterised by this industrial policy. However, other sectors of the economy was under competitive MSR. Thus in general economic terms it displayed competitive characteristics, corporatist characteristics were limited to the heavy and chemical industrial sector

known as the Yusin. The ideology of self-sustenance and modernisation was not only used to motivate industrial workers but was used to modernise and industrialise the agricultural sector and rural communities. The global recession in 1979 exposed the problems of government policies centred on heavy and chemical industries bringing internal legitimacy crisis. The Yusin regime was brought to an end, not only by the event on October 26, but also by the reformation of industrial policy to eliminate rent-seeking behaviour.

Table 1. Financial Trends

	1972	1974	1976	1978	1979	1980	1981	1982
Inflation Rate (WPI)	13.8	42.1	12.2	11.6	18.8	38.9	20.4	4.7
Interest Rates								
General Bank		15.5	18.0	19.0	19.0	20.0	17.0	10.0
KDBI Facility Investment	11.0	10.0	12.5	14.0	15.0	21.0	18.5	13.0
Export Finance	6.0	9.0	7.5	8.5	9.0	15.0	15.0	11.0
Curb Market	39.0	40.6	40.5	41.2	42.4	44.9	35.3	30.6
LIBOR rate ²	6.0	10.1	5.1	12.1	15.0	18.1	14.0	9.3
Benefits of Loans³								
General Bank		25.1	22.5	22.2	23.4	24.9	18.3	20.6
Export Finance	33.0	31.6	33.0	32.7	33.4	29.9	30.3	19.6
Real Interest Rates⁴								
General Bank		-26.6	5.8	7.4	0.2	-18.9	-3.4	5.3
Export Finance	-7.8	-33.1	-4.7	-3.1	-9.8	-23.9	-5.4	6.3

Note: 1. Korea Development Bank

2. London Interbank

3. Curb market interest rate minus interest rate of the loan concerned

4. Interest rate for loans minus Wholesale Price Index (WPI)

Source: cited in Rhee, S. (1987) p. 49.

The dominant Washington inspired ideology of the free market found resonance during the period of the Peripheral Fordist regime (1980–88), which promoted competition and productivity. The restructuring of the industrial system was brought about through heavy-handed state intervention, often giving

monopolistic control over an industrial to a favoured chaebol. However, the reduction in state subsidy and import tariffs forced the chaebol to look for other ways to raise profits. The intensification of production line automation and product development was pursued, while wages were severely restrained, with the state acting coercively in labour disputes. It was this labour repression that sowed the seeds of the collapse of the Peripheral Fordist regime in 1988. The chaebol groups had grown rapidly during the corporatist period, maturing into internationally competitive companies and diversifying into more profitable areas such as finance and real estate. The oligopolistic domination of the Korean economy by a handful of conglomerates led to very high concentration of capital. This not only raised social tension between classes but also became one of the main problems of the Korean economic structure: the sparseness of small and medium-sized enterprises.

International pressures for political reform and economic liberalisation and rising labour discontent due to poor wealth distribution transformed the Peripheral Fordist regime into Neo-Fordist regime in the late 1980s. This allowed for higher working class consumption, but with a competitive mode of regulation still in force. This meant that private consumption rose rapidly but social consumption did not rise in line. The gradual opening up of the domestic

market to overseas competition and the increase in Korean labour costs intensified the accumulation process. Thus, in the early 1990s the state started to play a greater role in socialising the cost of reproduction of labour by implementing medical insurance and pension schemes in order to reduce the pressure of wage demands. This did not signal the start of a welfare state, but instead a workfare state, where social welfare was purchased individually through a national programme of insurance schemes. Those outside formal employment were excluded from the social safety net. The high charges of a pay-as-you-go medical system excluded the poorer sections of the population. And the new regime did not end the repression of labour. As pressure on wages and the global recession of the early 1990s started to threaten the competitiveness of Korean firms, the state resumed its coercive tactics. The construction of the workfare system on the one hand and the strong-arm tactics in labour management on the other, operated well as a legitimisation strategy, where the dominant hegemonic bloc comprising of middle classes feared the loss of their economic stability.

These processes brought deep transformation of society and its spatial configuration. The growth of urban centres was accompanied by industrialisation of much of the countryside. In short, the restructuring of Korea's regime of

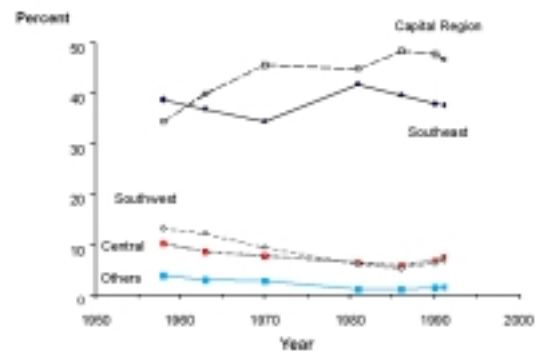
accumulation was clearly mapped in the changing space economy. Impediments to the accumulation regime were not merely those of the economic cycle: spatial constraints had their part to play. For this reason, emerging conflicts in the accumulation process demanded a restructuring of spatial structure. The old socio-spatial form, however, also constrained the formation of a new spatial-accumulation strategy. Its modification helped to overcome the accumulation blockage, but at the same time intensified existing socio-spatial problems.

Korea's space-environment has therefore been subjected to ever-increasing pressures as the accumulation system intensified under state strategies for national territorial development. In the 1960s, the labour intensive export-oriented development was implemented under a spatial strategy of concentration in the two largest cities with good transport infrastructure, Seoul and Pusan. Korea's Taylorist EOI regime was exhausted not only by the dysfunctioning of global Fordism, but also by the spatial barriers to the capital valorisation process. The concentrated spatial strategy stimulated rural-urban in-migration at a phenomenal rate, bringing urban overcrowding, squatter settlement and high urban unemployment as well as rising industrial land prices. Seeking scale economies, in the 1970s the heavy and chemical industries were located in the provincial, purpose-built industrial towns in the Southeast, creating a

new industrial space. To relieve the over-concentration of population and congestion, the state also implemented a policy of industrial decentralisation. However, the decanting of industries to the provincial areas of Pusan and Seoul did little to relieve migration to the primate city and their satellites. Instead, this was the start of suburbanisation of housing development in the surrounding areas of Pusan and Seoul. Few industries moved to other provinces at this time. The intensive methods introduced into the agricultural sector, and the spatial policies prohibiting industrial activities in rural zones, effectively sowed the seeds for rural underdevelopment and regional inequity. Agrochemical pollution and aging of rural population was the result. Thus, the country was divided into two functional zones; the industrial urban zone and the rural zone. Geographically, the country took on a bipolar development form, with the Southeast and the Northwest (Capital) regions receiving much of the investment in fixed capital and manufacturing industries as well as population in-migration (see Fig 4).

The Peripheral Fordist regime³⁾ of the 1980s introduced a greater degree of market competition, and a new industrial trajectory intensified competition at all levels of society. This stimulated the disintegration of production

Figure 4. Distribution of Manufacturing Employment by Regions 1958-1991



Source: data from Park, S.O. (1991), p.83, N.S.O, Korea Statistical Yearbook, 1993

(assembly) and control-marketing functions, particularly among the chaebol, thus creating a tripartite spatial structure. The de-industrialising city of Seoul with its concentrated control functions and high level of business services became the core consumption zone (CCZ), the provincial areas of Southeast and Capital regions with concentrated production functions formed the semi-peripheral industrial zone (SIZ), and the remaining areas of agricultural production constituted the peripheral rural zone (PRZ). De-industrialisation and the rise in the business-service sector of the CCZ meant that this zone had high concentration of upper-middle classes as well as 'lumpen proletariats'. The SIZ on the other hand, which received high government investments for productive infrastructure to promote efficient industrial

3) Peripheral Fordism is characterised by an authoritarian state, an economy dominated by export of Fordist products to core countries, labour repression and low wages (Tickell and Peck 1992b, p.202)

higher increases in North Kyongsang, North Chungchong and North Cholla Provinces which were formerly less developed. Since the 1980s, the PRZ and its population have been increasingly alienated from virtuous development as state subsidies were cut and greater market competition introduced into the agricultural sector. With the adoption of growth management principles in infrastructure provision, the infrastructure investment was minimal in the PRZ. The liberalisation of cheap agricultural imports from the United States to secure markets for Korean manufactured goods essentially sacrificed the rural community for the sake of the EOI strategy. Thus, the pursuit of the high growth export oriented industries, combined with competitive regulation and efficiency-seeking land and resource development strategies, resulted in a highly uneven spatial and social structure.

2. The Environmental Crisis in the Tripartite National Space

The division of national space into tripartite zones meant that there existed different social relations and institutional forms within and between these zones. Differences in production activities, in consumption levels and political inclusiveness would suggest quite differing social and environmental conditions. The research shows that the dynamics of each zone

within the overall national accumulation regime have created distinctive environmental problems. Capital concentration and centralisation towards the CCZ resulted in the overheating of the urban economy, alongside high levels of consumption. One of the most serious problems of this capital and population concentration was the competition over land. The demand for office space as well as middle class housing brought relentless eviction of the urban poor from central areas. However, the huge shortage of land within the city led to the suburbanisation of housing and office developments to the satellite cities. The greenfield sites on the urban periphery have undergone comprehensive commodification, widening the pollution effects. These developments exacerbated pollution of both water systems and of air, the latter due to the new mass ownership of motor vehicles. Korea's Neo-Fordist dynamics overwhelmed the available collective consumption infrastructure. The central and local governments faced huge problems of water purification, solid waste management and effluent treatment. They resorted to extreme measures, which often demanded the public to shoulder the costs. The environmental damage was huge.

The SIZ, the production core of the Korean EOI regime, received little in terms of surplus value produced: the siphoning off of capital to the CCZ resulted in a state of relative underdevelopment, particularly in the consumption

field. The relative underdevelopment of social infrastructure led to the flight of Korea's managerial classes. With the SIZ largely populated by industrial proletariat, the state-capital nexus was able to treat it merely as a 'production line', with minimal attention to the reproduction needs of labour. Here, the environment became seriously degraded by industrial pollution, capital externalising its production costs to the environment with little opposition from the working classes. Through a competitive mode of regulation, resting on the private provision of environmental needs, the state was able to transfer its environmental responsibilities to capital and to society at large. Monopoly capital was disinclined to voluntarily provide pollution mitigating facilities, while the immature civil society lacked the strength to protect the environment or take responsibility for the supply of environmental goods. Only when environmental disasters brought public outcry did the state act to regulate industries and increase social infrastructure.

The intensification of agriculture through high chemical inputs in the 1970s trapped the farmers in a cycle of debt repayment as the state reduced subsidies, while pushing market-led pricing. Competitive pressures obliged farmers to use increasing quantities of agrochemicals, bringing deteriorating soil fertility. The health problems associated with chemical use were

often extreme. Rising affluence of the middle classes brought additional pressures on the PRZ environment in the form of leisure developments: the proliferation of golf courses in particular compounded rural problems. Instead of much needed economic growth, the chaebol-dominated leisure industry brought their exploitative practices of casual employment. Surplus capital was again siphoned off to headquarters in the CCZ. In addition, the golf courses prolific use of pesticide increased damage to the local ecology. State investments both in production and in social infrastructure were conspicuously low. The lack of medical and educational facilities was the prime reason for rural population to continue their migration to the larger urban centres.

Table 3. Environmental Problems in Spatial Zones of Korea

Name of Zone	Environmental Problems
Core Consumption Zone (CCZ)	Housing shortages, waste disposal and sanitation problems, traffic congestion, air pollution, over-development
Semi-peripheral Industrial Zone (SIZ)	Industrial pollution, construction of productive infrastructure and nature conservation, low level of social amenities, nuclear power plants.
Peripheral Rural Zone (PRZ)	Agrochemical pollution, low level of social and physical amenity, environmentally unfriendly development of leisure facilities.

While each zone had its own environmental problems created by particular production and consumption structures, these could not of course be self-contained. Industrial discharges

affected water for agricultural use, while industrial and agricultural pollution reduced drinking water quality for the urban population. The cumulative effects of industrial, agricultural and domestic waste water resulted in coastal water pollution, well demonstrated by the Jeokjo or 'red tide' phenomenon which invaded much of the coastal waters of Korea, destroying huge tracks of marine life including traditional fisheries. Airborne pollution similarly crossed zonal boundaries, acid rain in particular affecting crop yields and causing health problems even in rural areas.

IV. Structures and Mechanism of Environment Degradation

The Structural features of Korean development can be analysed using the regulationist conceptual tools. Examining the subcomponents of Regime of accumulation and Mode of Social Regulation can identify the character of the structural features of Korean development process.

Within the Regime of Accumulation, there are 3 main subcomponents, which have been identified to be structural features. These will be examined in turn:

Balance between Production and Consumption

- The state discrimination of interventions between production and consumption is characterised by the term 'productivism'. That is, in order to promote export-oriented economic

development, the state played a limited role in maintaining domestic consumption demand (at least until the 1988), but took full charge of productive infrastructure provision. Discrimination in state intervention is particularly characterised as between differential expenditures in productive infrastructure and social welfare. Expenditure on social investment has been overwhelmingly directed towards production-related programmes such as the provision of infrastructure (for example, transportation and communication, power and water supply), or to the improvement of labour productivity (education and training, science and technology). As in other NIEs, in Korea the central state intervened massively in the realm of private production and has indeed constituted a key agency in the promotion of 'productivism'. The delivery of social consumption means has stood in great contrast. Throughout the EOI period, total government expenditure on social consumption, including social modernisation programmes and housing, environmental protection and public health was less than one third of that on 'economic services'. It is hardly surprising that less than one third of Korea's domestic sewage is subject to primary treatment. In examining environmental expenditure of major industrial countries, it was revealed that Korea had one of the lowest. When considering these countries had invested massively in SOC during their industrialisation period, Korea's environmental infrastructure

is at a quite low level. Although Korea's environmental investment has increased substantially in recent years, it is still considered not adequate. Still in 2001, the large proportion of sewage receives only primary treatment, whereas in other advanced countries, secondary and tertiary treatment is the norm.

Table 4. International comparison of ratio of environmental investment to GNP

(unit: %)					
Japan	Sweden	U. K.	U.S.A.	Switzerland	Korea
0.34	1.69	3.74	0.57	1.03	0.16

Source: OECD, (1985) Environmental Policy and Technical Charge, Paris.

Another example of productivism can be seen in the contrast between state intervention in the provision of social housing and in the development of industrial zones, both of which were afflicted by spiralling land prices to levels comparable to those of Tokyo. The central government has all along prioritised the provision of industrial estates nationwide, while public housing was for the most part neglected. The construction of Daedok Science Town in the early 1980s was fully sponsored by government, while housing for the urban poor were being eroded under name of urban redevelopment. Under a competitive mode of social regulation, the socialisation of collective consumption means is a hindrance to capital in its search for profits. Accordingly, the delivery of such social consumption means as housing

was overshadowed by activities serving capital accumulation. Throughout the post-war period the state met rather less than one third of its citizens' housing needs, with low-income rental housing virtually non-existent until 1990. The inadequate provision of public housing compelled the vast majority towards 'the second circuit of exploitation' of competitive property capital. Social tension over housing shortages, particularly in the Seoul metropolitan area was a major source of the state's legitimisation crisis. Thus, housing program was given priority in the early 1990s with the construction of new towns around Seoul. As for the provision of recreational space, its absence in urban areas has been extreme. At the same time, natural recreational spaces in the urban hinterland have undergone widespread commodification.

Industrial Trajectory – The particular features of Korean industrial trajectory which has had an impact on spatio-environmental problems are as follows: first, the focus on 'leading-sector' industries meant that all other industrial sectors were neglected, which in turn led to spatial concentration (in order to obtain scarce resources), and externalisation of environmental costs. Second, the reliance on high-technology as a solution to societal problems meant that environmental problems increased in its toxicity, i.e. adoption of nuclear energy programme to solve the energy requirements of rapidly increasing economy, abuse of pesticides and

fertilisers in rural sector to raise productivity and instillation of general social preference for advance technological products, etc.

The vehicle of accumulation – For the past 40 years, Korea's economic development rested on the chaebols, the large, family based monopolies. The problems arising from national economy dominated by the chaebols are unbalanced industrial structure coming from lack of small and medium sized companies, centralisation of capital and the concentration of technical know-how. However, they were technologically and managerially weak and their methods of accumulation was based on extensive strategies, i.e. enlarging the base of production for increasing the size of profit rather than raising productivity. This strategy was exhausted in the late 1990s due to falling rate of profit and productivity, competition from newly industrialising countries such as China and ASEAN countries and inability to raise its technological level.

As chaebols were the main driving engine for the export oriented industrialisation, government was willing to turn a blind eye to various unscrupulous activities of the chaebol including deliberate pollution activities and waste dumping. While Korea possesses quite an elaborate environmental regulation framework, the actual implementation of the law was quite lacks, only having to use them when pollution became a publicly known.

The Structural forms of Korean development examined above have been shaped by two extra-economic means: MSR and hegemonic structure. These allow further insight to the character of the structural forms.

Mode of Social Regulation – During the developmental era of Korea (1960 – 1992), the character of MSR has been competitive (Lipietz 1992). This not only characterises the mismatches between production and consumption, but also regulates social groups to act towards this end. In Korea, the state, particularly the government bureaucracy played the major institution of implementing the MSR, thus, determined the allocation of scarce resources towards productive infrastructure rather than collective consumption goods. It also enforced low wage policies and used coercive means to control labour unions. The wages were suppressed to give Korean products comparative advantage in the global markets.

The competitive MSR had significant environmental implications. As already mentioned, the environmental impacts of unbalanced infrastructure provision, of wage relations and of industrial trajectory were diverse. The competitive MSR forced the companies to externalise their environmental costs. Secret dumping of industrial waste were commonplace. Under such social conditions where environmental goods and services are to be privately purchased rather than socialised, charging for

Table 5. International Comparisons of Wages in Manufacturing, 1983

Country	Average Monthly Wage (U.S. \$)	Hours of Work	Wage per hour in won	Differential (Korea =100)	Conditions
Korea	285	236.1	936	100.0	Including some payment in kind. (companies of more than 10 workers)
Japan	1175	178.0	5,252	546.5	Cash. Wages only. (companies with more than 30 workers)
Taiwan	318	209	1,211	126.0	Cash wages only. (scale of company - n.a)
Singapore	90.70*	48.10*	1,500	156.1	Cash wages only. (companies of more than 10 workers)

Note: Figures with * for Singapore are based on average weekly wage and weekly work hours.

Source: Federation of Korea Trade Union (1984) p.55.

Table 6. Environmental Budget by Year

(Unit : Hundred Million Won)

Year	GNP		Government Expenditure1)		Environmental Expenditure		Expenditure of MOE		MoE Expenditure Ratio to :	
	GNP	Increase rate	Value	Increase rate	Value	Increase rate	Value	Increase rate	GNP (%)	Gov. Exp. (%)
1995	3,519,747	15.9	745,344	15.6	17,801	53.3	6,729	42.6	0.19	0.90
1996	3,898,134	10.8	853,083	14.5	22,406	25.9	8,851	31.5	0.23	1.04
1997	4,209,867	8.0	983,299	15.3	27,747	23.8	10,802	22.0	0.26	1.10
1998	3,965,695	-5.8	1,103,139	12.2	28,121	1.3	11,131	3.0	0.28	1.01
1999	4,282,951	8.0	1,200,206	8.8	27,636	-1.7	11,536	3.6	0.27	0.96

주 : 1) 정부예산액은 일반회계+특별회계순계 규모임

Source: Ministry of Environment 2000

garbage disposal by volume and purchasing of bottled water is a natural course of action. However, private individuals have been externalising environmental costs: illegal garbage dumping in derelict sites and open field is now quite common.

In the 1990s, the competitive MSR has been

giving way to neo-competitive mode. This is due to the state accepting the responsibility of managing the demand for collective consumption such as health care, pension and social welfare in general. However, the way in which this responsibility has been executed was to create a workfare state, which covered those in

employment and to the extent to which they contribute. Only in the last few years have we seen a move towards universal health care and social security, but still far from the cover provided in advanced Western countries.

The hegemonic ideology before the 1980s was one of anti-communism, collective action and nation building. This ideology demanded self-sacrifice for the good of society and country. It was believed that benefits of development would be for everyone. Confucianist work ethics was encouraged and concentration of capital was justified in terms of 'trickle down' theory. Thus, suppression of wages and imbalances in infrastructural provision was justified. The hegemonic ideology of 'free-market' philosophy was even more accentuated from the 1980s. Spatial balance and regional equity was virtually discarded, and was replaced by supply-demand philosophy. Both capital concentration in the hands of chaebol and a widening income gap were presented as natural and virtuous. Environmental degradation was claimed to be a side effect that had to be endured if economic growth were to be achieved. Indicative of this mode of regulation was the strategy to privatise environmental costs by introducing measures such as the 'polluter pays principle'. As a means of legitimating state environmental regulations, environmental ideology of the 1990s focused the blame for environmental degradation on the

sphere of consumption. The state, naturally, applied the polluter pays principle unequally, lessening the burden on monopoly capital and shifting the costs to society at large. Research showed that the financial penalties on industrial pollution discharges were minimal and indeed were not strictly enforced, while the environmental improvement taxes on small businesses were high and vigorously applied. Large-scale leisure developments of the conglomerates, often in sensitive natural environments, went ahead with minimal assessment, but small extensions of farmhouses or other such developments in greenbelts saw the full force of the law. The MSR can thus be seen to regulate social behaviour in favour of the dominant economic development agenda, with environmental ideology creating a social consensus for the mode of environmental protection, designed not to hinder the regime of accumulation.

The mechanism of environmental degradation in Korea can be said to be a complex interaction between the structural features moulded by the competitive MSR and supported by free market ideology. The combination of competitive MSR, free market ideology and strong government interventions may have been successful in maintaining high rate of capital accumulation, but it was a deadly combination for the environmental and social development.

In the environmental degradation process,

configuration of space has been a crucial factor in the character of environmental conditions. On the other hand, the distribution of environmental conditions defines space and its characteristics. Space and environment cannot be separately conceptualised. Spatial policies that the state implemented inherently had environmental implications since it means environmental condition are altered in favour of one place over another. Space cannot be seen as a cause or a mode of degradation, but as a representation of mechanism of degradation. However, the spatial condition over one place has implication for others. The existing spatial conditions restrict future options for developments. Space cannot be thought of as purely passive container where activity takes place. Thus, the examination of spatial development has given us the character of environmental problems and mechanisms.

From the analysis, it is possible suggest possible policy directions for developing countries to avoid the same types of environmental problems as Korea. Regional balanced development policies should be supplemented by local autonomy, decentralisation of government functions and infrastructural investment. Environmental policies should not use market-oriented charges for environmental amenities since this only encourages social disparity and externalisation behaviour. In economic policies, competition must not be overriding goal; job security, fair and easy

access to capital and government are also essential. These policies can only appear if general social consensus is centred on monopolistic MSR or some variant of it.

V. Concluding Statement

We have seen that environmental problems are produced by complex underlying forces controlling the reproduction of our economy and society. The regulationist framework, which has intermediate concepts of analysis, was able to uncover the complicated way in which political economic mechanisms operate to maintain the economic system as well as the society as a whole.

The examination of the Korean economic and spatial development process showed us that the mode of development experienced several moments of crisis which were overcome by readjustment of regime of accumulation and mode of social regulation. Thus there were five distinct phases of distinct mode of development with corresponding accumulation strategies, which were largely guided by the government. The configuration of space during each phase also displayed quite distinct characteristics, each time trying to configure space appropriate for to the need of the accumulation strategy, at the same time trying to overcome or build upon spatial structure left by previous accumulation systems. In the Korean case, the intensifying

mode of accumulation meant that spatial configuration also intensified creating spatial zones with functional concentration. Uneven spatial development was the outcome, creating 3 distinct spatial zones. Examination of environmental problems reflected the character of main economic activity of each zones. The way in which environmental problems were addressed reflected the character of the state and the dominant mode of social regulation. The environmental policies actively sought to redirect the main thrust of environmental activism towards the civil society vis-à-vis the capital, utilising the free market ideology to put the burden of environmental costs to the private individual.

The financial crisis of 1997 was a crisis in the mode of development arising from the integration of the internal accumulation structure with the global economic environment by opening up Korean markets. It revealed structural problems in the Korean accumulation system such as labour relations, low productivity of the Korean companies, monetary arrangement, state intervention and regulation and so on. These have been the objects of restructuring in the past years since the crisis. The government has declared that restructuring will make Korean companies, state bureaucracy and labour more flexible and market oriented.

It is still unclear exactly in what direction the new regime of accumulation will take and

what kind of MSR will be coupled with it. In the view of regulationists, crisis is an opportunity to forge a new mode of development. In the 21st century, the society is demanding a more environmentally sensitive and socially equitable development. What is clear through this research is that a paradigm shift is necessary to break away from the old way of regulation if we are to see a change in socio-environmental conditions.

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