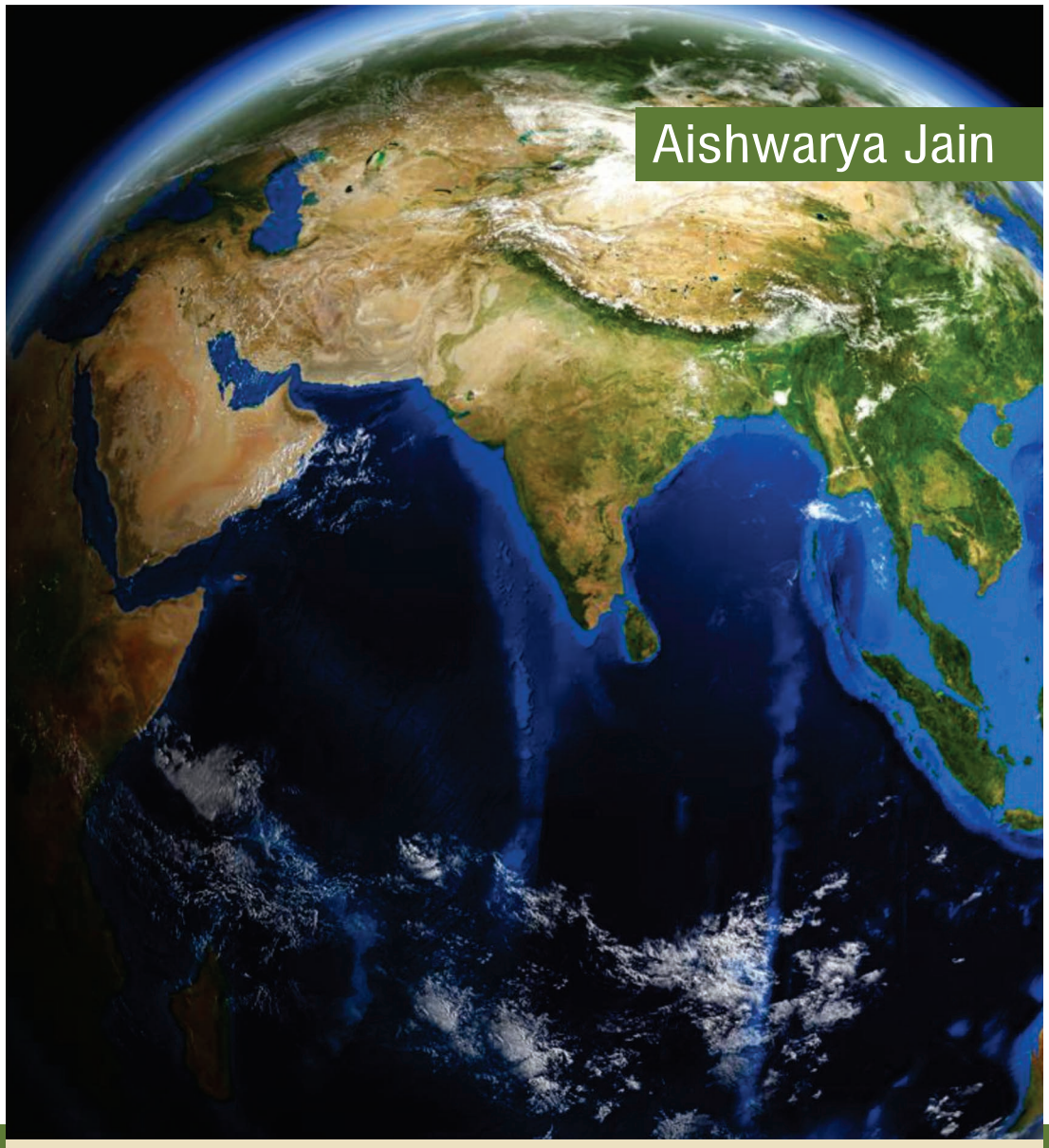

Aishwarya Jain

Economic Geography

A Contemporary Introduction

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Introduction

Economic geography is usually regarded as a subfield of the discipline of geography, although recently economists such as Paul Krugman and Jeffrey Sachs have pursued interests that can be considered part of economic geography.

Krugman has gone so far as to call his application of spatial thinking to international trade theory the "new economic geography", which directly competes with an approach within the discipline of geography that is also called "new economic geography". The name geographical economics has been suggested as an alternative.

Given the variety of approaches, economic geography has taken to many different subject matters, including: the location of industries, economies of agglomeration (also known as "linkages"), transportation, international trade and development, real estate, gentrification, ethnic economies, gendered economies, coreperiphery theory, the economics of urban form, the relationship between the environment and the economy (tying into a long history of geographers studying cultureenvironment interaction), and globalization.

This stage will introduce economic geography as a subdiscipline of geography that uses a geographical approach to study the economy. The stage will stress that an economic-geographical approach to studying economies is very different from the approach used by mainstream economics. In this stage as suggested, explore some of the key differences between the approaches used by geographers and economists. The stage will

suggest that the field of economic geography offers some unique insights and is well placed to analyse and understand the contemporary world economy in all its complexity. One of the key features and strengths of the economic-geographical approach is the use of the concepts of space, place and scale and these will be introduced in turn. The stage will also point out that economic geography itself represents a dynamic, evolving and diverse body of knowledge. However, this diversity also allows economic geography to engage with a number of issues in contemporary societies and economies. Indeed, despite the claims that economic globalisation will inevitably bring about 'the end of geography', geography matters more than ever and economic geography provides us with useful tools to analyse and understand economic processes that shape our world.

WHAT IS ECONOMIC GEOGRAPHY

Economic geography is a sub-discipline that uses a geographical approach to study the economy. It is a vibrant and exciting branch of geography. Its name would suggest that economic geography lies somewhere between, or at the overlap of, the disciplines of geography and economics. This is true to some extent. In fact, both geographers and economists use the term 'economic geography'. However, they mean different things by it. Indeed, it is important to stress from the outset that the approach that geographers are using to study the economy is very different from that used by most economists. A Contemporary Introduction written by Neil Coe and his colleagues, this subject guide uses the term economic geography and economic-geographical approach to describe the approach used by geographers.

On the other hand, the type of 'economic geography' that economists are using, can be best described as 'geographical economics' or 'spatial economics'. More generally, this distinction between 'economic geography' and 'geographical economics' reflects fundamental differences between the way the economy is treated by geographers on the one hand, and economists on the other. In other words, an economic-geographical approach to studying the economy is very different from the one used by mainstream economics.

AN ECONOMIC-GEOGRAPHICAL PERSPECTIVE

In contrast to a rather limited appreciation of geography by most economists, geographers emphasise the fact that no economy can function at the head of a pin. In other words, 'all economies must take place'. Geography, therefore, is always intrinsically present in all economic processes. One could therefore argue that, in fact, there are 'no economies, only economic geographies'. It follows then, that the kind of universalism that mainstream economics assumes is somewhat problematic.

Indeed, if all economic processes have a geographical dimension, then it is difficult to imagine that economic rules can apply equally to all places. Another major difference between an economic-geographical perspective and the assumptions of economic orthodoxy concerns the notion of a 'rational man'—homo economicus.

Mainstream economists assume that people are always behaving as rational, profitmaximising individuals responding to market signals. However, life is more complex than that and people's behaviour is not always the outcome of rational decision-making. Rather, it can be influenced and conditioned by their gender, race, age, class, religion, culture, health or disability. Geographers are keen to take these aspects on board when studying economies. A 'geographical man/woman'–or what I will call here homo geographicus–can behave very differently from the way they are supposed to behave just as to economic orthodoxy. This has important implications for the remaining assumptions of economic orthodoxy. Indeed, if people are not behaving in a predictable way, than it is hard to expect that the entire economy will behave just as to some predictable laws and principles.

However sophisticated, mathematical models may not be able to capture all the complexity of economic processes happening in the real world. Worse still, mathematical models are not very helpful in elucidating the ways people relate to each other within societies and economies. In other words, 'the language of mathematics limits the ways in which economists can think about questions of power and social relations'. However, the questions of power and social relations are crucial in understanding economies because people do not live and work in isolation.

We are connected to each other in complex ways and economic geography helps us to explore these connections and relations. This exploration becomes more important in the age of globalisation. Further to this, it could be argued that these connections and relations are not limited to market exchanges and transactions. Indeed, there is a wide range of economic processes happening outside the scope of the market. The diversity of forms of economic processes, both within and outside the scope of the market, means that many economic geographers are not talking about 'the economy' but about 'economies'. In recent years, the notion of 'diverse' or 'alternative' economies attracted much interest among geographers. The notion of 'diverse economies' further undermines the universalism of economic orthodoxy and paves the way for alternative explanations of what the economy is and how it works. Thus, one way or another, geographers in general, and economic geographers in particular, help to build a much richer, and perhaps more accurate, picture of the contemporary globalising economy. Coe and his colleagues go as far as to suggest that 'the set of approaches offered by the field of economic geography is best placed to help us appreciate and understand the modern economic world in all its complexity'. They identify the following key concepts that form part of the economic-geographical approach: space, place and scale.

HISTORY OF ECONOMIC GEOGRAPHY

In the history of economic geography there were many influences coming mainly from economics and geographical sciences. First traces of the study of spatial aspects of economic activities on Earth can be found in Strabo's *Geographika* written almost 2000 years ago. This has recently been challenged, however, by seven Chinese maps of the State of Qin dating to the 4th century BC. During the period known in geography as environmental determinism notable (though later much criticized) influence came from Ellsworth Huntington and his theory of climatic determinism.

Valuable contributions came from location theorists such as Johann Heinrich von Thunen or Alfred Weber. Other influential theories were Walter Christaller's Central place theory, the theory of core and periphery.

Fred K. Schaefer's article *Exceptionalism in geography: A Methodological Examination* published in American journal Annals (Association of American Geographers) and his critique of regionalism had a big impact on economic geography. The article became a rallying point for the younger generation of economic geographers who were intent on reinventing the discipline as a science. Quantitative methods became prevailing in research. Well-known economic geographers of this period are William Garrison, Brian Berry, Waldo Tobler, Peter Haggett, William Bunge (Apurba Dutta, Ranibandh) Contemporary economic geographers tend to specialize in areas such as location theory and spatial analysis (with the help of geographic information systems), market research, geography of transportation, land or real estate price evaluation, regional and global development, planning, Internet geography, innovation, social networks and others.

IMPORTANCE OF ECONOMIC GEOGRAPHY

Powerful arguments have been put forward about the impact of globalisation in general, and the effects of the ICT revolution in particular, on economic activities. Some observers have come to the conclusion that electronic communications have 'space-shrinking' effects and will bring about the 'death of distance' and thus, ultimately, the 'end of geography'.

The 'death of distance' thesis has been expressed by Cairncross as follows:

- 'Distance will no longer determine the cost of communicating electronically. Companies will organize certain types of work in three shifts just as to the world's three main time zones: the Americas, East Asia/Australia, and Europe…No longer will location be key to most business decisions. Companies will locate any screen-based activity anywhere on earth, wherever they can find the best bargain of skills and productivity.'

A similar argument has been put forward by O'Brien who argued that ICTs will allow money to be moved around the globe without constraints, thus spelling the 'end of geography':

- 'The end of geography, as a concept applied to international financial relationships, refers to a state of economic

> development where geographical location no longer matters, or matters less than hitherto. In this state, financial market regulators no longer hold sway over their regulatory territory; that is rules no longer apply to specific geographical frameworks, such as the nation-state or other typical regulatory/jurisdictional territories. For financial firms, this means that the choice of geographical location can be greatly widened… Stock exchanges can no longer expect to monopolize trading in the shares of companies in their country or region… For the consumer of financial services, the end of geography means a wider range of services will be offered, outside the traditional services offered by local banks.'

Both the authors of these statements attempt to convince their readers that, thanks to ICTs, space and place no longer matter or at least they matter much less than before. Indeed, they both seem to suggest that location in space is no longer an issue for firms as they can locate 'anywhere on earth'. Also, the role of place is apparently greatly diminished. Cairncross, for instance, suggests that the only place characteristics that firms may be interested in can be reduced to 'the best bargain of skills and productivity'.

O'Brien, in the meantime, does not seem to recognise any role that places may play in the globalised financial markets. But, interestingly, both Cairncross and O'Brien seem to imply that the national scale is increasingly irrelevant in the global economy. Indeed, O'Brien specifically points out that financial market regulators 'no longer hold sway' and that rules no longer apply to nation-states, because financial flows are spilling over traditional national boundaries. Similarly, Cairncross seems to suggest that the time zone is the only geographical scale that holds any relevance in the new era of global electronic communications. What is interesting about the above statements of Cairncross and O'Brien is that they both see globalisation as something positive.

Note, for instance, Cairncross's suggestion that companies will benefit from the new locational freedom by allowing them to find and exploit 'the best bargain of skills and productivity'. O'Brien, meanwhile, suggests that the 'end of geography' will be beneficial for both financial firms and their customers.

Views such as these can be labelled as 'hyperglobalist'. Some of them go as far as to suggest that freeing economic activities from their traditional geographical constraints will bring benefits to all people in all corners of the globe. However, this, manifestly, does not seem to be the case. Today's world is ridden with sharp inequalities both within and between countries and geography plays an important role in understanding economic and social processes and their uneven manifestations in the age of globalisation.

Importance of Economic Geography in the Era of Globalization

Despite the hyperglobalist views, the role of space, place and scale do not diminish in the globalising world. Quite the opposite perhaps. Indeed, as economic activities are increasingly internationalised, interconnections between various places increase, competition between them intensifies and inequalities are on the rise, so geography becomes more important than ever. And as we have pointed out earlier, an economic-geographical approach is perhaps 'best placed to help us appreciate and understand the modern economic world in all its complexity'.

This conviction is based on the knowledge that economic geography offers powerful tools for analysing and understanding contemporary economies and societies. Economic geography, for instance, can help us to understand that, despite years and decades of economic globalisation, the pattern of investment, production, trade and consumption is highly uneven. Economic geography can also help us to understand that even footloose multi-national corporations have to be 'grounded' in specific locations and often 'embedded' in places and their socio-political, institutional and cultural contexts. Economic geography also helps to elucidate the ways in which MNCs and other economic activities are 'governed' at various geographical scales from local and regional to national, macro-regional and global levels. Economic geography also helps us to understand that despite the widespread use of ICTs, trading places for global financial capital remain stubbornly located in a small number of global cities and these global cities, in turn, influence economic processes around the world.

Thanks to these and other insights, economic geography can thus contribute to our understanding of inequalities at various geographical scales from poverty in urban areas to global uneven development.

No other discipline can claim such a wide scope of interest and relevance to today's rapidly changing world. By following this subject guide, you will gain solid foundations in economic geography approaches, concepts and theories and their applicability to the contemporary world and policy-making.

Issues for Economic Geography

We highlighted the fact that economic geography can be seen as a diverse set of approaches and concepts that economic geographers use to study economic processes. In turn, this diversity of economic geography approaches allows economic geographers to engage with a diverse set of questions about the economy and society. Concrete questions often depend on a theoretical standpoint.

Peter Dicken and Peter Lloyd in their textbook Location in Space argue that:

- 'Fundamentally, the economic geographer is concerned with the spatial organisation of economic systems: with where the various elements of the system are located, how they are connected together in space, and the spatial impact of economic processes.'

On the basis of this, they argue that economic geographers are interested in three interconnected questions.

- In what ways are economic activities organised spatially on the earth's surface, and how do such spatial forms or patterns change over time?
- Why are economic activities organised spatially in particular ways; that is, what are the underlying processes at work?
- How does the spatial organisation of economic activities itself influence economic and other social processes?

On the other hand, Roger Lee suggests that economic geography is 'a geography of people's struggle to make a living'

and should therefore concern itself with 'the sustainable and humane production, use and reproduction of the social, natural and material conditions of human existence'.

On the basis of this, Lee argues that an 'inclusive economic geography' should include the study of:

- The cultural and environmental origins of economic activity, articulated through socially constructed gender and kinship relations; and the struggle to establish a particular set of social relations of production and their geographical extent
- The conceptualisation of nature
- The forms of calculation and measurement of value
- The processes and forms of production and consumption generated by such relations and value systems
- The division of labour
- The conditions of development within a particular set of social relations
- The forms of state and politics which support and legitimise particular social relations and processes of production and consumption
- The construction of cultural and ideological forms which shape the basis of discourse within a particular value system
- The structuring of relationships within and between different sets of social relations
- The conditions of transformation from one set of social relations of production to another

This is a long list indeed–it reflects the view discussed earlier that there are 'no economies, only economic geographies'.

Put differently, given that all economic processes are inherently spatial, economic geographers should be concerned about all the processes related to the people's struggle to make a living.

However, an important question arises about whether such an approach is still needed in the era of globalisation in which space is apparently being dissolved by modern information and communication technologies.

ART OF ECONOMIC GEOGRAPHY

How do you turn economic geography into art? The Mexican painter, writer, and long-time communist Diego Rivera did it between 1932 and 1933 in painting the 25 panels of the mural "Detroit: Man and Machine" at the Detroit Institute of Arts. The panels tell a rich and complex economic geographical story: extract-ing resources from the ground, bringing together "hands" of workers from across the world, using various kinds of machinery-furnaces, stamping machines, drills, hoists, conveyor belts in conjunction with the brawn of labor to manufacture and assemble, and finally produce, the finished product, in this case a car.

The mural was paid for by Edsel Ford, son of Henry, and modeled on perhaps the most famous factory of the twentieth century the Rouge complex, the Ford automobile manufacturing plant located at Dearborn, Michigan, just outside Detroit. The complex was first used to produce automobiles from 1913. Twenty years later, by the time Rivera came to paint it, it was already a symbol of the modern machine age, and more generally of the energy and might of industrial capitalism. Operations at the Rouge complex were vertically integrated, that is, all the different component processes of manufacture were contained within a single site, and as a result the workforce requirements were immense. At one point 75,000 employees worked there. The "B" building alone was a quarter of a mile long, containing the entire assembly-line operation on a single level (and much of the focus of Rivera's artistic attention).

The assembly-line technique used in the "B" building was one of Henry Ford's most significant innovations, and was first introduced to the plant in 1927. Workers stood in place, and the work came to them on a conveyor belt. Once the work task was completed, the belt moved on, making the worker, as one Ford assembly-line employee put it, "nothing more or less than a robot". There is a clear sense of that in Rivera's mural. The workers do not simply tend the machines, but are fully integrated with them, their bodies synchronized with the swirling, ceaseless movement of industrial manufacture at the plant.

In many ways the Ford family were an unlikely patron of Rivera. Ford senior was vehemently anti-left, and anti-union. He

once said, "people are never so likely to be wrong as when they are organized." What Rivera and Ford shared, however, was a fascination with machines, and the idea that the combination of "human and mechanical action" could produce a "creative power unparalleled in history". To capture that power in paint, Rivera spent his first three months in Detroit meticulously preparing before even picking up a paintbrush. He toured the plant, spoke to workers and engineers, and had hundreds of photographs taken of the different parts of the production process. What emerges, in spite of Rivera's communist sympathies, is a relatively uncritical portrait of industrial capitalism at the Rouge. True, one of the workers is carrying a partially obscured placard with the words "We want." But the full placard would have read "We want beer," a popular anti-prohibition slogan at the time. In contrast, Rivera's next mural commission, which was for another industrial mogul, John D. Rockefeller, was more overtly political, and included Lenin as one of the onlookers. In this case Rockefeller balked, and ordered the finished mural to be chipped off the wall of the Rockefeller Center, New York City, where it had been painted.

For Rivera, the Rouge complex and its production of automobiles was an illustra-tion of a broader phenomenon that he labeled a "wave-like movement" and found in "water currents, electric waves, stratifications of different layers under the surface of the earth, and in a general way throughout the continuous development of life". Economic geography as it emerges from the contributions to this volume is a bit like this, too. The kinds of phenomena that economic geo-graphers study - natural resources, manufacturing, information, money - are always on the move, continually undergoing transformation, morphing into new forms and identities. Of course, capturing that flux and movement is difficult. Diego Rivera did it by painting larger-than-life stories on walls. His 25 panels are a synchronic depiction of the economic geographical processes that produced and maintained the industrial behemoth of 1930s Detroit. But there are clearly other means to make that same depiction, some of which, we would argue, are found in the essays collected here. Of course, they are not couched in a visual idiom, relying on vivid colors or daring brush strokes, but in their own way, we contend, they are just as striking.

Although economic geographers are not in the business of daubing paint, at least in their professional lives, there is an art to what they do. For economic geographers of whatever stripe face the same difficulty as Diego Rivera - to represent on a flat surface economic geographical events that exist "out there." Rivera's medium was paint, and his flat surface was a wall, whereas the medium of economic geographers is writing, and their flat surface is a sheet of A4 or eight-and-a-half by eleven inch paper. In both cases, there is a need for appropriate techniques, sensitive interpreta-tion, enthusiasm, dedication, adequate preparation, and prior training. One of the primary aims of this volume is to introduce you to the art of economic geography.

The first is that since the 1970s there have been some enormous changes affecting the economy, and society more generally: deindustrialization, industrial restructur-ing, the rise of information technology (IT) and computerization, the feminization of the labor market, and globalization. Such changes beg understanding, and indeed are already subject to much scrutiny. What emerges from that work is that in many cases these changes are inextricably bound up with issues of space and place. We don't mean merely that, like many processes, they take on particular geographical forms (although there is nothing mere about that), but that space and place are integral to the evolution of the processes themselves. In this sense, economic geo-graphers are in exactly the right time and place to practice their art.

Consider again globalization. Arguably globalization has existed since the very first economic geographers were writing in the late nineteenth century, and likely well before then (certainly it is recognizable in Andree's ruminations). One aspect of globalization that has changed, though, is the means by which it is effected. Whereas in Andree's time it was bound up with Western European colonial policy and bureaucracy, now its prime bearers are multinational and transnational corporations (MNCs and TNCs). MNCs and TNCs are fundamentally economically geograph-ical institutions. Their very definition and rationale is based on the idea of geogra-phical differentiation: that different parts of their operations are located in different places. As such, they are ripe for economic geographical study. Others can and

should study MNCs and TNCs, but the sensibility of economic geography is espe-cially suited to the task and, given the role that they play in the globalization process, is ever more germane.

To take another example, the Fordist-style manufacture that Rivera depicted in his murals was increasingly abandoned from the 1970s onwards, and replaced by what was called post-Fordism, or flexible specialization. That move was not only about transforming a particular method of production - from assembly line and Taylorism to batch production and work teams - but also about transforming geography. Flexible specialization implied a set of new spatial arrangements that were part of its very definition. Greater physical interaction and closer proximity between firms became necessary by comparison to the more arm's-length relationship that had characterized Fordism in order to realize the benefits of flexible specialization. Subcontractors needed to be close to the production plant in order to respond quickly to changed demands; R&D staff were brought in from their research facil-ities, sometimes thousands of kilometers away, to work more centrally in the factory in order to consult with production staff; and workers were no longer spatially segmented along the assembly line, but enjoyed greater interaction and collabora-tion in work teams. Whatever else it was, the move from Fordism to flexible specialization entailed an economically geographical shift.

These are only a couple of examples, but we hope that they illustrate the broader argument. The recent changes in the economy, which have affected so many people in so many different ways, are not only economic but also fundamentally geogra-phical. Economic geography is relevant not just as background atmospherics, to add ambience and color, but for understanding why economic change occurs at all. It enters into its very frame, its skeletal structure. And what is bred in the bone, comes out in the marrow.

The second reason for the renewed attention to economic geography is that it continues to undergo potent intellectual shifts, making it an arena of discursive ferment and vibrancy. Economic geography, in fact, has long been an important forum for trying out new ideas. Much of human geography's quantitative revolution of the 1960s, for example, was discussed within the context of

economic geography. Since the late 1970s and early 1980s, the discipline has propelled discussions around political economy. As an approach, political economy is pervasive: it is how eco-nomic geography is now done. That said, political economy is no single, staid, monolithic tradition, but is multiple, dynamic, and differentiated. Debate is not always friendly, but through it new approaches, new theories, and new possibilities emerge, and constantly invigorate the field.

Political economy as a tradition began in the eighteenth century, but it is perhaps most closely associated with Marx's nineteenth-century writings about capitalism. In both cases, there was the insistence that the political and the economic are irrevocably bound; that the economy cannot be treated as sovereign and isolated, but must be understood as part of a set of wider social processes. While sharing these views, political economists and economic geographers have continued to debate two central questions: the definition of the social, and the nature of the connection between the social and the economic.

For Marx, the answers to those contentious questions were clear-cut. The social meant class relations, which under capitalism primarily consists of an antagonistic relationship between the working class and the capitalist class. Social classes, in turn, are connected to the economy by a functional relationship. This means that the form of the relationship among social classes is set by what contributes best to the development of the economy. Such a functional relationship is certainly not always smooth and unproblematic, but ultimately the economy prevails and produces those social relationships that are most appropriate for its development. If capitalism can best develop by a set of class relations consisting of workers and capitalists, that is what happens. The best, and the most well-known, economic geographical transla-tion of Marx's views about social processes and their connection to the economy was carried out by David Harvey (1982), particularly in his writings during the 1970s and 1980s on the geography of accumulation.

Subsequently, other economic geographers, drawing upon other traditions of political economy, have developed alternative approaches, ones providing quite different answers to the two

questions about the definition of the social, and its relation to the economy. This is not the place to provide a full-blown review, but those alternatives include:

- Doreen Massey's (1984) work on spatial divisions of labor. This is much more catholic than Harvey's in its definition of the social, and in the relationship it posits between the social and the economic. (Importantly, place itself partly determines the development of the economy).
- Regulationist theory. This partly defines the social in terms of institutional and regulatory frameworks, and also attempts to move away from crude functionalism.
- The analytical approach. This uses both mathematical reasoning and rigorous, formal statistical testing to determine logically how space and place make a difference both to the definition of social processes and to their relation to the economy.
- Most recently, the umbrella approach, sometimes called the "cultural turn." This brings together a variety of perspectives - post-Marxism, institutionalism, economic sociology, feminist theory - trying both to widen radically what is included within the social, and also to move away from Marx's functionalism, and instead make use of notions like embeddedness (Martin, this volume), overdetermination (Gibson-Graham, this volume), or cultural performance.

This review is necessarily very brief. Sustained examples of such political economic approaches can be found in the ensuing chapters. Our point, like the one we made about economic change, is that contemporary discussions around political economy make economic geography stimulating and provocative. There is a Chinese saying: "May you live in interesting times." Our argument is that they are here now in economic geography.

THE EMERGENCE OF FEMINISM IN ECONOMIC GEOGRAPHY

Some of the first topics of study by feminists in the discipline of geography included analyses of women's economic activity. These studies initially criticized conventional approaches for

neglecting women's roles and divisions of labor in their analyses of economic processes. Research in this area was mostly descriptive and aimed to make women's work visible. The seemingly unexamined category of woman was soon replaced by the concept of gender which focused on the social construction of male and female roles and behavior in society. This shift provided a more complex analysis and comparison of men's and women's economic activities. In turn, socialist feminism highlighted the role of gender and class in economic processes. Geography was central to this early feminist work because it incorporated multiple scales of analysis, and recognized the importance of place-based social relations.

Counting women and work

In the mid-1970s, geography underwent a significant transition as the quantitative methods and spatial science traditions were criticized for their normative assump-tions of a single universal truth and what has been cited as totalizing tendencies or "grand narratives" of rational science (Barnes, this volume). Feminists were among these critics and challenged the discipline for its male bias in constructing knowledge and theory. These constructions extended dualisms constructed around masculinity and femininity to the work sphere, where men were associated with paid labor in the public workplace and women with unpaid labor in the private household. The overall impact of this approach in the discipline of geography was to marginalize gender and neglect women's experiences in geographic inquiry.

During the 1970s, gender and work were important themes in feminist geography for reasons that coincided with societal concerns about women's inequality in the home, at work, and in society as a whole. Much of this concern stemmed from the feminist movement which claimed women were materially disadvantaged and marginalized because of their position in lower status jobs and their relative absence from positions of power. Efforts to empower women during this period included pay equity, expanded childcare, and equal opportunities in the workforce. Empiricist approaches that focused on case studies and empirical analyses dominated the research during this period.

Not surprisingly, early geographic literature on gender and work also emphasized the spatial dimensions of gender divisions of labor and occupational segregation. This research attempted to explain how individuals reproduce social phenomena in space through everyday activities. According to this approach, the "paths" taken by individuals in their daily lives are subject to certain constraints that include physical limits to movements, the need to gather in schools, workplaces or the like, and social rules that control where people can or cannot go. Accordingly, jour-ney-to-work studies document how gender roles influenced unequal access to trans-portation and constraints stemming from domestic responsibilities (Hanson and Hanson, 1981). Results from these studies indicated that women commute shorter distances to work, travel less frequently, and use different means of transport than men (Hanson and Johnston, 1985), which, in turn, contributes to, and stems from, unequal material conditions of men and women. Hanson and Pratt (1995), for example, argue that women's tendency to travel shorter distances to work is linked to their lower wages.

Early research in feminist geography, however, tended to homogenize women and overlook differences in their economic activity and commuting patterns. Recent studies include social categories other than gender, such as race, ethnicity, and class, to reveal the diversity of social and economic factors that impact the journey to work. For example, extensive research in the Buffalo and New York metropolitan areas demonstrates that the commuting experiences of African American and Latina women are often different from those of white women. The claim that women work closer to home than men because of their dual roles as mother and waged worker does not hold for Black and Hispanic women. These women commute as far as Black and Hispanic men, and spend more time commuting than white males and females (McLafferty and Preston, 1991).

Accompanying this focus on the spatial dimensions of individuals' daily activities was a growing literature within feminist geography on suburbanization, and house-hold social relations and divisions of labor. Suburbanization contributed to the social construction of domesticity and its physical as well as psychological separa-tion from paid labor. Miller (1982), for example, examined

how suburban women's roles were constructed through advertising and the media in the early twentieth century. Through this and the spatial constraints that structured women's lives, he draws conclusions about the impact of patriarchy on women's domestic roles. Other studies note how the economic sphere of the workplace was socially and spatially separated from the household and, by extension, the private realm of women. This separation of women into the private sphere and care-taking activities is related to the dominant perception of women's roles, and therefore their mobility.

The social relations and spatial dynamics of the domestic sphere and workplace are closely associated with occupational segregation of the labor market. Numerous studies have focused on the way in which labor supply and demand processes play out differently in various locations, but reveal the connections between the suppos-edly separate spheres of private domesticity and public labor. The number of women employed in the top ten occupations of women in the USA. It illustrates how women's segregation in the workforce is related to the perception of women's roles in our society. In the USA, jobs associated with care-taking, nurturing, and other so-called feminine traits are among the most common forms of female employment. Secretaries are the most numerous with nearly 3 million women in 1997, followed by cashiers with 2.3 million women (US Dept. of Labor, 1998). Additionally, most of these occupations are highly segregated: females represent over two-thirds of the workforce in nearly all of the occupations listed. Secretaries as an occupation have the highest proportion of females at 98 percent (US Dept. of Labor, 1998).

Finally, the wages of people in these occupations indicate the relatively low value placed on this type of work. Earnings range from $705 per week among registered nurses to $248 among cashiers. In 1997, the average weekly earning of all full-time women workers was $431 compared to $579 for men. These data demonstrate that occupational segregation is linked to socially embedded divisions of labor and contributes to economic inequalities between men and women. The feminist geographers approach this phenomenon from a geographical perspective by drawing connections between relations within the home and the workplace in both social and spatial terms.

In sum, the early phase of feminist economic geography offered empirical analyses of spatial patterns in women's (and men's) everyday experiences, especially work-related activities such as travel to work, employment patterns, and the relation between the domestic sphere and the workplace. The subsequent phase extended the analysis of gender inequality to include broader historical and material struc-tures in society.

Geographies of Socialist Feminism

Research on gender, women, and work during the emergence of feminist geography was also influenced by scholarship in socialist feminism and Marxism. Marxist geographers analyzed the economy from an historical materialist approach (Swyn-gedouw, this volume) which emphasized the contradictions of capitalist accumula-tion (Peet and Thrift, 1989). Some of the earliest pieces on women and geography appeared during the late 1970s and early 1980s, and were couched solidly within this political economy framework. This critical approach to conventional geography resonated with feminists because they were concerned with addressing issues of social justice and individual equality.

Additionally, many socialist feminists felt that answers to questions about women's lower-than-average incomes, unequal travel patterns, and segregation in lower status jobs were not completely addressed by the kind of empirical analyses. Instead, they tended to emphasize broader structures in society such as patriarchy, where gender relations are characterized by the domination of men over women, and capitalism, to explain social and economic inequality. Socialist feminists, however, were skeptical of the somewhat rigid categories and universal laws that were central to orthodox Marx-ism, because they tended to ignore gender divisions of labor and regard class as the dominant social relationship under capitalism.

An important aspect of socialist feminism was its analysis of the spatial and social dimensions of the domestic sphere, and its link to capitalist production. Socialist feminists drew from Marxist geography in their argument that the domestic work carried out by women was essential for the maintenance and reproduction of the labor force and hence for capitalism more generally. They also

maintained that capitalist patriarchy created a gender division of labor in which men primarily engaged in waged, productive labor, and women in unwaged, reproductive labor. Massey critically examined these dualistic approaches to work and home in her discussion of the way in which men and women negotiate the boundary between productive and repro-ductive labor:

Dualistic thinking leads to the closing-off of options, and to the structuring of the world in terms of either/or... Moreover, even when at first sight they may seem to have little to do with gender, a wide range of such dualisms are in fact thoroughly imbued with gender connota-tions, one side being socially characterized as masculine, the other as feminine, and the former being accordingly socially valorized.

Thus, in this complex and historically dynamic capitalist system, women's repro-ductive labor was rendered invisible, but was fundamentally connected to product-ive labor by providing support for capital such as clothing, feeding, and ensuring the reproduction of labor.

During the 1980s, feminist perspectives in economic geography began to explore the intersection of uneven development and the gendering of work. It was argued that unequal social relations are largely derived from capitalism, and are manifest through uneven regional development. For example, capital was invested in particular types of industry in regions where female labor was available and non-unionized. Feminist analyses of social and spatial inequality, however, were not limited to the scale of region, but also incorporated multiple scales such as the household, local, and international levels.

Overall, socialist feminism introduced new theoretical and methodological ana-lyses to economic geography while borrowing from some of the social and economic categories of Marxism. It challenged the binary division of spaces and roles in the domestic sphere and workplace, particularly as they related to livelihood strategies and the material conditions of everyday life. While the voices in this literature were not always in unison, they nonetheless advanced the discipline in its appreciation of the critical role of gender relations in understanding social, economic, and spatial inequality.

Economic restructuring and shifting employment patterns

Feminist analyses of economic processes contributed significantly to our under-standing of the economic restructuring that developed during the late 1970s. These analyses focused on the dramatic shift in employment from manufacturing to the service sector. For example, Hanson and Pratt's widely cited study of Worce-ster, MA (1995) examines the importance of gender and economic restructuring in an industrialized area that has experienced a shift from relatively high-paid, union-ized, and male-dominated jobs to lower paying, less secure, and female-dominated jobs. Studies such as this demonstrate that economic restructuring formed the basis for analyses in feminist geography that sought to explain social and spatial divisions of labor under capitalism.

One of the implications of this shift was the steady increase in many Western countries of economically active women, both in absolute numbers and as a propor-tion of the female population. In the United States, the number of working women doubled between 1970 and 1997, from 30 million to 60 million (US Department of Labor, 1998). In addition, during the post-WWII period, labor force participation -the percentage of working age persons actually employed or looking for work - rose significantly for women, while men's rates slowly declined. In 1950, 29.0 percent of all women in the USA were economically active compared to 78.9 percent of men. By 1995, female participation rates had more than doubled while male participation rates had declined nearly 4 percent. These figures have significant implications for gender roles and identity in our society as women have become more active in the paid labor force.

Aggregate analyses of employment, however, often neglect the diversity that appears in the workforce when consideration is given to race and ethnicity, as well as gender. Research on the impacts of economic restructuring on labor force parti-cipation has increasingly addressed differences among ethnic and racial groups. The participation rates of men and women in European American, African American, and Hispanic populations in the USA during the post-war period. Although accurate employment data disaggregated by race was not available until relatively

recently, studies indicate that in the early part of the century, African American women were more than five times more likely to be economically active than white women and are more likely to be employed than women of any other racial group (US Dept. of Labor, 1998). Women of European descent, however, have the fastest growth rates and are expected to have a higher participation rate than Black women at the turn of the century. Overall, women's economic activity rates have risen since 1950 except for a minor decline among Hispanic women from 1990 to 1995.

In contrast, male participation rates of European Americans and Hispanics are higher than those of African Americans, but have slowly declined since the 1960s. These statistics reveal the important intersec-tion of gender and race in empirical analyses of how work has changed over time. Feminist theory's engagement with gender, race, and ethnicity underlines the sig-nificance of social differentiation in economic practices.

Looking back on the initial phase of feminist geography, analyses of women's work and gender relations dominated much of the research within this subfield. These analyses took place in the context of widespread industrial restructuring, uneven regional development, and the rapid increase of women in the labor force. While some research was based on empiricist approaches, political economy, and particularly socialist feminism, was the dominant framework for much of this work. During this period, feminist geography examined increasing economic activity rates among women and the changing gender composition of the labor force in the context of economic restructuring. The following section shifts focus from analyses of gender and work in the context of developed regions to developing regions where Third-World feminism has focused on diversity among women and critical theorization of global capitalist domination.

2

Conceptual Frameworks for Institutional Economic Geography

As Samuels (1995) points out in his survey of institutional economics, a distinctive feature - indeed, as he sees it, a key advantage - of institutionalism is its multi-perspectival, multidisciplinary character. Three main conceptual approaches can be distinguished: rational choice institutionalism, sociological institutionalism, and historical (evolutionary) institutionalism. These provide somewhat different interpretations of institutions, their functions and mode of change.

In the rational choice perspective, the focus is on how particular institutional environments give rise to particular institutional arrangements, that is, organiza-tional forms, and how far and in what ways institutions serve to reduce transaction costs and increase economic efficiency. Institutions are seen as the outcome of market behavior, constantly changing through a process of "competitive selection" in response to shifts in relative prices and transactions costs. By contrast, the sociological model seeks to understand the economy as a socio-institutionally "embedded" system. Institutions are interpreted as culturally based social repertoires, routines, and networks of trust, cooperation, obligation, and authority. As such, they provide cognitive frameworks or templates of meaning through which economic identities and action are legitimized. Sociological institu-tionalists see institutional evolution as arising out of collective processes of inter-pretation, and emphasis is put on the ways in which existing institutions structure and circumscribe the range of institutional change and

creation. In its turn, the historical institutionalist approach focuses on understanding how institutional struc-tures evolve over time, and how this evolution impacts on and relates to the historical dynamics of the capitalist economy. Institutions are seen as the products of historically-situated interactions, conflicts, and negotiations amongst different socioeconomic actors and groups. Stress is put on the asymmetric power relations associated with institutions, and on major periods of transformation in the institu-tions of economic regulation and governance.

Economic geographers have drawn on all three conceptual frameworks. Thus the idea that institutions function to reduce transaction costs has been used to help explain the emergence and development of successful local and regional economies.

Access to information is the key to the costs of transacting (the costs of locating suppliers and customers, of serving markets, of determining values and prices, and of protecting property rights and enforcing contracts and agreements). By providing sources of information about markets, prices, finance, technologies, labor, etc., by codifying the multifarious histories of past transactions and business practices, and by providing a normative framework for conducting exchange and trade, institu-tions help reduce costs, and hence improve efficiency, competitiveness, and profit-ability. Whilst many institutions are national (and even international) in scope, geographical variations in the range and type of local institutions appear to be especially important in shaping the relative performance of local and regional economies. In particular, the spatial localization of an industry or of interrelated industries in an area tends to promote the formation of specialized local institutional structures (such as local business associations and consortia, research bodies, mar-keting agencies, employment and training agencies, and so on), all of which reduce transaction costs and increase the competitiveness of the local economy.

However, while economic geographers now attribute considerable importance to local institutions as a source of regional competitive advantage and dynamism, they do not necessarily subscribe to the rational choice theoretical framework that under-pins transactions cost institutionalist economics. Instead, they have increasingly drawn on the idea of "embeddedness"

from sociological institutionalism. According to Granovetter (1985, 1993), a leading exponent of the concept of embeddedness, economic institutions are constructed through the mobilization of resources through social networks, conducted against a background of constraints given by the pre-vious historical development of society, polity, and technology. In effect, institutions are "congealed" social networks.

Economic activity is said to be "embedded" in these ongoing social institutions or networks to the extent that it depends on interaction with other agents in those networks. The socio-institutional embedded-ness of the capitalist economy permits actors to circumvent the limits of pure rationality and the interactions of anonymous markets. Thus, for example, product and credit markets can exist because they are based on trust in the fulfillment of future transactions.

But trust is not easily manufactured. When and where economic activity is tightly connected with dense social relationships and networks based on family, tradition, skills, political culture, religion, educational ties, etc., trust can be used to build useful and efficient economic institutions. Considerable evidence now exists demonstrating that many organizations, public and private, operate effectively precisely because they are embedded in, and incorporate, these social networks.

Within economic geography, the "embeddedness hypothesis" argues that trust, reciprocity, cooperation, and convention have a key role to play in successful regional development. These social relations require community-like structures, associations, and networks for their existence. Suitably institutionalized, that is subsumed within local business and work cultures and routines, these social relationships serve to reduce uncertainty amongst local eco-nomic actors by providing tacit or collective knowledge, by disseminating strategic information, by sharing risks, and by establishing acceptable norms of competition. Yet, although most economic geographers would agree on the importance of such localized interactions among economic actors for successful economic development, the concept of embeddedness nevertheless remains under-theorized. In sociology, it is now recognized that Granovetter's original notion of embeddedness in social net-works

is only one type of embeddedness. There is also "political embeddedness" or the fact that economic action is always set within a specific context of political structures and conflict. Then there is "cognitive embeddedness," which has to do with the systems of meaning within which economic activity is conducted. And, finally, there is "cultural embeddedness," the embeddedness of economic action within specific cultural systems of ideological and normative beliefs. Likewise, different types of regional economic development tend to foster and depend upon different types of local institutional embeddedness. Thus the sort of socio-institutional embeddedness that develops in an area based on highly spe-cialized, large-employer-dominated activity (say, a coal or steel community) will be very different from the pattern that is likely to emerge in an area of small-firm-based, flexible specialization (of the sort found in many of the Italian industrial districts, for example; Amin, this volume). At present we know little about how and why the process of embeddedness differs between different regional and local economies.

Furthermore, while the idea of the embeddedness of economic activity in local institutional structures provides some important insights into the differential pat-terns of economic activity and performance across the space economy, it says relatively little about the nature of institutional change and how that change influ-ences the evolution of the economic landscape. How are local institutional structures built up, and how do they change? How are new institutional structures created? What happens if institutions prove resistant to change? What are the implications of these processes for the regulation and embeddedness of local economic activity? Historical institutionalism provides some concepts and ideas for addressing these questions.

Two of the weaknesses of old historical institutionalism (of the original Veblenian tradition) were its "structuralism," that is, its prioritization of institutional struc-tures over action (human agency), and the consequential tendency to attribute the existence of institutions to their history, as if this in and of itself explains their origins and persistence. Recently, however, some new conceptualizations have appeared which go beyond this limitation, concerning in particular the causes and con-sequences of periodic

transformations in institutional structures, and the tendency for some institutions to persist, despite being no longer conformable with or con-ducive to economic development. Incremental evolution is only one way in which institutional change occurs. Much more significant is the tendency for institutional structures to undergo major episodic reconfigurations.

These periodic upheavals can arise because institutions themselves ossify and become "sclerotic," thereby hinder-ing economic growth and development. Eventually, pressure will accumulate to reform or abandon particular elements of the institutional environment or particular institutional arrangements. Alternatively, economic deve-lopments may "outgrow" particular institutions, rendering them obsolete or in-efficient, again stimulating the search for new institutional forms and structures more appropriate to the new economic conditions (or at least as these are perceived). Institutional evolution thus consists of periods of relative stability (or slow change), punctuated historically by phases of major transformation.

Setterfield (1997) has combined both of these aspects of institutional evolution -slow, incremental path-dependent change, and occasional historic transformations - in his theory of "institutional hysteresis." This approach focuses on the complex interaction between institutions and economic activity in a way that recognizes the importance of current behavior in shaping future institutions, but which at the same time takes account of the extent to which this behavior is constrained by pre-existing institutional structures.

The distribution of power amongst socioeconomic actors and groups is central to the nature and outcome of this interaction. Economic pressures for institutional change arise continuously. Provided these pressures are not major or crisis-making in nature, they are counterbalanced by the forces of institutional durability and inertia. But, eventually, when economic trends build up to the point where existing institutional structures prove dysfunctional to economic growth and development, then those structures will come under intense scrutiny, and economic and political agents will search for a new institutional fix. The process of transformation and its particular outcome may be consensual in nature, but is

much more likely to involve conflict between different power groups (especially capital and labor) and between old institutions and new. Some old, inefficient institutions may persist, and even new institutional structures are likely to be based - at least to some extent - on pre-existing ones. By institutional hysteresis, then, is meant a process in which current institutions influence the nature of current economic activity, which in turn influences subsequent institutional forms. Integral to this model is a view of institutional evolution that foresees periods of institutional stability (deriving from the short-run exogeneity of institutions) punctuated by phases of substantial institutional change (reflecting the long-run endogeneity of institutional structures to the economic system).

The task for economic geographers is to conceptualize the spatial dimensions of this hysteretic process, not simply in order to determine whether and in what ways institutional change may have different effects on different regional and local econ-omies, but also to determine how far and for what reasons the process of institu-tional change itself is likely to vary geographically. In this context, one of the notions that economic geographers have sought to explore is that of "regional lock-in," the situation in which a local institutional regime gets "stuck in a groove." Because of a particularly strong degree of "interrelatedness" (mutual interdepend-ence entrenched vested interests, etc.) within and between its constituent elements, a local institutional regime may resist change, and in consequence may hinder econ-omic development. As Grabher (1993) highlights in the case of old industrial regions (he cites the example of the Ruhr in Germany), strong local ties to once favorable but now outmoded institutions can become a major structural weakness, contribut-ing to economic sclerosis and decline, and holding back the much-needed process of economic restructuring and renewal. In other areas, by contrast, typically those less dependent on old, heavy, specialized industry, local institutional structures may be much more "flexible," and hence adapt more readily and painlessly to new economic circumstances. In other words, different forms of regional development may give rise to regional differences in institutional hysteresis. Institutional transformation thus has a specifically local dimension.

As yet, however, local processes of institutional transformation remain poorly theorized. One of the key agents of institutional change, of course, is the state. State-led institutional change can take various forms, involving the reform of the legal-regulatory environment of economic activity (for example, changing the nature of competition law, employment law, etc.); major shifts in policy programs (such as changes in industrial policy, or monetary policy); changing the legislative framework governing the form and operation of institutional arrangements and other economic organizations (such as corporations, and labor unions); and reconfiguring the reg-ulatory structures and apparatus of the state itself (for example, setting up new regulatory institutions, and changing the division of policy responsibilities between central and local government).

Unraveling the specific effects of these different forms of state-led institutional change on individual regions and localities is a complex issue. The pressure for state-instigated institutional change may itself have particular geographical origins. Thus, in some instances the impetus may be the lobbying by business or labor in particular regions, especially those where political support for the government is concentrated. In other instances, it may derive from an ideological assault by the government on what are seen as outmoded or dysfunctional institutional structures in certain regions, structures that are deemed to be impeding not only the economic prospects of the regions in question but also the economy as a whole. What is almost certain is that, because of the regionally differentiated nature of the national economy, state attempts to change institutional structures are likely to generate conflict between regions and the political center. In the UK during the 1980s, for example, the Thatcher government's strident recasting of employment law, curbing of union power, and privatization of public sector activities found favor in the more prosper-ous, less unionized and pro-Tory south and east areas, closely linked into and benefiting from the dominant economic institutions centered in London, but were greeted with hostility in the less prosperous, highly unionized, and pro-Labour north. Such conflicts between central state and regions over institutional reform may influence the eventual path that such reforms take.

"INSTITUTIONAL THICKNESS" AND REGIONAL DEVELOPMENT

In the course of applying these various theoretical perspectives on institutions, economic geographers have sought to construct their own, specifically spatial con-cepts. Two of these stand out, namely the notions of "institutional spaces" and "institutional thickness." By "institutional space" is meant the specific geographical area over which a given institution is constituted and has effective reach or influence. On the one hand, we can define a hierarchy of institutional spaces ranging from supra-national institutional spaces (such as internationally agreed rules of competi-tion, trade, and monetary relations), through national institutional spaces (such as each nation's welfare system, its financial system, its employment laws, property laws, and national labor unions), some of which may incorporate sub-nationally differentiated structures, to regional and local institutional spaces (such as local state structures, locally specific legal arrangements, local employers' associations, local labor union cultures, and other local social or economic traditions and conventions). The "nestedness" - that is, the combination, interaction and mode of articulation -of these institutional spaces varies from place to place. Thus, as we move from one area to another within a national economic space, not only may the specifics of institutional nestedness change but also the interactions within that ensemble. It is in this sense that we may speak of different "local institutional regimes."

National-level differences in institutional regimes are now widely acknowledged to be a key factor in explaining national differences in economic organization, development, and growth dynamics. There is not one model of "capitalism," but many national models. In each nation, capitalism is embedded in different nationally specific institutional structures - differences that make "US capitalism" different from "UK capitalism," and these in turn different from "Japanese capital-ism," and so on. Differences in national institutional regimes underpin the distinc-tions economic geographers make between different national versions of post-war Fordism. But, equally, important differ-ences in institutional regimes also exist between regions and even localities within

national economies. Economic geographers have attempted to capture these differ-ences in their use of the concept of "institutional thickness."

Amin and Thrift (1995) define "institutional thickness" in terms of four key constitutive elements. The first is a strong institutional presence, in the form of institutional arrangements (firms, local authorities, chambers of commerce and other business associations, financial institutions, development agencies, labor unions, research and innovation centers, and various voluntary bodies). The second is a high level of interaction amongst these institutions so as to facilitate mutual and reflexive networking, cooperation, and exchange, thereby producing a significant degree of mutual isomorphism amongst the ensemble of local institutional arrange-ments. Thirdly, institutional thickness depends on there being well-defined struc-tures of domination, coalition-building, and collective representation in order to minimize sectionalism and inter-institutional conflict. This leads, fourthly, to the notion of inclusiveness and collective mobilization, that is, the emergence of a common sense of purpose around a widely-held agenda, or project, of regional or local socioeconomic development. The specific local combinations of these elements define the degree and nature of local "institutional thickness" or "integrity".

...which both establishes legitimacy and nourishes relations of trust... [and] which con-tinues to stimulate entrepreneurship and consolidate the local embeddedness of industry... [W]hat is of most significance here is not the presence of a network of institutions per se, but rather the process of institutionalization; that is, the institutionalizing processes that both underpin and stimulate a diffused entrepreneurship - a recognized set of codes of conduct, supports and practices which certain individuals can dip into with relative ease.

In this way, by seeking to define regions and localities in terms of situated institu-tional capacities, the concept of "local institutional thickness" provides a framework for underpinning the idea of "locality as agent" (Cox and Mair, 1991).

However, although now widely invoked by economic geographers, the concept of "local institutional thickness" is not without problems and limitations. Although highly suggestive,

the term still lacks definitional and theoretical precision (even in the work of Amin and Thrift). Neither case-by-case examples nor somewhat tauto-logical definitions are substitutes for a general conceptualization of how "institu-tional thickness" emerges at the regional and local level and what precise role it plays in regional economic development. If the key process is the mobilization and alliance of local institutions around a common agenda, what stimulates this mobilization, and who sets the agenda? Does local institutional thickness depend on consensus building and negotiation amongst diverse local interest groups and insti-tutions, or is it most likely to develop and work best where there is a dominant elite or leading interest group?

In particular, why does "institutional thickness" develop in some areas but not others? And how, exactly, does local institutional thickness promote local economic development and prosperity? Further, how do we explain the fact that some very successful regions do not appear to be underpinned by a highly integrated and coordinated matrix of institutions? An additional issue is that by focusing on specifically local institutions, the concept tends to downplay the significant role of the central state, both as a multi-scaled set of institutional forms in its own right and as a central influence on the formation and functions of other, national and local, institutions. How committed local institutions are to a particular regional agenda, if the latter runs counter to national-level economic policies and objectives its chances of being implemented and suc-ceeding are very much reduced. There is a real need to address these various issues, since the notion of "institutional thickness" has rapidly moved from being an analytical concept to a prescriptive one, in the sense of being seen as a necessary prerequisite to regional restructuring and regeneration, and particularly as a policy tool for stimulating new regions of high technology and innovation-based industrial development.

3

Impact of Changing Economic Landscape

Western media headlines as usual are as follows – twenty five percent of Indians live on less than a dollar a day and seventy percent live on less than two dollars a day. The forgoing was the headline of May 9, 2005 in a major international newspaper. Others headlines are not any less mischievous. These are all meaningless analysis. It does not reflect that same amount of money has differing values in different places. A more acceptable and bit accurate description of incomes in countries is Purchase Power Parity (PPP), which is, pricing identical products and services as needed by the local population in different countries, thus establishing a new and a more equitable exchange rate. The foregoing is applicable mostly to tradable goods.

The PPP will put India's GDP at $3.7 Trillion. This will raise daily monies of twenty five percent of Indians at the lowest rung of the society to seven dollars. The latter is still low but is much higher than the Western media would like to project. The forgoing is not the point; the point is that poverty is a major shame in India's otherwise decent, scientifically advanced, peace loving and at times turbulent image. Poverty creates slums and slums breed hopelessness and crime. Hence it needs to be tackled as an integral part of economic development.

The key question that arises-will the current hype in economical development in India alter the landscape for the very poor? The answer is that, not much will change in next 20 to 25 years. The

real impact will be felt later than twenty-five years. That is when 8% growth trajectory will take the PPP daily income of the very poor in India from seven dollars to forty dollars. By then, a $20 Trillion GDP economy (PPP basis) and $600 billion in exports (year 2001 basis) will add one hundred and fifty million jobs, of which forty to fifty million will go to the very poor segment of the society. This general prosperity will not only put food on the table but will add to better living, better housings etc. In the intervening period of 25 years, rising income levels will definitely add to the exodus from the slums to planned living areas. The forgoing also requires massive governmental effort to house people properly.

Let us examine this issue of poverty and slums in Indian cities and its relationship to the betterment of economic conditions of the masses, a bit further?

What Causes Slums in the Cities in the First Place?

It is vicious cycle of population growth, opportunities in the cities (leading to migration to the cities), poverty with low incomes, tendency to be closer to work hence occupying any land in the vicinity etc. The key reason out of all is the slow economic progress. After independence in 1947, commercial and industrial activity needed cheap labour in the cities. Plentiful was available in the rural area. They were encouraged to come to cities and work. People, who migrated to the cities and found work, brought their cousins and rest of the families to the cities. Unable to find housing and afford it, they decided to build their shelter closer to work. First, one shelter was built, then two and then two thousand and then ten thousand and on and on. Conniving governments provided electricity and drinking water. Politicians looked at the slums as vote bank. They organized these unauthorized dwellers into a political force; hence slums took a bit of a permanent shape. More slums developed as more population moved to the cities. By mid sixties Mumbai, Kolkata, Delhi, and all other large cities were dotted with slums.

Very poor people live in slums. They are not the only one dwelling there. Fairly well to do people also reside there. They are either offspring of the slum dwellers that found education and an occupation. They have prospered but are unable to find affordable housing, hence have continued to stay in the

shantytowns. Others are avoiding paying rent and property taxes. The latter is more often the case. It is not unusual that in the dirtiest of slums, where misery prevails that TV sets, refrigerators and radios are also blaring music. This is quite a contrast from the image which one gets in the media or from the opportunist politicians.

India's capital of Delhi has a million and a half out of fourteen million living in slums. Mumbai is worst with greater percentage living in slums. Other big urban centres have done no better. Newly built cities like Chandigarh and surrounding towns where shantytowns could have been avoided altogether have now slums. The forgoing is India's shame despite huge progress.

How will the Growing Economy Impact Poverty and the Slum Dwellers?

As stated above, 8% growth rate of Indian economy will push per capita GDP to $2,000 level in about twenty to twenty-five years (PPP per capita GDP will be much higher). The forgoing presupposes that the population does not explode in the near future but continue a healthy 1.5 to 2% growth. That is where the magic equilibrium of prosperity and desire to live a better life begins. These two together could end poverty and slums. With availability of affordable housing and jobs, slum dwelling is the last thought on people's mind.

On the other hand if the above does not happen then slums dwellers will triple in 25 years and so will the poverty. Delhi will have four and a half million-slum dwellers. Kolkata and Mumbai will have even bigger numbers. India's shame will have no end. To avoid that, India's economy has to remain at a high state of growth. Jobs created by the economic growth, hence higher incomes are key criteria for poverty reduction and slum elimination. The foregoing together with the current urban renewal in progress in the urban areas today will give cities in India a new look. Higher incomes will create a demand for in-expensive housing, which will have to be met with innovative use of land and building techniques. Government provided housing would be a great failure as it has been elsewhere in the world. Instead sufficient cash has to be placed in the people's hands together with in-expensive land

that people's housing program become efficient and affordable. In addition slum living has to be made unattractive with land taxes and denial of social services. Slum colonies, which opt out of current hopelessness, should get a better deal in housing which replaces the slums. This followed with rapidly growing rural economy will kill migration. That will also reduce pressure on housing.

No single policy has ever brought an end to poverty and slums. It is a concerted effort and better policies, which will end it. No country in the world has ever been able to end poverty and slums completely. That includes the richest nation of the world – USA. The point is that if economy progresses and special effort is made to uplift the poor, poverty and slums will be overtaken by better economic conditions of the people.

URBAN LAND MARKET AND ACCESS OF POOR

Several policy documents of the Government of India lay emphasis on land and housing for the urban poor. However, in spite of this explicit recognition in urban land use planning, right to housing remains a distant dream.

The JNNURM also recognizes the need to take care of housing needs of the urban poor. Last 10 years of economic reforms have observed the following features in the land market of the world metropolitan cities:

- Increase in land and property prices in metro cities.
- Land as a resource for infrastructure projects.
- Urban land diverted or given away cheaply for higher end real estate projects and townships.
- Permitting foreign direct investment in the real estate.
- Deregulation and land use zone conversions.
- Market based solution for slums.
- Introduction of new land management tools.
- Slum evictions a displacement in metro cities.

There are various land legislations in India which are related to different dimensions of land. Each of these has influenced land supply in specific contexts of city for determining access of the

urban poor to land. There are ownership related legislations and use related legislations.

Land legislations in general have converted urban poor or informal housing occupants as illegal occupants of land the poor access land through variety of occupancy rights for instance easement rights.

The 11th Plan approach paper lays emphasis of increasing land supply and making processes of land conversion simpler. The urban housing and habitat policy of 2007 states that shelter is one of the basic human needs next to food and clothing.

The Common Minimum Programme of the UPA Government commits itself to a comprehensive programme of urban renewal and to a massive expansion of social housing in towns and cities paying particular attention to the needs of slum dwellers.

The analysis shows that there are no realistic estimates of slum population living in urban areas and there have been vast fluctuations in these estimates. For housing rights activists', urban renewal is synonymous with slum demolitions. The legislative tools of the government have been used for converting urban poor as firstly illegal residents of the city and then delegitimized them.

The process of globalization has made urban land almost inaccessible to the urban poor and all national level policies are based on market solutions for the poor. Thus the hopes are dim and option fewer for the urban poor.

Basic Services for Urban Poor-Innovative Actions and Interventions

Access to land, shelter and basic services is not only essential for physical well-being but is also vital for their ability to earn a living. One of the most direct influences the city administration has on the scale and nature of poverty is in what it does with regard to provision of basic services and shelter construction and improvement.

The section analyses the provisions of basic services like Water Supply, Sanitation, Solid Waste management, Road Networks connectivity, Electricity, Drainage systems etc. in slums and suggests new initiatives for improving the amenities. In order to provide

water supply services of required standards in slums, it is suggested to provide individual pipe connections to each slum household, promote rain water harvesting, replace damage pipes and improve delivery pressures at public stand posts and remove illegal connections.

Similarly, to improve sanitation standards, it is suggested to construct community toilets where individual toilets are not possible, to extend sewerage networks to slum areas and connect toilet outlets with that, and community management of toilets in common places.

A demand led approach for improvement of access to public transport should be adopted. Appropriate technology should be used for developing road network depending on the geographical conditions and climate etc. and people's participation needs to be promoted in operation and maintenance of public transport.

Solar, bio-gas and non-conventional energy needs to be promoted for street lights as well as in household energy use wherever possible and feasible. Complete coverage of slum households through electric connections should be ensured.

In order to ensure proper drainage systems, flood prone habitats should be shifted to higher elevation, canal banks should be raised and protected and retaining walls constructed wherever required. Among other initiatives, it is suggested to have people's participation in design and implementation of the basic services in slums. The responsibility of O&M should be that of the stockholders and spatial analysis and GIS based databases with decision support system should be established for all the slums in a city along with computerised land records for providing an integrated plan for basic services in the slums.

LANDSCAPE ECOLOGY APPLICATION

Developments in landscape ecology illustrate the important relationships between spatial patterns and ecological processes. These developments incorporate quantitative methods that link spatial patterns and ecological processes at broad spatial and temporal scales. This linkage of time, space, and environmental change can assist managers in applying plans to solve environmental problems. The increased attention in recent years

on spatial dynamics has highlighted the need for new quantitative methods that can analyse patterns, determine the importance of spatially explicit processes, and develop reliable models. Multivariate analysis techniques are frequently used to examine landscape level vegetation patterns. Studies use statistical techniques, such as cluster analysis, canonical correspondence analysis (CCA), or detrended correspondence analysis (DCA), for classifying vegetation. Gradient analysis is another way to determine the vegetation structure across a landscape or to help delineate critical wetland habitat for conservation or mitigation purposes (Choesin and Boerner 2002).

Climate change is another major component in structuring current research in landscape ecology. Ecotones, as a basic unit in landscape studies, may have significance for management under climate change scenarios, since change effects are likely to be seen at ecotones first because of the unstable nature of a fringe habitat. Research in northern regions has examined landscape ecological processes, such as the accumulation of snow, melting, freeze-thaw action, percolation, soil moisture variation, and temperature regimes through long-term measurements in Norway. The study analyses gradients across space and time between ecosystems of the central high mountains to determine relationships between distribution patterns of animals in their environment. Looking at where animals live, and how vegetation shifts over time, may provide insight into changes in snow and ice over long periods of time across the landscape as a whole.

Other landscape-scale studies maintain that human impact is likely the main determinant of landscape pattern over much of the globe. Landscapes may become substitutes for biodiversity measures because plant and animal composition differs between samples taken from sites within different landscape categories. Taxa, or different species, can "leak" from one habitat into another, which has implications for landscape ecology. As human land use practices expand and continue to increase the proportion of edges in landscapes, the effects of this leakage across edges on assemblage integrity may become more significant in conservation. This is because taxa may be conserved across landscape levels, if not at local levels.

Relationship to other Disciplines

Landscape ecology has been incorporated into a variety of ecological subdisciplines. For example, a recent development has been the more explicit consideration of spatial concepts and principles into the study of lakes, streams and wetlands in the field of landscape limnology. In addition, landscape ecology has important links to application-oriented disciplines such as agriculture and forestry. In agriculture, landscape ecology has introduced new options for the management of environmental threats brought about by the intensification of agricultural practices.

Agriculture has always been a strong human impact on ecosystems. In forestry, from structuring stands for fuelwood and timber to ordering stands across landscapes to enhance aesthetics, consumer needs have affected conservation and use of forested landscapes. Landscape forestry provides methods, concepts, and analytic procedures for landscape forestry. Finally, landscape ecology has been cited as a contributor to the development of fisheries biology as a distinct biological science discipline, and is frequently incorporated in study design for wetland delineation in hydrology. Geomatics (also known as geospatial technology or geomatics engineering) is the discipline of gathering, storing, processing, and delivering geographic information, or spatially referenced information.

Overview and Etymology

Geomatics is relatively new as a scientific term. It was coined by *Dubuisson* in the year 1969 with the idea of combining the terms geodesy and geoinformatics. It includes the tools and techniques used in land surveying, remote sensing, cartography, geographic information systems (GIS), global navigation satellite systems (GPS, GLONASS, Galileo, Compass), photogrammetry, geography and related forms of earth mapping. It was originally used in Canada, because it is similar in origin to both French and English. The term geomatics has since been adopted by the International Organization for Standardization, the Royal Institution of Chartered Surveyors, and many other international authorities, although some (especially in the United States) have shown a preference for the term *geospatial technology*.

Similarly, the new related field hydrogeomatics covers the geomatics area associated with surveying work carried out on, above or below the surface of the sea or other areas of water. The older term of hydrographics was too specific to the preparation of marine charts and failed to include the broader concept of positioning or measurements in all marine environments. A geospatial network is a network of collaborating resources for sharing and coordinating geographical data, and data tied to geographical references. One example of such a network is the Open Geospatial Consortium's efforts to provide "ready global access to geographic information". A number of university departments which were once titled surveying, survey engineering or topographic science have re-titled themselves as geomatics or geomatic engineering.

The rapid progress, and increased visibility, of geomatics since 1990s has been made possible by advances in computer hardware, computer science, and software engineering, as well as airborne and space observation remote sensing technologies. Science of deriving information about an object using sensor without physically contacting it is called remote sensing which is a part of geomatics.

Applications

Applications areas include:

- Air navigation services
- Archaeological excavation and survey for GIS applications
- Coastal zone management and mapping
- Criminology
- Disaster informatics for disaster risk reduction and response
- The environment
- Infrastructure management
- Land management and reform
- Natural resource monitoring and development
- Seismic Interpretation
- Sociology
- Subdivision planning
- Urban planning

INTEGRATED GEOGRAPHY

Integrated geography is the branch of geography that describes the spatial aspects of interactions between humans and the natural world. It requires an understanding of the dynamics of geology, meteorology, hydrology, biogeography, ecology, and geomorphology, as well as the ways in which human societies conceptualize the environment.

The links between cultural and physical geography were once more readily apparent than they are today. As human experience of the world is increasingly mediated by technology, the relationships have often become obscured.

Integrated geography represents a critically important set of analytical tools for assessing the impact of human presence on the environment by measuring the result of human activity on natural landforms and cycles.

Integrated geography is the third branch of geography, as compared to physical and human geography. Integrated geography concentrates on the relationship between human and the surrounding world.

Journals and Literature

Physical geography and Earth Science journals communicate and document the results of research carried out in universities and various other research institutions. Most journals cover a specific field and publish the research within that field, however unlike human geographers, physical geographers tend to publish in inter-disciplinary journals rather than predominantly geography journal; the research is normally expressed in the form of a scientific paper. Additionally, textbooks, books, and magazines on geography communicate research to laypeople, although these tend to focus on environmental issues or cultural dilemmas.

Historical Evolution of the Discipline

From the birth of geography as a science during the Greek classical period and until the late nineteenth century with the birth of anthropogeography or Human Geography, Geography was almost exclusively a natural science: the study of location and descriptive gazetteer of all places of the known world. Several

works among the best known during this long period could be cited as an example, from Strabo (Geography), Eratosthenes (Geography) or Dionisio Periegetes (Periegesis Oiceumene) in the Ancient Age to the Alexander von Humboldt (Cosmos) in the century XIX, in which geography is regarded as a physical and natural science, of course, through the work Summa de Geografía of Martín Fernández de Enciso from the early sixteenth century, which is indicated for the first time the New World.

During the eighteenth and nineteenth centuries, a controversy exported from Geology, between supporters of James Hutton (uniformitarianism Thesis) and Georges Cuvier (catastrophism) strongly influenced the field of geography, because geography at this time was a natural science since Human Geography or Antropogeography had just developed as a discipline in the late nineteenth century.

Two historical events during the nineteenth century had a great effect in the further development of physical geography. The first was the European colonial expansion in Asia, Africa, Australia and even America in search of raw materials required by industries during the Industrial Revolution. This fostered the creation of geography departments in the universities of the colonial powers and the birth and development of national geographical societies, thus giving rise to the process identified by Horacio Capel as the institutionalization of geography.

One of the most prolific empires in this regard was the Russian. A mid-eighteenth century many geographers are sent by the Russian altamirazgo different opportunities to perform geographical surveys in the area of Arctic Siberia. Among these is who is considered the patriarch of Russian geography: Mikhail Lomonosov who in the mid-1750s began working in the Department of Geography, Academy of Sciences to conduct research in Siberia, their contributions are notable in this regard, shows the soil organic origin, develops a comprehensive law on the movement of the ice that still governs the basics, thereby founding a new branch of Geography: Glaciology. In 1755 his initiative was founded Moscow University where he promotes the study of geography and the training of geographers. In 1758 he was appointed director of the Department of Geography, Academy of Sciences, a post from

which would develop a working methodology for geographical survey guided by the most important long expeditions and geographical studies in Russia. Thus followed the line of Lomonosov and the contributions of the Russian school became more frequent through his disciples, and in the nineteenth century we have great geographers as Vasily Dokuchaev who performed works of great importance as a "principle of comprehensive analysis of the territory" and "Russian Chernozem" latter being the most important where introduces the geographical concept of soil, as distinct from a simple geological strata, and thus founding a new geographic area of study: the Pedology. Climatology also receive a strong boost from the Russian school by Wladimir Koppen whose main contribution, climate classification, is still valid today. However, this great geographer also contributed to the Paleogeography through his work "The climates of the geological past" which is considered the father of Paleoclimatology. Russian geographers who made great contributions to the discipline in this period were: NM Sibirtsev, Pyotr Semyonov, K. D. Glinka, Neustrayev, among others.

The second important process is the theory of evolution by Darwin in mid-century (which decisively influenced the work of Ratzel, who had academic training as a zoologist and was a follower of Darwin's ideas) which meant an important impetus in the development of Biogeography.

Another major event in the late nineteenth and early twentieth century will give a major boost to development of geography and will take place in United States. It is the work of the famous geographer William Morris Davis who not only made important contributions to the establishment of discipline in his country, but revolutionized the field to develop geographical cycle theory which he proposed as a paradigm for Geography in general, although in actually served as a paradigm for Physical Geography. His theory explained that mountains and other landforms are shaped by the influence of a number of factors that are manifested in the geographical cycle. He explained that the cycle begins with the lifting of the relief by geological processes (faults, volcanism, tectonic upheaval, etc.).. Geographical factors such as rivers and runoff begins to create the V-shaped valleys between the mountains

(the stage called "youth"). During this first stage, the terrain is steeper and more irregular. Over time, the currents can carve wider valleys ("maturity") and then start to wind, towering hills only ("senescence"). Finally, everything comes to what is a plain flat plain at the lowest elevation possible (called "baseline") This plain was called by Davis' "peneplain" meaning "almost plain" Then the rejuvenation occurs and there is another mountain lift and the cycle continues.

Although Davis's theory is not entirely accurate, it was absolutely revolutionary and unique in its time and helped to modernize and create Geography subfield of Geomorphology. Its implications prompted a myriad of research in various branches of Physical Geography. In the case of the Paleogeography this theory provided a model for understanding the evolution of the landscape. For Hydrology, Glaciology and Climatology as a boost investigated as studying geographic factors shape the landscape and affect the cycle. The bulk of the work of William Morris Davis led to the development of a new branch of Physical Geography: Geomorphology whose contents until then did not differ from the rest of Geography. Shortly after this branch would present a major development. Some of his disciples made significant contributions to various branches of physical geography such as Curtis Marbut and his invaluable legacy for Pedology, Mark Jefferson, Isaiah Bowman, among others.

4

Economic Geography in Transportation

Transportation Geography is the branch of geography that investigates spatial interactions, let them be of people, freight and information. It can consider humans and their use of vehicles or other modes of travelling as well as how markets are serviced by flows of finished goods and raw materials. It is a branch of Economic geography. "The ideal transport mode would be instantaneous, free, have an unlimited capacity and always be available. It would render space obsolete. This is obviously not the case. Space is a constraint for the construction of transport networks. Transportation appears to be an economic activity different from others. It trades space with time and thus money".

Geography and transportation intersect in terms of the movement of peoples, goods, and information. Over time, accessibility has increased and this has led to a greater reliance on mobility. This trend could be traced back to the industrial revolution although it has significantly accelerated in the second half of the 20th century for various reasons. Today, societies rely on transport systems to support a wide variety of activities. These activities include commuting, supplying energy needs, distributing goods, and acquiring personal wants. The development of sufficient transport networks has been a continuous challenge to meet growing economic development, mobility needs, and ultimately to participate in the global economy. Transport and urban geography are closely intertwined, with the concept of ribbon

development being closely aligned to urban and transport studies. As humans increasingly seek to travel the world, the relationship transport and urban areas have often become obscured.

Transportation geography measures the result of human activity between and within locations. It focuses on items such as travel time, routes undertaken, modes of transport, resource use and sustainability of transport types on the natural environment. Other sections consider topography, safety aspects of vehicle use and energy use within an individual's or group's journey.

The purpose of transportation is to overcome space which is shaped by both human and physical constraints such as distance, political boundaries, time and topographies. The specific purpose of transportation is to fulfil a demand for mobility, since it can only exist if it moves something, be it people or goods. Any kind of movement must consider its geographical setting, and then choose an available form of transport based on cost, availability, and space.

THE IMPORTANCE OF TRANSPORTATION

Transport represents one of the most important human activities worldwide. It is an indispensable component of the economy and plays a major role in spatial relations between locations. Transport creates valuable links between regions and economic activities, between people and the rest of the world. Transport is a multidimensional activity whose importance is:

- Historical. Transport modes have played several different historical roles in the rise of civilizations (Egypt, Rome and China), in the development of societies (creation of social structures) and also in national defence (Roman Empire, American road network).
- Social. Transport modes facilitate access to healthcare, welfare, and cultural or artistic events, thus performing a social service. They shape social interactions by favouring or inhibiting the mobility of people. Transportation thus support and may even shape social structures.
- Political. Governments play a critical role in transport as sources of investment and as regulators. The political role of transportation is undeniable as governments often

subsidize the mobility of their populations (highways, public transit, etc.). While most transport demand relates to economic imperatives, many communication corridors have been constructed for political reasons such as national accessibility or job creation. Transport thus has an impact on nation building and national unity, but it is also a political tool.

- Economic. The evolution of transport has always been linked to economic development. It is an industry in its own right (car manufacturing, air transport companies, etc.). The transport sector is also an economic factor in the production of goods and services. It contributes to the value-added of economic activities, facilitates economies of scale, influences land (real estate) value and the geographic specialization of regions. Transport is both a factor shaping economic activities, and is also shaped by them.
- Environmental. Despite the manifest advantages of transport, its environmental consequences are also significant. They include air and water quality, noise level and public health. All decisions relating to transport need to be evaluated taking into account the corresponding environmental costs. Transport is a dominant factor in contemporary environmental issues.

Substantial empirical evidence indicates that the importance of transportation is growing. The following contemporary trends can be identified regarding this issue:

- Growth of the demand. The last 50 years have seen a considerable growth of the transport demand related to individual (passengers) as well as freight mobility. This growth is jointly the result of larger quantities of passengers and freight being moved, but also the longer distances over which they are carried. Recent trends underline an ongoing process of mobility growth, which has led to the multiplication of the number of journeys involving a wide variety of modes that service transport demands.
- Reduction of costs. Even if several transportation modes are very expensive to own and operate (ships and planes

for instance), costs per unit transported have dropped significantly over the last decades. This has made it possible to overcome larger distances and further exploit the comparative advantages of space. As a result, despite the lower costs, the share of transport activities in the economy has remained relatively constant in time.

- Expansion of infrastructures. The above two trends have obviously extended the requirements for transport infrastructures both quantitatively and qualitatively. Roads, harbours, airports, telecommunication facilities and pipelines have expanded considerably to service new areas and adding capacity to existing networks. Transportation infrastructures are thus a major component of the land use, notably in developed countries.

Facing these contemporary trends, an important part of the spatial differentiation of the economy is related to where resources (raw materials, capital, people, information etc.) are located and how well they can be distributed. Transport routes are established to distribute resources between places where they are abundant and places where they are scarce, but only if the costs are lower than the benefits.

Consequently, transportation has an important role to play in the conditions that affect global, national and regional economic entities. It is a strategic infrastructure that is so embedded in the socio-economic life of individuals, institutions and corporations that it is often invisible to the consumer, but always part of all economic and social functions. This is paradoxical, since the perceived invisibility of transportation is derived from its efficiency. If transport is disrupted or ceases to operate, the consequences can be dramatic.

Transportation in Geography

Transportation interests geographers for two main reasons. First, transport infrastructures, terminals, equipment and networks occupy an important place in space and constitute the basis of a complex spatial system. Second, since geography seeks to explain spatial relationships, transport networks are of specific interest because they are the main support of these interactions.

Transport geography is a sub-discipline of geography concerned about movements of freight, people and information. It seeks to link spatial constraints and attributes with the origin, the destination, the extent, the nature and the purpose of movements.

Transport geography, as a discipline, emerged from economic geography in the second half of the twentieth century. Traditionally, transportation has been an important factor behind the economic representations of the geographic space, namely in terms of the location of economic activities and the monetary costs of distance. The growing mobility of passengers and freight justified the emergence of transport geography as a specialized field of investigation. In the 1960s, transport costs were recognized as key factors in location theories and transport geography began to rely increasingly on quantitative methods, particularly over network and spatial interactions analysis. However, from the 1970s globalization challenged the centrality of transportation in many geographical and regional development investigations. As a result, transportation became under represented in economic geography in the 1970s and 1980s, even if mobility of people and freight and low transport costs were considered as important factors behind the globalization of trade and production.

Since the 1990s, transport geography has received renewed attention, especially because the issues of mobility, production and distribution are interrelated in a complex geographical setting. It is now recognized that transportation is a system that considers the complex relationships between its core elements. These core elements are networks, nodes and demand. Transport geography must be systematic as one element of the transport system is linked with numerous others. An approach to transportation thus involves several fields where some are at the core of transport geography while others are more peripheral. However, three central concepts to transport systems can be identified:

- Transportation nodes. Transportation primarily links locations, often characterized as nodes. They serve as access points to a distribution system or as transshipment/ intermediary locations within a transport network. This function is mainly serviced by transport terminals where

flows originate, end or are being transshipped from one mode to the other. Transport geography must consider its places of convergence and transshipment.

- Transportation networks. Considers the spatial structure and organization of transport infrastructures and terminals. Transport geography must include in its investigation the infrastructures supporting and shaping movements.
- Transportation demand. Considers the demand for transport services as well as the modes used to support movements. Once this demand is realized, it becomes an interaction which flows through a transport network. Transport geography must evaluate the factors affecting its derived demand function.

The analysis of these concepts relies on methodologies often developed by other disciplines such as economics, mathematics, planning and demography. Each provides a different dimension to transport geography. For instance, the spatial structure of transportation networks can be analyzed with graph theory, which was initially developed for mathematics. Further, many models developed for the analysis of movements, such as the gravity model, were borrowed from physical sciences. Multi disciplinarity is consequently an important attribute of transport geography, as in geography in general. The role of transport geography is to understand the spatial relations that are produced by transport systems. This gives rise to several fallacies about transportation. A better understanding of spatial relations is essential to assist private and public actors involved in transportation mitigate transport problems, such as capacity, transfer, reliability and integration of transport systems. There are three basic geographical considerations relevant to transport geography:

- Location. As all activities are located somewhere, each location has its own characteristics conferring a potential supply and/or a demand for resources, products, services or labour. A location will determine the nature, the origin, the destination, the distance and even the possibility of a movement to be realized. For instance, a city provides employment in various sectors of activity in addition to consume resources.

- Complementarity. Locations must require exchanging goods, people or information. This implies that some locations have a surplus while others have a deficit. The only way an equilibrium can reached is by movements between locations having surpluses and locations having demands. For instance, a complementarity is created between a store (surplus of goods) and its customers (demand of goods).
- Scale. Movements generated by complementarity are occurring at different scales, pending the nature of the activity. Scale illustrates how transportation systems are established over local, regional and global geographies. For instance, home-to-work journeys generally have a local or regional scale, while the distribution network of a multinational corporation is most likely to cover several regions of the world.

Consequently, transport systems, by their nature, consume land and support the relationships between locations.

TRANSPORT ECONOMICS

Transport economics is a branch of economics that deals with the allocation of resources within the transport sector and has strong linkages with civil engineering. Transport economics differs from some other branches of economics in that the assumption of a spaceless, instantaneous economy does not hold. People and goods flow over networks at certain speeds. Demands peak. Advanced ticket purchase is often induced by lower fares. The networks themselves may or may not be competitive. A single trip (the final good from the point-of-view of the consumer) may require bundling the services provided by several firms, agencies and modes.

Although transport systems follow the same supply and demand theory as other industries, the complications of network effects and choices between non-similar goods (e.g. car and bus travel) make estimating the demand for transportation facilities difficult. The development of models to estimate the likely choices between the non-similar goods involved in transport decisions (discrete choice models) led to the development of an important

branch of econometrics, and a Nobel Prize for Daniel McFadden. In transport, demand can be measured in numbers of journeys made or in total distance travelled across all journeys (e.g. passenger-kilometres for public transport or vehicle-kilometres of travel (VKT) for private transport). Supply is considered to be a measure of capacity. The price of the good (travel) is measured using the generalised cost of travel, which includes both money and time expenditure.

The effect of increases in supply (capacity) are of particular interest in transport economics, as the potential environmental consequences are significant.

Externalities

In addition to providing benefits to their users, transport networks impose both positive and negative externalities on non-users. The consideration of these externalities-particularly the negative ones-is a part of transport economics.

Positive externalities of transport networks may include the ability to provide emergency services, increases in land value and agglomeration benefits. Negative externalities are wide-ranging and may include local air pollution, noise pollution, light pollution, safety hazards, community severance and congestion. The contribution of transport systems to potentially hazardous climate change is a significant negative externality which is difficult to evaluate quantitatively, making it difficult (but not impossible) to include in transport economics-based research and analysis.

Congestion is considered a negative externality by economists. An externality occurs when a transaction causes costs or benefits to third party, often, although not necessarily, from the use of a public good. For example, manufacturing or transportation cause air pollution imposing costs on others when making use of public air.

TRAFFIC CONGESTION

Traffic congestion is a negative externality caused by various factors. A 2005 American study stated that there are seven root causes of congestion, and gives the following summary of their contributions: bottlenecks 40%, traffic incidents 25%, bad weather

15%, work zones 10%, poor signal timing 5%, and special events/ other 5%. Within the transport economics community, congestion pricing is considered to be an appropriate mechanism to deal with this problem (i.e. to internalise the externality) by allocating scarce roadway capacity to users.

Capacity expansion is also a potential mechanism to deal with traffic congestion, but is often undesirable (particularly in urban areas) and sometimes has questionable benefits. William Vickrey, winner of the 1996 Nobel Prize for his work on "moral hazard", is considered one of the fathers of congestion pricing, as he first proposed it for the New York City subway system in 1952. In the road transportation arena these theories were extended by Maurice Allais, a fellow Nobel prize winner "for his pioneering contributions to the theory of markets and efficient utilization of resources", Gabriel Roth who was instrumental in the first designs and upon whose World Bank recommendation the first system was put in place in Singapore.

Reuben Smeed, the deputy director of the Transport and Road Research Laboratory was also a pioneer in this field, and his ideas were presented to the British government in what is known as the Smeed Report. Congestion is not limited to road networks; the negative externality imposed by congestion is also important in busy public transport networks as well as crowded pedestrian areas.

Road Pricing

Road pricing is an economic concept regarding the various direct charges applied for the use of roads. The road charges includes fuel taxes, licence fees, parking taxes, tolls, and congestion charges, including those which may vary by time of day, by the specific road, or by the specific vehicle type, being used. Road pricing has two distinct objectives: revenue generation, usually for road infrastructure financing, and congestion pricing for demand management purposes. Toll roads are the typical example of revenue generation. Charges for using high-occupancy toll lanes or urban tolls for entering a restricted area of a city are typical examples of using road pricing for congestion management purposes.

European Application

Facing rising levels of traffic congestion, European governments are giving serious consideration to nationwide road pricing schemes. Some of these could exploit the new Galileo satellite positioning system, although it is possible to arrange road pricing using various different technologies. A satellite based system would entail vehicles containing a satellite tracking device which would determine which roads were being driven along, for how far and at what time of day. This information would then be sent to a central computer system, and the appropriate charges levied against the driver.

Germany

Schemes for charging trucks (lorries) in Germany (by the company Toll Collect) and Austria are already underway. The LKW-MAUT road pricing scheme began on January 1, 2005, trucks pay between €0.09 and €0.14 per kilometre depending on their emission levels and number of axles. The expensive scheme, combining satellite technology with other technologies, suffered numerous delays before implementation, whilst a scheme using much simpler technology in Austria was up and running in 2004.

In the UK, the Labour government announced in July 2005 that the proposed UK truck road user charging scheme would not go ahead.

Italy

A traffic charge program in Milan, called "Ecopass", began on a trial basis on January 2, 2008. It exempts vehicles compliant with the Euro 3 and Euro 4 emission standards or higher, as well as several alternative fuel vehicles.

Residents within the restricted zone, called ZTL (Italian: Zone a Traffico Limitato), may purchase a discounted annual pass. Although the program is operationally similar to existing congestion pricing schemes, its main objective is to reduce air pollution from vehicle emissions rather than relieve traffic congestion. The program was extended until December 31, 2009, and a public consultation will be conducted to decide if the charge should become permanent.

Malta

A fully automated system called a Controlled Vehicular Access (CVA) system has been launched in Malta's capital city of Valletta since May 1, 2007. When compared to other countries that make use of congestion charging models, the Maltese system makes use of a wider array of innovations including variable payments according to the duration of stay, flexible exemption rules, including exemptions for residents within the charging zone, and monthly or quarterly billing options for vehicle owners. Pre-payment facilities, including direct debit arrangements and purposely designed vouchers, are also available. The billing system was designed in Malta and has been described as a state of the art 'next generation congestion charge billing solution'. The Valletta Congestion Charge, which is also known as Valletta CVA, was recently nominated for the Best European Transport Strategy Award. Public voting is still underway.

Norway

One of the earliest schemes was introduced in Bergen in Norway in 1986. Only traffic entering the town is charged and only during weekdays from 6:00 a.m. through 10:00 p.m. Public service vehicles pay no charge.

Bergen has now a fully automated toll plaza system that is based on passing without stopping for all traffic. There are no coin slots or manual service. A similar system was introduced for the Oslo Toll Ring from February 2, 2008. To ensure interoperability of electronic fee collection in Norway a system called Auto PASS is used throughout the country for toll roads and congestion charging schemes etc. Most local drivers have purchased a tag which is automatically read on passing the detectors. As of February 2008, there will be six fully automated schemes in operation. Motorists without a tag pay a fee at a manual barrier.

Sweden

Stockholm has a congestion pricing system, Stockholm congestion tax, in use on a permanent basis since August 1, 2007, after having had a seven month trial period from January 3 to July 31, 2006. The City Centre is within the congestion tax zone. All the entrances and exits of this area have unmanned control points

operating with automatic number plate recognition. All vehicles entering or exiting the congestion tax affected area, with a few exceptions, have to pay 10–20 SEK (1.09–2.18 EUR, 1.49–2.98 USD) depending on the time of day between 06:30 and 18:29. The maximum tax amount per vehicle per day is 60 SEK (6.53 EUR, 8.94 USD). Payment is done by various means within 14 days after one has passed one of the control points, one cannot pay at the control points.

United Kingdom

Durham became the first city in the UK to have a permanent congestion charge in 2002. London has had a congestion charge in the central area since 2003. Administered by Transport for London (TfL), the charge was initially set at £5, from 17 February 2003, then raised to £8 on 4 July 2005. The daily charge must be paid by the registered keeper of a vehicle that is on public roads in the congestion charge zone between 7 a.m. and 6 p.m. (previously 6:30 p.m.), Monday to Friday. Failure to pay the charge means a fine of at least £50. The charge area was extended into parts of west London on 19 February 2007.

A scheme similar to the one in London was proposed in Manchester, covering a wider area but with a much smaller daily charging window covering the morning and evening rush hours. However, this was overwhelmingly rejected when voted upon in Greater Manchester. A scheme for Cambridge is currently under consideration and the subject of heated public debate, with council surveys showing that a majority of Cambridge-area residents reject the scheme.

A scheme for Edinburgh was rejected in a public referendum in February 2005. On 2008-03-05, councils from across the West Midlands, including those from Birmingham and Coventry, rejected the idea of imposing road pricing schemes on the area, this was despite promises from central government of transport project funding in exchange for the implementation of a road pricing pilot scheme. Similar schemes proposed for cities in the East Midlands have also been dropped.

Extensive studies are being done on introducing a scheme for all UK vehicles, with an aim to implementation at the earliest

around 2013. In October 2005 the UK government suggested they explore "piggy-backing" road pricing on private sector technologies, such as usage based insurance (also known as pay-as-you-drive, or PAYD). This method would avoid a large-scale public sector procurement exercise, but such products are unlikely to penetrate the mass market. If introduced, this scheme would likely see a charge being levied per kilometre depending on the time of day, the road being driven along, and perhaps the type of vehicle. For example, a large car driving along the western section of the M25 in rush hour would pay a high charge; a small car driving along a rural lane would pay a much lower charge.

The very highest charges would be likely in the most congested urban areas. It is expected that rural motorists would benefit the most from such a scheme, perhaps by paying less through road pricing than they do at present through petrol and car taxes, whereas urban motorists would pay much more than they presently do. However, this is highly dependent on whether such a scheme would be designed to be either revenue neutral or congestion neutral. A revenue neutral scheme would replace (at least in part) petrol and vehicle taxes, and would be such that Treasury revenue under the new scheme would equal the revenue from current taxes.

A congestion neutral scheme would be designed so that growth in congestion levels would stop as a result of the new charges; the latter scheme would require significantly higher (and increasingly higher) charges than the revenue neutral scheme and so would be unpopular with the UK's 30 million motorists. The carbon emission consequence of moving from fuel duty to a charge per mile has been raised as a concern by some environmentalists, as has any diversionary response from heavily trafficked (and hence more expensive) roads. The UK government announced funding for road pricing research in seven local areas in November 2005.

In June 2005, Transport Secretary Alistair Darling announced the current proposals to introduce road pricing. Every vehicle would be fitted with a satellite receiver to calculate charges, with prices (including fuel duty) ranging from 2p per mile on uncongested roads to £1.34 on the most congested roads at peak times. A 2007 online petition against road pricing, started by Peter

Roberts and hosted by the British government attracted over 1.8 million signatures, equivalent to 6% of the entire driving population. Over 150,000 signatures were added during the last day before the petition closed on 20 February 2007. In reply, the prime minister e-mailed the petitioners outlining his rationale, denying that the proposals were to introduce a stealth tax or increase surveillance, and promising 'debate' before a decision was made as to whether to introduce a national scheme. Also, in a recent poll 74% of those questioned opposed road pricing.

SOCIOPOLITICAL IMPLICATIONS OF TRANSPORT GEOGRAPHY

It may seem axiomatic to argue that transportation is a necessary, but not sufficient, component of growth and development. Decades of research have exposed the critical relationships between infrastructure, accessibility, mobility, policy, and social change.

Simply put, those regions and places that are better endowed with transportation have fared better overall, as measured by macroeconomic statistics of development, than those that are poorly equipped. Simple comparisons of countries like Haiti, Afghanistan, or Chad with Japan, Germany, or the United States suggest that the role of transportation in driving socio-economic change is critical.

Yet transportation is more than just the provision of infrastructure, facilities, networks, or investment; it is inextricably intertwined with how humans interact through policies, ideologies, and societies across time and space.

Transportation provides a fundamental foundation for the building blocks of societies – labour, capital, territory – and intersects with the human and physical environment in ways that have profound geographical consequences.

Progress in transportation geography research has been impressive over the nearly two decades since Rimmer (1988) completed a series of reports on the state of the subdiscipline. New research theories and methodologies have been stimulated, in part, by the growing importance of globalization as both ideology and process, and the evolution of spatial analytical technologies.

The notion that one can now make anything anywhere on the planet and sell anything anywhere on the planet (political and economic barriers notwithstanding) argues for an intensity of interaction between people, goods, and information that has motivated significant shifts in the way that accessibility is analyzed at multiple scales. More sophisticated analytical and computing capabilities (GIS, for example) have facilitated broader, deeper, and more interrelated approaches to transportation research.

One-dimensional, structural approaches to transportation have been superseded by research agendas that embrace myriad perspectives on the relationship between transport and society. Yet significant research challenges remain, not least of which is the need to provide a more scaled and integrative approach to transportation's relationship with people and places. In this first of three progress reports, my focus is on transportation research at the global scale.

In future reports, transportation research at both the regional and local contexts will be examined. Before commencing this journey, however, a brief discussion of the broad framework of transportation research provides some context to how place and space are currently engaged with by transport geographers. Over the course of the 20th century, the automobile rapidly developed from an expensive toy for the rich into the *de facto* standard for passenger transport in most developed countries. In developing countries, the effects of the automobile have lagged, but are emulating the impacts of developed nations. The development of the automobile built upon the transport revolution started by railways, and like the railways, introduced sweeping changes in employment patterns, social interactions, infrastructure and goods distribution.

The effects of the automobile on everyday life have been a subject of controversy. While the introduction of the mass-produced automobile represented a revolution in mobility and convenience, the modern consequences of heavy automotive use contribute to the use of non-renewable fuels, a dramatic increase in the rate of accidental death, social isolation and the disconnection of community, rise in obesity, the generation of air and noise pollution, and the facilitation of urban sprawl and urban decay.

SUSTAINABLE TRANSPORT

Sustainable transport (or green transport) refers to any means of transport with low impact on the environment, and includes walking and cycling, transit oriented development, green vehicles, CarSharing, and building or protecting urban transport systems that are fuel-efficient, space-saving and promote healthy lifestyles.

Sustainable transport systems make a positive contribution to the environmental, social and economic sustainability of the communities they serve.

Transport systems exist to provide social and economic connections, and people quickly take up the opportunities offered by increased mobility. The advantages of increased mobility need to be weighed against the environmental, social and economic costs that transport systems pose.

Transport systems have significant impacts on the environment, accounting for between 20% and 25% of world energy consumption and carbon dioxide emissions. Greenhouse gas emissions from transport are increasing at a faster rate than any other energy using sector. Road transport is also a major contributor to local air pollution and smog.

The social costs of transport include road crashes, air pollution, physical inactivity, time taken away from the family while commuting and vulnerability to fuel price increases. Many of these negative impacts fall disproportionately on those social groups who are also least likely to own and drive cars. Traffic congestion imposes economic costs by wasting people's time and by slowing the delivery of goods and services.

Traditional transport planning aims to improve mobility, especially for vehicles, and may fail to adequately consider wider impacts. But the real purpose of transport is access-to work, education, goods and services, friends and family-and there are proven techniques to improve access while simultaneously reducing environmental and social impacts, and managing traffic congestion. Communities which are successfully improving the sustainability of their transport networks are doing so as part of a wider programme of creating more vibrant, livable, sustainable cities.

Definition

The term sustainable transport came into use as a logical follow-on from sustainable development, and is used to describe modes of transport, and systems of transport planning, which are consistent with wider concerns of sustainability. There are many definitions of the sustainable transport, and of the related terms sustainable transportation and sustainable mobility. One such definition, from the European Union Council of Ministers of Transport, defines a sustainable transportation system as one that:

- Allows the basic access and development needs of individuals, companies and society to be met safely and in a manner consistent with human and ecosystem health, and promotes equity within and between successive generations.
- Is Affordable, operates fairly and efficiently, offers a choice of transport mode, and supports a competitive economy, as well as balanced regional development.
- Limits emissions and waste within the planet's ability to absorb them, uses renewable resources at or below their rates of generation, and uses non-renewable resources at or below the rates of development of renewable substitutes, while minimizing the impact on the use of land and the generation of noise.

History

Most of the tools and concepts of sustainable transport were developed before the phrase was coined. Walking, the first mode of transport, is also the most sustainable. Public transport dates back at least as far as the invention of the public bus by Blaise Pascal in 1662. The first passenger tram began operation in 1807 and the first passenger rail service in 1825. Pedal bicycles date from the 1860s. These were the only personal transport choices available to most people in Western countries prior to World War II, and remain the only options for most people in the developing world. Freight was moved by human power, animal power or rail.

The post-war years brought increased wealth and a demand for much greater mobility for people and goods. The number of road vehicles in Britain increased fivefold between 1950 and 1979,

with similar trends in other Western nations. Most affluent countries and cities invested heavily in bigger and better-designed roads and motorways, which were considered essential to underpin growth and prosperity. Transport planning became a branch of civil engineering and sought to design sufficient road capacity to provide for the projected level of traffic growth at acceptable levels of traffic congestion-a technique called "predict and provide". Public investment in transit, walking and cycling declined dramatically in the United States, Great Britain and Australasia, although this did not occur to the same extent in Canada or mainland Europe.

Concerns about the sustainability of this approach became widespread during the 1973 oil crisis and the 1979 energy crisis. The high cost and limited availability of fuel led to a resurgence of interest in alternatives to single occupancy vehicle travel.

Transport innovations dating from this period include high-occupancy vehicle lanes, citywide carpool systems and transportation demand management. Singapore implemented congestion pricing in the late 1970s, and Curitiba began implementing its Bus Rapid Transit system in the early 1980s.

Relatively low and stable oil prices during the 1980s and 1990s led to significant increases in vehicle travel from 1980–2000, both directly because people chose to travel by car more often and for greater distances, and indirectly because cities developed tracts of suburban housing, distant from shops and from workplaces, now referred to as urban sprawl. Trends in freight logistics, including a movement from rail and coastal shipping to road freight and a requirement for just in time deliveries, meant that freight traffic grew faster than general vehicle traffic.

At the same time, the academic foundations of the "predict and provide" approach to transport were being questioned, notably by Peter Newman in a set of comparative studies of cities and their transport systems dating from the mid-1980s. The British Government's White Paper on Transport marked a change in direction for transport planning in the UK. In the introduction to the White Paper, Prime Minister Tony Blair stated that.

We recognise that we cannot simply build our way out of the problems we face. It would be environmentally irresponsible-and

would not work. A companion document to the White Paper called "Smarter Choices" researched the potential to scale up the small and scattered sustainable transport initiatives then occurring across Britain, and concluded that the comprehensive application of these techniques could reduce peak period car travel in urban areas by over 20%.

A similar study by the United States Federal Highway Administration, was also released in 2004 and also concluded that a more proactive approach to transportation demand was an important component of overall national transport strategy.

ENVIRONMENTALLY SUSTAINABLE TRANSPORT

Transport systems are major emitters of greenhouse gases, responsible for 23% of world energy-related GHG emissions in 2004, with about three quarters coming from road vehicles. Currently 95% of transport energy comes from petroleum. Energy is consumed in the manufacture as well as the use of vehicles, and is embodied in transport infrastructure including roads, bridges and railways.

The environmental impacts of transport can be reduced by improving the walking and cycling environment in cities, and by enhancing the role of public transport, especially electric rail.

Green vehicles are intended to have less environmental impact than equivalent standard vehicles, although when the environmental impact of a vehicle is assessed over the whole of its life cycle this may not be the case. Electric vehicle technology has the potential to reduce transport CO_2 emissions, depending on the embodied energy of the vehicle and the source of the electricity. Hybrid vehicles, which use an internal combustion engine combined with an electric engine to achieve better fuel efficiency than a regular combustion engine, are already common. Natural gas is also used as a transport fuel. Biofuels are a less common, and less promising, technology; Brazil met 17% of its transport fuel needs from bioethanol in 2007, but the OECD has warned that the success of biofuels in Brazil is due to specific local circumstances; internationally, biofuels are forecast to have little or no impact on greenhouse emissions, at significantly higher cost than energy efficiency measures.

In practice there is a sliding scale of green transport depending on the sustainability of the option. Green vehicles are more fuel-efficient, but only in comparison with standard vehicles, and they still contribute to traffic congestion and road crashes. Well-patronised public transport networks based on traditional diesel buses use less fuel per passenger than private vehicles, and are generally safer and use less road space than private vehicles. Green public transport vehicles including electric trains, trams and electric buses combine the advantages of green vehicles with those of sustainable transport choices. Other transport choices with very low environmental impact are cycling and other human-powered vehicles, and animal powered transport. The most common green transport choice, with the least environmental impact is walking.

Transport and Social Sustainability

Cities with overbuilt roadways have experienced unintended consequences, linked to radical drops in public transport, walking, and cycling. In many cases, streets became void of "life." Stores, schools, government centres and libraries moved away from central cities, and residents who did not flee to the suburbs experienced a much reduced quality of public space and of public services. As schools were closed their mega-school replacements in outlying areas generated additional traffic; the number of cars on US roads between 7:15 and 8:15 a.m. increases 30% during the school year.

Yet another impact was an increase in sedentary lifestyles, causing and complicating a national epidemic of obesity, and accompanying dramatically increased health care costs.

Cities and Sustainable Transport

Cities are shaped by their transport systems. In The City in History, Lewis Mumford documented how the location and layout of cities was shaped around a walkable centre, often located near a port or waterway, and with sububs accessible by animal transport or, later, by rail or tram lines.

In 1939, the New York World's Fair included a model of an imagined city, built around a car-based transport system. In this "greater and better world of tomorrow", residential, commercial and industrial areas were separated, and skyscrapers loomed over

a network of urban motorways. These ideas captured the popular imagination, and are credited with influencing city planning from the 1940s to the 1970s.

The popularity of the car in the post-war era led to major changes in the structure and function of cities. There was some opposition to these changes at the time.

The writings of Jane Jacobs, in particular The Death and Life of Great American Cities provide a poignant reminder of what was lost in this transformation, and a record of community efforts to resist these changes. Lewis Mumford asked "is the city for cars or for people?" Donald Appleyard documented the consequences for communities of increasing car traffic in "The View from the Road" (1964) and in the UK, Mayer Hillman first published research into the impacts of traffic on child independent mobility in 1971. Despite these notes of caution, trends in car ownership, car use and fuel consumption continued steeply upward throughout the post-war period.

Mainstream transport planning in Europe has, by contrast, never been based on assumptions that the private car was the best or only solution for urban mobility. For example the Dutch Transport Structure Scheme has since the 1970s required that demand for additional vehicle capacity only be met "if the contribution to societal welfare is positive", and since 1990 has included an explicit target to halve the rate of growth in vehicle traffic. Some cities outside Europe have also consistently linked transport to sustainability and to land use planning, notably Curitiba, Brazil, Portland, Oregon and Vancouver, Canada.

There are major differences in transport energy consumption between cities; an average U.S. urban dweller uses 24 times more energy annually for private transport than a Chinese urban resident, and almost four times as much as a European urban dweller. These differences cannot be explained by wealth alone but are closely linked to the rates of walking, cycling, and public transport use and to enduring features of the city including urban density and urban design.

The cities and nations that have invested most heavily in car-based transport systems are now the least environmentally sustainable, as measured by per capita fossil fuel use. The social

and economic sustainability of car-based urban planning has also been questioned.

Within the United States, residents of sprawling cities make more frequent and longer car trips, while residents of traditional urban neighbourhoods make a similar number of trips, but travel shorter distances and walk, cycle and use transit more often. It has been calculated that New York residents save $19 billion each year simply by owning fewer cars and driving less than the average American. The European Commission adopted the Action Plan on urban mobility on 2009-09-30 for sustainable urban mobility. The European Commission will conduct a review of the implementation of the Action Plan in the year 2012, and will assess the need for further action.

In 2007, 72% of the European population lived in urban areas, which are key to growth and employment. Cities need efficient transport systems to support their economy and the welfare of their inhabitants. Around 85% of the EU's GDP is generated in cities. Urban areas face today the challenge of making transport sustainable in environmental (CO_2, air pollution, noise) and competitiveness (congestion) terms while at the same time addressing social concerns. These range from the need to respond to health problems and demographic trends, fostering economic and social cohesion to taking into account the needs of persons with reduced mobility, families and children.

Sustainable Transport Policies and Governance

Sustainable transport policies have their greatest impact at the city level. Outside Western Europe, cities which have consistently included sustainability as a key consideration in transport and land use planning include Curitiba, Brazil, Bogota, Colombia Portland, Oregon and Vancouver, Canada.

Many other cities throughout the world have recognised the need to link sustainability and transport policies, for example by joining Cities for Climate Protection.

Community and Grassroots Action

Sustainable transport is fundamentally a grassroots movement, albeit one which is now recognised as of citywide, national and

international significance. Whereas it started as a movement driven by environmental concerns, over these last years there has been increased emphasis on social equity and fairness issues, and in particular the need to ensure proper access and services for lower income groups and people with mobility limitations, including the fast growing population of older citizens.

Many of the people exposed to the most vehicle noise, pollution and safety risk have been those who do not own, or cannot drive cars, and those for whom the cost of car ownership causes a severe financial burden.

FUNDAMENTALS OF TRANSPORTATION/GEOGRAPHY AND NETWORKS

Transportation systems have specific structure. Roads have length, width, and depth. The characteristics of roads depends on their purpose.

Modern roads are generally paved, and unpaved routes are considered trails. The pavement of roads began early in history. Approximately 2600 BCE, the Egyptians constructed a paved road out of sandstone and limestone slabs to assist with the movement of stones on rollers between the quarry and the site of construction of the pyramids. The Romans and others used brick or stone pavers to provide a more level, and smoother surface, especially in urban areas, which allows faster travel, especially of wheeled vehicles.

The innovations of Thomas Telford and John McAdam reinvented roads in the early nineteenth century, by using less expensive smaller and broken stones, or aggregate, to maintain a smooth ride and allow for drainage. Later in the nineteenth century, application of tar (asphalt) further smoothed the ride. In 1824, asphalt blocks were used on the Champs-Elysees in Paris. In 1872, the first asphalt street (Fifth Avenue) was paved in New York (due to Edward de Smedt), but it wasn't until bicycles became popular in the late nineteenth century that the "Good Roads Movement" took off. Bicycle travel, more so than travel by other vehicles at the time, was sensitive to rough roads. Demands for higher quality roads really took off with the widespread adoption of the automobile in the United States in the early twentieth century.

The first good roads in the twentieth century were constructed of Portland cement concrete (PCC). The material is stiffer than asphalt (or asphalt concrete) and provides a smoother ride. Concrete lasts slightly longer than asphalt between major repairs, and can carry a heavier load, but is more expensive to build and repair. While urban streets had been paved with concrete in the US as early as 1889, the first rural concrete road was in Wayne County, Michigan, near to Detroit in 1909, and the first concrete highway in 1913 in Pine Bluff, Arkansas. By the next year over 2300 miles of concrete pavement had been layed nationally. However over the remainder of the twentieth century, the vast majority of roadways were paved with asphalt. In general only the most important roads, carrying the heaviest loads, would be built with concrete.

Roads are generally classified into a hierarchy. At the top of the hierarchy are freeways, which serve entirely a function of moving vehicles between other roads. Freeways are grade-separated and limited access, have high speeds and carry heavy flows. Below freeways are arterials. These may not be grade-separated, and while access is still generally limited, it is not limited to the same extent as freeways, particularly on older roads. These serve both a movement and an access function. Next are collector/distributor roads. These serve more of an access function, allowing vehicles to access the network from origins and destinations, as well as connecting with smaller, local roads, that have only an access function, and are not intended for the movement of vehicles with neither a local origin nor destination. Local roads are designed to be low speed and carry relatively little traffic.

The class of the road determines which level of government administers it. The highest roads will generally be owned, operated, or at least regulated (if privately owned) by the higher level of government involved in road operations; in the United States, these roads are operated by the individual states. As one moves down the hierarchy of roads, the level of government is generally more and more local (counties may control collector/distributor roads, towns may control local streets). In some countries freeways and other roads near the top of the hierarchy are privately owned and regulated as utilities, these are generally operated as toll roads. Even publicly owned freeways are operated as toll roads

under a toll authority in other countries, and some US states. Local roads are often owned by adjoining property owners and neighborhood associations.

The design of roads is specified in a number of design manual, including the AASHTO Policy on the Geometric Design of Streets and Highways (or Green Book). Relevant concerns include the alignment of the road, its horizontal and vertical curvature, its super-elevation or banking around curves, its thickness and pavement material, its cross-slope, and its width.

FREEWAYS

A motorway or freeway (sometimes called an expressway or thruway) is a multi-lane divided road that is designed to be high-speed free flowing, access-controlled, built to high standards, with no traffic lights on the mainline. Some motorways or freeways are financed with tolls, and so may have tollbooths, either across the entrance ramp or across the mainline. However in the United States and Great Britain, most are financed with gas or other tax revenue.

Though of course there were major road networks during the Roman Empire and before, the history of motorways and freeways dates at least as early as 1907, when the first limited access automobile highway, the Bronx River Parkway began construction in Westchester County, New York (opening in 1908). In this same period, William Vanderbilt constructed the Long Island Parkway as a toll road in Queens County, New York. The Long Island Parkway was built for racing and speeds of 60 miles per hour (96 km/hr) were accommodated. Users however had to pay a then expensive $2.00 toll (later reduced) to recover the construction costs of $2 million. These parkways were paved when most roads were not. In 1919 General John Pershing assigned Dwight Eisenhower to discover how quickly troops could be moved from Fort Meade between Baltimore and Washington to the Presidio in San Francisco by road. The answer was 62 days, for an average speed of 3.5 miles per hour (5.6 km/hr). While using segments of the Lincoln Highway, most of that road was still unpaved. In response, in 1922 Pershing drafted a plan for an 8,000 mile (13,000 km) interstate system which was ignored at the time.

The US Highway System was a set of paved and consistently numbered highways sponsored by the states, with limited federal support. First built in 1924, they succeeded some previous major highways such as the Dixie Highway, Lincoln Highway and Jefferson Highway that were multi-state and were constructed with the aid of private support. These roads however were not in general access-controlled, and soon became congested as development along the side of the road degraded highway speeds.

In parallel with the US Highway system, limited access parkways were developed in the 1920s and 1930s in several US cities. Robert Moses built a number of these parkways in and around New York City. A number of these parkways were grade separated, though they were intentionally designed with low bridges to discourage trucks and buses from using them. German Chancellor Adolf Hitler appointed a German engineer Fritz Todt Inspector General for German Roads. He managed the construction of the German Autobahns, the first limited access high-speed road network in the world. In 1935, the first section from Frankfurt am Main to Darmstadt opened, the total system today has a length of 11,400 km. The Federal-Aid Highway Act of 1938 called on the Bureau of Public Roads to study the feasibility of a toll-financed superhighway system (three east-west and three north-south routes). Their report Toll Roads and Free Roads declared such a system would not be self-supporting, advocating instead a 43,500 km (27,000 mile) free system of interregional highways, the effect of this report was to set back the interstate program nearly twenty years in the US.

The German autobahn system proved its utility during World War II, as the German army could shift relatively quickly back and forth between two fronts. Its value in military operations was not lost on the American Generals, including Dwight Eisenhower.

On October 1, 1940, a new toll highway using the old, unutilized South Pennsylvania Railroad right-of-way and tunnels opened. It was the first of a new generation of limited access highways, generally called superhighways or freeways that transformed the American landscape. This was considered the first freeway in the US, as it, unlike the earlier parkways, was a multi-lane route as well as being limited access. The Arroyo Seco Parkway, now the

Pasadena Freeway, opened December 30, 1940. Unlike the Pennsylvania Turnpike, the Arroyo Seco parkway had no toll barriers.

A new National Interregional Highway Committee was appointed in 1941, and reported in 1944 in favour of a 33,900 mile system. The system was designated in the Federal Aid Highway Act of 1933, and the routes began to be selected by 1947, yet no funding was provided at the time. The 1952 highway act only authorized a token amount for construction, increased to $175 million annually in 1956 and 1957.

The US Interstate Highway System was established in 1956 following a decade and half of discussion. Much of the network had been proposed in the 1940s, but it took time to authorize funding. In the end, a system supported by gas taxes (rather than tolls), paid for 90% by the federal government with a 10% local contribution, on a pay-as-you-go" system, was established. The Federal Aid Highway Act of 1956 had authorized the expenditure of $27.5 billion over 13 years for the construction of a 41,000 mile interstate highway system. As early as 1958 the cost estimate for completing the system came in at $39.9 billion and the end date slipped into the 1980s. By 1991, the final cost estimate was $128.9 billion. While the freeways were seen as positives in most parts of the US, in urban areas opposition grew quickly into a series of freeway revolts. As soon as 1959, (three years after the Interstate act), the San Francisco Board of Supervisors removed seven of ten freeways from the city's master plan, leaving the Golden Gate bridge unconnected to the freeway system. In New York, Jane Jacobs led a successful freeway revolt against the Lower Manhattan Expressway sponsored by business interests and Robert Moses among others. In Baltimore, I-70, I-83, and I-95 all remain unconnected thanks to highway revolts led by now Senator Barbara Mikulski. In Washington, I-95 was rerouted onto the Capital Beltway. The pattern repeated itself elsewhere, and many urban freeways were removed from Master Plans.

In 1936, the Trunk Roads Act ensured that Great Britain's Minister of Transport controlled about 30 major roads, of 7,100 km (4,500 miles) in length. The first Motorway in Britain, the Preston by-pass, now part of the M-6, opened in 1958. In 1959, the first

stretch of the M1 opened. Today there are about 10,500 km (6300 miles) of trunk roads and motorways in England.

Australia has 790 km of motorways, though a much larger network of roads. However the motorway network is not truly national in scope (in contrast with Germany, the United States, Britain, and France), rather it is a series of local networks in and around metropolitan areas, with many intercity connection being on undivided and non-grade separated highways. Outside the Anglo-Saxon world, tolls were more widely used. In Japan, when the Meishin Expressway opened in 1963, the roads in Japan were in far worse shape than Europe or North American prior to this. Today there are over 6,100 km of expressways (3,800 miles), many of which are private toll roads. France has about 10,300 km of expressways (6,200 miles) of motorways, many of which are toll roads.

The French motorway system developed through a series of franchise agreements with private operators, many of which were later nationalized. Beginning in the late 1980s with the wind-down of the US interstate system (regarded as complete in 1990), as well as intercity motorway programs in other countries, new sources of financing needed to be developed. New (generally suburban) toll roads were developed in several metropolitan areas.

An exception to the dearth of urban freeways is the case of the Big Dig in Boston, which relocates the Central Artery from an elevated highway to a subterranean one, largely on the same right-of-way, while keeping the elevated highway operating. This project is estimated to be completed for some $14 billion; which is half the estimate of the original complete US Interstate Highway System.

As mature systems in the developed countries, improvements in today's freeways are not so much widening segments or constructing new facilities, but better managing the road space that exists. That improved management, takes a variety of forms. For instance, Japan has advanced its highways with application of Intelligent Transportation Systems, in particular traveller information systems, both in and out of vehicles, as well as traffic control systems. The US and Great Britain also have traffic management centres in most major cities that assess traffic conditions on motorways, deploy emergency vehicles, and control

systems like ramp meters and variable message signs. These systems are beneficial, but cannot be seen as revolutionizing freeway travel. Speculation about future automated highway systems has taken place almost as long as highways have been around. The Futurama exhibit at the New York 1939 World's Fair posited a system for 1960. Yet this technology has been twenty years away for over sixty years, and difficulties remain.

Layers of Networks

All networks come in layers. The OSI Reference Model for the Internet is well-defined. Roads too are part of a layer of subsystems of which the pavement surface is only one part. We can think of a hierarchy of systems.

- Places
- Trip Ends
- End to End Trip
- Driver/Passenger
- Service (Vehicle & Schedule)
- Signs and Signals
- Markings
- Pavement Surface
- Structure (Earth & Pavement and Bridges)
- Alignment (Vertical and Horizontal)
- Right-Of-Way
- Space

At the base is *space*. On space, a specific *right-of-way* is designated, which is property where the road goes. Originally right-of-way simply meant legal permission for travellers to cross someone's property. Prior to the construction of roads, this might simply be a well-worn dirt path.

On top of the right-of-way is the *alignment*, the specific path a transportation facility takes within the right-of-way. The path has both vertical and horizontal elements, as the road rises or falls with the topography and turns as needed.

Structures are built on the alignment. These include the roadbed as well as bridges or tunnels that carry the road.

Pavement surface is the gravel or asphalt or concrete surface that vehicles actually ride upon and is the top layer of the structure. That surface may have *markings* to help guide drivers to stay to the right (or left), delineate lanes, regulate which vehicles can use which lanes (bicycles-only, high occupancy vehicles, buses, trucks) and provide additional information. In addition to marking, signs and signals to the side or above the road provide additional regulatory and navigation information.

Services use roads. Buses may provide scheduled services between points with stops along the way. Coaches provide scheduled point-to-point without stops. Taxis handle irregular passenger trips.

Drivers and *passengers* use services or drive their own vehicle (producing their own transportation services) to create an *end-to-end trip*, between an origin and destination. Each origin and destination comprises a *trip end* and those trip ends are only important because of the *places* at the ends and the activity that can be engaged in. As transportation is a derived demand, if not for those activities, essentially no passenger travel would be undertaken. With modern information technologies, we may need to consider additional systems, such as Global Positioning Systems (GPS), differential GPS, beacons, transponders, and so on that may aide the steering or navigation processes. Cameras, in-pavement detectors, cell phones, and other systems monitor the use of the road and may be important in providing feedback for real-time control of signals or vehicles.

TRANSPORTATION PLANNING PROBLEMS IN DEVELOPING COUNTRIES

The importance of planning in transportation is obvious. As residents of Istanbul and Turkey, we can easily observe the negative effects of unplanned transportation, and see that ineffective planning, with regard to its concepts and instruments does not reduce the problems at all.

The most striking fact of the last fifteen years of the transportation field in Turkey is that 1700 kilometres of motorways were built by spending 16 billion US dollars. On the other hand, at the stage where decisions were being made for these motorways,

the "1983-1993 National Transportation Plan" was in operation and revisions were being conducted after its first three years. Decisions of building 1200 kilometres of motorways were made in spite of the fact that no new motorways were suggested in this national plan. On the contrary, a high-speed railway was suggested, and a quarter of the construction was complete when it was abandoned in favour of the new motorways. The National Plan was abandoned in this manner and without any reason and without any explanation at all. Today, none of these motorways use more than 10 % of their capacities. Another issue simultaneous with the motorway decision was the construction of new airports using the slogan "a new airport to each province". These airports were recently closed after about ten years of operation during which only a few planes used them weekly.

Another fact is the planning cycle formed by continuously repeating plan and project making. No feasibility studies were made for the motorways mentioned above, and even some had their projects made by the contractor firms after the beginning of the construction.

Studies and projects continued to be made many times for the abandoned high-speed railway. Another exaggerated example is the city of Bursa. It had its transportation master plan made 3 times in 10 years.

Some of the examples are unplanned developments resulting from the lack of or a misunderstanding of the planning concept. The others are developments against plans under operation. The lack of a planning tradition causes diffidence against the planning concept and reduces the effects of the efforts made in favour of planned development.

Planning approaches are criticised also in developed countries, where there is a planning tradition and where planned development is under operation. Some of the criticism centreson methodology and instruments (Genton, 1971; Wachs, 1985). Some say that instrumental approach should be replaced by the communicative approach. Most of the criticism focuses on demand predictions, which lie in the centre of the classical planning processes.

Talvitie (1997), who approaches the subject from a philosophical direction and bases his ideas on economical and psychoanalytic

theories, believes that transportation and societal planning is extensive far beyond the individuals' economical behaviour. He proposes that the utility function should be should be expanded beyond the limits of economical behaviour.

He stresses that the following three questions should be positively answered because of the important role of demand prediction in planning:

1. Can socio-demography, land use and travel demands be forecast as a function of observable variables?
2. Can stable goals and plans be formulated, satisfying both the goals and predictions?
3. Has a tractable process been devised for implementing the plan?

The only possible answer for all of these questions is stated to be "no". Also added is the fact that the effect of survey errors and errors resulting from unknown and unobservable variables is high regarding the results. Thus, these subjects should be…Planning problems are deeper in the developing countries. Without the necessary tradition and the past experiences, the planning efforts cannot yield the best results in a short period of time. First of all, the planning concept should be adopted and assimilated. The question is not "why planning?" This stage is over. The questions of "what kind of plan" and what kind of application" are waiting to be answered. This paper consists of some ideas on the answers to these questions, with regard to the developing countries.

LEVEL OF DEVELOPMENT AND TRANSPORTATION

The relationship between the level of development and transportation can be examined from different points of view. Certainly the most dominant indicator, among others, is the National income. Low national income results in poor transportation infrastructure. Therefore, big investments continue to be necessary in the developing countries.

The flexibility of transport demand against the national income is higher than 1. For example, as the increase in national income in Turkey in the 25-year period between the years 1970 and 1995, had an annual average of 4.31%, there were increases of 5.28% in passenger-km and 5.95% ton-km values. In this case, a 1% increase

in national income ignites an increase of 1.23% in passenger demand and 1.38% in freight demand. These figures are 2.34% for passengers and 0.90% for freight respectively in the 15 EU countries (European Commision, 1997). The increasing trend in the passenger transport is an expected development.

The relationship between the level of development and the level of car ownership is also obvious. The rapid increase of car ownership in the developed countries, and the fact that today it corresponds nearly to one car per two persons, has brought forward the problem of traffic congestion. On the other hand, it has also been understood through the years that the whole problem cannot be solved by just solving the congestion problem.

Although the level of car ownership is relatively lower in the developing countries (eg. onecar per ten persons in Istanbul), over the years traffic congestion has been accepted as the primary transportation problem indicator. Thus, the heart of the matter is missed and only the symptom is taken into consideration instead of the real problem. This traffic congestion does not exist only in the rush hours, but it continues throughout the day in cities like Istanbul. Actually, this problem has become a common syndrome for most of the big cities in developing countries.

The specific reasons of traffic congestion in Istanbul and other cities in developing countries can be summarised as follows:

- The urban texture is not appropriate for cars.
- Car owners spare a relatively big amount of time budget for transportation; ie they tend to use cars many times and for longer periods. Thus, the rate of car usage is high.
- Traffic management is inadequate.
- Disobedience to the traffic rules is widespread.
- Public transport is inadequate.

Actually, most of the measures taken against congestion are meaningless because they lack permanency and do not solve the non-car-owning majority's problems. Thus, it can easily be said that the real problem waiting to be solved in the developing countries, is public transportation, which the vast majority depends on. The average age of the population and the present rate of mobility are low (eg, daily mobility in Istanbul is 1.0, whereas it

is between 2.0 and 3.5 in the developed countries). This fact means that in the future, the rate of the population depending on public transport will increase.

PLANNING BASED ON DEVELOPMENT CONDITIONS

Transport plan can be expressed as a process of activities formed up for the purpose of meeting the cost of transport needs arising from the socio-economic activities in a specific region at an acceptable level of service and along with its external costs.

Making correct plans for the desired development is a subject of long-term studies. The developments taken place in the last 50 years are mostly structured around the developed economical and social systems of the USA and European countries. As far as the expressed structural features and facilities are concerned, it becomes even more essential to investigate this subject deeply for developing countries.

In the countries, where the current planning methodologies have been developed, there is astable balance in terms of economic and social aspects. The developments are, to a great extent, take place in the desired way. For this reason, efforts for creating the supply to meet the increasing transport demand with respect to increasing population, growing economy and search for quality have gained importance. This situation results in a requirement for the prediction of the demand, creation of different alternatives for supply and selecting the optimum. In the prediction of the demand that lies in the centre of the planning process, the assumption that the former trends in the selection of transport modes would be the same in the future, might be valid in the steady state structures of these countries. Furthermore, the data required for forecasting and assessments are usually reliable and adequate. Since the transportation infrastructure in these countries have almost been completed, investments of great importance may not be necessary.

However, in the developing countries, in terms of economy and the geographical distribution of socio-economic activities, definition of predictable trends extending from the past to the future is mostly impossible. The developments might take place in the forms of leaps rather than linear improvements. In this case,

investments may be much more expensive depending on demand predictions based on unrealistic assumptions.

In some big cities, as a result of inconsistencies in land use and rapid increase of the population, possibility of creating supply capacity may disappear in practice. In this case, validity of common planning methodology might become controversial and land use planning may become primary.

PLANNING IN DEVELOPING COUNTRIES

With respect to the explanations given above, might the planning approach and its methodology, widely applied in the USA and European countries be valid outside these countries, eg Turkey? The answer is unlikely to be positive. Because the core of this approach mentioned above, a different formulation should be assessed for the developing countries. For example, the development path in Turkey first needs to be stopped and then altered; because the highways, which carry 95% of the passengers and 93% of the freight, have almost taken the whole burden of transportation.

The railways seem to be approaching an end. Despite being inside a lively sector, the airways are a transport mode that has limited opportunities for growing. Although every geographical opportunity exists for it, marine transportation cannot be developed. And of course, there is the fact that around 7000-10000 people die in traffic accidents each year.

The share of highways in the city of Istanbul is around 92% despite the effort put in developing the rail systems. The time lost in urban transportation and its stress causes production losses and bring along negative effects on peoples' emotional state. Nationwide transportation in Turkey and urban transportation in Istanbul is in such a state that because of this imbalanced development, it can no longer reach a healthy structure. So, instead of supporting the present trend, it should be halted and redirected in order to solve the problems. In short, it can be said that a "passive" approach, which predicts the future through present trends and developments instead of directing it, can be valid for the developed countries. "Active" approaches that are directive in this sense are necessary for the developing countries. Accordingly, the planning process

should have an accomplished structure based on finding the most consistent and valid solution on economical and social development as well as land use, instead of satisfying the demand for the foreseeable future.

THE DECISIVE IMPORTANCE OF PUBLIC TRANSPORT

Public transport forms the skeleton of the transportation systems in the big cities. As stated before, especially in the developing countries the rate of the population depending on public transport is quite high.

The state of public transport in the cities of the developing countries differs widely from those of the developed countries. This difference brings different conflicts to the surface. Public transport in the cities of the developed countries can be considered adequate, at least when compared with the developing countries. However, this adequacy is not sufficient enough to attract the car-users to public transport.

In the developing countries, urban demand on public transport is higher. Yet, there is no existent public transport capacity that will attract the car-users. In this situation, congestion created by the relatively low car ownership comes to forefront and the unfair and illogical sharing of the transport facilities establish the main conflict. For example, the cars that use 70% of the roads carry only 20% of the travels, while the buses, which use 4% of the roads, serve 35%. The planning approach foresees the system development according to the past trends in private car demand. Since public transport is weak, this conflict is abided to. Bus ways become necessary on certain axes and at certain stages of the demand.

However, the priority is given to the cars and the share of the road that are necessary for them are determined first; the remaining portion is then allocated to buses. With this approach, the problem cannot be solved at all. On the other hand, at demand values, where rail systems become obligatory, feasibility studies mostly turn out to give negative results, not only financially but also economically.

The reason for this is that the value of time, which has wights of up to 80% among the utilities, stay at low levels as a function of national income. Economical values of fatalities and injuries in

traffic accidents are disturbing even ethically and the decrease in fatalities and injuries do not make a positive contribution to the feasibility results. The main conflict in the developing countries and their cities is that the capacities (bus ways or especially rail systems) which are necessitated by the demand cannot be created or there is an important delay in this process. Two natural results of this are:

- Required transportation support is not given for a healthy urban development; furthermore, hope for a healthy city disappears.
- The delay compensation resulting from the delay in constructing the high-capacity transportation system rises rapidly and surpasses the investment cost.

For example, this situation is present in Istanbul. Costs of investments such as the subway are increasing rapidly while alternative costs as operating costs reach quite high values.

The results of an old study on the public transport systems, and especially rail systems in the major cities of the developing countries are quite interesting. In this study financed by the OECD, survey results from 21 different cities including Istanbul, which have rail systems or have rail system projects under operation, are evaluated.

The total income curves (ie. population x income per capita) in the graph indicate that all of the cities having an income of over 15 million USD have subway systems; whereas, most cities having an income of lower than 5 million USD do not have them. This means that even cities with populations over 10 million do not possess rail systems.

The most important reason stated for building a subway system is the improvement of public transportation. This is followed by the requirement for solving or reducing traffic congestion, which should be considered as a false concept, as mentioned above. Another aim is to support land use planning policies. The main reason stated for Istanbul is this latter one.

The reasons of the problems in rail systems are also examined in this study. The main reason is found to be the mistakes made in the planning stage. According to this, no feasibility studies were

conducted for some of the subway systems. Those that were conducted are far from being adequate in both quality and scope. Significant deviations are observed in demand and cost predictions compared to reality.

Timetable and price matching with other systems is usually neglected. Errors can be made in route selection. Some of these errors can be of great extent and unrecoverable.

PLANNING METHODOLOGY

For the developing countries, transportation planning has become a methodological problem, or even further, a modelling problem; and has become equivalent to the modelit self. Reflection of the approach's passive behaviour on the methodology is a natural case.

Thus, it may not be very useful to go into the details of the methodology. Meaningful results can be obtained though, by mentioning certain points.

- The assumption that relationships based on measurements made in a time interval will not change in the prediction period will bring the model into a static state.
- There are many hidden and arbitrary assumptions in its structure.
- With demand production, travel decision is made before the idea of where, how and why to go. This means that it is not affected by the transportation system.
- It is assumed that the mobility of car owners will continue. No justice or fairness is considered in mobility between different social groups.
- There is the possibility of a well-calibrated model giving wrong results for movements between certain zones.
- There is no possibility for considering preferences arising from the inadequacy of the public transport system.
- Effects in the distant future are underrated by the actualisation technique.

For example, the reductions in traffic accidents cannot affect the result because of high actualisation.

Transportation Management and Financing

Since transportation management has many authorities in the developing countries, its ability of coordination is either quite low or there is no such ability at all. Thus:

- Even though plans are made, they cannot be applied with stability and without compensation. The planners try to operate the model without taking this structure into consideration.
- The investments do not always satisfy the primary needs. They sometimes cause big amounts of money to be wasted.
- The present potential cannot be utilised effectively.
- The issue of financing is neglected in the planning stage because management is chaotic from planning to investment, operation and supervising. The planned investments lose the chance of being realised. The plan cannot become an important document from the beginning. Actually financing is primary issue for the developing countries. Isolating it from the management's effectiveness cannot solve this issue.

PARTICIPATION ISSUE IN TRANSPORTATION PLANNING

Transportation is integrated with urban life as an action paving the way to reach economical, social and cultural resources. It is difficult to formulise all the needs, demands and trends that are to be satisfied by the transportation system. Thus, transportation planning is, first of all, a political issue. It is important to define the often-conflicting benefits of different groups in realising this issue.

With the help of this explanation, planning of transport systems cannot be regarded as processes other than a decision-making process that develops through the interactive influences of different sides and their exchange of ideas. These sides consist of individuals and benefit groups, planners, and decision-makers.

Evaluation of transport planning through only the engineering approach by neglecting its economical, social and cultural dimensions is no longer valid. Any impact of modern planning

and decision-making strategies and alternatives, on benefit groups may be evaluated by having them participate in the planning process.

Application Problem

Some difficulties may occur in the application of plans in developing countries as a result of inadequate financing and the existence of many authorities in the institutional structure.

The necessity of receiving credits for financing may cause the creditors to have the initiative on many subjects. They can be effective in different stages, from the selection of the project firms to the preferences on technical issues.

The most important problem in the application process is the institutional structure and the existence of more than one authority in this structure. The ins and outs of the application process are not thoroughly considered; the institutional framework and legislative arrangements are not evaluated satisfactorily. Foreign institutions are usually unaware of these issues. The primary requirement for the institutional framework is its reconstruction having one authority capable of coordination.

5

The Economic Value of Natural Resources

Land coverage in Wisconsin, is abundant in natural resources. Forestland and agriculture together comprise almost 70% of the land coverage. Another 29% of land is comprised of open water, wetland, forested wetland, shrubland, and grassland, with only 2% as urban land (WI DNR, Land Legacy Report). This variety of rural land contributes considerably to Wisconsinis economy. Wisconsins agricultural receipts ranked ninth in the nation in 1997 and its paper production and forest industry value of shipments ranked 1st in the nation in 1996. Wisconsin's natural resources not only provide many rural communities with a stable economic base, they also bring in a variety of related industries and businesses, generating more wages and jobs. In 1997, 17.4% of employment was comprised of farm and farm-related jobs and a 1994 analysis also showed that forest products and forest-based recreation accounted for 18% of Wisconsin jobs (USDA; WI DNR Forest Resources). The value of local natural resources to local economies is critical especially in rural areas of Wisconsin.

ECONOMY AND NATURAL RESOURCES

Exploitable mineral deposits (lead, zinc, copper, silver, gold) are sparsely dispersed throughout the entire system. The principal mining centres are Leadville and Cripple Creek, Colo.; the Butte-Anaconda district of Montana; Coeur d'Alene, Idaho; and the Kootenay Trail region of British Columbia. In the 1970s oil shale

found in the Rocky Mt. area led to an oil industry that spurred city and state growth, especially in Colorado; by the mid-1980s, the industry was already in decline.

Vast forests, largely under government control and supervision, are a major natural resource. Lumbering and other forestry activities are limited mainly to Montana, Idaho, and British Columbia, where commercially valuable stands are most abundant and accessible.

The Rockies are a year-round recreational attraction, and the surrounding states have seen a boom in vacation-housing construction and, thus, population increases since the late 1970s. The U.S. national parks in the system include Rocky Mountain, Yellowstone, Grand Teton, and Glacier. Rocky Mountain National Park. (265,723 acres/107,580 hectares) is in central Colorado. Straddling the Continental Divide in the Front Range of the Southern Rockies, the park features more than 100 peaks towering over 11,000 ft (3,353 m). The highest is Longs Peak (14,255 ft/4,345 m). The park, which was authorized in 1915, also contains many lakes and waterfalls. In Canada are Jasper, Banff, Yoho, Glacier, Kootenay, Mount Revelstoke, and Waterton Lakes national parks.

How can we provide future generations with environmentally rich yet socially and economically sound communities? If you are concerned about such a question, this article series will attempt to answer your question. The first article of this two-part series discusses the integration of the local economy and natural resources in the planning process from the perspective of planning for economic development. This piece highlights the value of addressing two key elements of a comprehensive plan-economic development and natural resources-simultaneously during the comprehensive planning process. It also discusses economic development in rural communities and local economic base data and natural resource inventories that are needed to strategize for rural economic development.

The second article, which will be published in the next Tracker, continues the dialogue from the perspective of planning for natural resources. It will discuss natural resource inventories followed by strategies that can also benefit both the local economy and natural resources. The piece will wrap up with suggestions on how to tackle consistency between elements during the planning process.

Planning for Economic Development

Many rural Wisconsin communities are facing challenges regarding the use of natural resources and the long-term health of their local economy. Controversies surrounding the environmental cost and economic benefit of Crandon/Mole Lake Mine in Forest County and the extraction of spring water in Adams County for bottling are two examples. In these examples and others, economic development and natural resources are juxtaposed and are placed at odds with each other.

Sustaining both the local economy and local natural resources requires a new way of thinking. Frequent dialogues among different levels of government (local, regional, state, and federal) and among different stakeholders of a community (businesses, local governments, environmental organizations, and local residents) are essential. Such interactions can lead to potential cooperation and collaboration at the local level, which is the key ingredient to addressing controversial issues. Even if cooperation or collaboration among stakeholders does not occur, at least issues have been opened up and discussed, and stakeholders have become aware of the contentious nature of the issues. It is a first step to finding common ground.

Local Economy with Natural Resources

Many economic activities such as agriculture, forestry, fishing, or mining, are directly dependent on extracting natural resources from a particular place. The extracted raw materials can be consumed directly or processed into durable goods (e.g., furniture or metal products) or non-durable manufactured goods (e.g., canned food or paper). These products need to be packaged, transported, and marketed. In rural communities that employ a significant number of people in the extraction or processing of natural resources, community transportation, retail businesses, and other services are highly dependent on these firms and thus the natural resources that these firms rely.

Tourism is also an important income generator for rural communities rich in natural resources. Communities with a robust tourism industry are not dependent on natural resource extraction per se. But rivers, mountains, forests, and the aesthetics of state/

national parks, are "being consumed" by tourists through recreational activities such as canoeing, skiing, hiking, camping, and snowmobiling. In these communities, transportation, retail businesses, and other services also rely upon the condition of the natural environment.

The Northwoods region for example, benefits greatly from its natural resource-based tourism. In the year 2001, tourist spending in this region generated an estimated $776 million in wages, which was approximately 16% of the total wages in the Northwoods, the highest percentage among the eight regions within Wisconsin. Tourist spending also supported 41,582 full-time equivalent jobs, which comprised about 21% of the total full-time and part-time jobs in this region (Wisconsin Department of Tourism; Bureau of Economic Analysis). Directly or indirectly, many rural communities in the Northwoods rely on tourism, and thus, the natural resources of the area.

THE POLITICAL ECONOMY OF NATURAL RESOURCES

This two-day workshop brought together natural resources and environment experts from academia, think tanks, non-governmental organizations (NGOs), and the private sector. Participants included economists, engineers, scientists, and forest, water, and mining experts from Bahrain, Bangladesh, Cambodia, Egypt, India, Indonesia, Jordan, Pakistan, Singapore, Thailand, and the United Arab Emirates (UAE). The discussion addressed issues as varied as the development-environment dilemma, best national practices, and obstacles and means of cooperation.

Current patterns of natural resources exploitation are contributing to human insecurity, political instability, and social conflict.

The arbitrary exploitation of natural resources and displacement of local communities by governments and the private sector is causing livelihood insecurity and poverty, and in some cases violent reactions from the marginalized communities. Such misuse has also led to transboundary problems, including environmental degradation, pollution, food and energy crises, floods, and spread of diseases. As natural resources, such as forests and water, become increasingly scarce, many countries are suffering

from a supply-demand disequilibrium. Pressures contributing to this shortage include globalization, unsustainable consumption and exploitative production patterns, population growth, and climate change. The scarcity is also compounded by state and business mismanagement, which has led to an uneven distribution of the resources.

Although community-based management is seen as an ideal solution, it faces a number of challenges including inadequate capacity and the lack of communication amongst the stakeholders. Furthermore, there are major legal issues: the lack of law enforcement; conflict over ownership; and compensation for the displacement of indigenous communities.

Some of the concerns are sector-specific. For instance, forest management is complicated by the lack of a consistent definition of what constitutes a forest, as well as overlapping layers of laws, jurisdictions and responsibilities for enforcement. In the water sector, transboundary issues such as pollution, flooding, and allocation are most prominent because rivers and water tables are not contained neatly within political boundaries. And in the highly profitable mining sector, efforts to eliminate illegal small-scale mining and properly regulate large international companies have been largely unsuccessful.

In spite of the various obstacles, there are numerous potential solutions for better managing natural resources and mitigating existing problems. They include strengthening regional and global cooperation, learning from best practices, promoting integrative policies, applying science and technology, and changing people's mindsets and behaviour.

DEVELOPING YOUR LOCAL RURAL ECONOMY

Economic development in the U.S. has mainly been concerned with achieving economic growth. Economic growth is not equivalent to economic development. Growth is a simple quantitative increase number of jobs, size of tax base-and concerned with near term expansion of the local economy. Often, communities that aim for growth direct resources to a few growing industries in order to generate wealth quickly in the short term. Development on the other hand, is qualitative, involving structural change—it

generates new technical, organizational, behavioural or legal structures that facilitate growth—in the long term. Communities aiming for development focus on economic progress that emphasizes qualitative improvement and capacity building.

Rural communities often have common characteristics such as relative geographic isolation, small populations, limited markets, and few skilled workers. Conventional economic development that typically focuses on business attraction and retention of large firms, usually bypass rural communities. There are some rural communities in Wisconsin with large firms, but such a strategy may not be feasible for every rural community. Rather, rural communities need to focus on a different economic development strategy.

The focus needs to turn to quality, knowledge, and networking. Creating quality jobs that provide (i) a stable, family supporting-wage, (ii) improve quality of life by providing better community services and protect the natural environment, (iii) establish business networks to help small businesses broaden their resources and expand their market, and (iv) continuous education of the local work force to keep them up-to-date with new technologies and skills, are probable antidotes for poor rural economic health.

This new concept should be kept in mind throughout the planning process. However, before jumping to strategy selection, communities need to first analyse their economic base and identify essential physical resources in order to have a broad understanding of the communities local capacity and potentials.

Identifying your Economic Base

The Economic Development Element requires communities to inventory their current socioeconomic situation, and to address relevant issues and concerns. Part of this process is identifying and analysing a community economic base. The economic base may include the following:

- ***Demographic:*** population & household forecast, demographic trends, age distribution.
- ***Employment:*** employment forecast, income levels, and employment characteristics.

- Industry: types of industry present, number of firms, top firms in a community, population/employment ratio by industrial sector and entire community.

Examining the physical features of your community that relate to the economic base is another critical step. Physical features include agriculture, mining, timber, tourism assets, industrial land availability, and transportation and telecommunication links. If your community relies on its natural resources base for the health of the local economy, an updated natural resources inventory is needed. Examples of an inventory relevant to communities pursuing agriculture, resource extraction, tourism, and industrial development, include:

- Natural resources inventories:
  - ***Agriculture-***Farm numbers and types, soils, topography, ground & surface water, environmentally sensitive area;
  - ***Mineral resources-***types, quantity, and quality of non-metallic and metallic resources;
  - ***Forest resources-***types, quantity, and quality of private and public (county, state, and federal) forestlands;
  - ***Recreational/tourism-***types, quantity, and quality of parks, recreational areas, and navigable waters.
- Land use inventories:
  - ***Industrial land availability-***size and quantity of available industrial zones and re-developable brown fields;
- Other supporting infrastructure inventories;
- Transportation corridors;
- Capacity and service area of telecommunication facilities.

These inventories indicate the potentials and limits of a community, so that a community can set realistic economic development goals with policies and programs that do not conflict with natural resource conservation.

This article has stressed the relevance of examining local economic development and natural resources simultaneously during the comprehensive planning process and has encouraged

rural communities to think outside the conventional economic development approach. To identify alternative economic development strategies that fit the need and capacity of a community, citizens and planners need to understand their community economic base by inventorying their natural resources. The forthcoming article will discuss the integration of the local economy and natural resources in the planning process from the perspective of planning for natural resources. The piece will continue the discussion of natural resource inventories followed by natural resource strategies that would also benefit the local economy. Finally, it will conclude by sharing some ideas on how to tackle consistency between plan elements.

NATURAL RESOURCES

Today's economy is based on an abundant supply of low-cost energy. Nearly 90% of this energy is derived from the fossil fuels: oil, natural gas and coal. Smaller amounts come from uranium and hydroelectric power. Aware of our dependence on energy, we use geological knowledge to search for new sources of these traditional fuels, and at the same time, we seek to develop new sources of energy. In all of these efforts, we must remain aware of the earth's limitations, and try to maintain a delicate balance between our need for energy and our desire to protect the environment.

Mining

About 70% of the coal mined in the U.S. comes from Open Pit or Surface mines. If a coal seam is relatively close to the surface, it can be mined by removing the soil or rock above until the coal is exposed. The coal can then be removed using enormous power shovels. This type of mining is efficient since it can employ large pieces of equipment which are operated by relatively few miners. Open pit mines are also reasonably safe since they are not likely to collapse or explode, and they do not subject the miners to polluted air. On the other hand, mines like this are much more likely to damage the local environment due to erosion and the production of acid mine drainage.

About one third of the coal mined in the U.S. comes from under ground or tunnel mines. When seams of coal are deep

below the surface, it is necessary to dig a vertical shaft down to the coal deposit and then mine it by digging horizontal tunnels called adits out away from the shaft. This type of mining is less likely to damage the local environment, but it is more costly. The need to use smaller equipment and a larger staff of miners means that underground mines are more expensive to operate. These mines are also likely to be more dangerous for the miners since they can collapse and they can trap explosive gasses and dangerously dirty air.

Petroleum

Petroleum supplies about 40% of the energy used in the U.S. Petroleum forms from the preserved remains of plants, bacteria, algae, and other microorganisms that lived in the ocean and were buried in ocean-bottom sediments. For preservation to be successful, these organic remains must be isolated from scavengers by rapid burial, or by deposition in water with a low supply of oxygen. Since marine life is abundant in the shallow waters of continental shelves, and since there is a great deal of sand and clay being deposited in these areas, it is likely that most petroleum formed along continental margins.

Once collected, the organic debris is slowly converted to petroleum as temperatures and pressures rise. These conditions convert the organic material into hydrocarbons. When hydrocarbons form, their low density causes them to rise and they move into adjacent permeable rock where they can collect in oil traps. Petroleum is removed from oil traps by drilling.

Hydrocarbons

Hydrocarbons are chains of carbon atoms with hydrogen atoms bonded along the outside and at the ends. The simplest hydrocarbon is CH_4 (Methane). This is the primary component in natural gas. As the chains of carbon atoms get longer, they form liquids such as octane (a chain of eight carbon atoms), and eventually thicker materials, such as tar and asphalt.

Oil Traps

Hydrocarbons collect in reservoirs when their upward migration is halted by an impermeable barrier. Barriers can be

faults which cut across the layer which contains petroleum, or places where the layers have been deformed into an arch or dome, which traps petroleum at its highest point.

Drilling

The primary job of the petroleum geologist is to locate potential oil traps and plan a way to drill into the trap and determine its contents.

If the trap contains a sufficient quantity of oil, the area is developed into an oil field by drilling several more wells into and around the trap. Some wells allow the petroleum to flow to the surface, others are used to pump water in below the oil and float it to the surface and force it up through the production wells. A properly planned oil field can eventually recover about 50% of the oil in the trap. If the drillers are careful, very little oil is spilled on the ground or allowed to escape into the local water supply.

Natural Gas

Natural gas forms under the same conditions as petroleum, and is the most abundant type of hydrocarbon. The lighter and more fluid gas can move upward easily, until it is caught in a trap or it escapes at the surface. Natural gas is recovered from the ground by drilling.

Coal

Coal supplies about 20% the energy used in the U.S. The fact that plant fossils are found in seams of coal is a clear indication that coal forms from the preservation and alteration of plant material. Swamps appear to be the ideal location for the origin of coal because they produce luxuriant plant growth and provide a shallow-water environment in which organic material can be preserved. Shallow water that is warm and stagnant contains very little oxygen, so the leaves and stems that fall into it are sealed off from scavengers and thus preserved. These materials are first converted into peat, a low-grade fuel that contains about 50 percent carbon. If the peat remains buried and is subjected to elevated temperatures and pressures, some of its volatile components are driven off. Since carbon is not lost in this process, its relative percentage is increased and the material becomes more compact.

The process proceeds to lignite with about 70 percent carbon, subbituminous and bituminous (soft) coal with about 80 percent carbon, and finally anthracite (hard) coal with over 90 percent carbon. Since coal represents the accumulation of material on the floor of ancient swamps, the coal tends to form in layers known as seams. Seams can range in thickness from a few inches to many feet. Usually only seams that are several feet thick are mined.

Alternative Fossil Fuels

As the conventional sources of petroleum are depleted, one choice is to turn to materials similar to petroleum known as syncrude, or synfuel. Various types of syncrude can be obtained by processing oil shales and tar sand. Oil shales are fine-grained sedimentary rocks containing organic material that can be released as an oil-like substance if the rock is heated. Tar sand, as the name suggests, is sand containing a tarry material which can also release oil when heated. The world's resources of oil shale and tar sand are significantly greater than the reserves of crude oil, and nearly half of these resources are in the United States. Another approach coal gasification, the conversion of coal into a flammable gas. Older processes used coal to produce water gas or blue gas which was composed primarily of hydrogen and carbon monoxide. More modern processes convert coal into methane. Though promising, all of these fuels present some problems. Currently they are more expensive to produce than oil or coal, and oil shale and tar sand pose a greater threat to the environment since they must be mined and processed with water, and the shale and sand must be disposed of after the oil has been removed.

Fossil Fuel Reserves

Reserves are deposits of a resource which have been located and are know to be minable. Together the United Sates, China and the former Soviet Union hold about 85 percent of the world's coal reserves. The United States, with about 15 percent of the world's coal, could supply its own needs for nearly 400 years at the current rate of use. If it becomes necessary, coal can be made into a liquid form known as syncrude, which could extend our supplies of petroleum. The United States produces about 11 % of the world's oil, but uses about 26%. If we were to depend solely on

our own oil resources, our supply would be depleted in about 20 years. Worldwide, reserves of petroleum are probably sufficient to meet the current demand for about 100 years. Technology may provide a partial solution to the problem. Current methods of oil production leave about half of the oil in the ground. Procedures designed to enhance the recovery of oil use steam, hot water, or carbon dioxide to mobilize deposits that were previously inaccessible. However large the world's reserves might be, they represent a set amount which will eventually become depleted if use continues. Eventually it will be necessary to find alternatives to fossil fuels.

Alternatives to Fossil Fuels

As mentioned earlier, the world's current use of crude oil and natural gas is expected to deplete the supplies within the next 100 years. Extensive development of oil shale and tar sand will extend our supply of petroleum, but it will not solve the problem. Increasing our dependence on coal might add another century to our supply of fossil fuel, but the carbon dioxide produced by burning any sort of fuel may turn out to be a more significant limit. Many people believe that the only solution lies in conservation of fossil fuels and the development of alternative sources of energy.

Nuclear Waste

The process of nuclear fission creates a number of highly radioactive elements which are not themselves useful for additional fission, but which obstruct the fission of uranium. As a result, nuclear fuel eventually becomes "polluted" with these wastes and must be replaced. When nuclear power was first envisioned, planners expected to remove the polluted fuel, clean out the contaminants, replenish the used fuel, and replace the fuel containers in reactors. This operation is known as "Reprocessing". Reprocessing is used in several countries outside of the U.S., but it is considered too risky to be employed here. As a result, used nuclear fuel containers must simply be stored.

The highly radioactive "wastes" they contain cannot be neutralized and therefore they must be permanently sealed off from the environment. At present, most such containers are stored

in “Spent Fuel Pools” (large shielded tanks of water) at the sites where the fuel was used. Eventually these wastes will need to be reprocessed in some way, or sealed away for thousands of years until they decay to safe levels. The U.S. government has not yet decided how to handle this waste. A likely possibility is that it will be mixed with molten glass, placed in durable containers, and eventually buried in mines. One such mine is being constructed and tested at Yucca Mountain in Nevada.

Nuclear Fusion

Nuclear fusion is the opposite of fission. In this process, the nuclei of smaller atoms are forced together to form larger atoms. The simplest way to look at this is the joining together of four hydrogen atoms, each of which has one proton in its nucleus, to form a helium atom which has a nucleus with two protons and two neutrons.

When these atoms are joined, the product weighs slightly less than the components. The small amount of mass which is lost, is converted into a vast amount of energy. In a bomb, this energy is the weapon’s “blast”. The problem is to harness this energy so that it can be released in a slower and more controllable manner. As yet, this problem has not been solved. An additional problem is the fact that a great amount of heat and pressure is required to initiate a fusion reaction. This is why the now discredited idea of “Cold Fusion” (fusion at low temperatures and pressures) appeared to be so attractive several years ago.

Geothermal Energy

We know that the earth is hotter on the inside than on the outside. Most of this heat is produced by the decay of radioactive materials, and it provides the energy to build mountains, create volcanoes and produce earthquakes. We can gain access to this heat when water passes though heated rock and rises toward the surface.

The most abundant geothermal energy is supplied by “low-temperature” water between 80°C and 180°C. This water can be used to heat homes and industrial facilities. Geothermal sources that can be used to generate electricity must be hotter than this,

and they generally occur as natural sources of steam in recent volcanic areas. The world's largest natural supply of steam is The Geysers, north of San Francisco, where steam is harnessed to supply about half of the city's electric power. Ironically, a source of power that appears to be clean and safe can pose an environmental threat. The ascending water or steam can pick up a heavy load of salts and toxic materials from the surrounding rocks, and thus create a distinct disposal problem. In addition, the local terrain may begin to subside if a great deal of water or steam is extracted and not replaced. Technically, the earth's supply of heat is inexhaustible. In reality, the heat that is easily accessible is in hot bodies of rock close to the surface. When these have been cooled, it will be necessary to drill deeper and use more expensive equipment to find new sources.

Solar Energy

The sun can supply all of the energy we need. Solar energy is clean and nondepletable, but it will require some new technology before we can use solar energy efficiently and inexpensively on a large scale. Presently our use of solar energy can be divided into two primary categories. One category includes Passive Methods, such as the design of buildings, and the other category is composed of Active Methods, such as solar collectors and batteries.

Passive Methods

Passive use of solar energy involves designing buildings so that they collect and store heat when it is needed, and avoid heat when that is appropriate. This can be achieved through the placement of windows and the selection of building materials. For example, windows might be arranged such that winter sunlight enters and warms walls and floors made of concrete and brick. The heat stored in the masonry material is then radiated to keep the room warm after sunset. The same windows might be protected by overhangs which block sunlight during the summer when the sun is higher in the sky. A well designed passive system can supply nearly all of the energy needed to heat a house. A solar heated house in Canada built by the University of Saskatchewan has an annual fuel bill of $40 which can be compared to $1400 for the average home in that area.

Active Methods

Humans have designed a great variety of mechanisms to harness solar energy, which range from ancient windmills to sophisticated solar batteries. These are vastly different ways to collect and use solar energy. The battery is a mechanism which uses solar energy directly. The energy from the sun is used as it arrives. The windmill also uses solar energy, but it does so indirectly. The sun's energy is stored or transformed in some way before it is used.

Alternative Sources of Energy

Calculations indicate that the world's current use of crude oil and natural gas is expected to deplete the supplies within the next 100 years. Extensive development of oil shale and tar sand will extend our supply of petroleum, but it will not solve the problem. Increasing our dependence on coal might add another century to our supply of fossil fuel, but the carbon dioxide produced by burning any sort of fuel may turn out to be a more significant limit. Many people believe that the only solution lies in conservation of fossil fuels and the development of alternative sources of energy.

Nuclear Energy

When most people mention Nuclear Power, they are referring to power from Nuclear Fission. This is the type of nuclear power used to generate electric power and operate navy ships. This is the same process which fuelled the atomic bombs used during World War II. This type of energy is obtained from the break-down, or Fission, of atomic nuclei. Another way to obtain energy from atoms is Nuclear Fusion. This process is based on the build-up, or Fusion, of atomic nuclei and is the system which creates energy in the sun, and which fuels the hydrogen bomb.

Nuclear Fission

The nuclear energy first released by the atomic bomb, and later applied to more peaceful purposes, is based on nuclear fission, or the splitting of atomic nuclei. Uranium 235 is one of several fissionable elements—elements whose nuclei can be induced to split, forming two new elements. As the atoms split,

a great deal of energy is released. This energy can be used to create steam for electric generating stations or to power naval vessels. The fission of one gram of uranium 235 liberates as much energy as 3 million grams of coal. In the United States 113 nuclear reactors provide about 20 percent of our electric power. Worldwide, more than 400 nuclear reactors produce electric power in 25 countries.

Nuclear Fuel

Uranium is a rare element (only.00016 percent of the earth's crust), and the problem is compounded by the fact that less than 1 percent of all uranium is fissionable. Uranium is extracted from uraninite (called pitchblende), which is a uranium oxide deposited in igneous and sedimentary rocks. Some of the richest deposits are found on the Colorado Plateau, and in adjacent parts of Utah, Arizona and New Mexico. Canada, Australia, South Africa and Brazil also have significant deposits. It is possible that the uranium from demilitarized weapons will also become an important commercial source. At one time nuclear power was considered a cheap and clean alternative to fossil fuels, but the cost of building and operating safe reactors, and the difficulty of finding sufficient fuel have become significant problems. An additional problem is the fact that we have not yet found a safe and acceptable way to dispose of nuclear waste.

Direct Sources

Most solar collectors are insulated boxes mounted on the roofs of buildings. Sun light enters the boxes through layers of glass and heats the interior. The heat is then carried out of the collector by moving air through the box or pumping water through a series of pipes inside it. The heat is usually stored in the building below as hot water until it is needed as domestic hot water, or as a source of heat for the building. In Israel and some surrounding countries, nearly half of the domestic hot water is produced by such systems. Solar batteries, or photovoltaic cells, contain silicon or other materials which emit electrons when struck by light. A flow of these electrons becomes an electric current. Presently these cells are expensive and not very efficient, so electricity produced in this way is three or four times more expensive than

electricity from a coal-fired generating plant. Even so, photovoltaic cells are an important source of electric power in remote areas and for navigation buoys and traffic signs, which cannot be easily connected to an existing source of electric power. As research improves efficiency and increased production brings down the cost, photovoltaic cells will become more acceptable as clean and dependable sources of electric power.

Minerals

Mineral resources are the materials derived from the Earth's surface which can either be single mineral products or rock products. Minerals, by definition, are naturally occurring, inorganic crystalline solids with a set chemical composition. Examples of economically desirable minerals would be gold or silver, bauxite (aluminum source), feldspar, quartz, and diamond to name just a few. Rocks are mixtures of different minerals. Economically important examples of these include sands and gravels, crushed stone, dimension and facing stone. Fossil fuels are not included here because of their organic origin, and because our intense dependence on them means they deserve special consideration on their own. Mineral resources form the foundation of our industrial society and an understanding of their origin, uses, mining processes and availability is essential to making informed decisions about them.

Ores

An ore is a body of rock containing a valuable mineral which is sufficiently concentrated to be mined at a profit. The higher the concentration of a mineral in the ore, the less expensive it is to remove. If the market value of a mineral is high, companies can afford to go to greater trouble to extract the material, as it is then worth the labour and cost to mine rock with a lower concentration of the mineral. If prices drop, they cannot afford the extra cost involved in extracting the material. Another factor that affects whether or not the mineral will be mined is the technology available to extract it. As mining technology advances, some previously unavailable ores become minable. Gold, for example, can now be chemically leached out of rocks that would not have been considered ores in the past.

Uses

These mineral and rock products are used for a huge variety of purposes. If the things we use are not grown as a crop, they must be mined in some fashion from the Earth's surface. Iron, aluminum and copper are used in large quantities for packaging, transportation, construction, and metal fabrication. Nonmetal resources include salt, clays used in paint, rubber and paper coating, quartz used in fiberglass and optical glass, and phosphate used in fertilizers. Sand, gravel, and quarried stones are used in road and building construction.

Formation in Rocks

Mineral deposits occur in a variety of geologic settings. Many form in association with the igneous rocks which arise from cooling magma. As magma begins to cool in a magma chamber (the space below the Earth's surface filled with magma), some crystals solidify before others. If the crystals have a high density (like metals), they will settle to the bottom of the chamber. Over time this can produce a great accumulation of material. Chromite and magnetite often occurs this way. Magmas with different compositions, produce different minerals when they cool. Feldspars, used in ceramics, form this way as do tourmaline and beryl. Metamorphic processes (which involve applying heat and pressure to a rock without melting it) produce useful minerals such as graphite and asbestos.

Both igneous and metamorphic processes are involved in the formation of important hydrothermal ore deposits. Hot fluids can dissolve, transport, and redeposit metals. The Mid-Ocean Ridges are a location where this process can be seen occurring today. At these spreading centers, hot rocks are moving upward toward the Earth's surface. Ocean water circulates through these hot rocks, dissolving minerals as it is heated, and redepositing them as it cools. Many metal deposits are formed this way. The importance of heat in the formation of these deposits helps geologists narrow down the areas in which to search for them. Heat is generated at plate boundaries, and using knowledge about the current and ancient location of plate boundaries, they can concentrate their efforts on areas with the highest probability of containing the

desired mineral resources. Some deposits are formed, or concentrated, by sedimentary processes which occur at much lower temperatures than the igneous or metamorphic processes. Salt (known by the mineral name halite) and gypsum form from the evaporation of briny water. Major iron ore deposits, known as banded iron formations, are believed to have formed from precipitation on the ocean floor. Earth's primitive atmosphere lacked oxygen. As oceanic organisms began producing oxygen, it caused the precipitation of iron, which had been dissolved in the sea water. While many mineral formation processes occur today (albeit at slow rates), this is one type which cannot occur today at any rate. Placer deposits, usually of gold, diamonds and tin oxides, are formed by water, which sorts materials according to their density. Streams flow at different rates in different places. When the stream's rate of flow decreases, it may deposit dense minerals which it no longer has the energy to transport.

Needed Resources

Taking a survey of the materials you use during the day can reveal just how dependent we are on the minerals and rocks mined from the Earth. All the metals we use in plumbing, automobiles, ornaments, photographic film and construction are derived from the Earth. All the rock products used in the construction of roads and buildings are mined. Today, plastics substitute for many objects that were formerly made from metal, and although plastics are not usually included as mined substances, their raw material is petroleum, which is derived from the Earth.

Indirect Sources

Solar energy can be harnessed indirectly in several ways. One way is to use biomass, material of biologic origin, such as wood or agricultural waste, that can be burned or converted to a liquid or gaseous fuel. When compared to coal or natural gas, biomass might be considered "unfossilized fuel". In either event, it is questionable if crops of any sort should be grown as a supply of energy. One problem is the environmental threat from the use of water, fertilizer, and pesticides. Another dilemma is whether it is acceptable to use arable land to supply fuel when the world is having trouble supplying enough food for its growing

population. The production of hydro-electric energy is another indirect application of solar energy. The sun powers evaporation and drives the circulation of the atmosphere, the resulting rain is collected in lakes and runs through turbines to generate electric power. This is clearly a clean, safe and cheap form of energy, but its expansion is limited by the fact that considerable land would be lost to the lakes created by dams, and many scenic areas could be spoiled. A final possibility is wind power, which is also derived from the sun, and is clean and safe. Overall the prospects for solar energy look good in the future. It has the potential to be a safe, clean and economical way to meet the world's increasing demand for energy.

Conservation

Using energy more efficiently is equivalent to finding new sources. The rise in the price of oil in 1973 initiated an effort to conserve that has saved four times more energy than has been developed from all new sources since that time. There is no reason why these conservation efforts cannot continue. The necessary technologies are generally simple, requiring such things as a change from incandescent to fluorescent lighting; the installation of better home insulation; the construction of more efficient appliances; and the design of better automobile engines. In almost all cases the cost of conservation is less than the cost of the energy it will save. For example, the cost of modifying appliances to be more efficient can cost 1 or 2 cents per kilowatt-hour of energy saved, while generation of electric power from coal-fired plants cost about 6 or 7 cents per kilowatt-hour.

6

The Economic Geography of Enterprise and Industry

Is it wise to try to build up structured knowledge about the spatial organization of TNCs through a case study approach? This is a questioned approach too, just like the focus on the multiplant firm. There is the cautioning example of the behavioral approach in economic geography, which ran aground in the nineteen seventies in a mist of interesting case studies, and missed the chance to develop a sound new body of theory based on behavioral assumptions. The geography of enterprise could run aground as well if it should continue a practice of case studies only. Dicken, quoting Michael Taylor as saying "the geography of enterprise requires a theory of enterprise" (Dicken 1990, p. 235), wrote in the 1990 issue of this book: "Perhaps enough 'facts' have been discovered. Perhaps it is time to step back, stressing theoretical coherence and consistency to a higher degree".

The warnings are clear enough but we nevertheless think that a continuation of empirical, casestudy oriented research is necessary to reach a full understanding of the changing activities of TNCs in the changing world production system, and in the end, to reach a sound theoretical view on this system. The case studies clearly illustrate the danger of inferring theoretical assumptions from too generalized, statistical datasets. Such sources cannot, for example, reveal the importance of individuals for changes in corporate policies, as exemplified in the studies for MacMillan Bloedel (with CEO Stephens) and Philips (with CEO Timmer). More generally, contemporary case studies will always be needed to infer

hypotheses for new theorizing, and to avoid theories lingering on the basis of aging case study sources.

Meanwhile, theoretical progress in the geography of enterprise has certainly been made. Theoretical models have been developed more often than not on the basis of case study material! They aptly describe the different organizational form of 'multinational', 'international', 'global' and 'integrated network' organizations, corresponding with varying degrees of personal, administrative and operational control over decentralized establishments. Other new theoretical models of the TNC organization take a marketoriented approach, like the one by Dicken that shows different possibilities of organizing spatially separated production facilities in accordance with different systems of serving international markets.

Next to spatially oriented models which emphasize corporate control and marketing strategies, the geography of enterprise developed an interest in the modeling of how transnational companies constantly restructure their portfolio of activities (including the spatial dimension of that portfolio) in order to strengthen their market position and as a consequence, their profits. Such restructuring implies upgrading and innovation, as can be seen in the Volkswagen case in Spain. Some new trends can be mentioned too, i.e. the various case studies in this book indicate a decline of inhouse R&D, a growth of strategic alliances aiming for innovation, and even the direct purchase of technology (the Philips case for medical activities). But the restructuring theme covers more than the subjects of control, markets, profits and innovation. It also implies attention for the organizational and spatial consequences of mergers and takeovers, the consequences of different ownership models, and the variations between different economic sectors. For instance, what happens to 'local champions' and the regions where these 'champions' used to dominate the economy, when they become subjects of a takeover as in the case of MacMillan Bloedel? How do cooperative structures influence a TNCs development and spatial organization, as in the case of AVEBE? Are the patterns and trends we observe in the world of production mirrored in the world of services, for example, in a real estate investor like ING?

One aspect that tends to be overlooked in the current practice of restructuring analysis and modeling is the influence of restructuring on local embeddedness – a theme that receives growing attention, especially in the institutional approach of firm behavior. Firm startups and fast growing survivors ('gazelles') are known to have a high degree of embeddedness in local social and economic networks; this is even believed to be one of the explanations of their successful performance and their unwillingness to leave their region (Stam 2003). Mature firms may also owe their growth to embeddedness in local networks but the 'punishment' for fast growth, whether it concerns a young or a mature firm, is often a takeover by a larger player, who is interested in the other firm's resources (as in the case of MacMillan Bloedel), its knowledge (witness the Philips strategy) or its market share (GlaxoSmithKline in Poland). As the case studies of the firms in question show, the degree of local embeddedness of the firms that are taken over tends to diminish within the context of the larger, transnational organization.

INDUSTRIAL LOCATION THEORY

Alfred Weber identified the most significant factors which determine industrial location in 1929. It is important to remember the ideas which Von Thunen, Christaller and Losch focused upon in order to understand Weber's focus upon transportation influencing industrial location.

Similarly, please remember that INDUSTRIAL activity is considered a secondary economic activity, and is also discussed as manufacturing. Industrial activity can be broken down further to include the following activities:

* processing
* the creation of intermediate parts
* final assembly

When Alfred Weber writes about industrial location in the 1920's, he is examining large companies whose industrial activities ALL take place within our national borders. This is not true of industrial activity today. With multi-national corporations, the three activities listed above may occur outside of the United States. Prior to 1983, all final assembly had to be completed in the USA

or American corporations who imported finished products back into the USA paid a large duty (which inflated the cost of good to the consumer). Since 1983, beginning with the Maquiladora industries and continuing further with the NAFTA treaty, American corporations now pay little, or no duty at all, on the importation of finished products to the American market. We will discuss the impact of this legislation more deeply in the next lecture as we focus upon the globalization of manufacturing. But, please keep in mind that Weber's theory did not address industrial activity outside the United States.

His theory does have validity in explaining some of the causes for current movement, yet such discussion would not come from Weber himself.

Weber's industrial location theory demonstrates the unique way that geographers look at the world. I often tell my classes that Weber asked the following question; "where is industry located? Why there?" much in the same manner that a physical geographer asks why a mountain is located where it is. Given this focus, Weber found through his examination of industrial activity that similar industries located in the area where he found it the least cost to produce. What this means is that you find industries that produce the same good, clustered in regions that enable them to reduce their costs of manufacturing (materials, labour, transport) and locate the largest market. This strategy would earn them the greatest volume of sales.

Least cost location then implies marketing the product at the least cost to the consumer. Much like retailers, such as Walmart, Target, and Costco, attempt to obtain large market shares today. It is explained economically as one way to make a profit, creating the cheapest product for the consumer market would lead to greater volume of sales and hence, greater profits. Therefore, companies which did not take the time to locate the cheapest inputs or the largest markets, would go out of business since their product would cost more to produce and cost the consumer more at the market.

It is important to understand that Weber's industrial location theory is an example of classical economic theory. As Smith and other classical economists thought, the consumer was

ECONOMICALLY RATIONAL. What this means is that the market economy is based upon the concept that all consumers have total market knowledge (what goods are available and how much they cost to produce). Given such knowledge, EACH TIME you consume (demand) a product, you RATIONALLY select the good that is the cheapest cost of equal quality. This allows the market price to reach an equilibrium between supply and demand. Do you do this EVERY time you purchase something?

Given consumer rationality and corporate wants for profits, Weber found that the most successful businesses had located in regions which allowed the least cost of production to be actualized. Like businesses often followed the lead of pioneering companies, leading to the clustering of similar activities. Weber called this clustering agglomeration. We have previously examined this clustering when discussing suburban sprawl and megalopolis development (such as Boswash). Just remember agglomeration as the clustering of people and industry. Which type of cluster comes first is important when we start attempting to locate cheap labour or we begin to evaluate the impact of corporate movement from one location to another.

Weber's main point was that the cost of transport (another theory on this) determined the location of industry. Therefore, he uses Von Thunen's idea (that the cost of transport determines crop selection) and applies it to industry. Similar to Von Thunen, the weight of the raw materials and the weight of the end product (this difference is known as the material index) will determine the site of production depending upon how much the industry is willing to pay to get its product to the market (connecting to Christaller's ideas of market area).

Weber's theory rest primarily on four such sites, what he calls industrial orientations.

* Material orientation
* Labour orientation
* Transport orientation
* Market orientation

Material Oriented Industries-These industries are called "weight-losing" or bulk industries, and it would be very expensive

to haul raw materials to the market for processing, so that manufacturing occurs near the raw materials. Besides mining, other primary activities (or extractive industries) are considered material oriented; timber mills, furniture manufacture, most agricultural activities. The Pacific Northwest is a good example of material oriented industries. Often located in rural areas, these businesses may employ most of the population. As they leave (such as Weyerhauser, Pacific Timber...) entire cities lose their economic base.

Labour Oriented Industries-these are industries, such as the garment industry in New York or San Francisco which require cheap unskilled labour to complete activities that have not been mechanized, or high tech firms, such as those located in Silicon Valley, which require exceptionally skilled professionals. Either type of industry is finds that labour (quality or cost) is the primary determinant in production.

Unskilled Labour-is often termed "ubiquitous" by geographers. What this means is that unskilled labour is found everywhere. If your factory is dependent upon unskilled labour, when you build the factory, they will come (similar to the movie "field of Dreams"). These types of industries may be retail (malls, theaters), communications (such as MCI), and even in high tech industry, most circuit board manufacture requires unskilled labour. If you are the businessman evaluating potential locations in this type of industry, you will be trying to find the areas which provide:

* low wages
* little unionization
* young employees (few healthcare costs)
* female employees (they have babies which allows you to keep wages low, and they tend not to be as demanding)

Pages 354 and 355 give some specific examples of this comparing hourly labour costs in many countries, and demonstrating true labour costs choices which may determine business location.

Skilled Labour-industries founded on the use of skilled labour faced an opposite dilemma, skilled labour is very scarce and often difficult to find. Silicon Valley is a good example of this. In 1992,

the Chronicle published an article which listed the percentage of residents throughout cities in the South Bay who possessed a bachelor's degree. I recall that 70% of Mountain View residents had BA's and 88% of Los Altos residents possessed a BA. Compared to the national average of 12.5%, these numbers demonstrate the pull for industries using skilled labour to the Bay Area. Other activities which reflect skilled labour industries are corporate headquarters, and research and development centres. Skilled labour requires higher education so this allows first world countries to retain jobs in these industries.

Transport Oriented Industries-these are industries whose primary production cost is transport. Geographers term the location for where these industries locate as "break-in-bulk" locations. This term is used to describe a location where two or more modes of transportation may connect.

San Francisco is a great example of this, having port, rail, air, and highway linkages. Such diversity allows the business to use the cheapest transport available. Current examples of such industrial agglomeration is illustrated on the inset map 2.8, which portrays the clustering of businesses along Interstate 65 and 75. A similar pattern exists in Tracy where food distributors have built large warehouses (cheap land) for Northern California distribution. Tracy provides rail access and highway linkages to most market, so that relatively little trucking (2-3 hours) is required.

Market Oriented Industries-these are industries whose product may be weight-gaining, breakable or perishable. Despite the high costs of land and labour in market regions (large cities), it is to the advantage of such industries to locate as close to the consumer as possible. Such industries are Coca-cola or bottling industries, auto assembly plants, such as NUMI, dairies, such as Berkeley Farms in Sonoma (close to urban market due to perishability), and computers and television assembly (due to break-ability).

Overall, Weber's theory is amazing because he was able to demonstrate how major production costs (labour, materials, transport) determined industrial location. He clearly articulated the major factors which businessmen used to identify prime locations. These factors are still the dominant factors which explain industrial location today.

Weber's theory also allows us to ask questions concerning how industry could be relocated. Could one stimulate economic development in a depressed region by investing in transportation? or education? What is the role of the market in generating economic development?

INDUSTRIAL DEVELOPMENT AND PROGRESS

India has made considerable economic progress since its Independence. Most noticeable are the expansion and diversification of production both in industry and agriculture. New technologies were introduced in many industries. Industrial investment took place in a large variety of new industries. Modern management techniques were introduced. An entirely new class of entrepreneurs have come up with the support system from the Government, and a large number of new industrial centres have developed in almost all parts of the country.

Over the years, the Government has built the infrastructure required by the industry and made massive investments to provide the much-needed facilities of power, communications, roads etc. A good number of institutions were promoted to help entrepreneurship development, provide finance for industry and to facilitate development of a variety of skills required by the industry as well as agriculture. The Government also followed a policy of encouraging indigenous industries and provide them all facilities and encouragement.

As a result, we have now a widely diversified base of industry and an increased domestic production of a wide range of goods and services. The index of industrial production has gone up from 7.9 in 1950-51 to 154.7 in 1999-2000. Electricity generation went up from 5.1 billion Kwh to 480.7 billion Kwh in the same period. Particularly significant achievement has taken place in the field of agriculture. Between 1950-2000, the index of agricultural production increased more than four-fold. Between 1960 and 2000, wheat production went up from 11 to 75 million tonnes, and the production of rice increased from 35 to 89.5 million tonnes. We are now having a problem of plenty, with Government godowns overflowing with wheat stocks. This is not a mean achievement for a country that relied on imported food aid until the early 1960s.

The credit for this green revolution goes to Indian scientists as well as to millions of Indian farmers, who wholeheartedly cooperated with the Government, to make India self-sufficient in the matter of its food requirements. This economic expansion contributed to a steady and impressive growth in India's GNP. With the exception of 4 years, India experienced a positive rate of growth. As a result, India's per capita Net National Product (NNP) in 1999-2000 was 2.75 times higher than that of 1951.

The rate of growth before 1980 was 1.2% per capita. Thereafter, it grew at the rate of 2.4%, and between 1950-90, by 3.2% on average every year. Between 1993- 94 and 1999-2000, it registered an average rate of growth of 4.8% per year. A variety of promotional policies were followed by the Government to achieve this success. In the early years, Indian industry thrived within protective tariff walls.

The policy was to encourage Indian industries and though foreign technical collaborations were encouraged, direct foreign investment in any corporate body was restricted to 40%. In 1991, this policy was changed completely and foreign majority investment was encouraged in a variety of industries, import restrictions were removed, customs tariff was brought down and the doors of the Indian economy were opened for foreign competition. We will briefly trace the developments that took place in the field of industrial economic policy of India during these years. The year 1991 will now be regarded as a landmark in the economic history of India. Therefore, a more detailed review of the economic policies after 1991.

INDUSTRIAL POLICY AND INCENTIVES SINCE 1947

After India became independent in 1947, the country embarked upon an ambitious plan of industrial development and encouraged the setting up of new industries and the expansion of existing industries. We may briefly recapitulate some of the steps that were taken to achieve these objectives.

India is probably one of the few countries in the world which used its import policy for the healthy development of local industries. Barring the first few years after Independence, the country was facing a shortage of foreign exchange, and because

of this shortage, imports had to be restricted. Imports of consumer goods were, therefore, disallowed. A good number of restrictions were put on the import of industrial goods, and the effort of the Government was to encourage the production of these goods indigenously.

Local industries were encouraged to have foreign collaborations and to import the technical know-how needed to produce what was being imported into the country. Levying higher tariffs restricted imports, and there was also a total or partial physical ban on the imports of such products. This gave a muchneeded sheltered market for Indian goods, and many industries thrived within these protective walls. Initially, products produced by Indian industries were not of good quality.

But as years went by, industries acquired experience in manufacturing and turned out quality products comparable with imported products. There was a continuous effort to improve quality. During the Second and Third plans, the emphasis was on the development of capital goods industries. India wanted to make machines that helped to produce other machines.

Therefore, greater emphasis was given to the development of machine tools, textile machinery, power equipment and so on. We were importing these mother machines, and the new effort was to produce them in India, to achieve selfsufficiency. As a result of this policy, encouragement was given to import technical know-how and to enter into foreign collaborations to undertake manufacture of capital equipment locally. This gave further fillip to industrial development. Protection from imports encouraged Indian industry to undertake the manufacture of a variety of products. There was a ready market for all these products. The Government also gave encouragement to industries to import parts and components that were required for indigenous production. The import policy was meant to serve two categories of importers-actual users and established importers. Actual users of imported raw materials or products were given preference over the category of established importers *i.e.* traders. Certain items that were scarce and not available were channelised through the State Trading Corporation, Mines and Minerals Trading Corporation and such other Government bodies. They arranged

for the import of such products and distributed them to indigenous industries according to requirements. Thus, imports were strictly controlled by the import policy announced every year by the Government of India.

High Customs Tariffs

Apart from strict control over imports and the physical ban on the imports of many products, customs tariffs were raised in some cases to 200 to 300% on imported products. This gave protection to local industries. The price of local products was comparatively cheaper than those of imported goods. The Government also followed a policy of low tariffs on the import of raw materials, parts and components compared to those on finished products. This encouraged Indian industries to import parts and components, and to manufacture or assemble final products in India.

Financial Infrastructure

To provide the financial infrastructure necessary for industry, the Government set up a number of development banks. The principal function of a development bank is to provide medium and longterm investments. They have to also play a major role in promoting the growth of enterprise. With this objective, the Government of India established the Industrial Finance Corporation of India (IFCI) (1948), Industrial Credit and Investment Corporation of India (ICICI) (1955), Industrial Development Bank of India (IDBI) (1964), Industrial Reconstruction Corporation of India (1971), Unit Trust of India (UTI) (1963), and the Life Insurance Corporation of India (LIC) (1956). For financial assistance to small entrepreneurs, Finance Corporations were established in all states on the basis of an Act that was passed by Parliament in 1951. In addition to this, the National Small Industries Corporation was also established at the Centre and a Small Industries Development Bank of India was established in 1989.

Control of Indian Business

As a consequence of the restrictions on imports, those who were importing products entered into collaboration with their principals and entered the field of manufacturing. Thus, what was

once a trading community, gradually transformed into a community of industrialists. Regulations under the Foreign Exchange and Regulation Act (FERA) restricted foreign investment in a company to 40%. This ensured that much of the control in companies with foreign collaboration remained in the hands of Indians. To succeed, Indian businessmen had to learn and apply modern management and production techniques.

Encouragement to Small Industries

Though some of the policies of the Government resulted in inhibiting the growth of large-scale industries, they gave encouragement to small-scale industries by providing a number of support measures for growth. Policy measures undertaken by the Central and State Governments addressed the basic requirements of the SSI like credit, marketing, technology, entrepreneurship development, and fiscal, financial and infrastructural support.

These promotional measures covered:

- Industrial extension services through small industries service institutes and other organisations.
- Factory space in industrial estates through cooperative and other industrial estates, ready built shades and developed industrial plots made available through State Government agencies.
- Credit facilities at concessional rates of interest and credit guarantees through commercial banks and State Finance Corporations.
- Special financial assistance schemes at concessional rates of interest and low margins for technician entrepreneurs.
- Availability of indigenous scarce raw materials through special quotas and imported materials through import licenses.
- Provision of training facilities.
- Subsidised power tariffs and exemption of electricity duties.
- Supply of local and imported machinery on hire purchase basis.
- Assistance for domestic as well as export marketing.

- Special incentives for setting up units in backward areas.
- Differential central excise levies for the small-scale sector.
- Preference for products produced in small-scale industries and 15% price preference to them in State Government purchases.
- Reservation of products for exclusive manufacture in the small-scale sector.
- Creation of a large number of institutions both by the State Governments and the Central Government to help small enterprises.
- Special effort to promote new entrepreneurs by providing them training in entrepreneurship development.
- While most of the institutional support services and some incentives were provided by the Central Government, the State Governments offered others in varying degrees to attract investments and to promote small industries.

Investment in Infrastructure

Energy-Transport-Communications facilities are extremely essential for smooth and accelerated industrial growth. The Government made huge investments in providing such infrastructure facilities to industries. The Central Government, as well as the State Governments invested huge funds in power generation and distribution, and many new power projects were undertaken and completed. Similarly, investments were made in road building, communications, creation of port facilities etc. Apart from this, various State Governments made developed plots of land or industrial estates with power, water, roads, and communications available to entrepreneurs who wanted to set up industries. This helped considerably in the growth of industries. Changes in the production of primary commercial energy since 1950- 51.

Oil and Natural Gas

The Oil and Petroleum industry must be considered a gift of the planning era. The indigenous oil exploration programme gained credibility in the seventies. New sources of oil were discovered, and considerable refining capacity was created. The Oil and Natural

Gas Commission was set up for oil exploration. Additional refining capacity was created through the expansion of some of the existing plants, and the commissioning of new refineries.

Training and Skills Development

Trained manpower is necessary for industrial growth. To cater to the growing needs of industries during the last fifty years, the Government set up a large number of industrial training institutes, all over the country to train skilled workers. It also set up Indian Institutes of Technology, Management Institutes and Engineering Colleges to train persons with higher management and technical skills. Our youth have been quick at learning skills. We have therefore had no shortage of skilled manpower to cater to the growing requirements of industry.

Scientific Research

Research in science and applied technology is very much needed in order to sustain technological development in industries. The Government of India set up 48 national laboratories to undertake applied research in chemistry, physics, electronics, botany, etc., and these research institutes developed a number of new processes which are commercially exploited by industries. Indian scientists and technologists also ushered in the Green Revolution, and the White Revolution, and developed space technologies on their own.

Backward Area Development

Before Independence, industries were mostly located in and around port cities like Mumbai, Kolkata or Chennai. After Independence, new centres of industries were developed as a result of the infrastructural facilities that were made available by the State Governments. Baroda, Coimbatore, Bangalore, Pune, Hyderabad, Faridabad, Rajkot, and many others, grew up as new industrial cities.

Both the Central Government and the State Governments followed a deliberate policy of encouraging industries in backward areas. The Central Government selected a few backward districts and offered 25% capital subsidy for industries set up in these areas. Various State Governments also offered similar capital

incentives, exemption from sales tax levy, subsidies on power rates, cheap developed land, sales tax, loans and other facilities for the growth of industries in these areas. This considerably helped the growth of under developed or backward areas in the different states.

EMPHASIS ON PUBLIC SECTOR

Right from the beginning, the planners attached great importance to the public sector. It was expected that the sector would control the 'Commanding heights of the Indian economy.' In the Industrial Policy Resolutions of 1948 and 1950, a very important role was assigned to the public sector. Power, telephones, communications, atomic energy, defence industries and some areas were reserved for the public sector. Certain industries like life insurance, civil aviation, banks were nationalised and were included in public sector. Thereafter, whenever there was a shortage, the Government stepped in to bail out, as it did with the cement and paper industries. The Government took over sick industries to provide employment. That is how a large number of textile industries came into the public sector. Upto the year 1999, there were 235 public sector undertakings and the Government had invested an amount of `273700 crores in such undertakings. In 1998-99, they made a gross profit of `397.7 crores.

EVOLUTION OF INDUSTRIAL POLICY IN INDIA

Before Independence, the policy of the British Government was against encouraging industrial development in India. No incentives were offered to Indian industries for their growth. There were many desired and undesired hurdles placed in the way of the growth of Indian industry. Whatever industrial development took place in India was in spite of the negative and hostile attitude of the British Government. Credit must be given to pioneers like Jamshedji Tata, Walchand Hirachand, Lala Sriram, G.D. Birla and others, who laid the foundations of modern industry in India.

After Independence

Immediately after Independence, the Government of India announced its industrial policy in 1948 and laid down the plan for future industrial growth in the country. It also declared its

policy on foreign capital in 1949, and invited foreign capital for investment in the country. The Government was keen to dispel the apprehension that foreign enterprises may be taken over.

Industrial Policy Resolution, 1948

The first Industrial Policy Resolution, announced in 1948, broadly laid down the objectives of the Government's policy in the industrial field and clarified industries and enterprises into four categories, namely:

1. Those exclusively owned by the Government, *e.g.* arms and ammunition, atomic energy, railways, etc.; and in emergencies, any industry vital for national defence.
2. Key or basic industries, *e.g.* coal, iron and steel, aircraft manufacture, ship building, telephone, telegraphs and communications equipment except radio receivers, mineral oils, etc. The undertakings already existing in this group were promised facilities for efficient working and 'reasonable' expansion for a period of ten years, at the end of which, the State could exercise the option to nationalise them.
3. The third category of 18 specified industries were to be subject to the Government's control and regulation in consultation with the then provincial (now State) Governments.
4. The rest of the industrial field was, more or less, left open to the private sector.

Industrial (Development and Regulation) Act, 1951

The Industrial Policy Resolution of 1948 was followed by a Government of India (GOI) Resolution on 2nd September 1948, constituting a Central Advisory Council of Industries under the chairmanship of the Minister for Industry. In 1951, the Industrial (Development and Regulation) Act was passed by the Parliament.

The main provisions of the Act were:

- All existing undertakings at the commencement of the Act, except those owned by the Central Government were compulsorily required to register with the designated authority.

- No one except the central Government would be permitted to set up any new industrial undertaking "except under and in accordance with a licence issued in that behalf by the Central Government."
- Such a licence or permission prescribed a variety of conditions, such as, location, minimum standards in respect of size and techniques to be used, which the Central Government may approve.
- Such licenses and clearances were also required in cases of 'substantial expansion' of an existing industrial undertaking.
- The industries to be brought under regulation were divided into two parts, Part I and II in the Schedule to the Act.
- In regard to the industries listed in Part I of the Schedule, the Central Government could issue necessary directions in respect of quality of its products, falling production, rise in prices etc.
- Government could transfer industries specified in one part to another.

Implementation of the Industrial Development and Regulation Act, 1951 (IDR)

The IDR Act gave very wide powers to the Government. This resulted in more or less complete control by the bureaucracy on the industrial development of the country.

They had full control over:

- Approval of any proposal on capacity, location, expansion, manufacture of new products etc.
- Approval of foreign exchange expenditure on the import of plant and machinery.
- Approval for the terms of foreign collaboration.

Industrial Policy Resolution, 1956

After 1948, India adopted a democratic constitution, guaranteed fundamental rights and also enunciated certain directives of state policy. The Parliament accepted the socialistic pattern of society as the objective of social and economic policy. A new Industrial

policy was therefore announced in 1956. This Industrial Policy divided industries into three categories.

All basic and strategic industries were to be set up in the public sector, and were called category A type of industries. In category B industries were private enterprises who could participate along with public enterprises. This sector was called the joint sector. All remaining industries falling in category C, were left to be developed by the private sector. The Industrial Policy of 1956, for the first time, emphasised the role of small-scale industries in the development of the national economy.

The statement pointed out the importance of the SSI Sector in providing employment. It also laid emphasis on the equitable distribution of national income and the effective mobilisation of resources. The industrial policy, therefore, recommended the development of ancillary industries in areas where large industries were to be set up.

Monopolies Commission

In April 1964, the Government of India appointed a Monopolies Inquiry Commission "to inquire into the existence and effect of concentration of economic power in private hands." The Commission was requested to look at the prevalence of monopolistic and restrictive practices in important sectors of economic activity, the factors responsible for these and the legal solutions for them. The Commission looked at concentration of economic power in the area of industry, and examined industrywise and productwise concentration.

The Commission also examined the concentration ratio. This Commission drafted a law to control monopolies and recommended the setting up of a permanent Monopolies and Restrictive Trade Practices Commission. On this basis, an Act was passed and a Monopolies Commission was appointed by the Government in 1969.

Industrial Licensing Policy Inquiry Committee

In July 1969, an Industrial Licensing Inquiry Committee was appointed to examine the shortcomings in licensing policy. The Committee felt that the licensing policy had not succeeded in

preventing the practice of pre-empting capacity by large houses; it had not ensured development of industries according to announced licensing policies; it did not prevent investment in non-priority industries etc. In 1969, the Monopolies and Restrictive Trade Practices Act (MRTP) Act was passed by the Government and following the report of Industrial Licensing Policy Inquiry Committee (ILPIC), a number of new restrictions were put on the large industrial houses in the industrial licensing policy announced in February 1970.

Fera Amendment, 1973

The Foreign Exchange and Regulation Act (FERA) was amended in 1973. This brought a great change in the foreign investment policy of the Government of India. Foreign equity was to be permitted only in companies, industries, or in those that were engaged in exports. Foreign firms were not allowed more than 40% of equity. Only certain industries in the area of sophisticated technology were allowed 51% foreign capital. FERA companies were subject to many restrictions, and were not allowed to participate in certain industries. They were also not allowed to expand and take up production of new products.

Industrial Policy Statement, 1973

The Policy Statement of 1973 drew up a list of industries to be started by large business houses so that the competitive effort of small industries was not affected. The entry of Competent Small and medium entrepreneurs was encouraged in all industries including industries. Large industries were permitted to start operations in rural and backward areas with a view to developing those areas and enabling the growth of small industries around. A Secretariat for Industrial Approvals (SIA) was set up in November 1973, and all industrial licenses, capital goods, import licenses, terms of foreign collaboration were brought under the SIA.

Industrial Policy Statement, 1977

The thrust of the Industrial Policy Statement of December 1977 was on effective promotion of Cottage and Small Industries widely dispersed in rural areas and small towns. It emphasised that "whatever can be produced by small and cottage industries

must only be so produced." The focal point of development of small-scale industries was taken away from the big cities to districts.

The concept of District Industries Centres was introduced for the first time. Each district would have such a district centre which would provide all the support and services required by small entrepreneurs. These included economic investigation of the districts, supply of machinery and equipment, raw material and other resources, arrangement for credit facilities, call for quality control, research and extension etc. Within the SSI sector, a new concept of tiny sector was introduced.

It was defined as an industrial unit with investment in machinery and equipment upto Rupees one lakh, and situated in towns with a population of less than 50,000 according to the 1971 census. This tiny sector was to be given special attention and extended help, by way of provision for margin money assistance. The policy statement considerably expanded the list of reserved items for exclusive manufacture in the small-scale sector. This concept was recommended by the Karve Committee and was introduced in 1967 with 47 products. The list of such reserved items was 504 till 1977. The new policy expanded this list to 807.

Era of Liberalisation

After 1980, an era of liberalisation started, and the trend was gradually to dilute the strict licensing system and allow more freedom to the entrepreneurs.

The steps that were taken in accordance with the policy included:

- *Re-endorsement of licenses*: The capacity indicated in the licenses could be re-endorsed, provided it was 25% more than the licensed capacity (1984).
- Automatic re-endorsement of licensed capacities (1988).
- Broad banding and selective delicensing (1985-86) extended to 25 industries.
- Liberalisation of 31 May 1990. This policy included:
- Exemption from licensing for all new units and those having an investment of `2.5 crores in fixed assets, and an entitlement to import upto 30% of the total value of plant and machinery.

- Investment of foreign equity up to 40% was freely allowed.
- Location restrictions were removed.
- Investment ceiling for small industries were removed.

Though the Government policies and procedures were aimed at industrial development of the country, the enactment of the IDR Act, procedures laid down for obtaining industrial licensing and various rules made under the Act acted as a great deterrent to the growth of industries in the country. The bureaucracy acquired unprecedented powers and authority over all kinds of industrial activities and industrial entrepreneurs felt that they were placed at the mercy of these bureaucrats. Apart from the IDR Act, there were a number of other Acts which were enacted and which acted as obstacles and retarded the industrial development of the country.

Despite industrial licensing, an entrepreneur had to obtain clearance from many Agencies, like:

- Secretariat for Industrial Approvals (SIA)
- Department of Industrial Development
- Chief Inspector of Factories
- Pollution Control Board
- Director of Town Planning
- Department of Company Affairs
- Registrar of Companies
- Exchange Control Department of RBI
- Chief Controller of Explosives
- Chief Inspector of Boilers
- Commissioner, Food and Drug Administration
- Director of Mines
- Controller of Capital Issues
- Chief Controller of Imports and Exports etc

Thus, when the Government of India announced the new economic policy in July 1991, Indian industries were not competitive in the world market. We propose to deal with the consequences. Our industries were suddenly required to face international competition. It is no wonder that many of these industries allowed their foreign collaborators to take over, sold

their interests or preferred to close down. Those who remained in the field are trying to downsize and reduce their operations. For the existing ones, it is becoming increasingly difficult not only to face competition in the world, but also competition at home with the products of multinationals, either produced in the country or imported from abroad.

FACTORS INFLUENCING INDUSTRIAL LOCATION

Generally, location of industries is influenced by economic considerations though certain non-economic considerations also might influence the location of some industries. Maximisation of profit which also implies cost minimization is the most important goal in their choice of particular places for the location of industries. There are several factors which pull the industry to a particular place. Some of the major factors influencing location are discussed below:

1. Availability of raw materials: In determining the location of an industry, nearness to sources of raw material is of vital importance. Nearness to the sources of raw materials would reduce the cost of production of the industry. For most of the major industries, the cost of raw materials form the bulk of the total cost. Therefore, most of the agro-based and forest-based industries are located in the vicinity of the sources of raw material supply.
2. Availability of Labour: Adequate supply of cheap and skilled labour is necessary for and industry. The attraction of an industry towards labour centres depends on the ratio of labour cost to the total cost of production which Weber calls 'Labour cost of Index'. The availability of skilled workers in the interior parts of Bombay region was one of the factors responsible for the initial concentration of cotton textile industry in the region.
3. Proximity to Markets: Access to markets is an important factor which the entrepreneur must take into consideration. Industries producing perishable or bulky commodities which cannot be transported over long distance are generally located in close proximity to markets. Industries located near the markets could be able to reduce the costs

of transport in distributing the finished product as in the case of bread and bakery, ice, tins, cans manufacturing, etc. Accessibility of markets is more important in the case of industries manufacturing consumer goods rather than producer goods.

4. Transport Facilities: Transport facilities, generally, influence the location of industry. The transportation with its three modes, i.e., water, road, and rail collectively plays an important role. So the junction points of water-ways, roadways and railways become humming centres of industrial activity. Further, the modes and rates of transport and transport policy of Government considerably affect the location of industrial units. The heavy concentration of cotton textile industry in Bombay has been due to the cheap and excellent transportation network both in regard to raw materials and markets.
5. Power: Another factor influencing the location of an industry is the availability of cheap power. Water, wind, coal, gas, oil and electricity are the chief sources of power. Both water and wind power were widely sought at sources of power supply before the invention of steam engine. During the nineteenth century, nearness to coal-fields became the principal locating influence on the setting up of new industries, particularly, for heavy industries. With the introduction of other sources of power like electricity, gas, oil, etc. the power factor became more flexible leading to dispersal and decentralization of industries.
6. Site and Services: Existence of public utility services, cheapness of the value of the site, amenities attached to a particular site like level of ground, the nature of vegetation and location of allied activities influence the location of an industry to a certain extent. The government has classified some areas as backward areas where the entrepreneurs would be granted various incentives like subsidies, or provision of finance at concessional rate, or supply of power a cheaper rates and provision of education and training facilities. Some entrepreneurs induced by such incentives may come forward to locate their units in such areas.

7. Finance: Finance is required for the setting up of an industry, for its running, and also at the time of its expansion. The availability of capital at cheap rates of interests and in adequate amount is a dominating factor influencing industrial location. For instance, a review of locational history of Indian cotton textile industry indicates that concentration of the industry in and around Bombay in the early days was mainly due to the presence of rich and enterprising Parsi and Bhatia merchants, who supplied vast financial resources.
8. Natural and Climatic Considerations: Natural and climatic considerations include the level of ground, topography of a region, water facilities, drainage facilities, disposal of waste products, etc. These factors sometimes influence the location of industries. For instance, in the case of cotton textile industry, humid climate provides an added advantage since the frequency of yarn breakage is low. The humid climate of Bombay in India and Manchester in Britain offered great scope for the development of cotton textile industry in those centres.
9. Personal Factors: In deciding location of industrial units, sometimes an entrepreneur may have personal preferences and prejudices against certain localities. For instance, Mr. Ford started to manufacture motor cars in Detroit simply because it was his home-town. In such cases, personal factor dominates other considerations. However, this kind of domination is rare.
10. Strategic Considerations: In modern times, strategic considerations are playing a vital role in determining industrial location. During war-time a safe location is assuming special significance. This is because in times of war the main targets of air attacks would be armament and ammunition factories and industries supplying other commodities which are required for war. The Russian experience during the Second World War provides and interesting example.
11. External Economies: External economies also exert considerable influence on the location of industries.

External economies arise due to the growth of specialized subsidiary activities when a particular industry is mainly localized at a particular centre with port and shipping facilities. External economies could also be enjoyed when a large number of industrial units in the same industry were located in close proximity to one another.

12. Miscellaneous Factors: Historical incidents also play a dominating role in determining the location of industries in certain cases. The development of cotton-textile industry in Lancashire provides an interesting example for this. Further, the size of and industrial unit would also have much influence in choosing location. This is because the size of industrial units depends upon the radius of the circle within which they can profitably distribute their goods and upon the density of population living within the circle.

7

Elements of Economic Geography

Economic geography is the study of the economic singularity of countries and regions, of spatial differences in economy on the earth's sphere, that is, differences from place to place, and also of spatial combinations within an economy. If these differences did not exist there would be no economic geography; it could not exist, for there would be no special object for investigation. In order to study these spatial differences, they must first be stated, then described as exactly as possible, and finally, the causes of these differences must be investigated. Ultimately, having investigated all these causes one must develop the mechanisms of these changes in the economy from place to place. In this way one can begin to formulate the problems of economic geography.

It must be emphasized that the differences from place to place in an economy are not due solely to differences in natural conditions. Let us assume that all differences in natural conditions have for some reason or another ended, that all climates have been blended, the seas have been divided evenly with land areas, and the mountains have been erased; even in such a case, contrasts in economy from place to place appear in each given country and at each given moment. These contrasts depend not only on the differences in natural conditions but to a great degree they also depend on the development of productive forces, on the past investment of labour on any part of the earth's surface, and on a number of other socio-historical features.

A description of a voyage is a very complete form of narrative. A person comes to a strange country and everything there is of interest to him. He is surprised and describes everything that he sees; he does not select the facts by categories as do specialists who are interested in only nature (even its individual elements), or only the economy (or only its individual branches) or only the life and customs of the population; the traveler describes absolutely everything that strikes his imagination–mountains, vegetation, climatic phenomena–and if he encounters something surprising in the economy or in the life and customs of the people, he then includes that in his description also. Writing this up along his route he interweaves everything to such an extent that no one can discern where physical geography ends and where economic geography or ethnography begins.

It was quite natural that the descriptive form of voyages was the initial form for geographic and ethnographic sciences. Why? We have already agreed that the essence of geography lies in the study of differences from place to place. But when a person lives in one place he gets accustomed to his surrounding world, to the surrounding nature and forms of economic activity and does not see anything surprising, especially interesting, or worthy of description. But when that person finds himself in other places where there are other natural conditions, other people, and another economy, everything amazes him, and he begins to notice and describe it. Thus, it is natural that literature devoted to voyages became the first form of geography.

This form of literature (descriptions of voyages) is as old as the voyages themselves. Literary monuments of this kind have remained from the ancient Greeks. In the last analysis, the *Odyssey* in nothing but a poetic description of voyages. Descriptions of voyages have remained also from the Egyptians, Carthagenians, and the Arabs. The largest number of voyage reports were made during the era of geographic discoveries, beginning at the end of the fifteenth century with the voyages of Vasco de Gama and Columbus and in the early part of the sixteenth century with the first voyage around the world by Magellan.

Since in the voyage reports the economic-geographic information was not separated specifically but was mixed with

other aspects, it is rather difficult to get a full and systematic notion of the economic peculiarity of each country from the description of the traveler who took one route and was not especially concerned with the economy of the country. On the other hand, however, what one has seen with one's own eyes can, of course, be described in a livelier, more buoyant, and more interesting manner, and these voyage descriptions combine economics, nature, and ethnography, all of which make them much more engrossing.

The value of a voyage description depends primarily upon the traveler himself, on this ability to observe, the breadth of his outlook, on the stock of general perceptions that guide him in processing his observations. The very content of the voyage depends on the predominant interests of the traveler. Interest in trade, imperialistic expansion, land acquisition, and so forth had an influence not only on the organization of the voyages and expeditions but also on the direction of the voyages. Many voyages were in essence nothing but a preliminary survery for seizures. The aims of the surveys–military, commercial, and others–were often cloaked under scientific geographic investigations.

Financial Statistics

Economic geography attained for the first time a more developed and independent form in the so-called financial statistics that developed in Germany at the beginning of the eighteenth century as the result of special needs of the “police state" that had risen on the ruins of feudalism. Under the feudal system the resources of the country could be made known without a special science, without forming a special branch of learning, and without creating any university courses. In the feudal era the land of the whole country was divided into comparatively small fiefs. Moreover, each feudal lord was not simply a landowner but also the governor of his land; he had the right to collect taxes, to recruit, and to judge those who lived on his territory. All of this belongs, in our opinion, to the area not private rights but of the rights of the state. Yet the lord's sovereign, the feudal king or duke, did not interfere in his internal affairs; the so-called right of immunity existed at that time, which was one of the privileges of the feudal lord.

Immunity as an institution of state law meant the freedom of the feudal lord from interference by the kings it meant also that the king's officials had no right to interfere in the internal affairs of the fiels. Under such a system each feudal lord could obtain directly from his lower lord information concerning how much could be taken from a given land in assessments and recruits and what resources the land had. Thus, the king could find out from each of the feudal lords under his power how much each could give in soldiers, money, and other resources. Hence within a feudalistic "coarse grained" system of government all this information could be obtained informally in a volume sufficient for practical purposes.

With the collapse of the feudal system, the governmental power began to reach the population directly as the government demanded taxes to draft recruits and passed judgment through its officials. As soon as a sizable territory with a large population came within the framework of a single national state so that a government economy could rapidly develop, everything became much more complex. A governmental apparatus had to be created for the administration of this huge state; in order to carry out the functions that had been those of the feudal lords and their administrators, new special cadres of educated officials were needed.

And in Germany a new science was created, *financial statistics.* Achenwall, the father of financial statistics, called this science "a descriptive government science of individual countries." His work, *Abrisse der neuesten Staatwissenschaft,* which initiated financial statistics, appeared in 1739. The aim of financial statistics was to provide the government with information and to train young officials by giving them a university education.

What were the structure and content of financial statistics? Attention was given to the territory of the state, its borders, and its administrative divisons; then came finances, budget, and individual branches of the economy–agriculture, industry, transport, communication, and so forth; then military forces, the fleet, relations with other countries; in one word, the governmental machinery considered as a whole. Thus, the subject of financial statistics was the state, but not so much from the legal viewpoint

as from the viewpoint of the resources of the state. This was a descriptive governmental science. Indeed, in order to understand any state one must know all that has been enumerated, that is, territory, borders, population, form of governmental system, all branches of the economy, military forces, diplomacy; all this is essential. Each educated official must clearly understand what relations his government has with other governments, what financial resources it has, and related information. All of this belongs to the field of education in government.

They were very few geographic elements in financial statistics: mainly directions for the distribution of individual branches of the economy, and sometimes descriptions of separate administrative units were included. Financial statistics created in Germany for the organization and strengthening of the police state, spread from Germany to other countries.

Financial statistics developed its own methodology. These were the times when science was permeated with the scholasticism of the Middle Ages and when methodological rules were brief formulas in Latin. Financial statistics had a formula, "Vires unitae agunt", translated literally: "United forces lead". As a whole this formula seems to recommend: "Describe first the material resources of the country, then describe the governmental organization on this territory, and then show all this in action." Clearly, the methodological formulas were not all useless. In fact, however, it did not go farther than endless lists, and, numerical information.

What was the fate of financial statistics? It had to utilize a large amount of every kind of numerical data. The methods of statistical investigation worked out on this basis were then applied to a number of natural sciences, to the study of genetics by botanists, zoologists, and others. As a result it turned out that financial statistics gave its "soul" so to speak, its method of investigation of mass phenomena, to the discipline we call statistics. And the perishable "body" that was left without a soul, that is, the collection of all kinds of reference information about one country or another, has become an essential element of what is called to sectoral-statistical approach in economic geography, and in this form it drags on its existence to this day.

Economic-Geographic Descriptions in the Regional Geography

Besides financial statistics and commercial geography, general geography, due to its complex content, also had an influence on the development of economic geography. General geography (including general earth science and especially regional geography) had become one of the general-education subjects in public schools during the eighteenth century and even earlier in a number of countries.

With the development of transport, international trade, and general international relations, the need for geographic knowledge began to grow and spread. A certain minimum became necessary not only for persons of narrowly defined professions such as state and trade representatives but for all educated people regardless of profession. This minimum included information on mathematical and physical geography, as well as economic geography. From this complex the school subject evolved under the general name of geography. The main content of this subject consisted of a description of individual countries, including information on the natural environment, population, and economy of each country. Two or three generations later, when geography was firmly established in the curriculum of the secondary school and the number of secondary schools had increased, the time had come to train school teachers of geography, and in the course of the nineteenth century geography penetrated higher education institutions, including the universities.

The immense amount of factual material collected since the beginning of the era of great geographic discoveries about the surface of the earth was so diverse that it demanded generalization and thereafter attracted the interest of brilliant minds who tried to find definite regularities in the distribution of natural phenomena and human society as a whole, and in their combinations within each separate country and in each separate region. With the development of secondary and higher education and with the increased number of educated people, the public demand for geographic literature grew. University courses and compilations on regional geography appeared more and more substantial in volume and content: they no longer had as their aim the training

of narrow specialists but rather a general education in geography. The development of such a general, university-level geography could not but exert an influence also on the development of the then incipient forms economic geography.

Instruction in economic geography often had to be turned over not to statisticians, students of commodities, or practitioners (agents or merchants) but to geographers–that is, regional specialists. The same occurred with the composition of textbooks. And if, on the one hand geography in the form of regional specialization influenced financial statistics and commercial geography, then the content of courses in financial statistics and commercial geography conversely penetrated into regional geography. Since no special theoretical knowledge was needed for an economic-geographic description in the sectoral-statistical style, regional geographers could take on this job with little concern. And who was not intelligent enough to find references in statistical collections? For their part, the regional geographers contributed their knowledge of physical geography, knowledge of maps, and sometimes certain skills in general geographic thinking.

Some of the regional specialists who undertook to describe economic activities would adopt, without much concern, the traditions and the structure of the sectoral-statistical school, and thereby ceased for a time to be geographers. Others, on the contrary, tried to describe the economy by taking account of general geographic practice, that is, by locating precisely the objects and phenomena described, by using maps widely, by attempting to tie in the features of the economy with those of natural conditions and finally, by attempting to rearrange this description from a sectoral framework to a regional one. At first such regional geographers who switched to economic geography from physical geography used a network of natural, physical-geographic regionalizations. But after the rapid development of transportation in the era of capitalism and the growth of a geographic division of labour within large national states, there came into being sharply specialized economic regions, and the geographers began a transition from natural regions to economic regions in the economic-geographic section of their descriptions. A new and very positive contribution made by these geographers

to economic geography consisted in the strengthening of the geographic components in it.

Many of the major regional geographers who were more interested in the geography of economic activity (or in a wider sense, the geography of man) and better trained in this activity made a sizable contribution to the development of economic geography with their general methodological statements as well as with concerete examples of the economic-geographic characteristics of countries and regions. Or the Russian geographers one can mention K.I. Arsenyev; P.P. Semenov, V.P. Mechnikov and A.I. Voyeykov; of the French, Reclus, Vidal de la Blache and his students Demangeon and Brunhes, as well as Blanchard and Baulig; of the Americans, Smith, Ekblaw, Bowman; of the English, Mackinder, Stamp, Beaver, Herbertson, and others. As examples of great works on regional geography (and the most interesting with respect to economic geography) one can cite *Rossiya* in Russian literature, edited by Semenov-Tyan-Shanskiy, and in French literature, the multivolume *Geographie Universelle.* The French *Geographic Universelle* has many valuable economic-geographic studies of whole countries and individual regions. Of special note is the work of Henri Baulig on North America and of Demangeon on the British Isles.

Standort [Location] Theories

Relatively recently economic geography received one more impetus from the practical demands of life, from capitalist monopolies and trust acting within the framework of an entire country and sometimes extending beyond its borders. Monopolistic groups developed primarily in the United States and Germany in the last decades of the previous century.

The trust, as the higest form of capitalistic union, in contrast to the cartel and the syndicate, assumes a *complete* merger of enterprises. A new stockholding company is created, and each participant sells to it his enterprises for a specific package of stock, and from the moment of founding of the trust the owners of the enterprises that are combined in the trust are no longer owners. A new elective board is created, handling all business, and the former owners become shareholders, with the right to receive

dividends and to influence the composition of the board during elections. On this basis, one of the world's largest trusts, the Steel Trust, was created in America in 1901. This was such a powerful organization that at one time its budget exceeded that of France. The main task of a trust is to maximize profits; the means for doing this are to raise prices, lower wages, and decrease production costs. One of the first tasks is the reduction of production to the level of demand and the concentration of production in enterprises with the least production costs.

The experts of such an organization calculate the productive capacity of all plants and come up with, say, 80 million tons. Then they calculate the purchasing power of the market, adjust for growth, and arrive at a total of 40 million tons. Obviously, in the process of capitalistic competition production had been inflated and did not conform to the market. The main problem, as the trust sees it, is overproduction, and the main task is to decrease production, to close superfluous establishments, especially those which are less well equipped and those with higher costs. After these plants have been closed, the productive power is still, let us say, 60 million tons, and the market demands only 40 million tons, which means the productive power must be reduced by another 20 million tons. What other criterion must be taken into account? Another criterion is that of the convenience of location; an enterprise is closed not only if it is more poorly equipped but also if it is inconveniently located. Thus, with the appearance and development of capitalist trusts there arises a very interesting question for the economic geographer: What must be the rational distribution of a given sector in order to maximize proper that is, for a maximum reduction of production costs and transportation expenditures?

If we compare this demand of life with the preceding, we see that there is a great qualitative difference. In the demand for educated officials and agents, the demand was mainly for strictly factual knowledge, purely empirical reference information. However, when we are concerned with the demand for captains of industry, managers of such tremendous unions, we are dealing with a demand not for reference material, but for an entire theory. It concerns the creation of a theory of the most rational distribution

of industry under the given capitalist conditions. The so-called *standort* theories served as an answer to this question posed by monopolistic capitalism. Best known is the theory of Weber in his main work, *Theory of the Location of Industries.* Weber created a whole school in Germany. On the basis of Weber's theory his students compiled a number of monographs on individual branches of German industry. Then there is a theoretical work by Englander, the works of Schroeder, Schilling, and others, and a number of articles in the German journal *Wirtschaft und Statistik.* All these location theories tend to anwer the demands for the most advantageous distribution of industry under capitalist conditions, demands that arose as the result of the creation of industrial trusts. Although they exerted a certain influence by strengthening the theoretical elements in economic geography, they did not create a separate school. The location theories were used in economic-geographic works to explain the existing distribution of industry; examples of such use can be found in *Geographic Universelle.*

Now let us turn to our own country and briefly give the essential characteristics in the development of economic geography before the revolution and then the main directions of development of our economic geography during the Soviet period.

In speaking of characteristic features in the development of economic geography in Tsarist Russia, one must first of all note the role of an exceptional intellectual giant of thought, M.V. Lomonosov. A. scientist-encyclopedist in the full sense of the word, Lomonosov, besides conducting investigations in the fields of nature and technology, also worked in philosophy, history, and philology. He also was very much interested in economic questions and initiated the economic-geographic study of Russia.

Taking account of the needs of economic development in Russia, Lomonosov emphasized the acute necessity of developing industry, especially metallurgy. In a work titled "First Foundations of Metalluargy, or Ore Industries," he wrote: "Warfare, trade, navigation and other necessary government institutions require metals". Lomonosov saw clearly that "the well being, glory and flourishing of the country" depend on the development of trade, "on the mutual exchange of internal surpluses with distant peoples by means of trade." Hence arose the necessity of a complete study

of the country. Directing the Geography Department of the Academy of Sciences, Lomonosov considered it necessary to compile an atlas with "a political and economic description of the whole Empire, including Siberia". For this purpose Lomonosov compiled a remarkable questionnaire consisting of thirty questions– a whole programme for the economic-geographic study of Russia. Lomonosov had planned to compile an economic lexicon of Russian products and evidence of their internal and external communications with attached maps. This would have been a detailed trade geography of Russia. In 1764 Lomonosov offered in the Academy of Science an opinion on the utilization of a census for a geography of Russia. Lomonosov was the initiator of expeditions for the geographic study of our country, moreover, he understood this in a comprehensive sense. He gave great attention to the study of the North.

From these brief references, the number of which could be greatly increased, it is clear how broadly Lomonosov understood the tasks of the new science that he had begun to create and for which he used the term *economic geography* for the first time in the 1760s, a term that was based on a correct understanding of problems in the development of Russia. One can not possibly say that Lomonosov coined the expression *economic geography* by chance. This was an exact definition of the new science that was fully developed in his mind and was filled with rich and varied content.

How broadly Lomonosov understood geography as a whole can be seen from his "Word of praise... to Ylizaveta Petrovna" [daughter of Peter the Great] where he wrote: "What is useful to mankind for the mutual sharing of their surpluses, what is more necessary to travelers in foreign lands, than to know the places, the course of rivers, the distances between cities, the size, abundance and proximity of various lands, the customs and habits and governments of various peoples? Geography, which at one glance reveals the vastness of the universe, shows this clearly. This remarkable characterization of geography, "which opens the whole vastness of the universe at a single glance," is also not a random expression by Lomonosov.

In his larger works of great geographic significance, such as *On the Earh's Layers, On Electric Atmospheric Phenomena* and *On*

Northern Navigation to the East Along the Siberian Ocean, Lomonosov invariably emphasized the interconnection of phenomena, the necessity to find and explain these relationships, the necessity of a historical approach to phenomena, and the exceptional importance in geography of maps including economic maps. It must be noted, however, that Lomonosov in his view was so far ahead of his time that his brilliant ideas remained without further development for a long time.

Nevertheless, it is to Lomonosov, and no one else in all of world science, that credit belongs both in terms of a broad view of geography, which "reveals the vastness of the universe at a single glance", and in the use of the term economic geography itself, and to the formulation of its main tasks.

The pre-revolutionary history of our economic geography was also characterized by the exclusive attention paid to questions of regionalization of the country, including economic regionalization. Regionalization of the country was of great interest in pre-revolutionary Russia, greater than in almost any country (with the exception perhaps of only the United States). The reason for this one must assume, lay in the vastness of the country itself and the diversity of its parts. Under such conditions it is impossible to know the country without distinguishing the various regions in it; regionalization becomes not only a necessary premise for this knowledge but one of the most important methods. It is not by chance that the greatest number of works on the regionalization of Russia began to appear in the nineteenth century, when, with the development of capitalism, the geographic division of labour rapidly developed, and also the differentiation and specialization of regions. About fifty attempts to regionalize pre-revolutionary Russia can be cited. Some of them, it is true, have a narrowly specialized character and give a regionalization based on only one component of the natural environment (climate or soil), but for the most part these attempts give a regionalization either by totality of all features (nature, population, and economy) or by one pre-dominantly based on the character of the economy.

The best known are the attempts of K.A. Arsen'yev (1818,1848), P.P. Semenov-Tyan-Shanskity (1871-80), D.I. Mendeleyev (1893, and then from census materials in 1897), and A.N. Chelintsev

(1910, 1916). Of great methodological interest was the article by N. P. Ogarev on questions of economic regionalization, published in *Moskovskiyae Vedomosti* in 1847. Also of great methodological significance is the classical work by V.I. Lenin, *The Development of Capitalism in Russia,* on questions of economic regionalization. The work showed the possibility and necessity of studying the economy of a capitalist country by regions and at the same time it gave a classical example of Marxist methodology by turning major attention to the singularities of the historical development of the country and its socio-political order.

As a whole, the pre-revolutionary works on regiona-lization made a great contribution to the geographic knowledge of our country and in addition helped to inject the principle of regions into the thinking of our geographers.

Our most outstanding geographers, beginning with V.V.Iockuchayev and ending with L.S. Berg, quite definitely stated that the task of geography is not to study individual components of the geographical environment only in their distribution but to study the inter-connections of these components in definite spatial combinations.

As early as 1912, A.A. Borzov wrote in his article "Geography" (in the *Practical School Encyclopedia).*

Geography is, consequently, a science of the earth's surface and deals not with its individual phenomena but with the totality, taking it as it is found in the various parts of the earth. In other words, geography does not deal separately with ores, plants, animals, or man and does not even study the prevalence of these individual phenomena–all this is the affair of other sciences. Geography examines the forms and landscapes into which all these phenomena are organized in the various places of the earth's surface, how soil, river and water basins as a whole, climate, plants, animals and man are inter-related in each locality, in each landscape and in what forms their influence on each other is expressed; it reveals the influence of an individual landscapes on another and tries to describe the kinds of landscape of which the surface of the earth is composed and to explain the life of each landscape individually as well as the law of their distribution and mutual influence.

During the Soviet period, economic regionalization has received a new meaning and a new significance. Formerly it was the major method of comprehensive geographic perception of territory, but under Soviet conditions, it became the necessary premise of planned development for the whole of Soviet economic planning. In the State Plan for Electrification of Russia (GOELRO), established according to the conception and plan of Lenin, who called it *the second programme of the party,* regionalization of the country was planned in connection with the plan for building electric power stations. Based on the transmission of electric current over a distance of not more then 300 to 400 kilometrs, regions were planned in such a manner that within each region there would be a correspondence between intake of electrical energy (from various sources) and output (for various needs).

This first draft of Soviet economic regionalization quite clearly reflected the characteristic features distinguishing it from the regionalization experiments of per-revolutionary time, namely:

1. a forward-looking nature, a concern with transfor-mation as well as understanding;
2. the conception of a region not as some "statistical homogeneity" but as an economic unit complete in itself (in this case according to the balance of electric energy).

In 1919 the work on economic regionalization was given over for completion to the section of regionalization in the Gosplan (State Planning Committee), which in 1921 drew up a projected economic regionalization scheme in which the USSR was divided into 21 regions. The report of the Sub-commission of the All-Russian Central Executive Committee, under the chair-manship of M.I. Kalinin, which examined this project, stated: A distinctive and, so far as possible, economically complete territory of the country must be set apart as a region and would represent one of the links in the chain of the national economy because of a combination of natural characteristics cultural traditions, and the specialized training of its populace for productive activity. This principle of economic completeness makes it possible to construct a project of economic development for the region that best utilizes all possibilities with minimum expenditures on the basis of a well-selected complex of local resources, capital values, and the general

state plan of the national economy. Other important results are achieved by insuring that regions specialize to a certain degree in those branches that can be most fully developed there and that the exchange between regions is strictly limited to the necessary quantity of expediently directed goods.

Thus, in the Gosplan project of 1921, a region was understood to be a productive territorial entity, which was so far as possible complete in itself (but not closed), with productive connections within it developed to a maximum extent, and with a specialization on an All-Union scale. In contrast to the regions projected in the experiments of pre-revolutionary regionalization schemes, a Gosplan region was thought of not as an area on a map and not as a totality of statistical indices but as an administra-tive-political unit with an organ of local power actively engaged in a struggle for the fulfilment of its share of assignments in the All-Union plan, actively transfor-ming its economy according to the planned specia-lization assigned to it by the center and linking all other branches of its economy with his major specialization. A region in the Gosplan conception must not only be homogeneous, as demanded in pre-revolutionary regionalization systems, but, as a general rule, very heterogeneous; for the most complete industrial combine can be obtained most easily from a combination of heterogeneous parts that complement each other.

A region as an industrial territorial complex with a specialization on an All-Union scale is not only a necessity but also a basic principle of regional development. Each of our regions must develop in such a manner that its economy can become more comprehensive, due to more complete utilization of its resources, and as self-sufficient as possible.

The Gosplan definition of a region contains not only the law of its development but also methodological directions on how this region must be studied and how to draw up and interpret its character. In its time, the 1921 Gosplan project of economic regionalization, which provided a complete and clear methodology linking theory with practice, caused a great deal of methodological and factual literature to be published. The economic-geographic literature connected with GOELRO (State Commission on Electrification of Russia) and the Gosplan project of 1921, together

with related works, created a Soviet regional approach that replaced the sectoral-statistical approach. The new approach was accepted by the Party and government in its resolution of 16 May 1934, and in the resolution of the Presidium of the Committee on Courses in Higher Institutions of Learning and Higher Technical Schools of 14 July 1934, "On the Teaching of Geography in Higher Schools of Learning and Higher Technical Schools". In accordance with these resolutions, the entire content of instruction in economic geography in secondary and higher schools of learning was reorganized.

In the process of the work on economic regionalization all knowledge of our territory had to be re-examined when questions were to be solved concerning the network of districts, the borders, and the choice of a center for each district.

Questions on economic regionalization were also posed at the Twelfth party Congress and at the fifteenth through twenty-first congresses; a fact that clearly shows the great significance attached to these questions by the supreme organs of our country. Questions on the rational distribution of industry and agriculture were ranked first in the political report of the Central Committee of the All-Union Communist Party at the Sixteenth Party Congress.

It must be said that the economic geographers, for example N.N. Kolosovskiy, made a great contribution to economic regionalization, rational distribution of the economy, and other practical questions of economic development.

Detailed large-scale investigations of the land, especially of a comprehensive economic-geographic nature, that were conducted as a result of the practical requests emanating from socialist construction of the economy had a great methodolo-gical significance for the development of Soviet economic geography. The economic geographers who formerly used secondary materials in the form of statistical information by large administrative units (by oblast), could now in these expeditionary investigations collect in the field the necessary material with the required detail. Large-scale field work was thereby initiated in economic geography making it possible to discover the regularities not evident in small-scale studies of the literature and statistical tables. Field investigations bring the geographer face to face with nature, with

the map, with the appearance of correlations, with conditions at the micro-scale, and thereby help to strengthen the geographic elements of economic geography.

Socialist economies, having separated land from the realm of private property, also create a demand for economic maps, including large-scale maps that under our conditions have the same function as the plan had under capitalistic conditions. Field preparation of large-scale economic maps, which no one had previously even thought about, has received an impetus from the works on the detailed study not only of agriculture but also of drainage and irrigation, and of improvement and development of paved roads. The development of economic cartography, especially on a large scale, connected with the field collection of data contributes even more to strengthening the geographic elements in economic geography and is of great methodological significance. A large-scale economic map plotted in the field fixes the distribution of natural conditions, population, and economy fully, exactly, and to a degree of detail unavailable in textual description. Such an economic map thereby compels the economic geographer to transfer his main emphasis from describing a distribution to explaining it.

Formerly economic geographers could succeed by empirically describing where something could be found, thereby considering their work finished. Now, however, with the appearance of such economic maps it is impossible to limit distribution to a bare description. Stimulating economic geography to explain the distributions on a large-scale economic map by the fullness and detail of portrayal simultaneously helps to point out the pertinent material. In addition, in the process of drawing up economic maps, methodological questions and needs in economic geography arise, and sometimes their solution is hastened. One such problem involves the typology of industrial types of agriculture.

All of the above-mentioned factors economic regionalization under conditions of a planned socialist economy, the rational distribution of industry, the correct regional specialization of agriculture and consolidation of subregions, and the large-scale economic cartography connected with it–greatly stimulates the development of economic geography and raises and expands the

demand for economic-geographic knowledge. The principal distinguishing features of Soviet economic geography, with regard to the way it has been shaped by the enumerated factors, can be formulated as follows: First its activity and close connection with the practice of socialist construction of the economy; the influence of socialist requirements and the dissatisfaction with bare statements of what is where; the desire for an exhaustive explanation on a Marxist-Leninist basis; the establishment of regularities making it possible to establish standards; and the scientific determination of further development plans for each region, large and small. Second, the characteristic feature of Soviet economic geography is its comprehensiveness and, at the same time, its concrete and detailed nature, which is achieved by field investigations and the mapping of the territory. Third, and inseparable from the first two, is the ever-growing technical training of our economic geog-raphers, which is necessary in order to understand more fully the geography of production and to plan the future more correctly.

Under Soviet conditions, both people and occupations grow in conformity with the tasks put upon them by our great era. Therefore, in spite of all kinds of survivals from the past in our discipline, there is no doubt that Soviet economic geography will in coming years be equal to the demands put upon it by our socialist development.

The Sectoral-Statistical Approach

One must also bear in mind that these various "orders" to financial statistics and commercial geography are not divided by some kind of barrier. They have influenced and penetrated one another and created something with a common nature. It is possible to train simultaneously an official, a merchant, and a military man. Elements of economic geography initiated by various demands have somehow united and become part of general education.

The majority of courses of economic geography that have evolved from financial statistics or commercial geography have retained traces of one approach. In these courses of a so-called traditional or sectoral-statistical approach, prime attention characteristically is given not to separate regions of a country but to individual sectors of the economy. The object of study is not

the territory itself but the economy in this territory, not as a whole but by individual sectors.

Economic geography in works of this sectoral-statistical approach is treated as the science of the state of individual sectors of the economy. The economy here is thought of as split into separate sectors, and each chapter is a description of the state of a given sector at a given moment in a given country, but the question of the distribution of this sector and the geography of production is only one of many and diverse interests guiding the author. Technology, history, and economic policy of the government in relation to the economic sector are all treated in the form of endless numerical references and enumeration, and only within all this is there also found some treatment of distribution. However, a minimum of space is given to questions of distribution, and even then the treatment of these questions is for the most part limited to simple references such as where a given industry is located and in what quantity, without explaining the reasons for the distribution.

It is in such consolidated and somewhat modified form–sectoral-statistical economic geography–that these two approaches (financial statistics and commercial geography) exist to this day. Both as financial statistics and as commercial geography, economic geography remained pure description without any inherent regularities, without a real scientific foundation. Economic geography in both these forms is better considered as simply a kind of somewhat dull literature rather than a science. If in these surveys there were some valuable generalizations with respect to science, it was not due to the method but in spite of the method; it was due to the personal talent of the author. The scientific thought of economic geography did not progress within economic geography itself but in disciplines allied to it, or simply in an amateurish way when scientists of other fields for some reason were temporarily interested in questions of economic geography and contributed some valuable thoughts as was the case with Lomonosov and later Mendeleyev.

Commercial Geography

Another impetus for the development of economic geography was the development of trade relations that followed

the era of great discoveries. In the course of the sixteenth, seventeenth and eighteenth centuries there occurred a tremendous expansion of seaways and a corresponding development of transoceanic trade by the leading Western European countries. Earlier the range of European sea trade was limited to the North by the North and Baltic seas, to the South by the Mediterranean Sea. The farthest expeditions within these limits were those between the Mediterranean and North Seas. Beginning with Vasco de Gama and Columbus, little by little, routes were discovered around Africa to India, then from Europe across the Atlantic Ocean to America and, finally, to the islands of the Pacific Ocean. Thus, the range of trade grew greatly, crossed national boundaries and took on an international character. This basic fact could not but affect the demands life placed on economic-geographic knowledge.

Actually, in small trade conducted on a local scale there is no need for any special science for the training of agents. Imagine a trade establishment under prerevolutionary conditions in a village that has a trade consisting of two kinds of operations: on the one hand, buying up local agricultural products and on the other hand, selling city goods such as cloth, ready-made clothes, utensils, and agricultural equipment. What knowledge must a man have who performs trade operations of this type and at this scale? He must know the volume of supply and demand within the limits of his trading sphere, that is, where and when he must buy up the surplus of local agricultural production and the dimension, composition, and season of demand for city goods. His whole scope may be limited to one or two districts. No special science would be needed; since he could get all the necessary information personally. It is quite different when the market widens and even extends beyond national borders. Crossing state borders we find different trade conditions. There are new measures of goods, new monetary systems, special trade rights, new legal procedures, and custom duties. The situation is completely different: quite different natural conditions, other trade customs, approaches, and so forth. To study all the diversity of trade conditions, the whole assortment of goods, and, finally, to study where to buy cheaper and where to sell at a higher price within the framework of the

whole world is already a science that demands special studies, a special literature, an special schools.

Just as the interests of the police state gave rise to the demand for educated officials and brought financial statistics to life, so the interest of a trade extending to international dimensions gave rise to the large-scale demand for educated merchants and business agents and resulted in the creation of commercial geography. Here again, there is clearly a transition from quantity to quality.

What then must be the scope of geographic knowledge demanded of an educated merchant as distinguished from the scope of knowledge demanded of an educated officials? An educated official could largely limit himself to information within the boundaries of his country, but the interests of an important merchant extended over the whole world, and included various countries with completely different natural conditions. Therefore, interest in natural conditions increased.

In order to systematize this entire mass of diverse trade knowledge, it is necessary to understand why in one country one can buy such products as sugarcane, coffee, or cocoa, and in another, fur or lumber; it is indeed necessary to have some geographic knowledge. This cannot be done through mechanical cramming of price-lists, reference books, or dictionaries. This knowledge must contain a great deal of geography, including physical geography.

On the other hand, those sections of financial statistics that dealt with governmental organization, finances, army, navy, and diplomatic relations, information that the official needed, where of less interest to the merchant. Thus, the structure of this kind of course changed considerably and was no longer financial statistics but commercial geography; many chapters became superfluous, but the number of countries studies rose, attention to natural conditions, geographic elements, and foreign trade increased. A characteristic feature of textbooks on commercial geography, especially English ones, was the special attention given to a detailed analysis of foreign trade (by countries and commodities). Thus, in addition to financial statistics (and often together with it), commercial geography was created. This was the time of growing capitalism, when it was still opposed to autocratic

monarchical power, when the ideology of the bourgeoisie was in its youth, and its ideologists still believed that the new bourgeois economic order was bringing harmony and universal happiness to mankind. It was assumed therefore that the less there was of official pressure and regulation, the sooner this harmony and general happiness would be established on the earth. This was the time of the dominance of the theories of "laissez faire, laissez passer," a time when one was inclined to look upon the government as a night watchman, and the young bourgeoisie wanted to limit its functions to the preservation of security while preventing its enterference in the economy. Hence one can understand the somewhat disdainful attitude of the leading bourgeoisie and its ideologists toward government and its functions, toward the officials and the knowledge the they needed.

If one says that a merchant is most interested in where to buy cheaply and sell dearly, one is basically correct. This is his main interest and to a considerable degree it predetermines the content of courses in commercial geography. In commercial geography there is surprisingly little or no discussion of the general characteristics of the economy. There are chapters discussing the general character of agriculture and of industry, but the discussion is for the most part limited to strictly tangible branches such as wheat or rye production. Why? It is, quite simply, that agriculture is not traded, but wheat and rye are; and these practical mercantile interests influence to a considerable degree the content of courses in commercial geography. The same preponderance of mercantile interests compelled the inclusion of reference information useful to the merchant, especially that concerning the science of staple commodities, in the courses in commercial geography. Commercial geography in its more practical forms is quite close to a descriptive science of staple commodities in their geographic aspects. And often scientists concerned with staple commodities undertook instruction in commercial geography.

In order to conduct trade, one needs more than a mere knowledge of where to buy cheaply and sell dearly; even for commercial capitalism it was of interest to know the conditions of police security in the country where one traded and that is why merchants were interested in law and order in foreign countries.

Another demand on geographic knowledge, in addition to that of an economic geographical order, is the demand for a knowledge of military defense. In this respect the information on the size of the army and military equipment is of prime importance, but this information does not exhaust the question. In order to judge the military strength of a country, it is necessary to know everything that enters into the idea of war potential; and this is a very broad idea, including not only war industries but the whole economy of the country and its concerete spatial manifestation. More than that, it is also important to know national policy, both domestic (including relationship of classes and parties) and foreign (including not only formal declarations but also interests). Thus it is clear how broad and diverse the demands are, from the military-defense point of view, on geographic knowledge, including economic-geographic.

After the period of trade capitalism came that of industrial and financial capitalism when the interest in foreign countries was no longer limited to just trade but included foreign capital investments, which in time acquired greater and greater significance. However, if one is interested in foreign countries not as a merchant but as a representative of financial capital looking for investment possibilities, then his interest in these countries is broader. All the natural resources of a country, of industrial as well as agricultural significance, are of interest: the levels of development of productive fores of the country; the levels of consumption of its population; also its labour skills and much else are of interest, and not only in general and on the average but in its spatial distribution and combination in the various parts of the country.

One will also want to know whether a revolution could occur that can cause him to lose everything he has invested. This is an interest of a very general order. It is natural, therefore, that present works of this kind include, together with all kinds of practical information that is frequently quite general detailed and more or less specific descriptions on individual countries. This the interests of a modern merchant or financial man with respect to foreign countries can be rather broad and extend far beyond the framework of a single reference book about where and what to buy more cheaply and where and what to sell more dearly.

INDUSTRIAL LICENSING POLICY

With the introduction of the New Industrial Policy (NIP) in 1991, a substantial programme of deregulation has been undertaken. Industrial licensing has been abolished for most items. In August 2008, the Department has also taken a decision to remove the licensing requirement under the Industries (Development & Regulation) Act, 1951 for location of industries. As a result, now the Industrial licensing is required in the following cases only:

(a) for manufacture of an item under compulsory licensing.

(b) when an item reserved for small scale sector is intended to be manufactured by an undertaking. Presently Industrial licensing is required only for the following 5 industries related to security, strategic and environmental concerns:
- distillation and brewing of alcoholic drinks;
- cigars and cigarettes of tobacco and manufactured tobacco substitutes;
- electronic aerospace and defence equipments all types;
- industrial explosives including detonating fuses, safety fuses, gun powder, nitrocellulose and matches;
- Specifies hazardous chemicals i.e. (i) Hydrocyanic acid and its derivatives, (ii) Phosgene and its derivatives and (iii) Isocyanates & disocyanates of hydrocarbon, or else where specified example Methyl isocyanate.

Industries not covered under compulsory licensing are required to file an Industrial Entrepreneurs Memorandum (IEM) to Secretarial for industrial Assistance (SIA), provided the value of investment on plant and machinery of such unit is above Rs. 10 crore.

A significant number of industries had earlier been reserved for public sector. The policy has been liberalised progressively and presently the areas reserved for the public sector are : (a) atomic energy; (b) the substances specified in the schedule to the notification of the Government of India in the Department of Atomic Energy number S.O.212(E), dated the 15th March, 1995, and (c) railway transport. The Government continues to provide

protection to the small scale sector, interalia, through the policy of reserving of items for exclusive manufacture in the small scale sector. Recently Micro, Small and Medium Enterprises Development (MSMED) Act 2006 has been enacted by the Government. In this Act, investment limit for Micro Enterprises, Small Enterprises and Medium Enterprises have been prescribed as Rs. 10 Lakh, Rs. 5 crore and 10 crore respectively. Industrial undertakings other than the small scale industrial undertakings engaged in the manufacture of items reserved for exclusive manufacture in the small scale sector are required to obtain an industrial license and undertaken export obligation of 50 per cent of their annual production. However, the condition of licensing is not applicable to such industrial undertakings operating under 100% Export Oriented Under takings Scheme, the Export Processing.

ZONE AND THE SPECIAL ECONOMIC ZONE SCHEMES

Foreign Direct Investment (FDI)

Foreign Direct Investment (FDI) is a means to supplement domestic investments and bridge the investment-savings gap. The role of FDI in the upgradation of technology, skills and managerial capabilities is now well accepted. Additional investments over and above the investments possible with the available domestic resources help in providing much needed employment opportunities. Government has put in place a liberal and investor-friendly policy for FDI under which FDI up to 100% is permitted under the automatic route in most activities/sectors. The policy on FDI is reviewed on an on going basis. Initiatives in policy liberalization during the past two years include enhancement of FDI cap in domestic airlines, telecom services, permitting FDI in FM Radio broadcating and other procedural simplification measures.

Review of the FDI policy is a continuous ongoing process. During the year 2007-08, the policy was reviewed and the following measures notified: Change of route : Credit Information Companies : FDI +FII has been allowed up to 49% investment by Registered FII under PIS will be limited to 24% only in the CICs listed at the Stock Exchanges with the overall limit of 49% foreign investment

through FIPB route for Credit Information Companies. FII investment will be subject to the conditions.

(a) No single entity should directly or indirectly hold more than 10% equity;

(b) Any acquisition in excess of 1% will have to be reported to RBI as a reporting requirement;

(c) FIIs investing in CICs shall not seek a representation on the Board of Directors based upon their shareholding.

Commodity Exchanges: FDI+FII has been allowed up to 49% investment by Registered FII under PIS will be limited to 23% and investment under FDI scheme limited to 26% through FIPB route for Commodity Exchanges subject to the conditions that:

- FII purchases shall be restricted to secondary market only;
- No foreign investor/entity, including persons action in concert, will hold more than 5% of the equity in these companies.

Industrial Parks : FDI has been allowed 100% on the automatic route in Industrial Parks both setting up and in established Industrial Parks. Subject to conditions in Press Note 2(205) applicable for construction development projects would not apply provided the Industrial Parks meet with the under mentioned conditions:

(i) It would comprise of a minimum of 10 units and no single unit shall occupy more than 50% of the allocable area;

(ii) The minimum percentage of the area to be allocated for industrial activity shall not be less than 66% of the total allocable area.

Civil Aviation Sector

(i) Airports :

(a) FDI has been allowed up to 100% on the automatic route in Greenfield projects subject to sectoral regulations notified by Ministry of Civil Aviation;

(b) FDI has been allowed up to 100% on FIPB route beyond 74% in Existing projects subject to sectoral regulations notified by Ministry of Civil Aviation.

(ii) Air Transport Services including Domestic Scheduled Passenger Airlines; Non-Schedules Airlines; Chartered Airlines; Cargo Airlines; Helicopter and Seaplane Services:

(a) FDI has been allowed up to 49% (100% for NRI Iinvestment) on automatic route in scheduled Air Transport Services/Domestic Scheduled Passenger Airline subject to no direct or indirect participation by foreign airlines and sectoral regulations.

(b) FDI has been allowed up to 74% (100% for NRIs investment) on automatic route in Non-Scheduled Air Transport Service/Non-scheduled airlines, Chartered airlines, and Cargo airlines subject to no direct or indirect participation by foreign airlines in Non-Scheduled and Chartered airlines. Foreign airlines are allowed to participate in the equity of companies operating Cargo airlines. Also subject to sectoral regulations.

(c) FDI has been allowed up to 100% on automatic route in helicopter Services/Seaplane services, requiring DGCA approval subject to foreign-airlines are allowed to participate in the equity of companies operating helicopter and seaplane airlines. Also subject to sectoral guidelines.

(iii) Other Services under Civil Aviation Sector

(a) FDI has been allowed up to 74% (100% for NRIs investment) on automatic route in Ground Handling Services subject to sectoral regulations and security clearance.

(b) FDI has been allowed up to 100% on automatic route in maintenance and repair organizations; flying training institutes; and technical training institutions.

Petroleum & Natural Gas Sector

(a) FDI has been allowed up to 49% in case of PSUs on FIPB route and 100% in cse of Private companies on automatic route in Refining Sector subject to sectoral policy and no divestment or dilution of domestic equity in the existing PSUs.

(b) FDI has been allowed up to 100% on automatic route in other than refining and including market study and formulation; investment/financing setting up infrastructure for marketing in Petroleum & Natural Gas Sector subject to sector regulations issued by Ministry of Petroleum & Natural Gas.

MINING OF TITANIUM BEARING MINERALS AND ORES

FDI has been allowed up to 100% on automatic route in mining and mineral separation of titanium bearing minerals and ores, its value addition and integrated activities subject to sectoral regulations and the Mines and Minerals (Development & Regulation) Act, 1957 and the following conditions :

(i) Value addition facilities are set-up within India along with transfer of technology

(ii) Disposal of tailing during the mineral separation shall be carried out in accordance with regulations framed by the Atomic Energy Regulatory Board such as Atomic Energy (Radiation Protection) Rules 2004 and the Atomic Energy (Safe Disposal of Radioactive Wastes) Rules 1987

The details of present FDI policy are as under :

POLICY ON FOREIGN DIRECT INVESTMENT (FDI) (31st March 2008).

I. Sectors prohibited for FDI

i. Retail Trading (except single brand product retailing)
ii. Automic Energy
iii. Lottery Business
iv. Gambling and Betting
v. Business of chit fund
vi. Nidhi Company
vii. Trading in Transferable Development Rights (TDRs)
viii. Activity/Sector not opened to private sector investment

FOREIGN INVESTMENT IMPLEMENTATION AUTHORITY

Foreign Investment Implementation Authority (FIIA) was established in the Department of Industrial Policy and Promotion,

Ministry of Commerce and Industry, vide Notification dated 9.8.1999, to facilitate quick translation of Foreign Direct Investment (FDI) approvals into implementation, provide a proactive one stop after care service to foreign investors by helping them obtaining necessary approvals, sort out their operational problems and meet with various Government agencies to find sulutions to problems of investors.

FIIA conducts regular interactions with investors of specific regions or countries. In these meetings of FIIA, apart from government of India, senior officials from State governments also participate. Apex industrial associations, viz. CII, FICCI, ASSOCHAM, are actively associated. In the series of country-specific meetings, DIPP held two FIIA meetings on 22.2.2008 and 26.5.2008 to resolve issues of German Investors and Korean Investors respectively. In addition, a meeting with representatives from JCCII & JETRO and Department of Revenue (CBEC) was held on 31.7.2008 to resolve the issues regarding refund claims of Japanese companies operating in India. During the year 2007-08, meetings were held ti discuss issues pertaining to setting up of an integrated Steel Plant with a capacity of 12 MTPA by POSCO in the State of Orissa. Apart from the above, Periodical meetings were also held to discuss the issues relating to the expansion project of MCC PTA India Pvt. Ltd. at Haldia, West Bengal, the setting up of the proposed newsprint plant by UPMKymmense Corpn. Finland in Maharashtra and the issues of Oracle Corporation seeking to acquire 100% stake in India's i-flex.

E-BIZ Project

The Department has undertaken an eBiz Project, which is among the Mission Mode Projects under NeGP. The objectives of setting up of the e-Biz Portal are to provide a number of services to business users covering the entire life cycle on their operation. The project aims at enhancing India's business competitiveness through a service oriented, event-driven G2B interaction.

The project involves setting up a comprehensive and integrated portal with services across central, state and local governments, that address all the needs of the businesses and Industries. Nine Central Government Ministries/Departments/Offices and five State Governments (Haryana, Tamilnadu, Andhra, Maharashtra and

Delhi) have been included under the Pilot Phase of the Project. At present, the Department is in the process of finalization of the tender documents (RFP) in consultation with stakeholders of the project.

The project will be for duration of 10 years. The pilot phase of the project will be completed within one year from the date it takes off and will provide 29 services at all three levels as indicated above. Subsequently the project will be expanded in the next 2 years throughout the country and cover all the services required by business houses. Finally, during the last 7 years of the project, it will be operated in a public-private partnership (PPP) mode with suitable arrangements for revenue sharing.

INDUSTRIAL CORRIDOR PROJECT

In pursuance of MoU signed between Government of India and Government of Japan during Hon'ble PM's visit to Tokyo in December 2006 to promote investments and explore opportunities for mutual cooperation, Union Cabinet had approved in principle the project outline of Delhi-Mumbai Industrial Corridor (DMIC) on 16th August, 2007. The DMIC seeks to create strong economic base with globally competitive environment and state-of-the-art infrastructure to activate local commence. Enhance foreign investments and attain sustainable development.

Delhi-Mumbai Industrial Corridor is proposed to be developed as a Model Industrial Corridor of international standards with emphasis on expanding the manufacturing the services base and develop DMIC as the 'Global Manufacturing and Trading Hub'. The project aims at doubling the employment potential, tripling the industrial output and quadrupling exports from the region, all within five years.

The project region of DMIC covers parts of Uttar Pradesh, Haryana, Rajasthan, Gujarat, Maharashtra and Madhya Pradesh. It is proposed to develop the project in two phases. In the Phase-I of the project (2007-2012), six investment regions and six industrial areas are proposed to be developed. Rs. 330 Crores has been allocated for the project under the 11th Five Year Plan. Another 12 nodes have been identified tentatively for development in the Phase II (2013-2018) of the project. With the objective to create

interest in private players in the DMIC Project, it is proposed to initiate work on three to four readily available and strategically important early bird infrastructure projects in each note. In Order to give overall guidance, planning and approvals, an Apex Monitoring Authority for DMIC Project was set up on 11th September 2007 with the Finance Minister as Chairperson, Union Ministers/Dy. Chairperson, Planning Commission/Chief Ministers of six States as Members.

Delhi-Mumbai Industrial Corridor Development Corporation (DMICDC), the central SPV, was incorporated on 7th January, 2008 with authorized equity base of Rs. 10 crores with initial equity structure of GOI 49% and Financial Institutions (IL&FS and IDFC): 51%. DMICDC will be coordinating execution of various tasks under the guidance of Apex Monitoring Authority, arrange financing, and provide advisory services for successful project implementation. DMICDC will have a revolving Project Development Fund of Rs. 1000 Crores contributed equally by Government of India and Government of Japan for master planning, project report preparation, technical studies/reports, etc. for the entire DMIC region as well as for individual investment nodes before they are bid out to successful private developers. In the first meeting of Board of Directors held on 28.1.2008, M/s IL&FS Infrastructure Development Corporation Limited (IIDC) was appointed as Project Management Consultant (PMC) to DMICDC. The Department has also initiated action for preparation of Concept Paper for the Chennai-Bangaluru-Mumbai Industrial Corridor Project on the lines of DMIC Project.

INVESTMENT PROMOTION & INTERNATIONAL COOPERATION (IP&IC)

The Department acts as a nodal point for bilateral Joint Commission Meetings (JCM) between India-Hungary, India-Libya, India-Sweden India-Poland and India-Belarus for promoting industrial, scientific, technical and scientific corporation with these countries namely Sweden, Poland, Hungary, Libya and Belarus. In order to promote bilateral/Industrial cooperation and to attract inflows of foreign direct investment into India, the Department extends financial support under the IC&JV Plan scheme to various

industrial organizations like CII/FICCI/ASSOCHAM etc. to organize seminars/workshops/road shows both in India and abroad. The Department also participates in the Joint Business Councils and other interactive sessions organized by the industry organizations.

Several foreign Government/Business delegations visit India and hold discussions with the Department for strengthening industrial cooperation. Indian delegations also hold discussions with foreign countries for investment promotion and industrial development in India. Major Investment Promotion events/ Conferences/Joint Commission Meetings during 2007-08.

The 3rd India-GCC Industrial Forum : The 3rd India-GCC Industrial Forum was organized in association with CII and FICCI in Mumbai from 29-30 May 2007. Commerce & Industry Minister headed the Indian delegation while Ministers and officials, including business delegation participated from GCC Status. Plenary sessions were held in five sectors of mutual interest to India and GCC states viz. Opportunities for investment, Opportunities in Real Estate Development, Opportunities in Energy cooperation-Oil, Gas and Power, Opportunities in Infrastructure sector and Opportunities in petrochemicals sector. The Mumbai Declaration adopted at the conclusion of the forum included setting up of a holding company from the collective funds of India and the GCC States, with private and public participation, that would work towards promoting Small and Medium Enterprises in both India and the GCC States. The 10th session of the Indo-Libya Joint Commission Meeting : The 10th session of the Indo-Libya Joint Commission Meeting was held in New Delhi on 12th July 2007. The objective of the meting was to increase the level of cooperation in various fields such as telecommunication, power, shipping, civil aviation, railways, hydrocarbon, trade and investment, banking and finance, etc.

23rd India Economic Summit-December 2-4, 2007 at New Delhi : The Department collaborated with CII and World Economic Forum as Summit Partner in organizing the 23rd India Economic Summit from 2-4 December 2007 at New Delhi. Over 600 business and government leaders from India and abroad participated along with other key stakeholders to debate important issues relevant

to the country's growth agenda. This year's edition of the India Economic Summit explored in depth the many facets of the country's economy to identify the opportunities and challenges facing the business, apart from new focus on the exciting opportunities offered by Indian States and the impact of global risks in the Indian economy.

Partnership Summit-2008 : The Summit was held at Gurgaon in January 2008. Haryana was the partner state. Meeting was attended by Trade & Industry Ministers/Officials of about 19 countries in addition to business delegations.

WEF 2008 : World Economic Forum (WEF) was held in Davos in January 2008. The principal theme of the Annual Meeting was "The Power of Collaborative Innovation". It was attended by Union Commerce & Industry Minister and Secretary (IP&P), who besides addressing the forum and other meetings on the sidelines, also met CEOs of multinational companies.

Second meeting of the India-Russia Forum on Trade and Investment : The second meeting of the India-Russia Forum on Trade and Investment was held in New Delhi (February 12-13, 2008). The Forum was addressed by the Russian Prime Minister Mr. Victor A. Zubkov. A high level Indian and Russian delegations comprising of senior officials and prominent business leaders were led by Mr Kamal Nath, Commerce & Industry Minister, Government of India and Mrs. Elvira. S. Nabiullina, Minister of Economic Development & Trade of the Russian Federation respectively. A Protocol for Cooperation was signed for enhancing bilateal investment, deepening trade engagement and to widen strategic partnership between India and Russia. Both sides also agreed to set up a CEO Council with a view to strengthen economic relations between the two countries. The main events likely to be held or having participation of the Department during 2008-09 are JCMs with Hungary, Libya and Belarus, 3rd meeting of Indo-Russia Trade and Investment Forum, India Economic Summit, WEF, Partnership Summit etc.

INDUSTRIAL SCENARIO

The industrial growth rate during 2007-08 has been 8.3% as per CSO's Index of Industrial Production (IIP) (Base 1993-94-100).

The manufacturing sector, which has a weightage of about 80% in the IIP recorded a growth of 8.8%. Following table provides the Sectoral growth profile of industry. From a use-based perspective, capital goods, sector emerged as the most buoyant sector and registered a double-digit growth of 16.9% in 2007-08. Capital goods had earlier also posted a double-digit growth during 2005-06 and 2006-07. Within the consumer goods sector, non-durables segment posted increase of 8.5%. The good performance of the capital goods sector is an indicator of future industrial growth. Disaggregated industrial profile depicts that out of 17 groups in the manufacturing sector, 16 groups registered positive growth rates. In particular, 8 industry groups showed growth rates of 10% and above which includes beverages & tobacco products (growth rate 12.0%), basic metals & alloys (12.1%), other manufactures (19.8%), Jute and other vegetable fibre textiles (33.1), Wood & wood Products & furniture & fixtures. (40.5), Leather & fur Products (11.7), Basic chemical & chemical Products (10.6), Machinery & equipments (10.4).

Performance of Six Core Infrastructure Industries : Performance of six core industries (i.e, electricity, crude petroleum, petroleum refinery products, coal, steel and cement, with combined weightage of 26.68 per cent in the IIP) is considered as an indicator of the economic health of the economy.

8

Geography and Agricultural Economics

Around ten to twelve thousand years ago, human began to domesticate plants and animals for food. Before this first agricultural revolution, people relied on hunting and gathering to obtain food supplies. While there are still groups of hunters and gatherers in the world, most societies have switched to agriculture. The beginnings of agriculture did not just occur in one place but appeared almost simultaneously around the world, possibly through trail and error with different plants and animals or by long term experimentation. Between the first agricultural revolution thousands of years ago and the 17th century, agriculture remained pretty much the same.

In the seventeenth century, a second agricultural revolution took place which increased efficiency of production as well as distribution which allowed more people to move to the cities as the industrial revolution got under way. The eighteenth century's European colonies became sources of raw agricultural and mineral products for the industrializing nations.

Now, many of the countries which were once colonies of Europe, especially those in Central America, are still heavily involved in the same types of agricultural production as they were hundreds of years ago. Farming in the twentieth century has become highly technological in more developed nations with geographical technologies like GIS, GPS, and remote sensing while less developed nations continue with practices which are similar

to those developed after the first agricultural revolution, thousands of years ago.

About 45% of the world's population makes their living through agriculture. The proportion of the population involved in agriculture ranges from about 2% in the United States to about 80% in some parts of Asia and Africa. There are two types of agriculture, subsistence and commercial. There are millions of subsistence farmers in the world, those who produce only enough crops to feed their families.

Many subsistence farmers use the slash and burn or swidden agricultural method. Swidden is a technique used by about 150 to 200 million people, and is especially prevalent in Africa, Latin America, and Southeast Asia. A portion of land is cleared and burned to provide at least one and up to three years of good crops for that portion of land. Once the land can no longer be utilized, a new patch of ground is slashed and burnt for another round of crops. Swidden is not a neat or well-organized method of agricultural production by it is effective for farmers who don't know much about irrigation, soil, and fertilization.

The second type of agriculture is commercial agriculture, where the primary purpose is to sell one's product at market. This takes place throughout the world and includes major fruit plantations in Central America as well as huge agribusiness wheat farms in the Midwestern United States.

Geographers commonly identify two major "belts" of crops in the U.S. The wheat belt is identified as crossing the Dakotas, Nebraska, Kansas, and Oklahoma. Corn, which is primarily grown to feed livestock, reaches from southern Minnesota, across Iowa, Illinois, Indiana, and Ohio.

J.H. Von Thunen developed a model in 1826 (which wasn't translated into English until 1966) for the agricultural use of land. It has been utilized by geographers since that time. His theory stated that the more perishable and heavier products would be grown closer to urban areas. By looking at the crops grown within metropolitan areas in the U.S., we can see that his theory still holds true. It is very common for perishable vegetables and fruits to be grown within metropolitan areas while less-perishable grain is predominantly produced in non-metropolitan counties.

Agriculture uses about a third of the land on the planet and occupies the lives of about two and a half billion people. It's important to understand where our food comes from.

MARGINAL AND SMALL FARMS

By their numerical strength, the marginal and small farmers form the majority of cultivators in the country as a whole and in Tamil Nadu and Madurai district which form the universe for the present study. The pattern of size distribution of farms is similar-the predominance of marginal and small farms in both number and area operated by them. Compared to all India, their predominance is much greater for Tamil Nadu and Madurai district. This served the purpose of this study-namely to understand the scope and constraints for commercialization of the small farms and to identify the policy options therefore.

Data

The study is necessarily based on primary data, because the required information was not available with any source of secondary data. Therefore, a sample of 200 farms was selected in Madurai district by a three stage random sampling method-the stages being CD blocks, villages and farms and by distributing the sample among the villages in probability proportion to the number of farms in each village to the total number of farms in all the 20 sample villages in five C.D. blocks. These sample farms were post-stratified into three size groups based on this operational area viz., small (< = 2 ha); medium (2-4 ha) and large (>4 ha). By definition therefore, small group included marginal farms and the large group included medium farms and the group of semi-medium in the secondary data corresponded to the medium size group of the sample.

The distribution of sample farms among the size groups and area operated by them. The striking similarity between the primary and secondary data for Madurai district in the percentage share of operational area of the three size groups in the total area of all the farms cannot be missed. Consequently the average size of operational area of a farm is 1.15 ha in the sample and 1.14 ha in the data for the district. Thus the sample is adequately representative of the district and allows generalisation of the results.

In all the size groups, average area of the farm was closer to the lower limit of the range rather than the upper limit.

Cropping Pattern

The concept of commercialization refers to the increasing share of the marketable surplus in the total farm business income of the farms. This share can be increased by (i) generation of more marketable surplus in subsistence oriented foodgrain crops; (ii) by increasing production of market oriented cash crops and other products (collectively known as high value adding enterprises) and (iii) both. An increase in foodgrain production through improvement in productivity of land and diverting area for the high value adding (HVA) crops or other enterprises will ensure food security and commercialization simultaneously. Therefore the cropping pattern of the farms will show the share of high value adding crops. Groundnut, onion, chillies, sugarcane and cotton are the value adding (cash) crops cultivated by the farmers of the district, while paddy, jowar and blackgram are the food crops raised by them. The share of the non-food crops in the gross cropped area of the farms. In the total gross cropped area of 297.05 ha, cash crops accounted for 64.03 ha (21.56 percent) only showing the farmer's preference to food crops-a sign of subsistence orientation. The share of the food crops in gross cropped area was as high as 90 percent in small farms as compared to 59.75 percent in large farms. Therefore commercialization through production of products for market (cash crops) was very small i.e., less than 10 percent in total area under cash crops. The large farms were just 12 (six percent) in the sample of 200 farms, but their share in area under the cash crops was 53.60 percent. Therefore the commercialization of agriculture would need attention to small farms, to encourage area under cash crops.

Productivity of Crops

The average productivity (in kg/ha) of the crops raised in the sample farms, for a comparative study. In jowar, bajra, blackgram and groundnut (rainfed crop), the small farms had the highest productivity. In other crops excepting sugarcane, the productivity of small farms was not significantly different from that in other groups. Only in sugarcane average productivity per hectare was

just 101 tonnes/ha as compared to 140 tonnes/ha on large farms. Therefore, productivity was not a serious constraint for commercialisation of small farms if the marketed surplus were not different for the size groups. By the time of enquiry (April '95) the sample farmers had completed the sale of crops raised in the previous years. Therefore their marketed surplus was estimated and expressed as percentage to total production.

It is readily seen that small farmers had the lowest percentage of marketed surplus in food crops, with only exception of blackgram, but they had 90 percent of GCA under them. The area under cash crops was just 10 percent but their marketed surplus was 100 percent with one exception of onion where it was 98.70 percent. The inference is that production in small farms is more subsistence oriented than market oriented. This is a constraint for their commercialization.

Livestock

The farmers maintained one or two cows/she-buffaloes, work bullocks, sheep and poultry birds. Income from livestock supplemented the income from crops. But the size of livestock depended upon the availability of family labour to attend them. As members of the family of small farms worked as wage earners off-farm and non-farm, the livestock maintenance was on a small scale and brought very little income to the farms. It was not a commercial activity. This can be seen in the source-wise income of the farms.

Farm Income

The income of the farm included income from crops (sale proceeds plus imputed value of produce retained by the family), livestock, off-farm income from wages earned by the members of the family going for work in other farms and income from other sources such as non-farm employment and property income.

In all the size groups, income from crops exceeded sixty percent, but it was least on small farms. Income from livestock was negligible (0.92 percent) on small farms, about 15 percent on large farms and 21.42 percent on medium farms. The small farms would be able to maintain livestock with the help of straw from grain crops that dominated the crop pattern, but they had not, largely

because members of the family went out to work on other farms as shown by the large (35.74 percent) wage income from such works. Large farms had very little family labour and therefore, their attention was mostly on crops and cows and poultry were maintained mostly to meet the home needs. It was the farms in the medium size group that had family labour which preferred maintaining livestock rather than going to work off-farm. Hence, income from livestock had a share of 21.42 percent of gross income, while off-farm wage income was just 1.40 percent. Other sources of income included non-farm employment of family members, properties and other miscellaneous sources. The share of this source increased that too very significantly as the farm size increased. Small farms were seen to be better than the medium farms in their operational efficiency as shown by the gross income/ cost ratio and net income. Then operational ability of the farmers is not a constraint for their commercialization.

Commercialization

In most of the recent literature, commercialization is approximated by the relative share of cash crops in the GCA. A more accurate measure of commercialization of farming (as opposed to commercialization of crop production)-especially in the context of a diversified agriculture including livestock and allied activities-is the percentage share of income from the sale of farm products in the total value of production. What did not enter the market would be retained for use on-farm and its value had to be imputed. The percentage value of farm products sold out to the total value of production was just 29.44 percent on small farms, while the value of retained products accounted for 70.56 percent, thus clearly revealing that small farms were subsistence oriented. In contrast, the share of sales in total value product was 61 percent on medium farms and 82 percent on large farms showing them to be largely market oriented. What would explain this situation? Opinion of the farmers was analysed and it revealed three major causes for their reservation on expanding area under cash crops and lack of interest in cultivation of high value adding horticultural crops such as vegetable, fruit and flower crops.

In seasonal cash crops which included groundnut, cotton, sugarcane and chillies, the non-availability of credit was the most

important constraint, followed by risk and unfavourable price. In livestock products of dairy, poultry and piggery, non-availability of credit and want of buyers (i.e., non availability of market outlet within their easy reach) were the reasons for limiting the size of those enterprises. In horticultural crops which included vegetables, fruits and onion, the need for making huge investments with production lag and the risk involved due to their bulkiness and perishability and also absence of market were the reasons reported by the farmers, as the constraints. The inability of the farmers to invest, reflected on the internal credit rationing, while their complaint of non-availability of credit would show the external credit rationing. Therefore, credit rationing and unfavourable market emerged to be the two major limiting factors for the commercialization of small farms. Interaction with officials of the commercial banks and Primary Agricultural credit Banks showed that they considered small farms as unviable units even for short term lending, not to speak of long term development credit. This statement was verified by analysing the ability of the farmers to repay the credit by comparing their income and expenditure levels and possible savings per annum.

Problem Focus

On an average the family of a small farm spent Rs. 10,380 per year, while it was Rs. 21,242 for medium farms and Rs 65,516 for the large farms. At this level of expenditure, there was little scope to reduce the consumption expenditure of a small farm family, which is neatly one half of the medium size group and one sixth of large farms. When this level of expenditure was compared with average annual income of the farms, small farm had only a negative saving, while medium and large farms saved nearly 10 percent and 19 percent of their income respectively. So, bankers are right that small farms were not viable for credit. Only way for making them viable was to increase their income. It should be further emphasised that any increase in income would be spent to increase consumption first rather than saving, because the marginal propensity to consume is 0.82 (estimated from the sample data).

Therefore income would have to raise much more than what was required to remove the presently seen negative savings. To allow for atleast five percent savings, the average income of small

farms should raise to Rs. 11,500. This was feasible with change in enterprise mix in favour of cash crops and improving productivity of the crops-both additional investment for which the average small farmer was not credit worthy. The problem is made more serious by two more facts. First majority among small farmers had farms smaller in size than the mean size, and thus they are problem farmers. Secondly, there was wide variation in net income from crops and the coefficient of variation of the net farm income was 18.10 percent. This might bring more farmers within the risk net and credit would have a low level of probability of recovery. Therefore a low income-low investment cycle exists and it sustains rural poverty. How to break this cycle and help a cumulative growth path to small farmers?

Policy Options

One way to break the cycle is to make credit available on the basis of prospective income or project based lending. The results of this study clearly show that commercialization of farming significantly contributes to the net farm income. Size of the farm was not a constraint for it; only capital rationing and market size were the real constraint. The crop pattern seen in medium farms are technically feasible and economically viable. Therefore alternate crop patterns may be identified and evaluated for their economic viability with the help of either partial budgets or linear programming technique to maximize aggregate net income of the farms. In the exercise, horticultural crops and allied activities may be the decision variables to be included. With the estimated costs and returns, plans with required level of savings may be identified and commended to the bankers. The advantage of this method is that the identified plans will win the confidence of both farmers and the lenders. Its major limitation is the cost and time involved in the exercise.

A second option is to encourage collective action such as group farming or cooperative farming, wherein farmers pool in their resources voluntarily to achieve larger scale of operation. Even medium size group farms were the net positive savers. Therefore, such a collective action is feasible. This is the approach suggested by Parthasarathy when he argues for alleviating poverty by a process of institutional reforms. Past experiences in

institutional reforms such as cooperatives, regulated markets and C.D. blocks place a heavy discount on this strategy. However, institutional reforms in the past were attempts to impose institutions on the farmers who never developed a sense of partnership in them. This weakness may be overcome by educating and guiding farmers to organise themselves rather than inviting them to join a sponsored institution. With this new approach, it is likely that cooperatives may emerge to be a practical way, of course with much of the present bureaucratic control discarded. It is of course a long term prospect. A third option is the marketisation of the farm sector, with continued subsidy on inputs to the marginal and small farmers. This is consistent with the New Economic Policy which places faith on liberalization and invisible hand. However, the basic condition for such a policy to succeed is the presence of perfectly or near perfectly competitive conditions in the market. Such a condition does not exist and it will take a very long time to integrate farmers into the system. The required process of adjustment will ruthlessly eliminate poor and less organised and institutional cannibalism may be inevitable and that makes the process both painful and antithesis of liberalization for social uplift of the weaker sections-one being the small farmer.

Therefore only a combination of the above options will succeed. It must be recognised that as a social group, farmers are averse to collective action, unless the provocation is very strong.

They also resist any imposition of institutions on them. However, if they have to survive in a liberalised economy, there is no alternative for an effective organisation for collective action. Only recently there is some sign of lobbying among farmers. Exploiting this trend, they should be helped to evolve their own organisation. This will be the real remedy to the small farmers' problems. Yet, they have to be helped with project based lending for joint borrowing by a group of small farmers. All these efforts would be cost effective if planning is from below.

Retail sales of organic food have been growing by about 20% annually since 1990. With the enactment of the USDA Organic Rule in October 2002, media and consumer interest in the topic have also grown. However, organic foods still comprise a small proportion of the total crop area and the total retail market. Sales

growth in some of the most intensively organic European countries is slowing. But fast or slow, continued growth raises questions regarding the productivity and sustainability of organic cropping systems.

CLIMATE CHANGE ON CROP PRODUCTION IN INDIA

Climate is one of the main determinants of agricultural production Through out the world there is significant concern about the effects of climate change and its variability on agricultural production. Researchers and administrators are concerned with the potential damages and benefits that may arise in future from climate change impacts on agriculture, since these will affect domestic and international policies, trading pattern, resource use, and food security.

The researchers are of the opinion that while crops would respond favourably to elevated CO2 in the absence of climate change, the associated impacts of high temperatures, changed pattern of precipitation and possibly increased frequency of extreme events such as drought and floods, would possibly combine to reduce yields and increase risks in agricultural production in several parts of the globe. In India agricultural production is often determined by the whims of nature. The climate Marginal and Small Farms change is expected to result in higher temperatures and rainfall. The higher expected temperature might lower the yields. However, at the same time, higher rainfall could enhance growing period of crops. Also the higher concentration of CO2 in the atmosphere under changed climatic conditions might act as aerial fertilizer and enhance crop yields.

All these factors have to be taken in to consideration while examining the climate change impact on agriculture. During the 1990s, researchers repeatedly claimed that global warming would have dire consequences for key crops. Professor Richer Adams, an agricultural economist says, "If you just take an agronomic model and make conditions hotter and drier, then, yes, crop yields go down." " But if you are a farmer, you see your crops aren't doing so well and plant a more resistant type. In India, climate change is expected to make an impact in agriculture, resulting in lower yields of crops. The objectives of this paper are to examine the

effect of fertilizer and labour inputs on crop productivity and to investigate the impact of climatic variables such as rainfall and temperature on crop production. Climate response functions have been estimated, using regression model by incorporating weather variables, in order to examine the impact of climate change on productivity of two crops. The impact of weather variables has been examined and the study is confined to two states.

Methodology

In a study Kaufmann R. K. and Seth E Snell (1997) had specified yield as a linear function of purchased inputs. For the purpose of analysis seed, fertilizer and labour inputs were considered in the regression model as explanatory variables and yield as the dependent variable. However, crop yield is affected not only by these purchased inputs but also by climatic variables and social factors. This integration allows complementing the earlier methodologies, which concentrate only on the purchased inputs and thereby, allows to better evaluating the adaptation strategy to climate change. The results show that climatic variables account for 19% of the yield change while the social variables account for 74% of the yield change.

Kavi Kumar and Parikh (2001) has also established a functional relationship between farm level net revenue and climatic variables, with a view to estimate the climate sensitivity of crop production in Indian agriculture.

To assess the impact of climate related variables and agricultural production in India, the present study has been undertaken. For this purpose, two crops viz. Rice and Jowar have been selected. These two crops are predominantly grown in monsoon season and any change in climate, particularly rainfall and temperature would effect the productivity of these crops significantly. In the present paper an econometric bio-model of crop production has been attempted. Agricultural production depends on not only climate related variables, but also on use of several factors like fertilizer, labour and other resources. For the purpose of present study, the following model has been used:

Y= f (F, HL, AR, NR, DFNR, MAXTEMP, MINTEMP)

Where,

Y= Crop yield on per hectare basis

F = Fertilizer used/ha.

HL = Human labour in hours/ha.

AR = Actual Rainfall (mm)

NR = Normal Rainfall (mm)

DFNR = Deviation from normal rainfall (mm. or %)

MAXTEMP = Mean maximum temperature during crop season (0C)

MINTEMP = Mean minimum temperature during crop season (0C)

The model was estimated for Rice and Jowar crops. The analysis was undertaken for the country as a whole, using state wise data for both these crops. The study was also undertaken using district wise data as well.

For Rice crop, the state of Orissa has been selected, because this is the main crop of the state. For Jowar, the state of Karnataka has been selected, because of it's significance in the region. Data on different variables for various states has been collected from the publications of Directorate of Economics and Statistics, Ministry of Agriculture, as well as from the Economics and Statistics Directorates of various states.

Similarly district-wise data has been primarily collected from the publications of these two state govts. Least square technique has been used to estimate different regression equations for the country as a whole as well as for both the states. Several forms of equations were analysed and results were computed. The analysis was done under usual assumptions. It has been hypothesized that productivity of the selected crops is positively influenced by the application of chemical fertilizers and human labour. These two are the main purchased inputs in the production of these crops. Climate, in the present model, has been approximated by rainfall – actual, normal as well as deviation from the normal. Other variables representing the climatic factors are mean maximum and mean minimum temperature in crop growing period. This has been further hypothesized that extreme variations in these variables such as excessive rain or scanty rain

and very high or low temperature would adversely affect the crop productivity in the selected states and districts for the selected crops.

Results and Discussion

In order to study the impact of climate change on productivity, regression equations were estimated using the model and data stipulated in the methodology. As already mentioned, earlier various forms of functions were estimated and out of these, linear form provided the best fit and therefore, only linear regression equations have been presented for Rice and Jowar crops for the country as well as both the selected states. For rice productivity and climate, using state-wise data for the country as a whole. Variable pertaining to fertilizer use, human labour, actual rainfall and temperature pertains to year 2000-01, whereas normal temperature consists of observations from a period of 30 years. Variation in the productivity of Rice. This implies that productivity of Rice on per hectare basis is influenced by these variables. Moreover, the fertilizer use variable had a highly significant coefficient, suggesting a significant impact of fertilizer use on productivity.

Surprisingly, the variables pertaining to actual rainfall and maximum temperature, during the growing period of the crop, had negative coefficient, implying that these two variables had negative impact on productivity. The mean minimum temperature had a statistically significant and positive coefficient, implying that this variable would effect the productivity of Rice positively.

Estimated regression equations for Rice crop and climate related variables, using data from various districts of Orissa state. Similar to the earlier analysis, results pertaining to the linear regression have been presented.

The results indicate that the variable of fertilizer use, normal rainfall, minimum and maximum temperature could explain 28% of variation in Rice yield. When actual rainfall variable was replaced by the deviation in the rainfall from the normal, the value of R2 dropped down to 7 percent, implying that the actual rainfall had better explanatory power, than that of deviation in rainfall from normal. Results also indicated that mean maximum and minimum

temperature could explain a larger part of variation in the Rice yield. Maximum temperature had a negative coefficient. It has implication that the increasing temperature would effect the productivity of Rice negatively, in the state.

The results indicated that the use of fertilizer variable has a negative impact on Jowar productivity, which is not correct on theoretical grounds. However, the human labour variable has a positive and statistically significant impact on Jowar productivity. The deviation from normal rainfall had negative impact on productivity. This implies that rainfall contributes significantly in raising productivity of Jowar, which is normally a rainfed crop. The mean maximum temperature, during the growing season of the crop had a negative implication for the crop, while the minimum temperature, during the same period, would effect the crop productivity positively. The R2 in all five selected equations are good and it's value ranges between 40% to 52%.

The rainfall during the crop growth period has also negative coefficient. Whereas mean maximum temperature will effect the crop positively. The results indicate that the effect of climate related variables have mixed effects on productivity of Jowar, as rainfall shows negative impact, while maximum temperature has a positive effect. However, for understanding the real effect of these variables on productivity of Jowar crop, a detailed study is required.

ECONOMICS OF VEGETABLE PRODUCTION

Tomato is the most important vegetable crop in the area. It was grown by 95.3 percent sample households and occupy 12.73 percent of total crop area. Share of tomato in total area under vegetable crops was about 40 percent. Size category wise input use, output and return from vegetable crops are studied by taking tomato as the representative crop.

Irrigated Farms

Tomato cultivation at irrigated farms shows that there was a mixed pattern in use of inputs related to farm size in various panchayats. Use of farm yard manure, fertilizers and family and total labour was higher at holdings above 2 acres compared to the holdings below 2 acres. Bullock labour use was higher at marginal

and small size holdings compared to other holdings. Expenditure on plant protection material was highest at the other farms in Dharot panchayat and at marginal farms in Deothi panchayat.

Conditions in Various Panchayats in Solan Block, 1992-93
Particulars Dharot Deothi Bhojnagar

Yield, total value of output and net return per acre were higher at the other farms in Deothi and Dharot, while in Bhojnagar small farms showed better performance compared to the other size categories. Input use and yield in Deothi and Dharot panchayats which have access to road was significantly higher compared to the sample farms in Bhojnagar located away from market and roadside. Net return from tomato production was many times higher in the villages located around roadside compared to the distant villages. Farm gate price realised by Deothi and Dharot farmers was 1.5 to 2.25 times the price of tomato obtained by Bhojnagar farmers.

Demand for offseason vegetables like tomato produced in Himachal Pradesh comes from outside states. Vegetable growers in Deothi and Dharot which are located around pucca road enjoy the advantage of transporting their marketable produce to markets in Delhi, Punjab and Haryana which fetches attractive price. The second reason for high price obtained by Deothi and Dharot farmers is the adjustment in crop growing season to get output in most tomato scarce period. Deothi farmers, who are in the business of vegetable production since long time, have almost perfected the technique of producing vegetables in offseason. On the other hand, Bhojnagar farmers have to carry the saleable output to a distance of 1-6 km involving steep slope; this causes heavy cost in terms of labour time and the net farm gate price reduces to quite low level. At the roadhead, the produce is purchased by private traders who operate there for few days when there is enough marketed output. Irrigated area in Bhojnagar is small and the output from this area is neither sufficient to attract private traders to buy it at the nearest roadhead nor it is economic for the producers to transport the produce to market. Therefore, irrigated farms also have to synchronise their crop production with the vegetable production in rainfed area-on which vegetables are produced in monsoon season. Thus the advantage of high price for tomato in

early season cannot be availed by the irrigated farms in the areas not having easy access to road or market.

Input use as indicated by cost A, and use of family labour in irrigated tomato crop was inversely related to farm size. Yield, value of output and net return per unit of area were significantly higher for marginal and small farms than for other farms. This shows that the production performance under irrigated conditions at the land holdings of the size below 2 acres is better compared to the other holdings.

Unirrigated Farms

Effect of infrastructure on productivity and profitability was quite sharp under unirrigated production also. Per acre value of output (TVP) of tomato in Kotho panchayat was Rs. 5 to 8 thousand higher compared to Bhojnagar, though yields were higher in Bhojnagar. The reason was that Kotho panchayat was located nearby the agricultural market in Solan town due to which Kotho farmers realised 50 to 120 percent higher farm gate price compared to Bhojnagar farmers.

Based on performance of tomato crop it can inferred that size of farm is not a constraint to diversify through offseason vegetable cultivation. Rather, under irrigated conditions performance of lower sized farms was better compared to higher sized farms. As we have observed earlier, there were large variations in crop intensity across farm size categories. In such situations production performance is better indicated by aggregate of all crops per unit of net cultivated area.

CROP ECONOMICS PER UNIT OF NET CULTIVATED AREA

Economics of aggregate crop production per unit of net cultivated area according to size classes is present. The estimates based on net cultivated area are better indicator of economic performance of aggregate crop production, as they take into account the difference in performance due to crop intensity. Per acre use of purchased as well as home produced inputs was highest at marginal farms and lowest at farms having more than 2 acres of cultivated holdings in all the panchayats. Even the use of hired

labour was highest at marginal farms. The most important factor underlying this kind of trend was percent of total crop area put under vegetables cultivation, which showed inverse relation with farm size But the hard working farmers used to bring water in buckets from distant places to meet water requirement of vegetable crops during the stress period. In this way, the marginal farmers offset to some extent the disadvantage they have with respect to irrigation, and put higher percent of area under vegetable crops as compared to other categories. Furthermore, marginal farmers in Dharot, Kotho and Bhojnagar made best efforts to overcome the irrigation constraint by using more human labour, higher quantity of other inputs and more use of bullock labour to prepare fine soil structure. As a result of these factors, value of total output per unit area was highest at marginal farms and lowest at other categories, except one case in Dharot where small farms recorded somewhat higher TVP than marginal farms.

In Deothi, where marginal farmers have advantage over other categories in access to irrigation, TVP per acre of net sown area for them was 30 percent higher than for small farmers and 63 percent higher than the TVP at other farms having holdings above 2 acres. The increase in TVP per unit of NCA over TVP per unit of TCA, was highest in the case of 'marginal' farm category and lowest in the case of 'other' category. The increase in TVP due to crop intensity at marginal farms varied between 63 to 93 percent in various panchayats.

The net return over cost AI was Rs. 12,827, 14,976 and 13,016 per acre of NCA at marginal, small and other farms in Dharot and Rs. 17,872, 14,054 and 11,557, respectively, in Deothi. The net return in Bhojnagar and Kotho for the three farm size categories was Rs.3151, 4,076, 3,134 and Rs.5,692, 4,985 and 6,912 for the respective categories.

In Dharot, marketed surplus as percent of total output was 89 percent for marginal and 87 percent for small and other farm size category, in Dharot. In Deothi, marginal and other farmers sold 86 percent and small farmers sold 84 percent produce. In Bhojnagar, marketed surplus ranged between 52 to 69 percent, the highest being at marginal farm size. In Kotho, sales comprise 81 percent of production at marginal farms, 78 percent on small and 84

percent on other farm category. This shows that marketed surplus per unit of area at marginal farms was either higher or same as at the bigger farm size categories in most cases, though the common Indian experience is that proportion of marketed surplus in total production is either near to zero or very small at smaller size farms, and it increases with the increase in farm size.

Our findings show that if there is, incentive, marginal farms can supply same or even higher percent of production to the market as the large farmers. In our sample, incentive was provided by crop diversification through vegetable crops which are produced with purely commercial considerations for sale in the market. Since the marginal farmers allocate higher proportion of cultivated area under vegetables, the share of vegetables in total output was also higher, which resulted in higher percent of marketed surplus in output compared to other farm size categories.

Sale Pattern of Vegetables

The sample farms disposed off their marketed surplus of vegetable crops at many places namely village roadside market, nearest agricultural market, Delhi market and various markets in Punjab and Haryana state. Bhojnagar farmers who neither have easy access to road nor to any market sold their entire surplus at the nearest roadside market irrespective of the size of the holdings. Sample farms in Kotho, which were located at a distance of 1-4 km. from the local market and 1-3 km. from road preferred to sell most of their produce in local market. Size wise, marginal and small farmers ventured to sell about 2 percent produce in Delhi market whereas other farmers sold 20 percent produce in Delhi Market.

Deothi farmers sold 83-90 percent produce in markets outside the state and remaining quantity in Solan market. About 78-81 percent produce from Dhrot panchayat was sold in Delhi and the neighbouring states. In Dharot and Deothi, small and marginal farmers sold only slightly higher proportion of their produce in roadside and local market compared to other farms. Size of holding in these two panchayats did not impose any constraint to market output to distant markets. The sales pattern of vegetable crops in various panchayats show that it was not size of holding but access

to infrastructure like road and market which determine marketing behaviour or the vegetable producers. In the areas where vegetables were produced by large number of growers and there was easy access to transport, small lot does not cause any problem to transport produce to remunerative markets. Where there are large number of producers the option to share common truck for transporting the produce is very easily available and forthcoming.

Income and Employment Implications of Diversification Through Vegetables

The estimates of labour use in vegetables and other crops, for aggregate of all panchayats, were used to study the employment implication of shift in crop pattern at block and district level. The calculations reveal that one percent shift in area from other crops to offseason vegetables would lead to 1.20 and 1.60 percent growth in existing level of labour employment depending on whether the shift takes place in irrigated or unirrigated area. The average of the two would be close to 1.60 percent due to higher share of unirrigated area in total crop area.

The employment growth would be higher in areas other than Solan block because area under vegetable cultivation in Solan block was highest among all blocks of the district. When the estimates were extended to district level, it was found that one percent shift in irrigated area from other crops to vegetable crops would result in 1.60 percent growth in existing level of employment. The increase for unirrigated area worked out to be 2.85 percent. These estimates show the potential of diversification through vegetable crops on 'onfarm' employment opportunities. Another dimension of labour use in vegetable cultivation is that it reduces seasonality in labour use because the peak time of labour requirement of vegetable crops differ from the peak labour demand in most of the other crops.

The impact of shift in crops pattern, in favour of vegetables, on net income was quite sharp. The net return from vegetable cultivation was 2 to 23 times higher than other crops under irrigated conditions and 3 to 40 times higher under unirrigated conditions. A one percent shift in area from other crops to vegetable crops in a district like Solan was estimated to lead to around 6 percent

increase in net return from existing cropping pattern under irrigated conditions and around 4 percent increase when the shift in area takes place on unirrigated land.

Policy Implications

Agricultural diversification through vegetable crops has a huge potential for employment and income generation in Western Himalayan Region. Vegetable cultivation, due to its labour intensive nature, is more beneficial for marginal and submarginal holdings where family labour availability per unit of land is higher compared to bigger size holdings. This is the reason that percent of area shifted to vegetable crops increase with the decrease in farm size in the vegetable growing area. Our findings based on micro level investigations reveal that in case of commercial and higher profitability enterprises, farm size is not a constraint for production and marketing. The study shows that it is not correct to assume that marginal and small farmers do not have sufficient land to put under commercial crops after allocating land to foodgrains to meet the family needs. It was found that where economic incentive is available, farmers allocate area based on relative profitability irrespective of the foodgrains requirement of family which can be easily met through purchases.

There is a strong evidence that it is not the farm size, but infrastructure like access to motorable road, market and irrigation which determine the extent, success and profitability of diversification through high paying crops like offseason vegetables. Promotion of enterprises like offseason vegetables would go a long way in generating productive employment and income in the hill areas in Western Himalayan Region where size of holdings and per capita arable land are very small and traditional crops with low productivity are not capable of providing sufficient income and employment to the population dependent on agriculture sector.

INDIAN AGRICULTURAL TRADE

Agricultural exports from India were 44 percent of total exports in FY 1960; they decreased to 32 percent in FY 1970, to 31 percent in FY 1980, to 18.5 percent in FY 1988, and to 15.3 percent in FY 1993. This drop in agriculture's share was somewhat misleading

because agricultural products, such as cotton and jute, that were exported in the raw form in the 1950s, have been exported as cotton yarn, fabrics, ready-made garments, coir yarn, and jute manufactures since the 1960s.

The composition of agricultural and allied products for export from India changed mainly because of the continuing growth of demand in the domestic market. This demand cut into the surplus available for export despite a continuing desire, on the part of government, to shore up the constant foreign-exchange shortage.

In FY 1960, tea was the principal export by value. Oil cakes, tobacco, cashew kernels, spices, and raw cotton were about equal in value but were only one-eighth of the value of tea exports. By FY 1980, tea was still dominant, but coffee, rice, fish, and fish products came close, followed by oil cakes, cashew kernels, and cotton. In 1992-93 fish and fish products became the primary agricultural export, followed by oil meals, then cereals, and then tea. The share of fish products rose steadily from less than 2 percent of all agricultural exports in FY 1960, to 10 percent in FY 1980, to approximately 15 percent for the three-year period ending in FY 1990, and to 23 percent in FY 1992. The share of tea in agricultural exports fell from 40 percent in FY 1960 to roughly 17 percent in the FY 1988-FY 1990 period, and to only 13 percent by FY 1992.

External Aid for India

Foreign aid—financial and technical—since the 1950s has made a significant contribution to the agricultural progress in rural India. Aid has come from many sources: the United States government, the Ford Foundation, the Rockefeller Foundation, the World Bank, the Food and Agriculture Organization of the United Nations (UN), the European Economic Community, the former Soviet Union, Britain, and Japan, among others.

Agricultural aid to India also has come in many forms. Between 1963 and 1972, for example, under a program of the United States Agency for International Development, some 400 American scientists and scholars served on the faculties of India's agricultural universities, while more than 500 faculty members from Indian institutions received advanced training in the United States and

other countries. Several hundred agricultural research projects, financed with funds generated from sales of American farm commodities under the United States Public Law 480 program, fueled technological breakthroughs in Indian agriculture.

Aid to the agricultural sector in India continued in the late 1980s and the early 1990s; the FAO, the European Union, the World Bank, and the United Nations Development Programme (UNDP) provided the bulk of the assistance.

The FAO provided technical assistance in a number of emerging areas; it provided quality control for exports; videos for rural communication and training; and market studies for wool processing, mushroom production, and egg and poultry marketing. Operation Flood--a dairy development program—was jointly sponsored by the European Economic Community, the World Bank, and India's National Dairy Development Board.

The UNDP provided technical assistance by sending foreign experts, consultants, and equipment to India. The World Bank and its affiliates supported agricultural extension, social (community-based) forestry, agricultural credit, dairy development, horticulture, seed development, rain-fed fish farms, storage, marketing, and irrigation.

India has not only been a receiver of aid. Increasingly since independence, India has been sharing its agricultural technology with other developing countries. Numerous foreign scientists have received special and advanced training in India; hundreds of foreign students have attended Indian state agricultural universities. Among other international agricultural endeavors, India has contributed scientists, services, and funds to the work of the International Rice Research Institute, headquartered in the Philippines.

In the late 1980s and early 1990s, India provided short- and long-term training courses to hundreds of foreign specialists each year under a variety of programs, including the Technical Cooperation Scheme of the Colombo Plan for Cooperative Economic and Social Development in Asia and the Pacific and the Technical Cooperation Scheme of the Commonwealth of Nations Assistance Program.

IMPACT OF ECONOMIC REFORMS ON AGRICULTURE IN INDIA

The serious foreign-exchange crisis in 1990 led to a number of well-publicized economic reforms in the early 1990s dealing with trade, industrial licensing, and privatization. The reforms had an impact on the agricultural sector through the central government's effort to withdraw the fertilizer subsidy and place greater emphasis on agricultural exports.

The cut in the fertilizer subsidy was a result of the government's commitment to reduce New Delhi's fiscal deficit by removing grants and subsidies from the budget. The government action led to a reduction in the use of chemical fertilizers and protests by farmers and opposition political parties. The government was forced to continue the subsidies but at a somewhat lower level.

New import and export policies aim at enhancing export capabilities of the agricultural sector by increasing productivity and promoting modernization and competitiveness. The measures to facilitate export growth include allowing the import of capital for the agricultural sector, reducing the list of agricultural products that cannot be exported, and removing the minimum export price from a number of products.

Agricultural exports increased by 30 percent in FY 1991 and 14 percent in FY 1992 in terms of rupee value, but declined by 8 percent from FY 1990 to FY 1992 in United States dollar terms because of the devaluation of the rupee in 1991.

In the mid-1990s, it was expected that agriculture would continue to be the most important sector of the economy for the rest of the decade in terms of the proportion of GDP.

However, even when it is not the sector providing the largest share of GDP, the importance of agriculture is not likely to diminish because of its critical role in providing food, wage goods, employment, and raw materials to industries.

Despite their preoccupation with industrial development, India's planners and policy makers have had to acknowledge the critical role of agriculture in the early 1990s by changing basic policy. The gains in agricultural production should not lead to complacency, however. Continuing increases in productivity,

developing allied activities in rural areas, and building infrastructure in rural areas are essential if India is to continue to be self-reliant in food and agricultural products and provide a modest surplus for exports.

AGRICULTURE AND RURAL DEVELOPMENTS

From a nation dependent on food imports to feed its population, India today is not only self—sufficient in grain production, but also has a substantial reserve.

The progress made by agriculture in the last four decades has been one of the biggest success stories of free India.

Agriculture and allied activities constitute the single largest contributor to the Gross Domestic Product, almost 33% of it. Agriculture is the means of livelihood of about two—thirds of the work force in the country.

This increase in agricultural production has been brought about by bringing additional area under cultivation, extension of irrigation facilities, the use of improved high yielding variety of seeds, better techniques evolved through agricultural research, water management, and plant protection through judicious use of fertilizers, pesticides and cropping practices.

Crops

The 1970s saw a multi-fold increase in wheat production that heralded the Green Revolution. In the next decade rice production rose significantly; in 1995-96, rice production was 79.6 million tons. Total grain production crossed 191 million tons in 1994-95, a big leap from 51 million tons in 1950-5 1. During the Seventh Plan, the average grain production was 155 million tons, 17 million tons more than the Sixth Plan average.

To carry improved technologies to farmers, a National Pulse Development Program, covering 13 states, was launched in 1986. The Special Food Production Program augmented efforts to boost pulse production further. In 1995-96, pulse production was 13.2 million tons. With some States offering more than the statutory minimum price, sugarcane production also received a boost, in 1995-96 a record 283.0 million tons was registered.

Irrigation

As efforts continued to increase the irrigation potential in the country, the last 40 years saw the gross irrigated area reach 8~ million hectares. Flood forecasting has become an important activity over the years. Over 500 hydrological stations collect and transmit data through 400 wireless stations for issuing forecasts for 157 sites. About 5000 forecasts are issued in a year with 94% accuracy.

The country also receives international support, with the World Bank as a primary source, for developing the water resources. International cooperation is also envisaged in setting up a National Center for Information on Water and Power. As there is a broad seismic belt in the country, particularly along the Himalayan, the Kutch region and ports of Maharashtra, a scheme is being evolved to collect all data on seismic activity at various dam sites.

Fertilizers

The fertilizer industry in India has grown tremendously in the last 30 years. The Government is keen to see that fertilizer reaches the farmers in the remote and hilly areas. It has been decided to decontrol the prices, distribution and movement of phosphatic and potassic fertilizers. Steps have been taken to ensure an increase in the supply of non-chemical fertilizers at reasonable prices.

There are 53 fertilizer quality control laboratories in the country. Since bio—fertilisers are regarded as an effective, cheap and renewable supplement to chemical fertilizers, the Government is implementing a National Project on Development and Use of Bio-fertilisers. Under this scheme, one national and six regional centers for organizing training, demonstrating programs and quality testing of bio-fertilisers has been taken up.

It was a challenging decision of the Government to take Bombay High gas through a 1,700-km pipeline to feed fertilizer plants located in the consumption centers of North India. However, the major policy which has ensured the growth of the fertilizer industry is the thrust on accelerating fertilizer consumption by fixing, on the one hand, low and uniform price for fertilizers, and on the other hand providing the manufacturers adequate compensation through the retention price and subsidy scheme. As expected, fertilizer nutrient demand has gone up from 0.29 million tons in

1960-61 to 13.9 million tons at the end of 1995-96, compared to 12.15MT during 1992-93.

Fisheries

Fish production achieved an all-time high of 4.9 million tons at the end of 1995-96. Programs that have helped boost production include the National Program of Developing Fish Seeds, Fish Farmers' Development Agencies and Brackish Water Fish Farmers' Development Agencies. The Central Institute of Fisheries Nautical and Engineering Training trains the necessary manpower. To diversify fishing methods and introduce processed fish products on a semi-commercial scale, an Integrated Fisheries Project has been launched. A National Fisheries Advisory Board has also been established.

Food Processing

A Ministry of Food Processing Industries was established in July 1988 to ensure better utilization of farmers' output by inducting modem technology into the processing of food products, thus augmenting the income of farmers and generating employment opportunities in rural areas. A new seeds policy has been adopted to provide access to high quality seeds and plant material for vegetables, fruit, flowers, oil-seeds and pulses, without in any way compromising quarantine conditions. Initiatives have been taken to encourage private sector investment in the food processing industry.

Agricultural Research

The apex body for education, research and extension education in the field of agriculture is the Indian Council of Agricultural Research (ICAR), established in 1929. India's transformation from a food deficit to a food surplus country is largely due to ICAR's smooth and rapid transfer of farm technology from the laboratory to the land.

ICAR discharges its responsibilities through 43 research institutes, four national research bureaus, 20 national research centers, nine project directorates, 70 all-India coordinated research projects, and 109 Krishi Vigyan Kendras (farm science centers). Besides, the program of Agricultural Education is coordinated by

ICAR with the curricula and other normative guidance given to the 26 Agricultural Universities and four National Research Institutes.

Oilseeds Production

A Technology Mission on Oilseeds was launched in 1986 to increase production of oilseeds in the country and attain self-sufficiency. Pulses were brought under the Technology Mission in 1990. Before the Mission was launched in 1985-86, oilseed production was 10.83 million tons; during 1995-96, it was estimated at 22.42 million tons, which is a record. Soybean, rapeseed and mustard largely contributed the increase in production. Production of pulses has seen many ups and downs, which is expected to be checked under the Mission. The country grows mainly nine oilseeds, with groundnut, rapeseed and mustard accounting for 62% of total production. Lately, soybean and sunflower have shown major growth potential.

Drinking Water

A Technology Mission on Drinking Water and Related Water Management has been constituted to cover the residual problem villages and provide potable water at 40 liter per capita per day, and 70 liters per capita per day in desert areas inclusive of 30 liters for cattle. The Mission is tackling the problem through 55 mini-missions in project districts and countrywide problem oriented sub-missions. A Village Level Operation and Maintenance (VLOM) pump called India Mark-11 has been developed and is being exported to 40 countries. By March 31, 1993, over 79% of the rural and about 85% of the urban population was provided drinking water facilities.

9

Urban Economic Geography

THE PROCESS OF URBAN DEVELOPMENT

Urban Area

An urban area is characterized by higher population density and vast human features in comparison to areas surrounding it. Urban areas may be cities, towns or conurbations, but the term is not commonly extended to rural settlements such as villages and hamlets.

Urban areas are created and further developed by the process of urbanization. Measuring the extent of an urban area helps in analysing population density and urban sprawl, and in determining urban and rural populations.

Unlike an urban area, a metropolitan area includes not only the urban area, but also satellite cities plus intervening rural land that is socio-economically connected to the urban core city, typically by employment ties through commuting, with the urban core city being the primary labour market. In fact, urbanized areas agglomerate and grow as the core population/economic activity center within a larger metropolitan area or envelope.

Metropolitan areas tend to be defined using counties or county sized political units as building blocks. Counties tend to be stable political boundaries; economists prefer to work with economic and social statistics based on metropolitan areas. Urbanized areas are a more relevant statistic for determining per capita land usage and densities (Dumlao & Felizmenio 1976).

Definitions

They vary somewhat amongst different nations. European countries define urbanized areas on the basis of urban-type land use, not allowing any gaps of typically more than 200 meters, and use satellite photos instead of census blocks to determine the boundaries of the urban area.

In less developed countries, in addition to land use and density requirements, a requirement that a large majority of the population, typically 75%, is not engaged in agriculture and/or fishing is sometimes used.

URBANISATION AND INDUSTRIALISATION

In complex agricultural societies administrative centres and trading places grew into urban communities. The size of the cities depended heavily on the agricultural productivity and the organisational quality of the society. More than 2000 years ago the number of large cities was limited to about twenty. This number increased rapidly after the medieval period to over a thousand cities having more than a hundred thousand inhabitants. Especially after the industrial revolution cities became the engines for economic growth. Most of the cultural heritage of nations is found in cities.

Specialisation and expansion of industries and services have led to a complex network of cities of various sizes. Nowadays urban areas are no longer limited to well-defined city boundaries. New modes of transport and communication have caused a wider spatial diffusion of urban activities: industries have become more footloose, services are no longer confined to the core of the cities and high income groups leave the neighbourhoods with the highest density and the poorest environmental quality. This is the way metropolitan areas have developed in advanced countries. Accessibility, social segregation, lack of social cohesion, air pollution in street canyons, traffic-noise and the loss of non-urban landscapes are the main challenges for the future.

In less advanced countries many cities are surrounded by informal settlements of lowincome groups, with poor access to clean water and urban facilities. Spatial and infrastructure planning are often lacking or lagging behind, which could harm the

attractiveness of cities for economic activities, despite the large potential (labour and consumer) market. The World Development Report 1999/2000 (World Bank, 1999) states that urbanisation and economic growth go hand in hand in all parts of the world, with the exception of Africa. According to the World Bank the African pattern of urbanisation without growth is caused by the subsidies on food and trade that favoured urban consumers over rural producers. Poverty will thus remain to be the main problem of cities in Africa.

The share of urban residents is steadily increasing and could ultimately become 80-90% of the world population. Much of the urbanisation is taking place in areas where water is scarce. Now 2.5 billion people live in areas where annually more than 50% of the available water is used. In 2020 it is expected that 4 billion people live in such areas. The Global Scenario Group (Raskin et al., 1998) has explored future urbanisation-trends up to the year 2050. As compared to 1995 the total population in developing regions will almost double to about 8 billion. Already now most urban dwellers live in developing countries. The population in the developed part of the world will only slightly increase to less than 1.5 billion. In advanced countries about 90 % of the population will live in urban areas. The urbanisation rate in less advanced countries will almost double in this fifty years period to about 70 %.

The determination of causal mechanisms explaining urbanisation is still in its early stages. An older UN-study (UN, 1980) suggested that income level and growth is positively associated with rural out-migration. An average additional $100 per capita of GDP corresponds with a migration of about 0.3% of the rural inhabitants to the urban areas. Most of the economic growth in the developed world is caused by the shift from agriculture to industry and services. The urban environment is well suited to accommodate this growth. Its energy and material efficiency is high and it provides flexible and productive labour forces. In the developed world, some 60 percent of GDP is generated in urban areas. Some other factors are playing a substantial additional role in the developing world. Rural-to-urban migration accounts for 40 to 60 percent of the total urbanisation in these

regions. On top of this process, high fertility rates of the low income groups in the urban population is speeding up urbanisation.

Urbanisation is characterised by high population densities and high densities in the use of primary energy. The spatial distribution of these indicators shows high densities in large parts of Asia, Northwest Europe and some parts of the Americas and Africa. High population density and high densities of human activities are a potential source of local environmental problems if no appropriate measures are taken. Insufficient investments in urban infrastructure and inadequate urban planning and management may result into a variety of environmental problems. Water supply and sanitation, waste disposal, and urban air quality are the main environmental problems associated with urbanisation, although the variability both among cities and within city quarters are significant. The size and rate of control of these problems are related to GDP. Inadequate water supply, sanitation and waste disposal are crucial causes of death due to infectious and parasitic diseases. Air pollution can cause respiratory and circulatory diseases.

Water-related problems and point-sources of airborne emissions are gradually solved when GDP increases and means for investments become available for water supply, sanitation and the substitution of fuels that contribute to local air pollution (such as coal). While air pollution due to point sources is decreasing, air pollution due to traffic is increasing with GDP. In advanced countries traffic is now the main source of air pollution in cities. In many developing countries decreases in the population exposure to particulate matter due to the use of cleaner fuels, are now substituted by an increase in photochemical smog, mainly caused by traffic. In some advanced countries, measures are underway to implement the cleanest car-technologies and to redesign the urban traffic and transport system, in order to reduce high population exposure in street canyons.

Many urban areas in developing regions are not yet capable to cope with these types of infra-structural problems. Higher levels of energy use may cause severe air pollution problems affecting human health and nature. The highest levels of sulphur and nitrogen emissions per km^2 are nowadays occurring in Western

and Central Europe, South East Asia and the eastern part of North America. Emissions of particulate matter are following similar spatial patterns. Considerable effects on public health are associated with these types of air pollution. Currently the loss of about half a healthy life year per inhabitant is associated with air pollution in Western Europe. This loss may be considerably higher in parts of Asia.

Urbanisation processes appear to be of great importance from an environmental perspective. Development of metropolitan areas at the sub-regional or even the regional level is going to play a dominant role in future land use. Investments in roads, railways, waterways, harbours and airports plays a crucial role in the accessibility of cities and the network of cities that may arise in metropolitan areas. The protection of landscapes and natural parks and forests in metropolitan areas will require a strict land use plan and in some cases ownership of such 'commons' by governmental organisations. Segregation within urban areas requires investments to upgrade the attractiveness of city quarters for companies and middle and high income classes.

In order to balance all relevant economic, social and environmental aspects comprehensive urban and infra-structural planning will be needed. The right balance between the different domains will differ in time and space. Even the choice of relevant local indicators for sustainable development shows very different results among cities and stockholders, and depends on prevailing perspective on sustainability. It seems important to acknowledge these differences, for instance by facilitating public participation in the definition of indicators and desirable futures. Lessons from several local sustainability debates are that every town develops it own set of indicators and that the content of what 'sustainability' means changes over time and space. Harmonisation of indicators seems less important than the interactive process of public participation, communication and experimental forms of local partnership focused on integrated planning.

In the future most of the economic metabolism will take place in cities. Two factors are crucial for a sustainable development: (1) technological optimisation of the urban metabolism, aimed at the reduction of material and energy losses and an increase of the

reliance on renewable resources; and (2) the future life style of the urban resident. Pricing, product information, education and infrastructural urban planning all are ways to influence the consumer towards a sustainable life style. Both in advanced and in less advanced countries further improvements in the efficiency of the use of energy and materials and the use of land can contribute to the protection of the surrounding ecosystems. The challenge is to define investment programs that will improve the economic attractiveness of cities (accessibility, urban facilities) and at the same time reduce unemployment and poverty and the pressure on the environment.

Policy studies carried out in the framework of UNEPs Global Environment Outlook underscore the global need for local action. In the absence of policy measures the emission of sulphur and nitrogen compounds to the air will at least triple in the next three decades in continental Asia. To stabilise these emissions at its current levels a comprehensive urban policy is required. It will have to contain the accelerated introduction of clean technologies in energy production and transport, fuel switching, increasing transportation efficiency and promoting investments in public transport systems. Both in North America and Europe substantial reductions are underway with the new protocol on acidification, electrification and ground level ozone under the UN Convention on Long-Range Transboundary Air Pollution. In both advanced and developing countries uncontrolled urbanisation is major problem. A strict spatial planning together with clear property rules and land-pricing mechanisms could be part of the solution. Spatial planning tools could be developed as to optimise land-use for rural and urban purposes. Methods are being developed in the European Union and used in some of its member states.

In May 1999 the European Ministers responsible for spatial planning adopted the European Spatial Planning Perspective (Ministry of VROM, 1999). Common policies are proposed in this document with regards to spatial planning at a European scale. This planning perspective aims at narrowing the spatial differences in welfare and prosperity, optimising business environments and providing a common spatial framework. It defines three main goals to be reached:

- Polycentric spatial development and a new urban-rural relationship
- Parity of access to infrastructure and knowledge
- Prudent management of the natural and cultural heritage

The European urban system is dominated by a high intensity economic area between London and Milan, in which the generation of GDP per capita is relatively high. This spatial trend is most likely to prevail in the next decades. The European spatial structure consists of several core areas of global importance supported by a number of highly competitive metropolitan regions outside these areas.

An integrated transport, environment and regional development should mitigate the negative effects of increasing traffic volumes. Trans-European Networks for transport and telecommunications are an important component of such a policy. Implementing this policy requires substantial (private and public) investments and inter-regional co-operation.

If one applies the subsidiarity-principle (which means that political actions are only taken at a more centralised level, when those actions cannot be taken more effectively at a more decentralised level), the role of the UN for local governments is very limited. Subsidiarity seems crucial to maintain cultural differences and a maximum of (local) freedom.

The UN could help in capacity building, stimulate local initiatives and information exchange via the Internet and disseminate successful local experiences, as is currently already done by Habitat and UNEP. The UN could for instance effectively exchange information between mega-cities, e.g. via a council of mayors of the top 50-mega-cities of the world.

Globalisation of the economy causes cities to compete with each other on their economic, social and ecological attractiveness. Competitive mega-cities will continue to grow, the other ones may stagnate or decline. The Woodrow Wilson Centres report (1999) concludes that: “how the world’s mega-cities are managed in the coming decades will shape patterns of economic growth, the settlement of vast populations and the social and political stability of many developing countries”.

URBAN ECONOMICS

Urban Economics is broadly the economic study of urban areas. As such, it involves using the tools of economics to analyze urban issues such as crime, education, public transit, housing, and local government finance. More narrowly, it is a branch of microeconomics that studies urban spatial structure and the location of households and firms. Much urban economic analysis relies on a particular model of urban spatial structure, the monocentric city model pioneered in the 1960s by William Alonso, Richard Muth, and Edwin Mills. While most other forms of neoclassical economics do not account for spatial relationships between individuals and organizations, urban economics focuses on these spatial relationships to understand the economic motivations underlying the formation, functioning, and development of cities.

Since its formulation in 1964, William Alonso's monocentric city model of a disc-shaped Central Business District (CBD) and surrounding residential region has served as a starting point for urban economic analysis. Monocentricity has become weaker over time due to changes in technology, particularly due to faster and cheaper transportation (which makes it possible for commuters to live farther from their jobs in the CBD) and communications (which allow back-office operations to move out of the CBD). Additionally, recent research has sought to explain the polycentricity described in Joel Garreau's Edge City. Several explanations for polycentric expansion have been proposed and summarized in models that account for factors such as utility gains from lower average land rents and increasing (or constant returns) due to economies of agglomeration.

Urban economics is rooted in the location theories of von Thünen, Alonso, Christaller, and Lösch that began the process of spatial economic analysis (Capello & Nijkamp 2004:3-4). Economics is the study of the allocation of scarce resources, and as all economic phenomena take place within a geographical space, urban economics focuses of the allocation of resources across space in relation to urban areas (Arnott & McMillen 2006:7) (McCann 2001:1). Other branches of economics ignore the spatial aspects of decision making but urban economics focuses not only on the location decisions of firms, but also of cities themselves as cities

themselves represent centers of economic activity (O'Sullivan 2003:1).

Many spatial economic topics can be analyzed within either an urban or regional economics framework as some economic phenomena primarily affect localized urban areas while others are felt over much larger regional areas. Arthur O'Sullivan believes urban economics is divided into six related themes: market forces in the development of cities, land use within cities, urban transportation, urban problems and public policy, housing and public policy, and local government expenditures and taxes (O'Sullivan 2003:13-14).

Market Forces in the Development of Cities

Market forces in the development of cities relates to how the location decision of firms and households causes the development of cities. The nature and behavior of markets depends somewhat on their locations therefore market performance partly depends on geography. If a firm locates in a geographically isolated region, their market performance will be different than a firm located in a concentrated region.

The location decisions of both firms and households create cities that differ in size and economic structure. When industries cluster, like in the Silicon Valley in California, they create urban areas with dominant firms and distinct economies. By looking at location decisions of firms and households, the urban economist is able to address why cities develop where they do, why some cities are large and others small, what causes economic growth and decline, and how local governments affect urban growth (O'Sullivan 2003:14). Because urban economics is concerned with asking questions about the nature and workings of the economy of a city, models and techniques developed within the field are primarily designed to analyze phenomena that are confined within the limits of a single city.

Land Use Within Metropolitan Areas

Looking at land use within metropolitan areas, the urban economist seeks to analyze the spatial organization of activities within cities. In attempts to explain observed patterns of land use,

the urban economist examines the intra-city location choices of firms and households. Considering the spatial organization of activities within cities, urban economics addresses questions in terms of what determines the price of land and why those prices vary across space, the economic forces that caused the spread of employment from the central core of cities outward, identifying land-use controls, such as zoning, and interpreting how such controls affect the urban economy (O'Sullivan 2003:14).

Economic Policy in Urban Areas

Economic policy is often implemented at the urban level thus economic policy is often tied to urban policy. Urban problems and public policy tie into urban economics as the theme relates urban problems, such as poverty or crime, to economics by seeking to answer questions with economic guidance. For example, does the tendency for the poor to live close to one another make them even poorer? (O'Sullivan 2003:15).

Urban Transportation and Urban Economics

Urban transportation is a theme of urban economics because it affects land-use patterns as transportation affects the relative accessibility of different sites. Issues that tie urban transportation to urban economics include the deficit that most transit authorities have, and efficiency questions about proposed transportation developments such as light-rail (O'Sullivan 2003:14).

Housing and Public Policy

Housing and public policy relate to urban economics as housing is a unique type of commodity. Because housing is immobile, when a household chooses a dwelling, it is also choosing a location. Urban economists analyze the location choices of households in conjunction with the market effects of housing policies (O'Sullivan 2003:15).

Government Expenditures and Taxes in Urban Economics

The final theme of local government expenditures and taxes relates to urban economics as it analyzes the efficiency of the fragmented local governments presiding in metropolitan areas (O'Sullivan 2003:15).

URBANIZATION AND ENVIRONMENTAL DEGRADATION

Rapid urbanization has caused wide spread environmental degradation in the country. The government has conceded that despite imposition of regulatory measures, the magnitude of pollution from industrial sources in the country has not shown any appreciable decrease during the last two decades. Increase in pollution levels in urban areas is also fuelled by ever-growing traffic.

The number of registered automobiles in the country, mostly concentrated in the cities, has increased from 1.87 million in 1971 to 5.39 million in 1981 and 25.28 million in 1993. These figures show an extraordinary high annual (exponential) growth rate of 10.6 percent during 1971-81 and 12.9 percent during 1981-93, while the urban population grew only by about four percent annually during this period. Thus, the growth in the number of vehicles per capita in the past 12 years has been very high in the country. The highest growth rate has been recorded in the number of two-wheelers, at 15.1 percent during 1971-81 and 15.6 percent during 1981-93. These vehicles contribute the most to air pollution levels. Poor maintenance of vehicles and traffic congestion have been found to be critical factors of air pollution problems in urban areas. Most vehicles do not confirm to permissible emission limits.

It has been revealed by a survey of ten major cities of India by the National Environmental Engineering Research Institute (NEERI), Nagpur that there has been a substantial increase of the suspended particulate matter (SPM) in the air, which suggests the presence of dust and carbon particles coated with toxic gases. The highest level of SPM is reported to be in Delhi and Calcutta. It is as high as 460. The other metropolises, which cross the maximum, prescribed for SPM by WHO (200 micrograms per cubic meter of air) are Kanpur, Nagpur, Jaipur, Mumbai and Ahmedabad. The high levels of air pollution in these cities are largely attributable to incomplete combustion of diesel and leaded petrol, particularly in case of two-and three-wheelers, which use inefficient two-stroke engines and indirect fuel injection. The study has revealed that the SPM levels in the residential areas of all industrial cities have reached a critical level. Rapid urbanization together with other

associated problems of shelter and provision of infrastructural facilities has caused a pernicious effect on the eco-stability of the country.

Yet, another serious problem is related to treatment of sewage collection and disposal of waste materials. Hardly any city in India has 100 percent sewage collection treatment and waste disposal facilities. Incidentally, of all the capital cities of different states and union territories Patna (the capital city of the State of Bihar) is considered to be the worst of all. The untreated and partially treated wastewater ultimately contaminates rivers, lakes and reservoirs causing manifold pollution problems. Rivers passing through cities such as Ganga, Yamuna, Krishna, Kaveri, Godavari, Hoogly, Damodar, Kshipra, Gomti, Mahanadi, Narmada, Tapti, Betwa, etc. are reported to be heavily polluted. Urbanization had also enhanced the solid waste problem in the country. With the present culture of use and throw and increasing use of biodegradable packing material, the quantity and composition of waste is likely to change in the coming decades.

Indian cities also have serious problem of noise pollution. It is considered to be a very big health hazard. Noise affects man physically, psychologically and socially. Intense noise or long stay in a noisy environment can cause permanent reduction of hearing sensitivity by damaging sensory organs of the inner ear. It can also influence blood circulation, cause stress and other psychological effects and could also be an accident risk by drowning warning signals.

RELATIONSHIP BETWEEN SUSTAINABLE DEVELOPMENT, URBANIZATION AND SLUMS

There are two axes of power struggle within the world development community. One is the struggle between those who control the resources and those who need them, in other words, between the developed and the developing world. The tension in question has become the subject to myriads of UN General Assembly Resolutions, the Millennium Declaration which emphasizes international partnerships, and the World Summit on Sustainable Development in Johannesburg. The second axis of struggle occurs between different development sub-cultures. That

is, the tension between those stakeholders who are proponents of different mandates of development. Those who follow the development literature can without difficulty detect the covert, if not overt efforts to refute the thesis of the "other" development sub-culture, either empirically or theoretically. Juxtaposed against each other, these themes are packaged in dichotomous relationships, such as rural versus urban development, health versus education, economic development versus social development, and the like. Each development sub-cult argues that, *its* specific development problem causes the highest suffering to humanity, and therefore should not be neglected by the international community.

This paper revolves around the mainstream debates held within the international development community around the relationship between urbanization, slums, and sustainable development.

One such debate revolves around the juxtaposition between urbanization and sustainable development. The UNEP-UN-HABITAT joint initiative, the Sustainable Cities Programme, in effect for over a decade, has demonstrated that the two sub-cultures, urban development and sustainable development are *not* contradictory. There are recent efforts to show that urban growth and development can be managed to both make cities more livable and to curb the destruction of the environment. Yet, the tendency to think that urbanization is primarily responsible for unsustainable development is still predominant.

The logical reasoning of these arguments follow the below premises, 'if-then' connections and sequences:

The starting premise is that, rapid urbanization is a major determinant behind the destruction of forests, reduction of biodiversity and high emission of CFCs. If the world community wants to protect the environment, then urbanization should be curbed. If the world community wants to curb urbanization, then it should invest more in areas of environment and rural development, rather than in making cities livable and in improving the lives of slum dwellers. This is the reasoning behind most donor policies whose thrust is to invest in 'preventive' measures, such as on rural development or environment, rather than 'curative' ones, that is, urban development and slum upgrading. It is believed

that slum upgrading especially, can *encourage* rapid urbanization rather than curb it, and jeopardize sustainable development. This think piece aims to address some of the above links and assumptions. Our arguments include the following:

It is true that rapid urbanization can bring many environmental hazards and problems as documented in many flagship publications of the agency. The disagreement starts at how each party perceives 'prevention'. The point of this paper is that rapid urbanization is not preventable, as it has become an irreversible trend.

Urbanization is irreversible: It is not a value judgment to say that the world is inevitably becoming more urban day by day. Very soon, for every villager, there will be one citizen. In three decades from now, for every one villager there will be two citizens. With Latin America where 70 percent of the population already resides in cities, Africa, making up for slow rates of urbanization of the previous decades and China pursuing a high urbanization policy, virtually all the population growth expected at the world level during 2000-2030 would concentrate in urban areas. The vast majority, 95%, of the population increase, forecast for the same period, will be absorbed by the urban areas of the less developed regions. A substantial proportion of these people will be residents of mega-cities of the third world. Considering the overwhelming figures, time is ripe to take the urban revolution of the last two centuries, as a given. We assert that by weaving this demographic and human settlements reality into development policies, sustainability will be better achieved.

Rapid urbanization is increasingly caused by natural population increase in cities and annexation and reclassification of human settlements, as well as by rural to urban migration:

Another pillar of the pro-rural development argument is that high concentration of population in cities is due to migration flows from villages to cities, which cause the urban sprawl, which in turn puts a pressure on natural resources. Addressing the first thesis, on migration being the cause of high urban growth, we should note that there is abundant evidence that urban population increase is due to multiple factors which embrace migration, natural population increase, and reclassification and annexation of human

settlements. Migration can originate not only from rural areas, but also from other urban settlements and other countries, international migration.

The second point is that the role of migration in causing high urbanization depends on the historical stage at which countries or human settlements are undergoing the demographic transition. At initial stages of demographic transition which the Western world and Latin America went through, the increasing urban population was mostly due to migrants streaming from rural areas to cities. Historically, in Europe, the first stage of transition occurred at the late 19th century and lasted until the post Second World War era. For Latin America the demographic transition started during 1940s and lasted until 1980s for most highly populated countries of the continent. The second stage of demographic transition is when rural-urban migration comes to a standstill, and cities start increasing either due to natural population increase or due to reclassification and annexation. For decades, spatial population movements of Latin America were dominated by rural-urban migration, however, currently the places of origin have changed. The predominant form of migration is now, from urban to urban. The intra-metropolitan migration flows have gained significance among other population movements. Scholars of Latin America estimate that the rural-urban population transfer becomes less important in explaining urban growth. "If during 1950s, 46% of urban growth was explained by rural-urban migration, between 1990-2000 it accounts for 35%".

Africa is the continent where most countries, especially those in the Sub-Saharan, have gone through their initial stages of demographic increase during and post-independence eras of 1960s and 1970s. Although the rural population still outnumbers their urban counterparts, and thereby are potential migrants/slum dwellers, it is interesting to see that natural increase contributes highest to the growth of urban areas. A UN study showed that the contribution of natural growth to urban growth is much more substantial in West Africa than in other parts of the world: in this continent natural growth represents 75% of urban growth while this share was only 50% in Asia (excluding China) in the 1980s. The share of natural growth in rapid urban growth is higher,

because the overall natural increase, is still very high, 2.7% as opposed to the 1.9% for the developing world as a whole. The traces of this macro demographical phenomenon in the slum neighborhoods of the cities are seen in the residential histories of people. To illustrate, the average resident of Kibera, Africa's largest slum in Nairobi, has been living and reproducing the second and the third generation slum dwellers, over the last 20-30 years.

The biggest of all continents, Asia, brings together a mosaic of countries at their various stages of demographic transition. "Asia is the only developing region where share of urban growth is attributed to migration/reclassification increased over the decades 1960-1990. ESCAP (2000) projections foretell that the role of migration in urban growth will increase over the first decade of the 21st century, with almost two thirds of urban growth in the period 2010-2020 attributable to net migration, reclassification and annexation; compared to only 51 percent in 1990-2000.

In all sub-regions, except for the highly urbanized Pacific sub-region, net migration is projected to account for over 60% of urban growth." The share of reclassification of rural settlements as urban, and of annexation of fringe villages to metropolitan regions, in explaining high urbanization needs to be better documented. The higher rates of urbanization, in such cases are not accounted for, by population movements, but by socioeconomic change within the same human settlement which metamorphosed from a village to a town, or by a policy decision on definition of what rural and urban means.

Among other regions, it can be concluded that migration contributed more to urban growth for Asia than for either Latin American or African countries. Fallacies about individual decisionmaking dynamics of the rural and urban poor, on where and when to migrate.

Another assumption made by the pro-rural development community is a behavioural one. According to this thought, rural migrants/slum dwellers would be deterred from living in cities, if cities lose their appeal for them. Or, it is believed that they would return back to their villages, if rural development takes effect. In sum, by encouraging policies that would reverse the 'push of the village and pull of the city' dynamic, they are convinced

that sustainable development would be attained. There are two kinds of fallacy behind this argument. One is that most slum dwellers are not current migrants. They are second or third generation rural migrants, whose current home is the city itself. Most slum settlements in India, Pakistan, Kenya and Egypt, if not others, fall under this category. Thus, any argument which supposes that second-third generation migrants would return home, if the international community makes the politically correct development decisions, is sociologically and demographically incorrect, because the second-third-fourth generation villagers would *not* behave the same way that a current migrant would, that is return home, if rural development is guaranteed.

Another hypothesis promoted by the pro-rural community is that rural-urban migration can be curbed if development investments are channelled to rural areas rather than upgrading slums with infrastructure, services and security of tenure. Many migration studies indicate, however, the pull of the city could be as powerful as the push of the villages.

There are many reasons why villagers find cities more attractive, aside from access to secure shelter, furbished with infrastructure. One such reason is the hope of finding better livelihoods. Over a generation of studies indicate that it is the high population concentration of cities itself that draws in migrants from villages.

Because, in the eyes of migrants, big numbers of people is a swarming market for informal business, that the they will not be able to find in any 'developed' village. Especially in the case of Africa, the thesis that migration into cities can be discouraged if slums are not upgraded, can be refuted by evidence, as most households in African cities lack durable housing, water, sanitation and adequate living space, as well as lack security of housing tenure.

Lack of such services neither prevents new migrants from settling in these slums, nor the old slum dwellers to move. The slum dwellers of Accra note that the reason they migrated to the city was not that the infrastructure and services were adequate and accessible, but the "hustle and bustle of city", that is, its capacity to create opportunities for informal business.

CHANGING STRUCTURE OF URBANISATION AND ACCESS TO INFRASTRUCTURE

The changes being introduced in the system of financing infrastructural financing have serious implications for the trend and pattern of urban growth in future years. During fifties and sixties, some kind of ceiling on the absorptive capacity of large cities was sought to be imposed through physical planning and controls on location of economic activities and urban land-use, imposed through Master Plans etc. These, however, could not restrict RU migration as there was large-scale violations in the Master Plan norms and land use restrictions. The growth urban population thus worked our as high or medium during the first four decades since Independence.

The annual exponential growth rate was very high-3.5 per cent per annum-during forties. This had prompted several scholars propound the thesis of urban explosion, dysfunctional urbanisation, urban accretion etc., basically stipulating that urban centres are growing beyond their capacity, determined by the level of infastructural facilities. The rate came down substantially during fifties and sixties but that was attributed to the adoption of a rigorous definition of urban centres in the Census of 1961. In seventies, however, the country recorded an all time high growth of 3.8 per cent. This was due not only to the existing urban centres experiencing an acceleration in their growth rates but emergence of a large number of new towns.

There has been a striking change in the urban scenario in the country since the eighties reflected in deceleration in urban growth. The annual growth rate of population recorded for urban India was as low as 3.1 per cent during 1981-91. This has gone down further to 2.7 per cent during 1991-2001. It is indeed true that the numbers of new towns identified in the last two Censuses are not as high as reported in Census 1981. The main reason for the deceleration is however, slower demographic growth recorded in existing urban centres. The declining demographic growth goes against not only the popular perception of "urban explosion" but also questions the projections made by Expert Groups set up by various government departments during eighties and nineties, besides that of the India Infrastructure Report and the Tenth Five

Year Plan. Even the United Nations had projected urban growth during nineties to be close to that of the eighties. All these can now be dismissed as overestimates. The data from Population Census 2001, thus, provides an occasion to have a fresh look at the infrastructure development policy in the country and the perspective on urbanisation.

Measures of structural reform in urban sector launched informally during eighties but formalised since 1991 were expected to accelerate rural urban migration and give boost to the pace of urbanisation. The proponents of the reform often argued that linking of India with global economy would lead to massive inflow of capital from outside the country as also rise in indigenous investment. This, in turn, would give impetus to the process of urbanisation since much of the investment and consequent increase in employment would be either within or around the existing urban centres. Even when the industrial units get located in rural settlements, in a few years the latter would acquire urban status, resulting in emergence of a number of new urban centres by the year 2020.

Critics of globalisation had, however, pointed out that employment generation in the formal urban economy might not be high due to capital intensive nature of industrialisation. Also, the reduction in the rate of public sector investment in infrastructure would continue for the next couple of decades, for keeping budgetary deficits low. A cut in infrastructural investment in rural areas, coupled with open trade policy, would, in turn, slow down agricultural growth, causing high unemployment and exodus from rural areas. This would lead to rapid growth in urban population. Thus, the protagonists as also the critics of economic reform converged on the proposition that urban growth in the post liberalisation phase would be high. The data from the Population Census 2020, however, is likely to prove them both wrong as there will be significant decline in urban growth not merely due to slowing down of natural growth of population but also RU migration.

More important than the decline in the growth rate of urban population is the change in the pattern of urban growth. During 1951-91, urban growth was generally high in relatively backward

states, the states of Bihar, Uttar Pradesh, Rajasthan and Orissa and Madhya Pradesh topping the list. This is because the pace of RU migration and urbanisation were high in most of the backward states and regions that were stuck in the vicious circle of poverty. The relationship between urban growth and economic development was negative but not very strong as a few among the developed states such as, Maharashtra, Gujarat and Haryana, too, recorded high or medium growth. The other developed states like West Bengal, Tamil Nadu and Punjab experienced low urban growth. The scenario of urban growth during this period was characterised by dualism. The developed states attracted population in urban areas due to industrialisation and infrastrctural investment. However, the backward states – particularly their backward districts and small and medium towns – also experienced rapid urban growth. This can party be attributed to government investment in the district and *taluka* headquarters, programmes of urban industrial dispersal, and transfer of funds from the states to local bodies through a need based approach. A part of RU migration in backward states could also be attributed to push factors, owing to lack of diversification in agrarian economy.

Nineties, however, make a significant departure from the earlier decades. The developed states like Tamil Nadu, Punjab, Haryana, Maharashtra and Gujarat have registered urban growth above the national average. West Bengal is the only exception whose growth rate is not particularly impressive. The backward states, on the other hand, have experienced growth either below that of the country or at the most equal to that. It may, therefore, be argued that the dynamics of urban growth would become weak and tend to get concentrated more and more in developed regions, with the exclusion of the backward states, during 2001-2021.

The decline in the rate of urbanisation and the increasing concentration pattern of growth in the next couple of decades must be examined in relation to the new systems of urban governance and methods of financing infrastructural investment. Indeed, launching of the measures of privatisation, strengthening of legal system relating to pollution and land-use etc., would adversely affect the "informal and illegal" market for land and provision of civic services. It may be noted that the functioning

of these informal markets had helped the poor to find a foothold in urban centres during the first few decades since Independence. The stricter implementation of planning norms and frequent invocation of legal system for eviction etc. during the incoming decades would further slow down inmigration of rural poor. Lack of their access to basic amenities, due to a reduction in public investment on urban development and social sectors, would be yet another factor, adversely affecting the pace of urbanisation. It is possible to predict an increase in inequality in the urban structure, along with regional imbalance in the incoming decades. The distribution of population in different size class of settlements, as defined by the Census, is likely to become more and more skewed. The share of Class I towns or cities, with population size of 100,000 or more, has gone up significantly from 26 per cent in 1901 to 65 per cent in 1991. The percentage share of class IV, V and VI towns, having less than 20,000 people, on the other hand, has gone down drastically from 47 to 10 only. This is largely due to the fact that the towns in lower categories have grown in size and entered the next higher category. Unfortunately, however, there has not been a corresponding increase in the number of urban centres, especially at the lower levels, through transformation of rural settlements during the period from 1901 to 1991.

The slow process of graduation of large sized villages into towns, through growth of industrial and tertiary activities, would be a major problem in India's urbanisation in the next few decades. The number of additional urban centres identified by the Census of 2001 is 630 which is less than that of 1991 and much below that of 1981. The process of sectoral diversification in rural economy is so week that one would not expect more that 800 additional urban centres during the next two decades. Also, given the spatial concentration of the growth process, these new towns are likely to remain concentrated around a few large cities or regions.

The second and more important reason for the urban hierarchy to become skewed and top heavy in the year 2021 is that the larger urban centres would experience faster demographic growth as compared to smaller order settlements. The class I cities, for example, have registered an average annual growth rate of 3.0 per cent during 1981-91, which is higher than that of lower order

towns. The same pattern is noted during 1991-2001 as well. More important, the class I cities exhibit a lower disparity in their growth rates, measured through coefficient of variation, compared to those in other size classes. One would expect the former to experience relatively higher and stable demographic growth in future years as these would get more and more linked to the national and even global market. In the smaller towns that are mostly rooted in their regional economy, however, population growth would tend to be low and fluctuating over time and space. This would further reinforce the dual urban structure in the country wherein the larger cities would get integrated with higher order system and would thus share the growth dynamics at national or global economy. This would, by and large, be absent in case of smaller towns.

The higher demographic growth in large cities, compared to the smaller towns, could, at least partly, be attributed to the measures of decetralisation whereby the responsibilities of resource mobilisation and launching infrastructural projects have been given to the local bodies. The large municipal bodies, particularly those located in developed states, tend to have a strong economic base, and this would result in their high economic and demographic growth during the next couple of decades.

It has been noted that a strong lobby is emerging, particularly in these cities, pleading for disbanding all zoning restrictions, building laws and bye-laws and making them relatively independent of state and central level controls. As a consequence, decisions regarding location of industries, change in land-use etc. would be taken expeditiously at the local level. The decentralisation of responsibilities for development planning, sought to be ushered in through the 74th Constitutional Amendment, would help this lobby. The large cities that have relatively stronger economic base would be able to benefit from this opportunity of empowerment of local governments. As a consequence, a few of these cities would be able to attract infrastructural investment and record a high population growth. The small and medium towns, on the other hand, are unlikely to benefit from this changed policy regime. All these would explain the urban structure becoming more and more top-heavy by 2020.

It was pointed out earlier that planning controls, bye-laws etc. have had little impact in restricting demographic growth of large cities in the past. Interestingly, the advantages of relaxation in these controls as also systems of infrastuctural financing in the next two decades would also be taken up mostly by these cities. Due to their strong economic base and consequently high tax and non-tax revenue generating capacity, these would be in a position to put in more resources in creating basic physical conditions, necessary for attracting private investment. This would make the urban structure further top heavy as these large cities and their immediate hinterland would absorb most of the migrants.

10

Sustainable Development in Economics

Economists have since focused on viewing the economy and the environment as a single interlinked system with a unified valuation methodology. Intergenerational equity can be incorporated into this approach, as has become common in economic valuations of climate change economics. Ruling out discrimination against future generations and allowing for the possibility of renewable alternatives to petro-chemicals and other non-renewable resources, efficient policies are compatible with increasing human welfare, eventually reaching a golden-rule steady state. Thus the three pillars of sustainable development are interlinkages, intergenerational equity, and dynamic efficiency. Arrow et al. (2004) and other economists have advocated a form of the weak criterion for sustainable development – the requirement than the wealth of a society, including human-capital, knowledge-capital and natural-capital (as well as produced capital) not decline over time. Others, including Barbier 2007, continue to contend that strong sustainability – non-depletion of essential forms of natural capital – may be appropriate.

'SUSTAINABLE ECONOMIC DEVELOPMENT'

The term 'Sustainable economic development' acquires a major importance in the economic parlance of countries all across the globe. World has witnessed major economic development in last century. Industrial revolution of two centuries back has resulted into all round economic growth and prosperity across the nations.

But the major beneficiaries of this economic boom have been western countries.

Major parts of Africa and Asia lagged behind in this context. The difference of economic chasm is so stark that, terms like 'First world countries' and 'Third world countries' were coined. On the one hand, poverty has reduced in many countries along with overall increase in income but at the same time, this economic growth has not spread equally along all spheres of economy. To go further into the issue, inclusive growth has remained a mirage. There is a huge gap in income distribution, almost to the point that rich has become richer whereas poor have remained same. In view of such conditions, sustainable economic development plans are the need of the hour.

Sustainable economic development strives for reducing poverty and equitable use of resources. The means adopted consist of minimization of depletion of environmental dilapidation, social unsteadiness, economic resources and cultural disorder.

It also aims to use the resources in a judicious way so that present as well future needs be met. Now a day's biggest concern is rapidly diminishing of natural resources, whether it is oil, minerals, energy sources or food etc. Because of the rapid industrialization, natural resources have suffered the most.

We are also constantly struggling with environmental issues. World has taken notice to this grave scenario and has started to address the issue by focusing upon economic as well as environmental and socio-political sustainability so that future generations can meet their demands. Different means of energy conservation, alternate energy resources, nature protection and equal distribution of income have been taken to ensure sustainable economic development.

Concept

Sustainable development is defined as a pattern of social and structured economic transformations (i.e. development) which optimizes the economic and societal benefits available in the present, without jeopardizing the likely potential for similar benefits in the future. A primary goal of sustainable development is to achieve a reasonable and equitably distributed level of

economic well-being that can be perpetuated continually for many human generations. Sustainable development implies using renewable natural resources in a manner which does not eliminate or degrade them, or otherwise diminish their usefulness for future generations. It further implies using non-renewable (exhaustible) mineral resources in a manner which does not unnecessarily preclude easy access to them by future generations. Sustainable development also requires depleting non-renewable energy resources at a slow enough rate so as to ensure the high probability of an orderly society transition to renewable energy sources.

Based on similar arguments, sustainable development has been alternatively defined in various manners also, some of them are as follows:

> *"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs". The World Commission on Environment and Development, Brundtland Commission 1987.*

"Sustainable development ensures that the maximum rate of resource consumption and waste discharge for a selected development portfolio would be sustained indefinitely, in a defined planning region, without progressively impairing its bio-productivity and ecological integrity. Environmental conservation, therefore, contrary to general belief, accelerates rather than hinders economic development.

Therefore, the Development plans have to ensure:

- Sustainable and equitable use of resources for meeting the needs of the present and future generations without causing damage to environment;
- To prevent further damage to our life-support systems;
- To conserve and nurture the biological diversity, gene pool and other resources for long term food security".

Key areas where the partnership works hard to address sustainable economic development issues include the following:

Economic Integration, Investment and Dialogue

The FEMISE network has been financed by the European Commission since 1997, and undertakes economic research and

organises dialogue to assess the state of the EU-Med Partnership. The Barcelona Summit in November 2005 advocated the acceleration of Free Trade Agreements (FTAs) among Mediterranean partners to stimulate investment within an integrated economic zone and to achieve concrete progress towards the objective of a Euro-Mediterranean Free Trade Area by 2010.

EC support to South-South FTAs has so far materialised through a programme to support the implementation of the Agadir Agreement. Under this programme, activities such as studies/ analyses in the economic and trade domain have been developed as well as support to the creation of a technical unit established in Amman, Jordan.

MODELS OF ECONOMIC DEVELOPMENT

The 3 building blocks of most growth models are: (1) the production function, (2) the saving function, and (3) the labour supply function (related to population growth). Together with a saving function, growth rate equals s/a (s is the saving rate, and a is the capital-output ratio). Assuming that the capital-output ratio is fixed by technology and does not change in the short run, growth rate is solely determined by the saving rate on the basis of whatever is saved will be invested.

Harrod–Domar Model

The Harrod–Domar model delineates a functional economic relationship in which the growth rate of gross domestic product (*g*) depends positively on the national saving ratio (*s*) and inversely on the national capital/output ratio (k) so that it is written as $g = s / k$. The equation takes its name from a synthesis of analysis of growth by the British economist Sir Roy F. Harrod and the Polish-American economist Evsey Domar. The Harrod–Domar model in the early postwar times was commonly used by developing countries in economic planning. With a target growth rate, and information on the capital output ratio, the required saving rate can be calculated. It was the best system.

Exogenous Growth Model

The exogenous growth model (or neoclassical growth model) of Robert Solow and others places emphasis on the role of

technological change. Unlike the Harrod-Domar model, the saving rate will only determine the level of income but not the rate of growth. The sources-of-growth measurement obtained from this model highlights the relative importance of capital accumulation (as in the Harrod–Domar model) and technological change (as in the Neoclassical model) in economic growth. The original Solow (1957) study showed that technological change accounted for almost 90 percent of U.S. economic growth in the late 19th and early 20th centuries. Empirical studies on developing countries have shown different results.

Even so, in our post-industrial economy, economic development, including in emerging countries is now more and more based on innovation and knowledge. Creating business clusters is one of the strategies used. One well known example is Bangalore in India, where the software industry has been encouraged by government support including Software Technology Parks.

However, when looking at the growth rate put forward from the neoclassical growth model, it seems to suggest that countries with same characteristics and technology will eventually converge to the same rate of growth. However, one should know that the knowledge presented in countries that promotes technological advancement is not stationary. Meaning that knowledge are linked to individual and not to the country.

According to Lucas Jr (1988) to compensate the movement of knowledge, we should implement factors such as labour factor to predict immigration flow. With labour movement coming into factor, we can then predict the flow of knowledge which can then successfully lead to increase in technology.

ECONOMIC GROWTH VERSUS ECONOMIC DEVELOPMENT

Economic development refers to social and technological progress. It implies a change in the *way* goods and services are produced, not merely an increase in production achieved using the old methods of production on a wider scale. Economic growth implies only an increase in quantitative output; it may or may not involve development. Economic growth is often measured by rate

of change of gross domestic product (eg., percent GDP increase per year.) Gross domestic product is the aggregate value-added by the economic activity within a country's borders.

Economic development typically involves improvements in a variety of indicators such as literacy rates, life expectancy, and poverty rates. GDP does not take into account important aspects such as leisure time, environmental quality, freedom, or social justice; alternative measures of economic wellbeing have been proposed. A country's economic development is related to its human development, which encompasses, among other things, health and education.

Intensive Versus Extensive Growth

A closely related idea is the difference between extensive and intensive economic growth. Extensive growth is growth achieved by using more resources (land, labour and capital). Intensive growth is growth achieved by using a given amount of resources more efficiently (productively). Intensive growth requires development.

Does Growth Create Development?

Dependency theorists argue that poor countries have sometimes experienced economic growth with little or no economic development; for instance, in cases where they have functioned mainly as resource-providers to wealthy industrialised countries. There is an opposing argument, however, that growth causes development because some of the increase in income gets spent on human development such as education and health.

According to Ranis (2000), we view economic growth to human development as a two-way relationship. Moreover, Ranis suggested that the first chain consist of economic growth benefiting human development with GNP. Namely, GNP increases human development by expenditure from families, government and organizations such as NGOs. With the increase in economic growth, families and individuals will likely increase expenditures with the increased in incomes, which leads to increase in human development. Further, with the increased in expenditures, health, education tend to increases in the country and later will contribute to economic growth.

In addition to increasing private incomes, economic growth also generate additional resources that can be used to improve social services (such as healthcare, safe drinking water etc...). By generating additional resources for social services, unequal income distribution will be limited as such social services are distributed equally across each community; benefiting each individual. Thus, increasing living standards for the public.

To summarize, as noted in Anand's article (1993), we can view the relationship between human development and economic development in three different explanations. First, increase in average income leading to improved in health and nutrition (known as Capability Expansion through Economic Growth). Second, it is believed that social outcomes can only be improved by reducing income poverty (known as Capability Expansion through Poverty Reduction). Thirdly, (known as Capability Expansion through Social Services), defines the improvement of social outcomes with essential services such as education, health care, and clean drinking water.

CAPITAL IN SUSTAINABLE DEVELOPMENT

The sustainable development debate is based on the assumption that societies need to manage three types of capital (economic, social, and natural), which may be non-substitutable and whose consumption might be irreversible. Daly (1991), for example, points to the fact that natural capital can not necessarily be substituted by economic capital. While it is possible that we can find ways to replace some natural resources, it is much more unlikely that they will ever be able to replace eco-system services, such as the protection provided by the ozone layer, or the climate stabilizing function of the Amazonian forest. In fact natural capital, social capital and economic capital are often complementarities. A further obstacle to substitutability lies also in the multi-functionality of many natural resources. Forests, for example, do not only provide the raw material for paper (which can be substituted quite easily), but they also maintain biodiversity, regulate water flow, and absorb CO2. Another problem of natural and social capital deterioration lies in their partial irreversibility. The loss in biodiversity, for example, is often definite. The same can be true for cultural diversity.

For example with globalisation advancing quickly the number of indigenous languages is dropping at alarming rates. Moreover, the depletion of natural and social capital may have non-linear consequences. Consumption of natural and social capital may have no observable impact until a certain threshold is reached. A lake can, for example, absorb nutrients for a long time while actually increasing its productivity. However, once a certain level of algae is reached lack of oxygen causes the lake's ecosystem to break down all of a sudden.

Market Failure

If the degradation of natural and social capital has such important consequence the question arises why action is not taken more systematically to alleviate it. Cohen and Winn (2007) point to four types of market failure as possible explanations: First, while the benefits of natural or social capital depletion can usually be privatized the costs are often externalized (i.e. they are borne not by the party responsible but by society in general). Second, natural capital is often undervalued by society since we are not fully aware of the real cost of the depletion of natural capital. Information asymmetry is a third reason—often the link between cause and effect is obscured, making it difficult for actors to make informed choices. Cohen and Winn close with the realization that contrary to economic theory many firms are not perfect optimizers. They postulate that firms often do not optimize resource allocation because they are caught in a "business as usual" mentality.

The business Case for Sustainable Development

The most broadly accepted criterion for corporate sustainability constitutes a firm's efficient use of natural capital. This eco-efficiency is usually calculated as the economic value added by a firm in relation to its aggregated ecological impact. This idea has been popularised by the World Business Council for Sustainable Development (WBCSD) under the following definition: "Eco-efficiency is achieved by the delivery of competitively-priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life-cycle to a level at least in line with the earth's carrying capacity."

Similar to the eco-efficiency concept but so far less explored is the second criterion for corporate sustainability. Socio-efficiency describes the relation between a firm's value added and its social impact. Whereas, it can be assumed that most corporate impacts on the environment are negative (apart from rare exceptions such as the planting of trees) this is not true for social impacts. These can be either positive (e.g. corporate giving, creation of employment) or negative (e.g. work accidents, mobbing of employees, human rights abuses). Depending on the type of impact socio-efficiency thus either tries to minimize negative social impacts (i.e. accidents per value added) or maximise positive social impacts (i.e. donations per value added) in relation to the value added.

Both eco-efficiency and socio-efficiency are concerned primarily with increasing economic sustainability. In this process they instrumentalize both natural and social capital aiming to benefit from win-win situations. However, as Dyllick and Hockerts point out the business case alone will not be sufficient to realise sustainable development. They point towards eco-effectiveness, socio-effectiveness, sufficiency, and eco-equity as four criteria that need to be met if sustainable development is to be reached.

Critique of the Concept of Sustainable Development

The concept of " Sustainable Development " raises several critiques at different levels.

Purpose

Various writers have commented on the population control agenda that seems to underlie the concept of sustainable development. Maria Sophia Aguirre writes:

> *"Sustainable development is a policy approach that has gained quite a lot of popularity in recent years, especially in international circles. By attaching a specific interpretation to sustainability, population control policies have become the overriding approach to development, thus becoming the primary tool used to "promote" economic development in developing countries and to protect the environment."*

Mary Jo Anderson suggests that the real purpose of sustainable development is to contain and limit economic development in

developing countries, and in so doing control population growth. It is suggested that this is the reason the main focus of most programs is still on low-income agriculture. Joan Veon, a businesswoman and international reporter, who covered 64 global meetings on sustainable development posits that:

> *"Sustainable development has continued to evolve as that of protecting the world's resources while its true agenda is to control the world's resources. It should be noted that Agenda 21 sets up the global infrastructure needed to manage, count, and control all of the world's assets."*

Consequences

John Baden reckons that the notion of sustainable development is dangerous because the consequences are proceedings with unknown effects or potentially dangerous. He writes: "In economy like in ecology, the interdependence rules applies. Isolated actions are impossible. A policy which is not enough carefully thought will carry along various perverse and adverse effects for the ecology as much as for the economy. Many suggestions to save our environment and to promote a model of 'sustainable development' risk indeed leading to reverse effects." Moreover, he evokes the bounds of the public action which are underlined by the public choice theory: quest by the politics of their own interests, lobby pressure, partial disclosure etc. He develops his critique by noting the vagueness of the expression, which can cover anything : It is a gateway to interventionist proceedings which can be against the principle of freedom and without proven efficacy. Against this notion, he is a proponent of private property to impel the producers and the consumers to save the natural resources. According to Baden, "the improvement of environment quality depends on the market economy and the existence of legitimate and protected property rights." They enable the effective practice of personal responsibility and the development of mechanisms to protect the environment. The State can in this context "create conditions which encourage the people to save the environment."

Vagueness of the Term

The term of "sustainable development" is criticized because of its vagueness. For example, Jean-Marc Jancovici or the

philosopher Luc Ferry express this view. The latter writes about sustainable development: "I know that this term is obligatory, but I find it also absurd, or rather so vague that it says nothing."

Luc Ferry adds that the term is trivial by a proof by contradiction: "who would like to be a proponent of an "untenable development! Of course no one! [..] The term is more charming than meaningful. [..] Everything must be done so that it does not turn into a Russian-type administrative planning with ill effects."

Basis

Sylvie Brunel, French geographer and specialist of the Third World, develops in *A qui profite le développement durable* (Who benefits from sustainable development?) (2008) a critique of the basis of sustainable development, with its binary vision of the world, can be compared to the Christian vision of Good and Evil, a idealized nature where the human being is an animal like the others or even an alien. Nature – as Rousseau thought – is better than the human being. It is a parasite, harmful for the nature. But the human is the one who protects the biodiversity, where normally only the strong survive.

Moreover, she thinks that the ideas of sustainable development can hide a will to protectionism from the developed country to impede the development of the other countries.

For Sylvie Brunel, the sustainable development serves as a pretext for the protectionism and "I have the feeling about sustainable development that it is perfectly helping out the capitalism".

"De-growth"

The proponents of the de-growth reckon that the term of sustainable development is an oxymoron. According to them, on a planet where 20% of the population consumes 80% of the natural resources, a sustainable development cannot be possible for this 20%: "According to the origin of the concept of sustainable development, a development which meets the needs of the present without compromising the ability of future generations to meet their own needs, the right term for the developed countries should be a sustainable de-growth".

ECONOMIC DEVELOPMENT

Planned socialist economies of the 20th century emerged in underdeveloped regions of the world and played a great role in industrialization there to help these regions catch up with industrialized nations. However, they had lacked indigenous technological innovation capability and failed to get on an innovation track. Since the 1970s, they have remarkably lagged behind other economies in the world. None of economies in transition has developed into a high-income economy. Again, therefore, they have been considering the challenge to intentionally pursue economic development and catch up with industrialized economies.

ECONOMIC POLICY PROBLEMS

The demonstrate great roles that governments must play in economies in transition. First, the governments must ensure right incentives for enterprise managers and create appropriate conditions and environments for competition. Second, they must enhance international competitiveness and accelerate economic growth. Third, they must train people as market economy actors. In fact, economic policies in economies in transition do not necessarily indicate a persistent pursuit of these goals.

Importance of Macroeconomic Policy

As known well, the Russian financial crisis in 1998 paradoxically created conditions for later economic growth. The 50% devaluation of the ruble amid the crisis has served to push up prices of imports, enhance domestic products' competitiveness against imports in the domestic market and stimulate production of goods replacing imports. As a result, imports' share of domestic retail sales has dramatically declined.

The ruble devaluation has also served to promote exports and boost export \ sales, and a substantial fall in real wages amid fast inflation has reduced production costs at enterprises. These developments have led to improvements in financial performance of Russian enterprises and prompted them to expand investment, stimulating their production of investment goods for domestic use. The Russian government had not designed these

improvements, which are attributable to external factors. But they indicate the importance of macroeconomic policy for improving economic performance. In turn, they also indicate negative effects on the Russian economy of thorough import liberalization since 1992 and incomplete revisions to the liberalization since 1995.

Another point we must not overlook in the economic recovery course is a change in the policy stance of the Central Bank of the Russian Federation. Anti-inflation measures have emerged as an urgent challenge again since the 1998 financial crisis. The central bank has tried to hold down inflation while easing liquidity shortages after the crisis. Such monetary policy is indicated in Russian Central Bank Governor Viktor Gerashchenko's report on "Transition to New Currency and Credit Policy in 1999." His report emphasizes a transition to a balanced policy that prevents anti-inflation money supply restrictions from hurting the revitalization of production.

The stance of the Russian Central Bank is close to the monetary policy stance that the National Bank of Hungary had maintained in 1990. The Hungarian central bank then adopted the policy of guaranteeing money supply required for economic functions and anti-inflation monetary tightening that enterprises and citizens could tolerate. It rejected any one-sided, rough monetary tightening policy. The balanced monetary and credit policy that gave priority to the real economy could successfully prevent any excessive increase in overdue debt and deficit-ridden enterprises and made the implementation of a bankruptcy law (a new bankruptcy law established in 1991) feasible. Russia was too late in departing from a rough money supply restriction policy.

The Russian economy's remarkable recovery is indicated in the next table. Noteworthy is basic investment that recovered in 1999 after a persistent decline since 1992 and scored substantial growth in 2000. Russia has resumed economic growth even in the absence of effective improvements in the transparency of the enterprise ownership structure, commercial banks' malfunctions and other structural microeconomic problems. This indicates how great the impact of macroeconomic conditions and the central bank's monetary and credit policy on the economy is. In respect to Russia, macroeconomic conditions include the exchange rate

and terms of trade. The purpose of macroeconomic policy must thus be to set a normal economic environment where most of existing enterprises can usually compete for profit.

Macroeconomic Policy and Enterprise Reform

The Russian economy has featured the prevalence of deficit-ridden enterprises, overdue debt and barter trade, as well as irresponsible corporate governance that has led to the "barter economy." These problems involving acts of enterprises and their managers have frequently been attributed to defects of privatization methods, lagging development of law, insufficient enterprise reform, etc. They have also been interpreted as factors to explain Russia's deteriorating macroeconomic performance. Such interpretation is right in a sense. At the same, we can also note that macroeconomic policy has deteriorated the enterprise management environment and caused the problematic acts of enterprises and their managers, as indicated by the Russian economy's recovery since the latter half of 1998. Enterprise bankruptcies and other negative incentives, as well as acquisition of profit, private obtainment of wealth and other positive incentives, are required for a market economy to work well. If macroeconomic policy is too rough and forces a great number of enterprises to go bankrupt, implementation of bankruptcies will become impossible to prevent negative incentives working well and will cause malpractices in enterprise management. We cannot overlook such great negative effect of rough macroeconomic policy.

Policy Mix

During the transition to a market economy, the government must abolish or relax various regulations set by a socialist regime. Also as noted earlier, liberalization itself requires appropriate government regulations.

In Hungary, for example, price liberalization was promoted as outline. Hungary took three years to increase liberalized-price products' share of consumer goods transactions from 41% in 1987 to 77% in 1990, while maintaining reports and consultations on prices to fight against monopoly or oligopoly. It also adopted rules to link prices of raw and other materials for massive consumption to global market prices. The basic idea behind such approach was

that the introduction of an overall free market price system must be gradual to prevent inflation and other negative effects from outdoing positive effects of a market price system. Hungary mixed gradual price liberalization with administrative intervention.

Hungary also implemented gradual trade liberalization. Imports free from import licenses or quotas accounted for only 40% of total imports in value in 1989. The percentage was raised to 65% in 1990, 90% in 1991 and 95% in 1995. Hungary, which joined the Central Europe free trade agreement in 1993, has been a member country of the General Agreement on Tariffs and Trade and the World Trade Organization. In March 1995, however, it introduced an 8% import surcharge in the face of trade balance deterioration. In this way, trade liberalization was accompanied by government regulations. We must remember that if a great competitiveness gap exists between domestic and foreign enterprises, any reckless import liberalization can effectively deprive domestic enterprises of freedom in management and fail to lead to real liberalization.

Policy Sequencing

From 1991 to 1992, Russia was dominated by excess liquidity on one hand and by monopolistic industrial organizations on the other. In such circumstances, thorough price liberalization was unreasonable. Some economists then insisted that Russia should begin with sales of state assets to absorb excess liquidity. This was reasonable. A reasonable argument may be that values of goods including state assets cannot be determined unless prices are liberalized. However, there is no guarantee that price liberalization could result in reasonable prices under a distorted market structure. Price liberalization, including a price system formation process, should be gradual. It may also be reasonable that antimonopoly measures should be enhanced before price liberalization.

It was unreasonable for Russia to promote privatization before developing law to govern enterprise management after privatization. It was also problematic for Russia to liberalize trade before taking measures to enhance the competitiveness of domestic industry. These Russian experiences indicate that policy sequencing is very important for the course of transition to a market economy.

TOURISM, GLOBALISATION AND SUSTAINABLE DEVELOPMENT

Tourism is one of the fastest growing sectors of the global economy and developing countries are attempting to cash in on this expanding industry in an attempt to boost foreign investment and financial reserves. While conceding that the uncontrolled growth of this industry can result in serious environmental and social problems, the United Nations contends that such negative effects can be controlled and reduced.

In the following article, Anita Pleumarom considers whether the global tourism industry can really be propelled towards sustainability under the current international and political regime that underpins the drive towards globalisation.

Before getting into the cold facts of global economics, let me begin with another story to warm up. I was perplexed when I recently read in the newspaper that Thailand's forestry chief had said: 'Humans can't live in the forest because human beings aren't animals. Unlike us, animals can adapt themselves to the wild or any environment naturally.' This was to legitimatise the government's plan to remove hundreds of thousands of rural and hill tribe people from protected areas. This man, who is in charge of conserving the forests, is at the same time very strongly pushing to open up the country's 81 national parks to outside investors and visitors in the name of 'eco-tourism'. Can we conclude, then, that the forestry chief considers developers and tourists as animals that know how to adapt to the forest and behave in the wild naturally?

While authorities want to stop the access to forest lands and natural resources of village people, another group of people-namely tourism developers and tourists with lots of money to spend-are set to gain access to the area. While authorities believe that local people, who have often lived in the area for generations, are not capable of managing and conserving their land and natural resources-under a community forestry scheme for example-they believe they themselves in cooperation with the tourist industry can properly manage and conserve 'nature' under a national eco-tourism plan. Taking the above quote seriously, cynics may be tempted to say there is obviously a gap between 'human rights' and 'animal rights'.

How is this story linked to globalisation? First of all, that humans cannot live in the forest is-of course-not a Thai concept. It is a notion of Western conservation ideology-an outcome of the globalisation of ideas and perceptions. Likewise, that eco-tourism under a 'good management' system is beneficial to local people and nature is also a Western concept that is being globalised. In fact, Thailand's forestry chief thinks globally and acts locally. A lesson that can be learned from this is that the slogan 'Think Globally, Act Locally' that the environmental movements have promoted all the years, has not necessarily served to preserve the environment and safeguard local communities' rights, but has been co-opted and distorted by official agencies and private industries for profit-making purposes. The tourism industry is demonstrating this all too well.

Many developing countries, facing debt burdens and worsening trade terms, have turned to tourism promotion in the hope that it brings foreign exchange and investment. Simultaneously, leading international agencies such as the World Bank, United Nations agencies and business organisations like the World Travel & Tourism Council (WTTC) have been substantially involved to make tourism a truly global industry. However, tourism in developing countries is often viewed by critics as an extension of former colonial conditions because from the very beginning, it has benefited from international economic relationships that structurally favour the advanced capitalist countries in the North. Unequal trading relationships, dependence on foreign interests, and the division of labour have relegated poor countries in the South to becoming tourism recipients and affluent countries in the North to the position of tourism generators, with the latter enjoying the freedom from having to pay the price for the meanwhile well-known negative impacts in destinations.

TRANSNATIONAL CORPORATIONS

Travel and tourism has emerged as one of the world's most centralised and competitive industries, and hardly any other economic sector illustrates so clearly the global reach of transnational corporations (TNCs). Over recent years, the industry has increasingly pressured governments around the world to liberalise trade and investment in services and is likely to benefit

tremendously from the General Agreement on Trade in Services-a multilateral agreement under the World Trade Organisation (WTO).

GATS aims to abolish restrictions on foreign ownership and other measures which have so far protected the services sector in individual countries. For the hotel sector, for example, GATS facilitates franchising, management contracts and licensing. Moreover, foreign tourism companies will be entitled to the same benefits as local companies in addition to being allowed to move staff across borders as they wish, open branch offices in foreign countries, and make international payments without restrictive regulations.

Foreign investment will also be increasingly deregulated under the GATT/WTO system. According to the Agreement on Trade-Related Investment Measures (TRIMs), foreign companies will no longer be obliged to use local input. The Multilateral Agreement on Investment (MAI) proposed by The Organisation for Economic Cooperation and Development (OECD) countries goes even further, calling for unrestricted entry and establishment of foreign firms, national treatment, repatriation of profits, technology transfer, etc.

Accordingly, the WTTC has recently presented its 'Millennium Vision' on travel and tourism, including the following key areas:

Get governments to accept travel and tourism as a strategic economic development and employment priority.

Move towards open and competitive markets by supporting the implementation of GATS, liberalise air transport and deregulate telecommunications in international markets.

Eliminate barriers to tourism growth, which involves the expansion and improvement of infrastructure-e.g. the increase of airport capacity, construction and modernisation of airports, roads and tourist facilities.

On a tour through South-East Asian countries in February 1998, WTTC president Geoffrey Lipman also strongly supported the privatisation of state enterprises, particularly airlines and airports. His visit in Thailand, for example, coincided with the announcement of British Airways-a prominent member of the WTTC-that it was interested in taking over 25% of Thai Airways

International. And the British Airport Authority promptly followed up by proposing to buy a major equity share in the provincial airports of Chiang Mai, Phuket and Hat Yai, which are all located at popular tourist spots. However, the selling out of state companies to foreigners has been facing growing public opposition in Thailand so that privatisation is not progressing as planned.

Meanwhile, even the voices of the tourism industry in Asia are urging a cautious approach towards globalisation. Imtiaz Muqbil, a renowned tourism analyst based in Bangkok, warned: 'The independence of thousands of small and medium size enterprises, including hotels and tour operators, is at risk.' This is because most local enterprises will hardly be able to compete with foreign companies. Moreover, Muqbil suggested that as an outcome of globalisation, Asian countries may face 'the prospects of huge growth in leakage of foreign exchange earnings.' In conclusion, he said, 'The radical restructuring of travel and tourism... could strike at the heart of national economies. It is already a well-established fact that in some developing countries, more than two-thirds of the revenue from international tourism never reaches the local economy because of the high foreign exchange leakages. Now, as the new free trade and investment policies are being implemented, their balance sheets may even worsen because the profits and other income repatriated by foreign companies is likely to grow larger than the inflow of capital. That means, the claims that globalisation and liberalisation of tourism will bring wealth, progress, social achievements and improved environmental standards to developing countries need to be seriously questioned.

A recently published document by the UN Conference on Trade and Development (UNCTAD) states that Asia-Pacific countries urgently need to bolster their bargaining positions in the field of tourism services and negotiate better terms in exchange for opening their markets. However, governments have barely had time to examine the potential impacts of globalisation, and many local tourism-related companies are already in financial trouble due to the economic crisis. So it is very unlikely that they can strengthen their negotiating power. Even major Asian airlines can hardly survive in this crisis-hit business environment; the

recent temporary closure of Philippine Airlines is an illustrative example. Economic globalisation has also generated considerable criticism because it comes along with the erosion of power of governments. Opponents argue that local and national institutions will no longer be able to properly fulfil their responsibilities such as providing social services, preserving the environment, and implementing sustainable development programmes.

Indeed, the multilateral agreements facilitating globalisation have shown little, if any, concern for social and ecological issues. On the environment front, the WTO has discussed proposals to introduce 'environmental standards' and 'eco-labels' developed by international setting bodies. Critics say this move is likely to be dominated by TNC interests, which attempt to appropriate the environmental agenda and push for self-regulation. Meanwhile, existing national environmental policies and laws adopted by democratically elected governments will be undermined. The WTTC, for example, vows to 'promote sustainability in travel and tourism' through its Green Globe programme, but-as its 'Millennium Vision' document states-'strongly believes that the environmental policy agenda should focus on (the industry's) self-improvement, incentives, and light-handed regulation as the preferred approach'.

Concerns

The increasing influence of private sector interests on international forums negotiating the environmental agenda has reinforced concerns that genuine efforts to set up a more stringent framework for the tourism industry may be jeopardised. In this context it is important to note that the seventh session of the UN Commission on Sustainable Development (CSD) this year will include important discussions on the issues of sustainable tourism.

So far, the UN General Assembly has adopted a resolution on 'Sustainable Tourism' as part of its 'Programme for the further implementation of Agenda 21', the action programme adopted at the Rio Earth Summit. This resolution acknowledges the need to consider further the importance of tourism in the context of Agenda 21. Among other things, it states: 'For sustainable patterns of consumption and production in the tourism sector, it is essential

to strengthen national policy development and enhance capacity in the areas of physical planning, impact assessment, and the use of economic and regulatory instruments, as well as in the areas of information, education and marketing.' Furthermore, the resolution calls for participation of all concerned parties in policy development and implementation of sustainable tourism programmes.

What is important to keep in mind is that this UN resolution stresses the need for a democratic regulation of tourism development, which is in stark contradiction to the lobbying efforts by the agents of tourism globalisation towards deregulation and an industry-led and self-regulated scenario.

This conflict featured prominently at the fourth Conference of Parties to the UN Convention on Biological Diversity (COP4) in Bratislava, Slovakia, last May, which included discussions on the integration of biodiversity into sectoral activities such as tourism. Many government delegates there resisted attempts by the German government to get approval from the Ministerial Roundtable at COP4 for a programme to develop global guidelines on biodiversity and sustainable tourism. Observers noted that the increased promotion of interests of the powerful German tourism industry at the UN level by the German government has been conspicuous over recent years.

Official and NGO representatives were surprised by the insistence of the Germans to work on global guidelines and to seek endorsement for this programme from the CSD. The delegate from Samoa, for example, reiterated that sustainable tourism is a complicated issue that will be dealt with by the CSD next year and complained: 'We are not in favour of some of the top-down approaches we have seen here (at COP4).' Other delegates expressed concern over the relevance, objectives and funding of the proposed programme.

Significantly, critical observers warned that an ill-advised proposal on global guidelines under the Convention could have devastating consequences for local and indigenous communities-socially, culturally and ecologically. 'The tourism industry's propensity towards unrestricted growth and its commoditisation of indigenous cultures must be recognised as clearly unsustainable,'

commented an NGO representative during the Bratislava Conference.

Meanwhile, there are justifiable fears that under the new economic globalisation schemes, sustainable and eco-tourism activities will even further enable TNCs to gain commercial access to ecologically sensitive areas and biological resources and accelerate the privatisation of biodiversity, all to the detriment of local communities' land and resource rights and the natural environment. As the Austrian environment minister told delegates at COP4, 'Sustainable tourism offers new market opportunities.'

Vague, with Buzzwords

Indeed, the debate on tourism principles and guidelines is a tricky one-not only because it is heavily overshadowed by politics of global players. Another point of concern is that guidelines and programmes, as discussed and adopted by advocates of sustainable tourism at the international level, naturally remain very vague. Usually, they are also overly euphemistic, with buzzwords abounding: e.g. empowerment of local communities; local participation and control; equitable income distribution; benefits to nature conservation and biodiversity protection; etc.

A tourism researcher from the University of British Columbia, Nick Kontogeorgopoulos, suggested that attempts to implement tourism projects based on such guidelines are bound to fail altogether because it is simply impossible to apply them to highly disparate and heterogeneous destinations. He says, 'While these altruistic principles are laudable in theory, the absence of place-specific context strips them of empirical evidence.' In conclusion: Not the global game, but local circumstances and conditions represent the essential determinant of success for sustainable development.

In Asia, social and environmental activists argue that the inflationary tourism policies in the context of globalisation have greatly contributed to the present economic crisis. During the era of the so-called bubble economy, indiscriminate and unsustainable investments led to the rapid conversion of lands into massive tourism complexes, including luxury hotels, golf courses and casinos, and related infrastructure such as airports, highways, and

dams to generate electricity. With economic liberalisation, the tourism, real estate and construction industries boomed, backed by local banks and global speculative capital. An essay written by renowned tourism critic and media activist Ing. K. reflects the anger of many Thais about the developments that have led to the country's bankruptcy. She presents the hard facts as follows:

'Land speculation became a national pastime, permeating every beautiful village, however remote. Land prices skyrocketed. Villagers sold agriculturally productive land to speculators. Practically overnight, fertile land became construction sites. The plague kept spreading; corruption got out of control. National parks and forest reserves were encroached upon by golf courses and resorts.

'Many instant millionaires were made, but much of this new rich money was not wisely invested in productive ventures. Instead, most of it was spent on luxury "dream" products and services, in pursuit of the consumer lifestyle.

'Many of these people were merely imitating tourists and were influenced by the prevailing free-spending frenzy. Greed and consumerism devastated whole communities all over Thailand, raising the temperature even higher, on every level of society...

'In the end, we have nothing to show for it but whole graveyards of unsold high-rise condominiums, shophouses, golf course and resort developments and housing estates.'

Now, all discussions and work programmes relating to the implementation of global and local Agendas 21 and sustainable development appear-more than ever-removed from reality in view of the unfolding Asian crisis-a human disaster with millions of unemployed and landless people falling below the poverty line. According to the latest figures from UN agencies, more than 100 million people in the region are newly impoverished. And there are growing fears that the machinations of unregulated global speculative capital now threaten to ruin not only Asian economies but the rest of the world as well.

A major question that needs to be addressed in this context: Where will all the money come from for sustainable development and tourism projects?

In Thailand, for example, the World Bank and the Japanese OECF have agreed to provide loans to improve and expand tourism as part of a social investment programme (SIP) aimed at tackling the problems of unemployment and loss of income arising from the economic crisis. It has been stressed that tourism development is crucial for the country's economic recovery, and 'community participation' and 'sustainability' are mentioned as major components in projects. But critics have warned that firstly, tourism is not a quick commodity that can pull the country out of its economic pains. And secondly, much of the borrowed money will be used for new developments in national parks and biodiversity-rich areas in the drive to promote 'eco-tourism'.

Let me confront you with a provocative idea now. It is not the longstanding efforts by the many experts promoting and working on the implementation of global and local Agendas that bring us closer to sustainable tourism. Ironically, it is rather the current all-embracing crisis which may eventually make tourism more sustainable-at least in environmental terms. Why?

First of all, a basic problem of sustainable tourism has been the rapidly expanding numbers of travellers. But as a result of the crisis, tourism growth has come to a standstill. Due to currency devaluation, increasing unemployment, declining income and deflation, Asian markets are collapsing. Even the numbers of Japanese going abroad for holidays are now declining for the first time in 18 years. European and American holidaymakers have also shunned South-East Asian countries because of 1997's smog disaster, caused by forest fires in Indonesia, and political turmoil in the region-e.g. in Burma, Cambodia and-more recently-Indonesia.

As the economic contagion is spreading, the travel fever that had gripped Russia and other East European countries after the fall of the Soviet Union is also on the wane, as the Russian currency, the rouble, has plummeted dramatically and the economy slumps.

Moreover, amid the decline of business activities in Asia, stockmarket slumps and fears of a global recession, nervous companies around the world are limiting corporate travel spending. The WTTC, which had earlier in 1998 forecast growth averaging 7% a year throughout 2008, now expects the global tourism market

to remain flat in the next years. This may be bad in terms of economics but, unquestionably, the environment will benefit from stagnating or even decreasing tourist numbers.

For instance, the air travel industry has been identified as one of the biggest environmental villains in tourism. With fewer people travelling, however, the Asia-Pacific aviation industry is now flying into a deep recession. Airlines are fighting for survival by closing or cutting unprofitable routes, selling aircraft and cancelling orders for new aircraft. Governments are forced to cut budgets for airport expansion and construction. Ultimately, that means less pollution and less environmentally damaging developments.

The real estate and construction industries, which are both inextricably linked to the tourism industry, were the first industries that crash-landed when the Asian bubble economy burst. As a result, many speculative and unsustainable hotel and resort development projects have been abandoned, and new construction is down to a trickle. An excellent example is golf, which became a symbol of globalised leisure and tourist lifestyle in Asian tiger societies. But as the frenzy to build luxurious golf course complexes-including hotels, housing estates and shopping centres-has almost stopped completely, and middle-class people affected by the crisis are turning away from the expensive sport of golf, environmentalists can be relieved: The malaise of rampant land grabs, national park encroachments, deforestation, etc. related to golf courses is no longer as threatening as it was a few years ago.

On the other hand, while many tourism-related companies may have scrapped or postponed potentially harmful projects, one needs to acknowledge that because of the financial crunch, public and private investments in environmental protection are also being cut. Moreover, there have been warnings that the crisis has resulted in an upsurge of crime, prostitution, drug abuse and other social vices related to tourism.

Failed

But most importantly, Asian societies are beginning to realise that the current global economic capitalist system has utterly failed to bring achievements in all terms. Now burdened with having to pay for the activities of unscrupulous speculators and

additionally suffering from free-market-oriented structural adjustment programmes imposed by the International Monetary Fund (IMF), people are losing faith in a globalised economy. Some experts even go so far as to say that free trade and investment liberalisation is 'yesterday's story'. Malaysia in particular has recently taken decisive steps to shut itself off from global markets by strictly controlling foreign capital flows.

Asian governments are now likely to move towards greater self-reliance as they are pressured by people of all walks of life to look into economic strategies that are chiefly based on domestic financial resources and the domestic market. This involves the strengthening of the agricultural sector and local industries to protect people's livelihoods in the first place. Forces still seeking to further prop up economically risky service industries such as tourism are likely to be weakened.

Moreover, the crisis has also created considerable public debate about the impacts of global culture and lifestyle, including the issues of consumerism and the wasteful and unproductive use of resources. In several Asian countries-such as Korea, Thailand and Malaysia-outbound tourism is now being discouraged as it is seen as conspicuous consumption that has contributed to the negative balance of payments.

The issues of democracy and human rights are also gaining momentum in the region. As never before, people are making use of their civil rights and call for transparency and democratic procedures to phase out corruption and harmful government policies and development plans. The growing opposition of Thai environmentalists and villagers to the move of the government to open up protected areas for 'mass eco-tourism' is just one example.

All in all, I believe, the current Asian crisis, which is likely to become a global crisis, poses a fundamental challenge-and an important opportunity-to re-evaluate the issues of globalisation, sustainable development and tourism.

As Asian societies begin to acknowledge that rapid economic growth under global regimes has devastating effects on people's lives and the environment, we may find that a stringent regulation of tourism, which involves a stricter limitation of tourist numbers

and a halt to the unlimited spatial expansion of tourism, is better than further promoting tourism growth and hoping that this growth can be handled with 'good management', education of tourists, etc. What the current crisis really appears to confirm is-what many tourism critics have been saying all along-the global tourism industry just cannot be propelled towards sustainability under the conventional economic and political structures. That means, efforts to implement social and environmental agendas and sustainable tourism are unlikely to progress unless profound structural changes take place in the global system.

11

Regional Development and Economic Geography

INTRODUCTION

Substantial disparity in regional incomes is a reality in every geographically large country, and the causes of the disparity are numerous and complex. The enduring character of many cases of regional backwardness is also a reality, for example, the Appalachians in the United States, Northern Shaanxi in China, Chiapas in Mexico, and Madura in Indonesia. The persistence of poverty in these locations has led many prominent social scientists to see the main causes of entrenched regional poverty to be inter-related in a self-reinforcing or self-perpetuating manner. Sociologists talk about the culture of poverty. Psychologists highlight the absence of the drive to achieve. Classical Marxists expound about the systemic need of the capitalist economy for a reserve army of unemployed. Latin American *dependenistas* see domestic regional disparity to be the inevitable reflection of the neo-imperialistic relationships in the international arena, the global metropolis-periphery arrangement reproduced within the dependent economy. Finally, neo-classical economists explicate the working of local dynamics that produce multiple equilibria, with the "low-income trap" being one of the stable outcomes.

Natural scientists too have their own discipline-based explanations for spatial inequality in economic development. The most well-known recent example of which is the book, Guns, Germs and Steel by the physiologist Jared Diamond (1997). One

of Diamond's main arguments is that many types of innovation (especially those in agriculture and construction) are not applicable across ecological zones. So, in ancient times, while new improved varieties of crops and beasts of burden can spread from northern Asia in the east to Europe in the west (and vice-versa), they cannot be transmitted from the temperate zone in north America to the temperate zone in south America because of the intervening tropics. Biological endowments also matter. Most of Asia and Europe have more naturally-pliable livestock (horses and cows) that can be harnessed to help in war and production. The African-equivalent of those animals, e.g. zebras, hippopotamuses, antelopes and wildebeests, have proved themselves, up to today, resistant to domestication efforts to turn them into beasts of burden. Even the African elephant is temperamentally uncooperative compared to its Asian cousin.

There is clearly no shortage of explanations for regional disparity and its, sometimes centuries-long, durability. This surfeit of views is suggestive of ignorance about this phenomenon, and confusion about what to do about it. What is clear however is that the successful development strategies of some countries cannot produce the same salubrious results when implemented in other national settings. When China opened some coastal pockets for foreign direct investment, these Special Economic Zones (SEZs) quickly blossomed into vibrant export platforms and created backward linkages with the immediate hinterland. Whereas, when landlocked Mongolia turned the entire country into a free trade and investment zone in the late 1990s, the inflow of foreign capital was a mere trickle compared to China's experience. The specific lesson in this case is that the time-tested effective growth policy package for a coastal economy, and minor modifications of it, are unlikely to work for an interior economy.

Public concern for regional income disparity in China has been increasing quickly since the early 1990s. This concern is rooted in the widening of provincial income gaps that started in the 1988-93 period, with the exact timing dependent on the method of measurement. The coefficient of variation of provincial incomes for 29 provinces fell from 0.73 in 1978 to 0.63 in 1989 and then rose to reach 0.70 in 1998. By 1995, the obvious rise in regional

inequality had caused the international news media to raise the possibility of the political disintegration of China.

The "optimistic" scenario for China's breakup is an amicable one. The affluent provinces could now afford to quietly ignore the authority of the central government, or to indirectly control the central government – a situation of de facto political independence for the affluent provinces. The May 11, 1995 issue of the Far Eastern Economic Review carried on its cover the heading "Fragile China: Affluent Regions Go Their Own Way", and it reported that the political scientist Susan Shirk:

"knows of a half-dozen provincial functionaries who 'have declined promotions to Beijing and opted to stay at home to get rich and exercise informal political influence.' With regional fortunes so drastically on the rise, Shirk says, national politicians are tempted to play [to] the provinces and outbid each other in pandering to local interests."

The "pessimistic" scenario for the political disintegration is a civil war sparked by the resentment of the poor provinces. According to the economist Hu Angang who advocates the abolition of the special economic zones:

"If Deng Xiaoping knew the disparities were as big as they are, he would be more militant than I am in trying to eliminate them... In America, the deep differences between the North and the South more than 100 years ago led to the Civil War."

"We must cease subsidizing rich coastal cities. Preferential treatment should be reserved for the poor."

Regardless of whether it is concern for social equity or for social stability, China's top leaders have now clearly committed themselves to accelerating the economic growth of the interior provinces. The budget for infrastructure investments in the poor provinces have increased substantially every year, and a Western Region Development Office has just been established under the State Council (the Chinese cabinet) to formulate a comprehensive development strategy and to coordinate its implementation.

This paper seeks to integrate some recent advances in regional science, ecology and geography into economics to arrive at some preliminary findings on the barriers to economic growth in China's

interior provinces. In particular, we present estimates on the role contributions of preferential economic polices and geographical location to the growth of China's provinces. The quantification and policy suggestions presented here are necessarily tentative and primitive because this is the first phase of our collective efforts to understand this longstanding problem of large regional inequality in China's history.

THE IMPORTANCE OF GEOGRAPHY

On a global scale, the wealth of nations is well characterised by two geographical divides. The first geographical divide emphasizes differences in ecological conditions, the temperate zone versus the tropical zone. The second geographical divide emphasizes differences in the ability to conduct international trade, the coast versus the interior. As we will show, both of these geographical divides are a combination of independent causes of economic wealth and of proxies for some important determinants of economic prosperity.

The empirical validity of the temperate-tropical divide is well-vouched for by the fact that over 90 percent of the world's poor lives between the Tropic of Cancer and the Tropic.

Capricorn. The result is a GDP per capita (PPP-adjusted) of $3,326 in 1995 for tropical economies, and $9,027 for nontropical economies. This strong correlate between ecological zone and income level is not a new observation in economics, e.g. Lee (1957) and Kamarck (1976), but it has not been a major analytical organizing principle in development economics. The incorporation of new insights from physical geography and societal dynamics have led Jared Diamond (1997), David Landes (1997), Stanley Engerman and Kenneth Sokoloff (1997) and Gallup, Sachs and Mellinger (1998) to focus on physical geography as an over-arching explanation of economic performance.

Because most of Africa lies in the tropical zone, Bloom and Sachs (1998) have identified the virulence of diseases and the limited potential for large gains in agricultural productivity in the tropics to be the key obstacles to economic development there. This biology-based analysis of Bloom and Sachs is of course not the only recent attempt to explain the upward income gradient

that begins at the Equator. Hall and Jones (1997) have suggested that the distance from the Equator proxies for the relative penetration of European economic institutions, and European-style economic institutions are the ultimate engines of growth.

The coast-interior dichotomy highlights the importance of transportation cost in determining a country's participation in the international division of labor. In the industrial age, water transportation has the lowest cost for extended distance. The growth effects of trade are well-known, beginning with Adam Smith's observation that productivity improvements are enabled by the greater division of labor that, in turn, is enabled by the expansion of the market.

The clear policy lesson here is that investments in physical infrastructure and transportation technology can change the comparative advantage of a region. The temperate-tropical dichotomy will not be a major analytical organizational principle in this paper. This is because China, unlike Brazil and Australia, does not have a substantial part of its territory within the tropical zone. The southern border of China extends only a little miles beyond the Tropic of Cancer. This feature is of interest in itself because it is more than coincidental that after centuries of steady southward expansion, the Chinese empire stopped at approximately where the tropical zone begins. While we will not dwell on the temperate-tropical divide, the general point about differences in the development potential of different ecological zones is an important one. The appropriate development package for the arid plateaus of northwestern China has to be different from the grain-growing plains of central China, and the relevant development package for the wet, warm southwestern provinces has to take disease vectors into greater account.

China in Time and Space

China covers 9.6 million square kilometers and stretches from the temperate to sub-tropical zones. It is similar in size and climate to the United States but its topography is quite different. The most important difference being that the U.S. has coastlines running the length of its eastern and western borders, whereas western China is landlocked. China is also more mountainous and hilly, with

plains at less than 500m elevation making up only 25 percent of the total land area, and mountains and plateaus accounting for 60 percent. These topographic features of China imply higher transportation costs and a greater requirement for physical infrastructure construction. The task of economic development in China is hence more challenging than in the U.S.

Physically, China resembles a three-step staircase running downward from west to east. It begins with the 4,000 meters high Qinghai-Tibet Plateau in the west, proceeds to the highlands and basins in the center which are about 1,000 to 2,000 meters above the sea level, and ends with hilly regions and plains that are less than 1,000 meters high. The combination of higher precipitation, warmer climate, and access to navigable rivers and the sea have made the central and eastern provinces more conducive for farming and trade, and, hence, the population centers of China. The Qinghai-Tibet Plateau was traditionally the poorest region.

The location of China's economic center has changed over time, moving eastwards from the Loess Plateau and the Yellow River Valley in the northwest (where Chinese civilization began in 2000 BC), which is about 1000 kilometers away from the coast. The reason for this original location is because, in ancient times, high agricultural productivity and land-based trade was much more important than sea-based trade. The bulk of China's international trade at that time was conducted through the famous Silk Route that went through the northwestern corner of China. The southeastern coastal region, where Guangdong and Fujian (two of today's most dynamic provincial economies) are located, was largely remained uncultivated and sparsely populated in early Chinese history. Although the natural conditions in the southeast were favorable for agriculture, farming was undeveloped because malaria ('zhangqi' in Chinese) and other subtropical diseases checked population growth, and the high temperature sapped human energy faster, resulting in lower labor productivity. Guangdong was considered an almost uninhabitable place in ancient times.

Over time, the pressure of expanding population and the frequent invasions by the northern tribes caused more of the population to move south and into the mid-coastal and southeastern

regions. By the 12 century, the Yangtze River valley had become very developed and densely populated. The economic importance of the coastal region increased dramatically after the Opium War in 1840 when the Western powers forced China to first open several ports and then the whole country for trade. China's economy and subsequently politics were quickly (by historical standards) transformed. International trade expanded, foreign direct investments flowed in, and local industrialists made their appearances, especially in the mid-coastal and southeast regions. The Qing dynasty was overthrown in 1911, followed by a long chaotic period of protracted civil wars and Japanese colonialism, that ended with the declaration of the People's Republic of China on October 1, 1949 by the Communist Party of China (CPC) under the leadership of Mao Zedong.

Some key geographical and economic characteristics of China in the six regional groupings that are useful for analyzing the post-1978 period.

The municipalities of Beijing, Tianjin and Shanghai that have province-level status (Chongqing was granted province-level status in 1997, but we have included its data under Sichuan province). These are the richest pockets of China, and have had high growth in the 1990s. These cities are highly industrialized, and over 71 percent of their population lives within 100 kilometers of the coast or navigable waters. Beijing, Shanghai and Tianjin are *the exceptionally rich (city) provinces*.

The northeastern provinces of Heilongjiang, Jilin and Liaoning, which are collectively called Manchuria, and was the industrial heartland of China in 1949 (because of the Japanese control of the economy that started in 1905). During the central planning period, their early start in industrialization was consolidated, making these provinces the part of China that most resembled the Soviet Union in industrial organization and production structure. In the national ranking of per capita GDP, omitting the three municipalities, Heilongjiang and Liaoning ranked first and second, respectively, in 1978, and ranked seventh and fifth, respectively, in 1998. Heilongjiang and Liaoning are *the traditionally rich provinces*.

The coastal provinces of Hebei, Shandong, Jiangsu, Zhejiang, Fuijian, Guangdong and Hainan (Hainan was separated out from

Guangdong in 1988). These seven provinces have 82 percent of their population living with 100 kilometers of the sea or navigable rivers. They have grown the fastest of these six groupings in the 1978-1998 period, an annual average of 10.7 percent. The result is that Zhejiang and Guangdong have soared to the top of the per capita GDP ranking, omitting the municipalities, from fourth and sixth, respectively, in 1978 to first and second, respectively, in 1998. Zhejiang and Guangdong are the archetype of *the nouveau riche provinces*.

The central provinces of Shanxi, Henan, Anhui, Hubei, Hunan, and Jiangxi, through which the plain runs relatively unimpeded from the north of the Yellow River to the south of the Yangtze River. The temperature and rainfall make this region the agricultural heartland of China, which explains why its population density is almost twice that of the northeaster and southwestern regions. The two large rivers and their many tributaries endow 57 percent of the population with easy water transportation. The Yangtze between Wuhan and Shanghai has the industrial potential of the Rhone Valley multiplied several times.

The northwestern provinces of Inner Mongolia, Shaanxi, Ningxia, Gansu, Qinghai, Xinjiang and Tibet (data of Tibet omitted) are truly isolated. The center of the land mass is 1,400 kilometers from the coast. This region is more arid and steeper compared to the four previous groupings, and it is marked by desert on its western and northern borders. Furthermore, 5 percent of the land has a slope of greater than 10 percent compared to 2.5 percent for the northeastern, coastal and central provinces. The general lack of water makes the region difficult for agriculture, only 8 percent of the land is arable, which helps explain why it has the lowest population density in China in 1998, 46 persons per km^2 versus 126 persons per km^2 in the southwestern region, which has the next lowest population density. A large number of residents are of Turkic origin, and are practicing Muslims. The Han people are in the minority in Xinjiang and Tibet.

The southwestern provinces of Sichuan, Yunnan, Guizhou, and Guangxi have rainfall and temperature conditions that are ideal for crop cultivation but they suffer from being too mountainous. The average elevation is 1,400 kilometers, the average

slope is 5.2 degrees, and 14 percent of the land has a slope of greater than 10 degrees. The proportion of arable land of 10 percent is barely above that of the arid northwestern provinces. Lacking the mineral resources of the northwestern provinces, the southwestern provinces have the lowest GDP per capita in 1978, and the lowest growth rates in the period of market-oriented reform. A significant proportion of the population belongs to non-Han ethnic groups.

Regional Economic Policy, 1949-1978

Industrialization was shallow in 1949, and a largely coastal phenomenon. In 1952, the secondary sector produced 8 percent of GDP and employed 7 percent of the labor force compared with the primary sector, which produced 74 percent of GDP and employed 84 percent of the work force. The coastal provinces had 72 percent of fixed assets, and accounted for 69 percent of the gross value of industrial output. Naturally, just like the Communist Party of the Soviet Union in 1917, CPC saw its most important economic task to be industrialization.

China adopted the two key sets of guiding principles behind the Soviet development strategy: (a) the Marxist principles of common ownership with the state as trustee, and of generalized egalitarianism; and (b) the Stalinist practices of central planning for resource allocation, suppression of light industries and services in favor of heavy industries, and minimizing trade and financial linkages with the capitalist economies.

Mao added a third guiding principle to China's economic policy-making, the principle of regional economic self-sufficiency, a region should be self-sufficient not only in food production but also in industrial goods as well. This third principle had unquestionably the greatest impact on regional economic outcomes. The self-reliance principle had several virtues. The first was that it overlapped with the egalitarian principle because it reduced provincial inequality, which Mao had identified to be one of the key social contradictions to be eliminated in the new China.

The second virtue was that the biggest beneficiaries of the self-reliance principle were the poorest provinces (because they were overwhelmingly agricultural), and this was in accordance with the

gratitude that many veteran party leaders felt toward these provinces. Many of the poorest provinces were where CPC had retreated to and rebuilt their strength after the Kuomintang had driven it out of the urbanized areas.

The third, and most decisive, virtue of self-sufficiency was that, beginning in 1963, it coincided with the national security considerations of China. The worsening Sino-Soviet political relationship and the growing military presence of the United States in Vietnam convinced Mao that regional economic self-sufficiency was key to China being able to engage in protracted defense of the motherland. Mao and his generals envisaged three lines of defense (coastal, central and western), and they decided in 1964 on a massive construction of military-industrial complexes in western China, the third line of defense, popularly translated as the "third front." To minimize the vulnerability of the third front industries to air attacks, Lin Biao, then the Defense Minister and Mao's designated successor, instructed that these projects be located "in mountains, in dispersion, and in caves."

The first two virtues of the self-sufficiency principle helped to ensure that the First Five-Year Plan (1953-1957) allocated 56 percent of state investment to the interior provinces, and that the Second Five-Year Plan (1958-62) allocated 59 percent. As the concern for national security grew in the early 1960s, the Third Five-Year Plan (1966-1970) allocated 71 percent of state investment in the interior provinces, with the bulk of it in Sichuan, Hubei, Gansu, Shaanxi.

Henan, and Guizhou. Furthermore, many companies in Shanghai and other coastal cities were relocated to the mountains in Guizhou, Sichuan, and Hubei, where highways and railroads were deficient or non-existent, water and electricity were in shortage, and the sources of raw materials were far away. A significant proportion of the relocated factories could not produce anything for many years, with the equipment rusting into junk.

Post-mortem studies of the third front industries concluded that: "only half of the factories built performed to design specifications and the rest were either only partially completed (30 percent) or not completed at all (20 percent). Fully one- third of the total investment was wasted..." One such example of wastage

was the Second Automobile Company built in the mountains of Hubei. The part and assembly plants were scattered over the mountainous region, transportation among the plants was poor, and they were long way away from their input suppliers and the final consumers of their products.

Given the large amount of wastage that occurred in the industrialization of the interior provinces, it is no wonder that even though the interior share of fixed assets went from 28 percent in 1952 to 57 percent in 1983, its share of gross value of industrial products only went up from 31 percent to 41‘percent. The primary cause of the higher productivity of coastal industries was that the coastal provinces had deeper pools of management and technical expertise, better linkages between the industrial enterprises and the local economies, and more developed infrastructure. It was been estimated that 100 yuan of fixed asset investment in 1978 yielded 70 yuan of output from the third front enterprises compared to 141 yuan from the coastal enterprises. The profit rate in 1978 was 9 percent for the third-front enterprises compared to 23 percent for coastal enterprises.

The pouring of investment funds into the interior provinces was a clear violation of the comparative advantage principle. The growth of the interior provinces not only occurred at the expense of the coastal provinces, it also lowered the overall growth rate of the economy. The discrimination against the coastal region was so severe that although Shanghai provided more 40 percent of the state revenue during the Cultural Revolution period, it was not even allowed to retain enough funds money to cover depreciation of its capital stock.

The wastage that occurred with this discrimination against coastal investments was further increased because of the poor planning, poor execution and poor management of the investments in the interior provinces. As we will argue later, the appropriate development strategy for the interior provinces should not be focussed on making the production structure of interior provinces identical to the production structure of the coastal provinces. For example, given the strong extractive capacity and implementation ability of the government under Mao, it would have been more efficient to have located the investments in the coastal provinces,

taxed the profits, and used the tax revenue to benefit the interior benefits. What should have been important for the government was not where the investments were located but whether the dividends from the investments were used to enhance the development of the interior provinces.

It is interesting to note that by 1972, China was reducing its discrimination against investments in the coastal provinces and increasing its economic interaction with the capitalist economies. This policy shift occurred because the government realized that China's economy and technological capacity was falling further behind the rest of the world. If this negative trend were not reversed, China might not be able to defend itself. Furthermore, because the Soviet Union was fast becoming a bigger threat than the United States, an invasion by the traditional land route was therefore much more likely than a coastal landing. The national security justification for the third front industries was hence undermined. Economic modernization required the import of foreign technology, and this necessitated that China increased its export earnings.

With the improvement of Sino-US relations on course after Kissinger's secret visit in July 1971, the coastal enterprises, especially those in Guangdong, were expanded in order to increase their export capacity. Total export earnings jumped from US$2.6 billion in 1972 to US$3.4 billion in 1973, and continued soaring to reach US$9.8 billion in 1978. Just as national security considerations in the 1950s and 1960s have played a large part in justifying the bias in favor of investments in the interior provinces, national security considerations in the face of changes in international politics in the 1970s helped to reverse this bias.

Regional Economic Policy, 1978-98

The process of increased economic interaction with the outside world accelerated at the end of 1978 upon the decisive political victory by the rehabilitated cadres over the remnants of the Maoist establishment at the Third Plenum of the 11th Party Congress. The emphasis on the domestic front was the decentralization of agricultural production, the decentralization of the fiscal system, and the deregulation of prices; and the emphasis on the international front was the Open Door Policy.

Fiscal decentralization took the form of tax contracting between the central government and the provinces. Each fiscal contract was individually negotiated, and it ranged from fixed lump-sum contracts for five years like in the cases of Guangdong and Fujian to highly complicated (province-specific) revenue-sharing formulae. The provincial governments in turn negotiated individual revenue contracts with the local governments. Since the marginal tax rate set by the central government varied tremendously across provinces, the incentive of the provincial and local governments to engage in local economic development in order to generate tax revenue also varied tremendously. Given the importance of Shanghai to the central coffers, its marginal tax rate was set higher than that of most coastal provinces until the early 1990s.

The fiscal decentralization might have helped economic growth, but this led to state revenue declining from 35 percent of GDP in 1978 to 14 percent in 1992, producing a near fiscal crisis for the state. The state lacked the funds to invest in infrastructure projects to remove production bottlenecks, and to undertake poverty alleviation programs. The practice of each provincial government covering more of its expenditure from local revenue necessarily meant reduced development expenditure in the poorest provinces that had been receiving fiscal subsidies from the center. The tax reform of 1994 that had the value-added tax as its center-piece has reduced the discriminatory elements of the fiscal system, and restored the fiscal capacity of the state to help the poorer provinces.

The deregulation of prices in the industrial sector mainly took the form of a dual track price system for industrial inputs. Since the central and western provinces were the main suppliers of raw industrial materials, the continuation of artificially low prices for these industrial inputs meant that the dual track pricing system was in effect transferring income from the interior producers to the coastal factories. The elimination of the dual-track price system in the 1990-91 period was an equitable move from the viewpoint of regional disparity.

The Open Door Policy was initially limited to two southern provinces (Guangdong and Fujian), then gradually extended to larger geographical units: first along the coast, then in the inland

provinces. The distributional consequence of this selective opening-up process was a heavy concentration of foreign investment flows and international trade activity in the coastal provinces, particularly Guangdong. The dominance of Guangdong is a natural consequence of the fact that this province is one of those having received the greatest benefit from the open door policy, notably through the establishment of the three Special Economic Zones of Shenzhen, Zhuhai and Shantou as early as the beginning of the 1980s.

The implementation of regional preferential policies has gone through 3 broad stages during which open economic zones have been settled to provide investors with various preferential tax treatments, exemptions on duties, etc.

1. Early 80s: limited extent to Guangdong and Fujian provinces, with the establishment of Special Economic Zones (SEZ) in 1979-80.
2. Mid to end of the 80s: coastal preference strategy enforcement, with the designation of Coastal Open Cities (COC), entitled to settle their own Economic and Technological Development Zones (ETDZ), in 1984, followed by the establishment of Coastal Open Economic Zones (COEZ) in 1985, an Open Coastal Belt (OCB) in 1988 and the Shanghai Pudong New Area in 1990.
3. Early 90s: further extension towards whole China, after Deng Xiaoping southern tour in 1992. During this year, new open economic zones were officially started in Major Cities along the Yangtze River (MC), Border Economic Cooperation Zones (BECZ), Capital Cities of inland provinces and autonomous regions (CC), ETDZ and Bonded Areas (BA).

The establishment of these various types of economic zones over time. As pointed out by Yang (1997) and Ma (1999), the acceleration in the opening-up process in 1992 led to an inflated number of so-called open economic zones set up by local official without proper authorization. Besides the official policy launched by the State Council, the 30 provinces, as well as hundreds of counties and townships indeed started to formulate their own preferential policies for foreign investment in specific

"development zones". As a consequence of this "zone fever", there were around 2,000 open economic zones of any kind at and above the county level by 1993 (and probably even more below the county level), offering tax exemptions and reductions of all sorts in order to attract investment. Following the implementation of the austerity program in 1993, most of these unapproved zones have been closed, and regional policies have tended to equalize over time (at least up to the end of the 90s).

The gradual geographical extension of the reforms brought about a highly unequal regional distribution of foreign capital flows throughout the period. In 1983, nearly 93 per cent of foreign direct investment went to the coastal provinces, including 69 per cent for Guangdong alone. This imbalance decreased slightly over time, but 88 per cent of foreign direct investment (FDI) flows still went to the coastal region in 1996; however, the share of Guangdong had dropped sharply (to 28 per cent) in favor of other coastal provinces such as Fujian, Jiangsu and Shanghai, which attracted approximately 30 per cent of total FDI. If we reason in terms of disparities, as above, these developments indicate a trend towards equalization within the coastal zone. In the inland provinces there are inverse trends, however, between an increase in the central region's share of FDI over time (from 1.1 percent in 1983 to 9.5 percent in 1996) and a decrease in the western region's share (from 6 percent to 2.5 percent). The cumulative FDI flows for the 1983-96 period was 88.3 percent to the coastal provinces, 8.3 percent to the central provinces, and 3.4 percent to the western provinces. Guangdong received 30 percent of it.

Examination of international trade reveals the same inequalities between coastal provinces and inland provinces. At the national level, exports grew at an average annual rate of 17 per cent over the 1978-96 period, but once again it was Guangdong that derived the greatest benefit from this growth. In 1978, Guangdong was the third-ranking province in terms of exports, after Shanghai and Liaoning, but in 1996 it was far ahead of the other provinces and accounted for 34 per cent of China's exports. As in the case of FDI, the coastal provinces were much more export-oriented than the inland provinces, and although the coastal region's share of total exports fell over the period (87 per cent in 1996 versus 93 per cent

in 1978), it remains very high. The share of exports in GDP is also four to five times higher in the coastal region (30 per cent in 1996) than in the two other regions (around 6 per cent each).

The geographical distribution of imports has changed very little since 1978, and the figures for 1996 are very similar to those for exports: 87 per cent, 8 per cent and 5 per cent respectively for the coast, the center and the west. As was the case for exports, the structure of imports within the coastal region changed in favor of Guangdong province (whose share in total imports rose from 26 per cent in 1978 to 40 per cent in 1996) to the detriment of the municipality of Shanghai in particular.

The high level of foreign trade activity in the coastal provinces is generally linked to that of FDI, since foreign enterprises are supposed to be inherently more export-oriented than domestic firms. Indeed, the contribution of foreign firms to China's total foreign trade has grown since the mid-1980s. Exports by firms with foreign ownership amounted to 41 per cent of total exports in 1996, as against 1 per cent in 1985. Enterprises established in the coastal region accounted for nearly all of these (98 per cent on average in 1994). Moreover, the share of foreign firms in total imports rose from 5 per cent in 1985 to 54 per cent in 1996, since such firms on the whole imported more than they exported. As in the case of exports, the import share of foreign firms is highest in the southern coastal provinces.

Provincial Growth Experiences, 1952-1998

The distribution of per capita GDP growth rates. The periodisation follows the following policy episodes:

- 1953-58: the normal centrally-planned economy
- 1959-65: the Great Leap Forward, the economic collapse and recovery
- 1966-1978: the Cultural Revolution
- 1979-1984: first reform phase, emphasis on agriculture
- 1985-1991: second reform phase, Oskar Lange-inspired reforms
- 1992-1998: third reform phase, ultimate goal is a market economy with substantial diversification of ownership structure

Any unconditional b-convergence across Chinese provinces, during the planned and reform periods.

This is confirmed by cross-section regressions on the whole period and by sub-periods (not reported here) which all indicate that there is no significant relationship between the per capita GDP annual growth rate and its initial level, except for the last sub-period (1992-98) during which a b-divergence phenomenon emerged.

Provincial Income Disparity, 1952-1998

The movements of the coefficient of variation of provincial income summarized that:

1. China experienced much greater fluctuations in income disparity in the planned period of 1952-1978 than in the reform period after 1978. During the planned period, the coefficient moved up 0.13 in 1952-60, down 0.16 in 1960-62, and then up 0.29 in 1962-78 compared with the 0.05 decline in 1978-87, and the 0.09 rise in 1987-98.
2. Periods of extremely low inequality were economically difficult periods when much of the population were brought to subsistence level. 1952 was right after a warring period that lasted over twenty-five years, and 1962 was the depth of the famine caused by the Great Leap Forward. To put it cynically, poverty is always distributed equally because those with extremely low income will not be around to be counted.
3. The overall increase of 0.26 in inequality during the planned period greatly exceeded the 0.03 increase in inequality during the reform period. Market economics may not have decreased inequality, but economic planning certainly increased it faster.

The ranking of provincial income in key years of China's economic history summarizes the changes in the relative fortune of each province in the planned period of 1952-1978, and in the reform period after 1978. They show that:

1. The chief beneficiaries of the planned period were Beijing, Qinghai and Ningxia, and the biggest losers of the reform period were Qinghai and Ningxia. The rise of Beijing's

relative standing, and its maintenance of the attained income rank, reflects its paramount political status in the country. The initial large gains of Qinghai and Ningxia (up 10 and 8 places respectively), and the subsequent large reversals (15 and 10 respectively) showed the tremendous transfer of resources under the third front industrialization program.

2. There has been basically no change at the very top and the very bottom of the scale. Indeed, the three municipalities remained the richest throughout the whole period and Yunnan, Shaanxi, Gansu and Guizhou remained the poorest provinces. Mobility, both upward and downward, is a middle-class phenomenon.
3. The significant winners of the reform period were generally the coastal provinces, especially Fujian, Shangdong, and Hainan. The traditional industrial bases of northern China (Heilongjiang, Jilin, Liaoning) and western provinces experienced a decline in the relative scale of regional per capita income.

The income distribution, the movements in the gap between the five richest provinces and the five poorest provinces. The absolute income gap has increased tremendously over both the planned and reform periods. When we examine the gap in relative terms first by normalizing the absolute gap with the average national income, and second by the ratio of the two incomes, the evidence is mixed. The relative gap decreased from 1.5 in 1978 to 1.4 in 1998, but the income ratios rose from 3.4 to 3.6. In any case, the widening of relative income in the reform period is small compared with the widening in the planned period, confirming the conclusions drawn from the movements of the coefficient of variation.

PROVINCIAL DIFFERENCES IN GROWTH: GEOGRAPHY AND POLICY

We are presenting this section in telegraphic form because we are out of time. Please accept our apologies. (Wing Woo is responsible for this situation, the other co-authors completed all their contributions in good time.) Regional inequality in China has

been extensively studied in recent years. The reform pogrom has increased growth rates of the coastal provinces by:

(a) allowing them to take advantage of their locations to participate in the international division labor, i.e. pure geography effects

(b) giving them preferential tax policies which enable them to have more retained funds to invest more and hence grow faster, i.e. fiscal subsidies

(c) giving them preferential access to foreign capital which increased total capital formation, and hence income. i.e. foreign funds So coastal dummy proxies for two effects: geography and preferential policy

Since coastal provinces were initially discriminated against, and in the middle-income group, the reform program allowed them to grow faster to catch up with the traditionally rich Manchurian provinces, so provincial inequality falls. But if the coast effect is constant, the growth of the coastal provinces need not slow down once they reach income level of the Manchurian provinces. If so, then inequality will increase. If the coast effect comes from the preferential policies, then their removal will slow down the coastal provinces and maintain existing inequality.

If the coast effect represents geographical advantage, removal of preferential policy would slow increase in provincial inequality but would not reduce it.

Problem: geographical and policy effects not disentangled.

Wang and Hu (1999)

Preferential policies generated the high growth of the coastal provinces. Proof is that foreign capital has flowed most to the provinces that received preferential policies. Conducted horse-race between economic model and policy model. Economic model says foreign funds flow to areas with best growth potential (indicated by adequacy of infrastructure, availability of educated workforce, and size of market) Policy model says foreign funds flow to areas with most preferential tax treatment. Addition of preferential policy index removes statistical significance of variables championed by economic model.

Since provincial FDI is highly correlated with provincial GDP growth, Wang and Hu regressions could be interpreted as provincial growth regressions. Coastal growth is thus more the result of preferential policies than of their more favorable economic conditions. Importance of physical terrain in determining economic growth. They also note that their "policy variable may also reflect a province's geographical location." Yet, their policy discussion ignores the geography factor as the main reason for the success of the coastal provinces.

Debatable assumption is that if coastal region did not have preferential policies, then more of FDI would have flowed into interior provinces. If FDI was aimed at producing for China's market, FDI might have moved to central provinces. If FDI was aimed at export-processing activities, then FDI could have gone to Southeast Asia instead. Given existence of preferential tax policies in other developing countries, absence of it in China would have reduced export-oriented FDI, and hence growth.

Problem: geographical and policy effects not disentangled. Bao, Chang, Sachs and Woo (2001) Assumes that each province is a small economic unit (a price taker), and there is adequate labor and capital mobility within China. So individual growth not constrained by own amounts of L and K.

Finds that geographical determinism fits the data well. Problem: Did not show that policy does not matter, especially if policy stance is collinear with geographical location. Demurger (2000) Specification based on conventional growth model fits the data well. Significance of FDI represents presence of externalities because total investment is already in equation, albeit not significant.

If FDI had come in for export-processing activities, was FDI geographically-induced or policy-induced? Zhang (2000) Export (more generally, international integration) reached critical mass to become important boost to China's economy only after 1985, which explains why coastal dummy and export variable are insignificant in 1978-84 and significant in 1985-95.

Same problem: geographical and policy effects not disentangled. Our approach in this paper We replace the black box of coastal dummy with two variables:

(a) transportation cost and pure geography effect represented by the proportion of provincial population in 1994 living within 100 kilometers of the coast or navigable rivers (excluding coastline above the winter extent of sea ice and the rivers that flow to this coastline)

(b) a preferential policy index for each province

We also try other geographical variables like: Distance from the coast [*Distf* = 1/(1+distance in km)] Percentage of area within a province with a slope greater than 10% [*Slope10*] Average slope of a province [*Slavge*] Average elevation [*Elavge*] Note that topography indicators can be considered as measuring both agricultural feasibility (important up to the end of 70s) and market accessibility (from the 80s onward).

Two sets of regressions are run: one including all provinces, but Tibet; the other excluding municipalities (considered as potential "outliers" due to their particular size, economic structure, administrative role, etc).

Constructing the "preferential policy" index The is based on the number of designated open economic zones in a province, and the extent of the preferential treatment The construction of this index relies on available information on designated "open economic zones" across China, gathered from different sources, as well as a subjective classification according to their importance in terms of special treatments given to investors and industrial enterprises.

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Importance of Economic Geography in Globalisation

Despite the hyperglobalist views, the role of space, place and scale do not diminish in the globalising world. Quite the opposite perhaps. Indeed, as economic activities are increasingly internationalised, interconnections between various places increase, competition between them intensifies and inequalities are on the rise, so geography becomes more important than ever.

And as we have pointed out earlier, an economic-geographical approach is perhaps 'best placed to help us appreciate and understand the modern economic world in all its complexity' (Coe et al., 2007, Preface, p.xviii). This conviction is based on the knowledge that economic geography offers powerful tools for analysing and understanding contemporary economies and societies.

Economic geography, for instance, can help us to understand that, despite years and decades of economic globalisation, the pattern of investment, production, trade and consumption is highly uneven. Economic geography can also help us to understand that even footloose multi-national corporations (MNCs) have to be 'grounded' in specific locations and often 'embedded' in places and their socio-political, institutional and cultural contexts. Economic geography also helps to elucidate the ways in which MNCs and other economic activities are 'governed' at various geographical scales from local and regional to national, macro-regional and global levels. Economic geography also helps us to

understand that despite the widespread use of ICTs, trading places for global financial capital remain stubbornly located in a small number of global cities and these global cities, in turn, influence economic processes around the world. Thanks to these and other insights, economic geography can thus contribute to our understanding of inequalities at various geographical scales from poverty in urban areas to global uneven development.

No other discipline can claim such a wide scope of interest and relevance to today's rapidly changing world. By following this subject guide, you will gain solid foundations in economic geography approaches, concepts and theories and their applicability to the contemporary world and policy-making.

MEASURING THE ECONOMY

Perhaps the most common way of measuring 'the state in which a country is in terms of the production and consumption of goods and services' is an indicator called Gross Domestic Product (GDP). GDP measures, in money terms, the total market value of production in a particular economy in a given year. It is usually calculated as a sum of expenditures by households, firms and the government plus net exports. By household expenditure (or consumption expenditure) we mean the total amount spent by individuals in a given year including their expenditure on food, fuel, housing, clothing, household appliances, leisure, etc. Expenditure by firms is measured as investment expenditure by which we mean the amount invested by businesses in future productive capacity. Government expenditure is the amount spent by the government to build infrastructure (e.g. roads or railways) or provide services (e.g. health or education). Finally, net exports represent the value of goods and services sold to other countries minus the value of goods and services imported from abroad.

Problematising and re-defining the economy

GDP represents a fairly standard way of measuring the economy. It captures three key economic agents – namely households, firms and the government – all of which play important roles in the economy. Yet measuring the economy in this way can be highly problematic. One of the key problems is that GDP measurement is derived from a definition of the economy that is

rather narrow – it includes certain things and processes but excludes others. Coe et al. offer a very good example of this problem. If you have taken a bus or drive a car to your place of work or study then you have engaged in an economic act. Your bus fare or your fuel bills and parking costs would be included in your individual consumption and therefore included in the conventional definition of the economy. But if you decide to cycle or walk instead, no money will change hands and, therefore, oddly, you have not engaged in an economic act! Another good example is unpaid work. Since no wages are paid, unpaid work occurs outside the formal monetary economy and therefore is not included in the consideration of the state of the economy. This way, not only is the economy miscounted, but also the work of certain people is discounted.

A similar problem arises with the 'black economy'. In the 'black economy', money can indeed change hands, but because these monetary transactions are not recorded by the government, they are not included in what counts as 'the economy'. Yet, the livelihoods of millions of people around the world may be dependent on such transactions. Thinking about what constitutes an economic act or process is crucial for our understanding of the economy and is, therefore, a point of contention.

The way in which cultural, social, political and environmental processes are related to the economic processes is another contentious issue. A conventional definition of the economy (which places rigid boundaries around the 'economic') supports the impression that the economy is somewhat separated from other dimensions of our lives. This in turn helps to create the impression that the economy is something 'out there', which affects our lives, but which we, as individuals, cannot control. This impression is often reinforced by the way the economy is represented in everyday use and policy documents. Indeed, the economy is often represented by metaphors such as a 'machine', an 'organism' or a 'body'; that presumably has a life of its own. However, it could be argued that the economy is inseparable from cultural, social, political and environmental processes. Ray Hudson, for instance, understands 'the economy' as referring to: those simultaneously discursive and material processes and practices of production,

distribution and consumption, through which people seek to create wealth, prosperity and well-being and so construct economies; to circuits of production, circulation, realisation, appropriation and distribution of value.

However, he is quick to add that value is 'always culturally constituted and defined' (Hudson, 2005, p.1, original emphasis) and that '[w]hat counts as "the economy" is, therefore, always cultural, constituted in and distributed over space, linked by flows of values, monies, things and people that conjoin a diverse heterogeneity of people and things' (Hudson, 2005, pp.1–2). He further argues that '[e]qually importantly, the social processes that constitute the economy always involve biological, chemical or physical transformation via human labour of elements of the natural world' (Hudson, 2005, p.2, original emphasis).

This also means that thinking about 'the economy' in terms of ever-growing GDP, for instance, may not be a universally shared, nor necessarily desirable, concept. Indeed as Hodder and Lee have argued several decades ago, that it is 'all too easy, for instance, to assume that the dream of each less-developed country is to become developed'. Indeed, 'such a view can easily disregard highly developed local cultures'. They add that 'self-respect is at least as important a measure of social and economic progress as are increases in… material wealth' (ibid). Similarly, studying 'the economy' without considering the environmental dimension of economic processes is problematic, not least because 'economic activities are taking an increasing toll of balanced interactions within the life-giving ecosystem' (Hodder and Lee, 1974, p.7).

Another way to approach a definition of 'the economy' is to remind ourselves of the notion that there are 'no economies, only economic geographies'. In turn, economic geographies can be defined as 'geographies of people's struggle to make a living'. Importantly, this struggle to make a living is framed in both material and social processes. In other words, 'all economies and economic geographies are both material and social constructs' (Leyshon and Lee, 2003, p.8, original emphasis). What is more, in the construction of economic geographies the relations between the material and the social are 'inseparable and mutually formative'. The recognition of this further undermines the notion of the

economy as simply being 'the state of production and consumption of goods and service and the supply of money' or as being measurable by GDP.

The Marxist Approach

The Marxist perspective on the economy is derived from the work of Karl Marx and Friedrich Engels, two German philosophers of the late nineteenth-century. Like Adam Smith, Karl Marx was interested in the question of how wealth is created in the economy and how wealth is distributed among members of society. However, in stark contrast to the win–win situation alluded to by Smith, Marx pointed out that wealth will increasingly concentrate in the hands of the few. How so? To answer this question, Marx devised his labour theory of value.

In order to explain the basics of the labour theory of value as devised by Marx, let us go back to the pin-making factory described earlier. As we have seen, the productivity gains from organising pin production in the pin factory were substantial. But who reaps the benefits? If the factory was jointly owned by the 10 workers who work there, it is possible to imagine a situation in which they could split the benefits of their production between themselves. However, in the capitalist market economy, the factory is likely to be privately owned. The owner, the capitalist, would own the land on which the factory is built, the factory building itself, the raw materials needed to produce the pins and all the machinery and tools used by the workers. In other words, he or she would own the means of production. Workers, on the other hand, do not own the means of production and the only way they can sustain themselves is to sell their own work (or as Marxists call it, their labour power) to capitalists. Thus, in the capitalist market economy, labour itself becomes a commodity – labour power can be bought and sold like any other commodity. So, workers sell their labour and receive wages in exchange for their work and that looks fine on the surface.

However, the question arises as to what capitalists do to sustain themselves? They have to engage in the circuit of capital and make profit. The way Marx described how the circuit of capital works. Imagine a capitalist who has capital in the form of money – money capital (M) – to invest. He or she can turn this money capital into

productive capital (P) by purchasing two commodities – the labour power (LP; e.g. labour of 10 workers) and the means of production (MP; e.g. pin-making factory, raw materials, machinery, tools, etc., needed to produce pins). The labour power and the means of production are then combined in the process of production to produce 48,000 pins a day – representing another form of capital – commodity capital (C). Commodity capital can be turned back into money capital when the factory owner sells pins on the market at a certain price (and this price represents what Marxists call exchange value). For the capitalist to survive, he or she has to make a profit. This means that the money he or she receives in exchange for the commodities produced must be greater than the money originally invested in the enterprise (M' > M). The search for profit is the motivating force of the capitalist economy.

However, Marx argued that such individual action will not lead to the equilibrium and win–win situation envisaged by Smith – far from it. Marx argued that capitalism (the system based on capital) is both unequal and unstable. He argued that inequalities within society will increase as capitalists try to increase their profits and squeeze workers' wages, by introducing machines, intensifying labour processes or simply by forcing workers to work longer hours, for example. Capitalists can also endeavour to replace workers by machines and by doing so, they create a growing pool of the unemployed, which in turn will push wages down further still. The result of this process will be an increasing concentration of wealth in the hands of a few (the capitalist class) and the impoverishment of the working class masses (proletariat). Simply put, the capitalist system will ensure that the rich will become richer and the poor will become poorer.

Ethical issues aside, Marx argued that such a system is unlikely to reach an equilibrium of the kind envisaged by Adam Smith, because sooner or later the fundamental economic contradiction arises: too many commodities (e.g. pins) will be produced, but there will be too few people able to buy them. Marxists call this situation an overaccumulation. Overaccumulation can take various forms, but overaccumulation of capital in the form of unsold commodities is one of the most striking symptoms. Ian Craib offers a very good illustration of how such a crisis of

overaccumulation can happen, using a crucial distinction in Marxist theory between use value and exchange value:

'If I am a worker and I produce £50 worth of goods in a day (the use value of my labour to my employer), and I receive £10 a day in wages (the exchange value of my labour power), then I do not receive in wages sufficient to buy back the value of goods I have produced. This applies right across the system, so that if stocks of unsold goods build up, workers have to be laid off, and the economy enters a crisis, a depression, or slump, until the stock of goods are used up and firms go back into production. There is a cycle of growth and slump, something that capitalist economies have been trying to deal with for over a century and a half.'

This is then one of the possible causes of the familiar boom-and-bust cycle. Each boom is followed by a crisis in which devaluation must take place to kick-start the accumulation process all over again. For Marx then, the capitalist economy is neither equal nor stable – it is inherently unequal and crisis-prone. The profit-making imperative that drives the capitalist economy and makes it dynamic, is also a source of its fundamental contradiction. Marxist conceptualisation of the economy therefore represents a stark contrast to the equilibrium-prone and win–win expectations of mainstream economics.

Importantly, Marx also argued that in the long run, the capitalist system is unsustainable, because the increasing contradictions will reach a tipping point at which the system will eventually collapse. This, according to Marx will happen in the most advanced capitalist countries, where the contradictions between labour and capital will be the greatest. The collapse of capitalism will pave a way (via a socialist revolution led by the working class) for a new social and economic order (communism). Marx said very little about how such a new system would operate. However, for a system to be freed from exploitation, both private property and class relations based on property rights would have to be abolished.

While Marxism provides a powerful analysis of the way the economy works, it also leaves us with a number of important issues. Indeed, the economy does not always work as predicted by Marx and, so far, the socialist revolution has failed to materialise in the most advanced capitalist countries. One of the key questions

therefore is how can we account for the fact that the capitalist system manages to survive despite its contradictions? The economic geographers have made an important contribution to the debate on this question. But for now, let's turn to the alternative approaches.

Alternative Approaches

It is clear from the above two sub-sections that mainstream economic and Marxist perspectives differ dramatically in their analysis of the workings of the economy. However, despite the differences, these two perspectives also share one common feature – they both focus on formal market transactions. Indeed, as we have seen, mainstream economics is concerned with the relationship between the demand and supply of goods or services as expressed by a price fixed through the market mechanism. The Marxist analysis, meanwhile, focuses on the difference between the price of labour (exchange value of labour power) and the exchange value of the commodities produced by the labour. However, as we have seen in the opening section of this chapter, what constitutes 'the economy' and 'the economic' is a contentious issue. Echoing these concerns, a number of alternative economic approaches have emerged. These approaches usually fall within a category of heterodox economics since they are providing a counterbalance to the established mainstream (orthodox) economic views. One of the leading heterodox approaches is associated with evolutionary and institutional economics.

Evolutionary and institutional economics is in itself a diverse set of approaches, but there are some key shared characteristics that clearly distinguish these approaches from both the mainstream economics and Marxist perspectives. The starting point of evolutionary/institutional and other alternative approaches is their insistence that the economy cannot be reduced to market transactions only. Instead, they argue that wider social, cultural and institutional contexts need to be taken into consideration if one is to explain how economies work. Institutional contexts are defined broadly here and may include both formal institutions (e.g. laws, regulations, formal procedures) and informal institutions (e.g. habits, customs, conventions, cultural norms, etc.) at various scales – from the level of the firm to the institutional landscapes underpinning the whole economy.

The inclusion of the wider social, cultural and institutional considerations has profound implications for the understanding of the ways economies work. Importantly, such an inclusion challenges the neo-classical notion of the rational behaviour of 'economic man' guided by the 'invisible hand' of the market. Instead, it emphasises the way in which social institutions play an essential role in guiding the action of economic agents. (This also differs from the Marxist view that the role of economic agents is structured by the prevailing social relations of production). In the evolutionary/ institutionalist view, firms, for instance, are not seen as atomistic units competing against each other on the free market. Rather, firms are perceived as being embedded within wider socio-economic relations and networks. These networks may include various formal and informal links with suppliers, customers and competitors. Importantly, transactions within these networks are not simply guided by market competition. Rather they often involve valuable elements of coordination and cooperation. This is important because such cooperative networks are often crucial for fostering innovation which is seen as vital for economic development or economic evolution. In turn, this raises the question whether the 'pure market' is the best mechanism for ensuring economic progress. Evolutionary and institutionalist economists would argue that successful economies are neither pure markets nor pure hierarchies. Instead, successful economies are 'mixed economies' with important roles for the public sector and for different kinds of policy. Mixed economic systems are also seen as capable of producing a diversity of economic forms which contributes to the adaptability and long-term survival of economic systems (rather than just the simple short-term 'survival of the fittest' enforced by unfettered markets).

Another line of argument advanced by alternative approaches relates to the claim that successful economies are increasingly knowledge-intensive or knowledge-based. The knowledge-based economy can be simply defined as an economy in which knowledge becomes the key economic resource. While all economies can be seen as knowledge-based, there is a perception that we witness a major shift in the relative importance of land, physical capital and knowledge capital, in favour of the latter. For some observers, the shift towards the knowledge-based economy represents an

epochal transformation. As Burton-Jones (1999) vividly put it: 'Since ancient times, wealth and power have been associated with the ownership of physical resources. The traditional factors of production, materials, labour, and money, have been largely physical in nature. Historically the need for knowledge has been limited, and access to it largely controlled by those owning the means of production. Steam power, physical labour, and money capital largely facilitated the Industrial Revolution... In contrast, future wealth and power will be derived mainly from intangible, intellectual resources: knowledge capital. This transformation from a world largely dominated by physical resources, to a world dominated by knowledge, implies a shift in the locus of economic power as profound as that which occurred at the time of the Industrial Revolution. We are in the early stages of a "Knowledge Revolution."' (Burton-Jones, 1999, p.3)

The notion that the economy is moving towards a post-industrial, knowledge-intensive phase, in turn, opens up a whole set of questions. Both mainstream (neo-classical) economics and Marxist approaches have been devised in the context of an (emerging) industrial era. But will the same principles apply to the new knowledge economy?

Evolutionary and institutionalist economists have devised their own approaches to account for the ways knowledge economies work. One of the most influential concepts is that of the 'learning economy' introduced by Lundvall and Johnson (1994). The starting point of the 'learning economy' concept is the argument that if knowledge is the most fundamental resource in our contemporary economy, then learning is 'the most important process'. Although Lundvall and Johnson admit that knowledge always has been a 'crucial resource' for the economy, and was in the past 'layered in traditions and routines', they argue that knowledge and learning have more recently become much more fundamental resources than before. They argue that the economy is now characterised by 'new constellations of knowledge and learning in the economy' mainly through the development of ICTs, flexible specialisation and, finally, changes in the process of innovation. These changes are bringing challenges that firms have responded to by changing organisational forms and by building alliances in order to gain

access to a more diversified knowledge base. This implies 'broader participation in learning processes' to include all layers within the firm, the development of 'multi-skilling and networking skills' and enhancing the 'capacity to learn and to apply learning to the processes of production and sales'. This is why Lundvall and Johnson 'regard… capitalist economies not only as knowledge-based economies but also as "learning economies"'. They offer the following definition of the 'learning economy':

'The learning economy is a dynamic concept; it involves the capacity to learn and to expand the knowledge base. It refers not only to the importance of the science and technology systems – universities, research organisations, in-house R&D departments and so on – but also to the learning implications of the economic structure, the organisational forms and the institutional set-up.'

At the core of the 'learning economy' are apparently firms that 'start to learn how to learn' and which are able to handle various types of knowledge. Lundvall and Johnson distinguish at least four categories of knowledge: know-what, know-why, know-who (when and where) and know-how. The first category, know-what, represents knowledge about 'facts'. The meaning of this is probably close to that of 'information'. The, second category, know-why, refers to scientific knowledge of principles and laws of motion in nature and in society. This kind of knowledge, Lundvall and Johnson argue, is extremely important for technological development. The third term, know-who, (together with know-when and know-where) is already a more complex construction that reaches a sphere of specific social relations and time–space dimension. A simple example of know-who can be a situation when, for a successful innovation, it is more important to know key persons than to know basic scientific principles. Know-when and know-where refers to economically useful knowledge about markets with their temporal and spatial dimensions, for instance. Finally, know-how refers to practical skills in production or other spheres of economic activity.

Lundvall and Johnson (1994) also address different aspects of learning. Importantly, they do not understand learning as a simple absorption of science and technical knowledge. Rather, they define it more broadly as learning (about) changes in economic structures,

organisational and institutional forms. Learning is presented as a dynamic and interactive process aimed at the accumulation of knowledge at the level of the firm and the economy as a whole. Learning is present in both production and consumption processes and is expressed through 'learning by doing' and 'learning by using'. From the point of view of permanent renewal (learning) and adaptation of economic and organisational structures, Lundvall and Johnson have also introduced an innovative term 'forgetting'. They argue that the 'learning economy' should not only preserve and store its pool of knowledge, but also should be able to 'forget'. 'Forgetting' at the level of individual workers refers to their ability to abandon obsolete skills and professional expertise. An example of 'forgetting' at the level of the firm or economy includes closing down ailing branches or whole sectors. Thus, the 'learning economy' is supposed to intelligently manage continuous self-organised learning (and forgetting). The work of Lundvall and Johnson and other evolutionary/institutionalists has proved highly influential in framing the discussion on contemporary economic geographies, despite the fact that there remain questions about the precise nature of the supposed transformation of the economy towards the 'knowledge-based economy' or 'learning economy'.

One contentious issue relates to the question of whether the transformation beyond an old industrial economy also signifies a move beyond a capitalist economy. Geoffrey Hodgson – one of the prominent evolutionary/ institutionalist economists – contributed to the debate by offering his own definitions of the 'knowledge-intensive economy' and 'learning economy'. Hodgson has argued that the 'knowledge-intensive economy' would still be a capitalist one, but it would be an economy in which an 'enlightened group of business leaders' is 'aware of the kind of democratic culture and participatory industrial relations that facilitate productivity'. Alongside 'collaborative and cooperative relationships between firms… against the neo-liberal insistence on fierce, price driven, market competition', Hodgson suggests that: '[s]uch a progressive movement of business people could find valuable allies among trade unionists and the population as a whole'. However, for Hodgson, the 'learning economy' or 'market cognitism', in contrast, is a scenario clearly 'beyond capitalism'

(ibid, pp.211–215) where the 'degree of control by the employer over the employee is minimal'. Hodgson has argued that such an economy, 'would not be socialist, in any common sense of the word', but nevertheless, 'it is not capitalism' presumably because the means of production (brains of knowledge workers) are effectively controlled by the workers themselves, not by the employers (capitalists). Such a benign view of the emerging new 'knowledge era' thus implies that the contradictions identified by Marx as inherent to the capitalist economy may be waning. But if proven true, it can have potentially important implications for the way we conceptualise economic geographies of the 'new era'.

IMPORTANT OF ECONOMIC GEOGRAPHY

Issues for economic geography

In the previous section we highlighted the fact that economic geography can be seen as a diverse set of approaches and concepts that economic geographers use to study economic processes. In turn, this diversity of economic geography approaches allows economic geographers to engage with a diverse set of questions about the economy and society. Concrete questions often depend on a theoretical standpoint. Peter Dicken and Peter Lloyd in their textbook *Location in Space* (Dicken and Lloyd, 1990) argue that:

'Fundamentally, the economic geographer is concerned with the spatial organisation of economic systems: with where the various elements of the system are located, how they are connected together in space, and the spatial impact of economic processes.'

On the basis of this, they argue that economic geographers are interested in three interconnected questions.

1. In what ways are economic activities organised spatially on the earth's surface, and how do such spatial forms or patterns change over time?
2. Why are economic activities organised spatially in particular ways; that is, what are the underlying processes at work?
3. How does the spatial organisation of economic activities itself influence economic and other social processes?

On the other hand, Roger Lee suggests that economic geography is 'a geography of people's struggle to make a living' and should therefore concern itself with 'the sustainable and humane production, use and reproduction of the social, natural and material conditions of human existence'. On the basis of this, Lee argues that an 'inclusive economic geography' should include the study of:

- the cultural and environmental origins of economic activity, articulated through socially constructed gender and kinship relations; and the struggle to establish a particular set of social relations of production and their geographical extent
- the conceptualisation of nature
- the forms of calculation and measurement of value
- the processes and forms of production and consumption generated by such relations and value systems
- the division of labour
- the conditions of development within a particular set of social relations
- the forms of state and politics which support and legitimise particular social relations and processes of production and consumption
- the construction of cultural and ideological forms which shape the basis of discourse within a particular value system
- the structuring of relationships within and between different sets of social relations
- the conditions of transformation from one set of social relations of production to another

This is a long list indeed – it reflects the view discussed earlier that there are 'no economies, only economic geographies'. Put differently, given that all economic processes are inherently spatial, economic geographers should be concerned about all the processes related to the people's struggle to make a living. However, an important question arises about whether such an approach is still needed in the era of globalisation in which space is apparently being dissolved by modern information and communication technologies (ICTs).

THE AGE OF GLOBALISATION: THE END OF GEOGRAPHY?

Powerful arguments have been put forward about the impact of globalisation in general, and the effects of the ICT revolution in particular, on economic activities. Some observers have come to the conclusion that electronic communications have 'space-shrinking' effects and will bring about the 'death of distance' and thus, ultimately, the 'end of geography'. The 'death of distance' thesis has been expressed by Cairncross as follows: 'Distance will no longer determine the cost of communicating electronically. Companies will organize certain types of work in three shifts according to the world's three main time zones:

the Americas, East Asia/Australia, and Europe…No longer will location be key to most business decisions. Companies will locate any screen-based activity anywhere on earth, wherever they can find the best bargain of skills and productivity.'

A similar argument has been put forward by O'Brien who argued that ICTs will allow money to be moved around the globe without constraints, thus spelling the 'end of geography':

'The end of geography, as a concept applied to international financial relationships, refers to a state of economic development where geographical location no longer matters, or matters less than hitherto. In this state, financial market regulators no longer hold sway over their regulatory territory; that is rules no longer apply to specific geographical frameworks, such as the nation-state or other typical regulatory/jurisdictional territories. For financial firms, this means that the choice of geographical location can be greatly widened… Stock exchanges can no longer expect to monopolize trading in the shares of companies in their country or region… For the consumer of financial services, the end of geography means a wider range of services will be offered, outside the traditional services offered by local banks.'

Indeed, they both seem to suggest that location in space is no longer an issue for firms as they can locate 'anywhere on earth'. Also, the role of place is apparently greatly diminished. Cairncross, for instance, suggests that the only place characteristics that firms may be interested in can be reduced to 'the best bargain of skills and productivity'. O'Brien, in the meantime, does not seem to

recognise any role that places may play in the globalised financial markets. But, interestingly, both Cairncross and O'Brien seem to imply that the national scale is increasingly irrelevant in the global economy. Indeed, O'Brien specifically points out that (national) financial market regulators 'no longer hold sway' and that rules no longer apply to nation-states, because financial flows are spilling over traditional national boundaries. Similarly, Cairncross seems to suggest that the (macro-regional) time zone is the only geographical scale that holds any relevance in the new era of global electronic communications.

What is interesting about the above statements of Cairncross and O'Brien is that they both see globalisation as something positive. Note, for instance, Cairncross's suggestion that companies will benefit from the new locational freedom by allowing them to find and exploit 'the best bargain of skills and productivity'. O'Brien, meanwhile, suggests that the 'end of geography' will be beneficial for both financial firms and their customers. Views such as these can be labelled as 'hyperglobalist'. Some of them go as far as to suggest that freeing economic activities from their traditional geographical constraints will bring benefits to all people in all corners of the globe. However, this, manifestly, does not seem to be the case. Today's world is ridden with sharp inequalities both within and between countries and geography plays an important role in understanding economic and social processes and their uneven manifestations in the age of globalisation.

MARXIST-INSPIRED APPROACHES AND UNEVEN DEVELOPMENT

Marxist-inspired approaches in economic geography also challenge the neo-classical idea of spatial equilibrium, although coming from a completely different perspective. As we have seen earlier in this chapter, Marxist theory sees capitalism as a system based on the exploitation of labour. The profit imperative makes such a system incredibly dynamic, yet, at the same time, inherently unequal and crisis-prone. Internal contradictions mean that crises of overaccumulation are inevitable in such a system. Devaluation must take place to kick-start the accumulation process all over again. Building on these systemic features of capitalism, Marxist

economic geographers do not see inequalities in space as disappearing with the operation of market forces. Instead they consider uneven development as a permanent, unavoidable and, in fact, necessary feature of the capitalist market economy. Indeed, in Marxist-inspired approaches, uneven development is usually seen as both the necessary precondition and the unavoidable consequence of capitalist economic growth.

Several concepts have been put forward that try to describe the way capitalist economies work over space. One of them uses a 'see-saw' metaphor to describe the ebb and flow of capital from one region to another in search of profit. Destruction and devaluation of places left behind may create pre-conditions for future renewed growth. In a similar vein, the concept of spatial fix recognises that geographical space is an important element in the functioning of the capitalist economy and its ability to contain, absorb or delay crises. This includes the expansion of the spatial horizons of the capitalist system, for example, in the form of new (more profitable) spaces of production or new regional markets. Such a spatial expansion (or spatial fix) is perhaps one of the ways in which the capitalist system is able to postpone the collapse predicted by Marx. In this view, geographical space plays a crucial role in the workings of the capitalist system. Another concept that tries to capture the operation of the capitalist economy over space is that of spatial divisions of labour. It describes the way in which capitalism creates spatial structures that assign distinct economic functions to particular regions. The economic fortunes of these regions are thus linked to their position in the spatial division of labour within the wider economic structure. Related to this is a concept of core-periphery which conceptualises uneven development as a set of uneven economic relations between a (dominant) core region and (dominated) periphery region(s). Somewhat echoing the exploitative nature of capitalist class relations, the core-periphery concept suggests that rich regions (or countries) exist thanks to the exploitation of peripheral regions (or countries). One way or other, in Marxist-inspired approaches, uneven development is always linked to the structural features of the economy. This is in stark contrast to some alternative approaches that are going to be examined in turn.

EVOLUTIONARY/INSTITUTIONALIST APPROACHES AND NEW ECONOMIC GEOGRAPHY

Economic geography approaches that draw from heterodox economics and the evolutionary/institutionalist perspective represent a diverse and evolving group. However, some common features are discernible.

As we have seen earlier in this chapter, the evolutionary/ institutionalist perspective emphasises the importance of social, cultural and institutional factors for the understanding of the ways economies work. This is in contrast to both neo-classical views (that largely disregard such factors) and the Marxist approach (that assumes that such factors are determined by, rather than being determinants of, the economy).

However, the evolutionary/ institutionalist perspective sees the economy as always embedded in, and constituted by, social, cultural and institutional spheres. Economic geography approaches developed from this perspective thus see uneven development as inextricably linked to (or shaped by) institutional contexts. One of the key points that such economic geography approaches are making is that social, cultural and institutional contexts are place-specific. In other words, economic fortunes of regions (or whole countries) depend on the institutional arrangements that these regions (or countries) are able to create.

At the regional level, for instance, the concept of 'institutional thickness' has been proposed to capture the strength of local/ regional institutions, their ability to cooperate and to promote a coherent development strategy. In line with the view that successful economies are increasingly knowledge-based or learning economies, successful regions have also been conceptualised as learning regions. The key feature of such regions is their ability to innovate, to learn and to accumulate knowledge in various forms, thanks to their institutional set-up. It is argued, for instance, that the capacity to innovate and to learn depends on various collaborative networks, which are sustained thanks to the institutions of trust, shared culture and social capital, all of which are dependent on particular regional settings. In this view then, regions are in fact seen as key engines of the knowledge economy and uneven development in such an economy is a result of

differences in regional 'institutional thickness', innovation capacity, learning and knowledge accumulation.

Interestingly, there are two opposing views with regard to the prospect of achieving balanced development in the knowledge-based or learning economy. The first view is based on the assumption that economically lagging regions (or nations) can catch-up because favourable conditions for growth can be created locally by making appropriate institutional arrangements. This view is further supported by the assumption that thanks to information and communication technology (ICT), the key resource in the knowledge economy – knowledge – can move freely around the world. It should therefore be possible for previously underdeveloped regions to emulate the success of leading regions such as Silicon Valley. The second, and opposing, view suggests that uneven development will continue to be a feature in the knowledge-based economy. This view is based on the assumption that the key sources of competitiveness and economic success is non-standardised tacit knowledge (as opposed to standardised, written, explicit knowledge). Tacit knowledge, the argument goes, is embedded in local/regional institutions, regional innovation cultures and clusters and these are apparently place-specific to the extent that they cannot be replicated by regions elsewhere.

One way or another, the interest in regional institutional settings has been associated with the emergence of so-called new economic geography. While the term 'new economic geography' is used by some economists to describe recent advances in economics in relation to space, in geography the term is used to describe an economic geography approach which moves away from viewing economic processes as separate from social, cultural and political contexts and emphasises that these contexts are crucial for understanding economic dynamics. New economic geography therefore also enthusiastically embraces the notions of culture, social capital, ethnicity and gender in its study of the economy, reflecting a wider 'cultural turn' in social sciences.

Neo-classical Approach, Location Theory and Beyond

This section will examine concepts and theories in economic geography that use the mainstream (neo-classical) perspective of

the economy as their starting point. This will include a discussion on neo-classical spatial equilibrium which presupposes that factors of production (capital and labour) will disperse across regions to create a balanced and efficient pattern of development. This will be followed by a discussion on the neo-classical location theories, one of which is the central place theory. The central place theory shows that even under perfect market conditions economic activities will cluster in certain locations (central places) creating a dynamic equilibrium in space and a distinct urban hierarchy. Such an urban hierarchy, in turn, creates different levels of market potential and connectivity-accessibility, concepts that will be examined subsequently. Finally, the section will turn attention to the concepts of agglomeration economies and increasing returns and the theory of cumulative causation, all of which help to explain why the spatial equilibrium envisaged by the neo-classical theory is hard to achieve. These latter concepts demonstrate that rather than having a self-correcting dispersal effect, market forces can in fact reinforce existing inequalities in space.

Neo-classical Spatial Equilibrium

The simplest version of the neo-classical spatial model involves the movement across space of the two key factors of production – capital and labour. Imagine a country – an island – that has two regions, one 'rich' and one 'poor'. In the rich region, there is a great supply of capital, but a relative shortage of labour. As a result of this labour shortage, the wages in the rich region will be very high. In the poor region, wages are much lower, due to the abundance of labour and a relative lack of capital. According to the neo-classical model, labour will move from the poor region to the rich region in search of higher wages, while the capital will move in the opposite direction in search of cheaper labour. This is fully in line with the expected behaviour of a rational 'economic man'. Importantly, individual actions of this kind will ensure that the system as a whole will reach spatial equilibrium. The economic geographer, Diane Perrons, summarises the neo-classical hypothesis as follows:

'Labour and capital are predicted to move from areas of surplus to areas of deficit, stimulated by higher returns – wages or profits respectively. Thus, labour should move from poor to rich regions

and capital should move in the opposite direction until wages and profits are equalised across regions resulting in an efficient and balanced pattern of development.' (Perrons, 2004, p.56)

Even more complex neo-classical models that involve other factors of production (e.g. technology) are all built around the assumption that some sort of spatial equilibrium will be achieved in the long run, because such factors of production will inevitably spread or disperse over space. The processes of spatial dispersal can indeed be observed in reality. However, the examples of spatial equilibrium that the neo-classical theory envisages are hard to find. Firms, for instance, do not disperse over space but cluster in particular locations. The explanation for this has been offered by the neo-classical location theory to which we now turn.

Neo-classical Location Theory

One way of accounting for the fact that spatial equilibrium does not occur, is to acknowledge that in real life, factors of production cannot move 'freely' over space. Indeed, there are various constraints involved. One of the obvious obstacles is the friction of distance. In other words, moving people, machinery, materials or goods over geographical distance usually involves a cost. For workers, there is usually a price tag associated with travelling to work, for instance. For firms, there is a cost involved in moving raw materials from the source to the factory and there is a cost associated with delivering finished products from the factory to consumers (i.e. literally bringing them to market). Thus, for both people and businesses, location in space is a crucial part of their strategy of self-interest and profit-maximisation. The calculation of the cost associated with moving across space and the implication of this for location in space, forms the basis of the neo-classical location theory. Key concepts that build upon the location theory include central place theory, urban hierarchy, market potential and connectivity-accessibility, all of which will be explored in turn.

Cumulative Causation

An important advantages (economies) occur for firms locating close to each other in specific locations. We can now ask the question: what are the implications of this for uneven development?

The theory of cumulative causation introduced by a Swedish scholar Gunnar Myrdal argues that a circular chain reaction will emerge leading to a greater polarisation between rich (core) and poor (economically peripheral) regions. In the rich regions with strong agglomeration economies, a virtuous circle of growth and development may emerge in which 'success breeds success'. In part, this is possible thanks to the multiplier effect, a mechanism in which each dollar spent in the local economy generates further income down the line. Indeed, it is not difficult to imagine that existing agglomeration economies may attract further firms into the region (or allow for the expansion of existing firms). If this happens then a circular chain reaction will begin. Indeed, jobs created by new or expanding firms will increase employment and the population of the region. This in turn will increase local demand for goods and services, thus leading to an enlarged local supply base and expanded service sector. This in turn will enlarge the local financial (tax) base and spending power of the local government, which will allow for local infrastructure to be upgraded. This in turn will increase agglomeration economies. The increased agglomeration economies will again attract more firms into the region, fuelling a virtuous circle of growth and development. This is then a principle of circular and cumulative causation in which one event triggers a sequence of causal links in a circular and self-reinforcing way.

What we observe could also be described as a process of the increasing returns to scale, although this time at the level of the entire agglomeration. If in operation, such a process would ensure that the bigger the agglomeration gets, the bigger the agglomeration economies that can be achieved. In addition to the advantages, such a growing agglomeration may go hand in hand with an increasingly diverse economic base characterised by a complex division of labour. Indeed, as a given agglomeration grows, there is a possibility that more and more specialised tasks will be carried out by specialist firms, contributing to the increasing division of labour between firms, thus increasing economies of agglomeration further still.

While the increasing dynamism of successful regions may be welcome, the problem is that their expansion may be happening

at the expense of other regions. Indeed, it may well be the case that firms that are being attracted by the vibrant economic climate of large agglomerations relocate there from poorer, 'less developed' or less favoured regions. The loss of a firm in a less favoured region generates a negative chain reaction that mirrors the process of cumulative causation in an adverse sense. Indeed, it is not difficult to imagine that the closure of a firm leads to the loss of employment and possibly to a loss of population too, via out-migration. Either way, the spending power of the local population decreases, reducing the local demand for goods and services and in turn undermining the local tax base, leading to the reduced ability of the local government to maintain local infrastructure. This, in turn, affects the agglomeration economies and reduces the attractiveness of the peripheral region further still. More firms may choose to relocate to richer (core) regions, and the younger and skilled workforce may follow suit. In essence, this constitutes what Myrdal called a backwash effect – a flow of capital and labour from lagging regions to developed regions. Contrary to the neo-classical assumption of spatial equilibrium, the backwash effect will cause the economic gap between rich and poor regions to widen further. The rich (advanced) regions will end up with increasing levels of investment, young workers, growing purchasing power and improving local services and infrastructure, while less developed regions will be characterised by a lack of investment, an ageing labour force, a decline in local services and a dilapidated infrastructure. This polarised spatial pattern is often referred to as core-periphery. The important question is whether such a core-periphery pattern will remain in place once established.

This is a difficult question. Some economists and economic geographers believe that just as is the case with individual firms, agglomerations too have their limits, beyond which diminishing returns will kick-in. Indeed, the dis-economies that may occur in large cities may include the prohibitive cost of land, the cost of labour, pollution and congestion. Such dis-economies may indeed encourage the decentralisation of operations or whole firms to less developed regions. In other words, spread effects may emerge, as predicted by the neo-classical spatial equilibrium model. However, according to cumulative causation theorists, backwash effects

(centripetal forces) will always be greater than spread effects (centrifugal forces), thus contributing to the polarisation, rather than the dispersal, of economic fortunes between regions. This is because: 'market forces, if left to their own devices, are spatially disequilibriating. Economies of scale and agglomeration lead to the cumulative concentration of capital, labour, and output in certain regions at the expense of others: uneven regional development is self-reinforcing'.

In essence, the theory of cumulative causation provides further evidence that, rather than having a self-correcting effect, market forces can in fact reinforce existing inequalities in space. The kind of spatial equilibrium envisaged by neo-classical theory (introduced at the beginning of this chapter) is therefore difficult to achieve. Importantly, this conclusion has been reached while using the neo-classical conceptual framework (e.g. profit-maximising agents, market operation, price signals, etc.). It could therefore be argued that the cumulative causation theory and similar concepts 'use the approach and language of neo-classical economics to reach contrary conclusions'.

Uneven Development and 'Spatial Fix'

Spatial fix, or more precisely, spatio-temporal fix is another concept developed by David Harvey (1982, 2006). The concept refers to the way in which both time and space play a central role in the operation (and survival) of the capitalist system. The word 'fix' has a double meaning here. On the one hand, it describes a situation in which a certain portion of capital is 'literally fixed in and on the land in some physical form for a relatively long period of time' (Harvey, 2003, p.115, emphasis added). On the other hand, the term 'fix' is used as 'a metaphor for a particular kind of solution to capitalist crises through temporal deferral and geographical expansion' (Harvey, 2003, p.115, emphasis added).

There are several ways in which capitalism can cope with crises:

1. devaluation
2. macro-economic management
3. temporal displacement of capital (temporal fix)
4. spatial displacement of capital (spatial fix)

Devaluation may involve the devaluation of money (via inflation), devaluation of labour (via unemployment) as well as the devaluation of productive capacities (devaluation or physical destruction). Macro-economic management involves attempts to bring together idle capital and idle labour (the unemployed) back into productive use through government intervention. This can be done by curbing excessive labour exploitation (which pushes up wages and increases the spending power of the population) or through increased government spending (to create jobs and stimulate demand), for instance. An example of such an approach to the economic crisis is Keynesianism. More generally, various modes of regulation may be instituted to prevent the system from collapsing. A temporal displacement of capital (temporal fix) involves placing surplus capital in long-term ventures. This may include the investment in secondary and tertiary circuits of capital. Social expenditures and long-term investments in infrastructure of various kinds are examples of this, as is the advancement of loans (credit). The effect of such temporal displacements of capital is that they avert crises at the present and delay them into the future. A temporal fix is therefore responsible for expanding the time horizons of the circuits of capital.

The spatial displacement of capital (spatial fix), on the other hand, expands the spatial horizons of the capitalist system. The spatial fix includes the opening of new spaces of production (e.g. those with cheaper production costs); spatial expansion into new markets (with the effect of boosting much-needed demand); finding new sources of raw materials; or the re-creation of old places (places previously devalued). The logic behind the spatial fix has been summarised by Harvey as follows:

If the surpluses of capital and of labour power exist within a given territory (such as a nation-state or a region) and cannot be absorbed internally (either by geographical adjustments or social expenditures) then they must be sent elsewhere to find a fresh terrain for their profitable realization if they are not to be devalued. (Harvey, 2003, p.117).

In other words, capital constantly searches for the spaces in which surplus value can be created. This search for new spaces of capital accumulation may involve re-investment in previously

devalued old spaces or pushing the boundaries of capitalist enterprise beyond the established circuits of capital. Understanding the operation of the economy in this light opens up new ways of looking at processes such as globalisation. One way or another, it is important to note that Harvey's conceptualisation of economic geographies include the notion that uneven development 'is not only an inevitable feature of capitalism, but also a necessary one'. This is because: [s]pace is not just the container in which capitalism takes place. Rather, economic geography is fundamental and inherent to the successful operation of the system.

To put it differently, 'uneven development is both a cause and an outcome of capitalist growth'. Further insights into the issue of uneven development in the capitalist economy have been offered by the concept of spatial divisions of labour to which we now turn.

Spatial Divisions of Labour

The concept of spatial divisions of labour has been developed by a British geographer Doreen Massey in her highly influential book *Spatial Divisions of Labour: Social Structures and the Geography of Production.* In it, Massey has discussed the geography of production and uneven development through the prism of the social relations of production. Under capitalism, social relations of production revolve: around the social relations between capital and labour, employers and employees, investors and wage earners. These are essentially relations of economic power, within which control lies with capital, employers, and investors.

Another way of putting this would be to say that social relations under capitalism are structured along the relations based on class (e.g. the capitalist class on the one hand, and the working class on the other). Massey's point is that social relations are also organised spatially and this is captured in her concept of spatial divisions of labour. In order to explain the concept of spatial divisions of labour, we will first examine two key related concepts – technical division of labour and social division of labour.

Technical division of labour, in its simplest form, involves the division of labour within a firm. As we have seen in the example of the pin-making factory, the process of making pins involves 18 distinct stages. The technical division of labour implies a division

of the production process into distinctive tasks and the assignment of workers to these tasks. In the pin-making factory described by Adam Smith, 10 workers covered 18 tasks. But it is possible to imagine that a more refined technical division of labour can be achieved.

Social division of labour, on the other hand, is a more general concept which goes beyond the boundaries of a firm to describe the roles performed by various people or groups of people within a society at large. Social divisions of labour thus may refer to the division of labour between various sectors (e.g. agriculture, fisheries, pin-making, car-making industry, banking sector, education sector, health service...) or to workers in different jobs or professions (e.g. farmer, fisherman, pin-maker, car factory worker, banker, teacher, nurse...). One way or another, the concept helps us to understand that we rely on each other for society to function. In the capitalist society, however, both technical and social divisions of labour reflect the underlying capitalist social relations of production.

The idea of spatial divisions of labour is based on the recognition that the economy is characterised by complex technical and social divisions of labour which are reflected in complex spatial structures. Massey argues that the economy cannot work at the 'head of a pin' – therefore the spatial dimension is always present. Inevitably, the economy is stretched over space and so are social relations of production. In other words, social relations are organised spatially. The spatial organisation of the economy is rather complex, reflecting complex spatial divisions of labour.

A simple example of the spatial division of labour involves the division of labour within a firm, in which different tasks are undertaken in different locations. For instance, head office functions, administrative functions, research and development (R&D) and production functions can all be located in different regions. Also it is possible to imagine a situation where the different stages of production are located in different regions. Another example of the spatial division of labour involves the division of labour between firms and sectors – e.g. the steel industry, the electronics industry, financial services) concentrating in certain locations (regions). One way or other, at the level of the national

economy, all regions are functionally inter-connected through economic linkages and social relations of production. Individual regions thus must be seen as parts of a wider economic structure. The economic power and fortunes of particular regions depend on their position within the wider social relations of production (i.e. on their position within the wider spatial divisions of labour). The position within the spatial divisions of labour, in turn, is modified or maintained by successive rounds of investment. Uneven development, therefore, cannot be understood in relation to the characteristics of individual regions only. Rather it involves a recognition that the roles the regions are playing are mutually constituted. In addition, it involves a recognition that uneven development can vary not only in degree (i.e. the extent of disparities – the rate of unemployment, for instance) but also in character. Simply put, high-level strategic, control and R&D functions would remain concentrated in major metropolitan regions in core countries; management of operations would be delegated to regional capitals; while routine operations and production itself would be based in the periphery.

Core-periphery

The key idea of the core-periphery model is that uneven development results from a set of uneven economic relations between a (dominant) core region and (dominated) periphery regions. Simply put, economically advanced regions (or national economies) become rich by exploiting economically less developed regions (or nations). The idea of domination and subordination between regions has a strong resonance with the principle of exploitation of labour under capitalism. According to the Marxist-inspired core-periphery models, the economic fortunes of regions are dependent on their economic power within the uneven economic relations which allow for an unequal exchange (of values) to take place between regions. Unequal exchange, in turn, contributes towards uneven development between regions. The insistence by the core-periphery model that the fortunes of regions are mutually linked thus echoes both the concepts of spatial divisions of labour reviewed above and that of cumulative causation. The core-periphery model offers a simple way of looking at economic dependency between economies and has been applied

at various spatial scales from national to international and global. For instance, the above-mentioned south-east of England may be seen as a core region of the UK national economy. In relation to this, the extent to which Britain is economically divided into prosperous South and declining North by the North–South divide has been debated. Meanwhile, at the European level, the south-east of England can be seen as but a part of a much larger core area which stretches from London through Germany to Northern Italy. With the fall of state-socialism in Central and Eastern Europe, the extent to which the East–West development divide characterises the New Europe has become an issue. Finally, at the global level, the reference is frequently made to the advanced 'core economies' of the Global North (a group of countries including the US, Canada, UK, France, Germany, etc.) and the extent to which the global North–South divide is a useful way of describing divisions within the global economy. While the core-periphery model has its limits (for instance, it hides inequalities within both the core and peripheral regions), it nevertheless alerts us to some important issues about the mutual interdependencies within and between economies and the creation of 'core' and 'peripheral' spaces at various spatial scales (please note that economic peripherality is not necessarily the same as geographical peripherality).

ALTERNATIVE APPROACHES AND NEW ECONOMIC GEOGRAPHY

The third and final section of this chapter will examine concepts and theories associated with various alternative approaches to economies and their geographies. In doing so, the section will provide basic insights into concepts associated with new economic geography. Most (although not all) of these concepts have been developed from intellectual vibrations of the evolutionary-institutionalist perspective. New economic geography approaches thus often provide a stark contrast to both the neo-classical and Marxist approaches in the way they see the operation of economies over space. Indeed, by taking on board various social, cultural, institutional and other factors, new economic geography approaches are shedding a new light on the issue of uneven development. This is a vibrant area of geography and one that has seen many exciting developments in recent years. Having said

that, it is important to recognise that some of the new concepts are still hotly debated. You need to be aware of this and keep a critical eye on whatever you read (and this applies to any other concepts and theories you may encounter). Also, you need to be aware that many scholars use a combination of various approaches in their study of economic geographies. Therefore, a sharp delineation of boundaries between various perspectives is sometimes not easy. However, some key differences between the neo-classical and Marxist approaches on the one hand, and new economic geography and other alternative approaches on the other hand, are apparent and will be highlighted in this section.

The section will begin by discussing geographical implications of broad sectoral shifts between agriculture, manufacturing and services (stages theory), stages of product and industry life cycles (cycle theories) and technological shifts (wave theories). This will set a stage for the examination of selected new economic geography concepts. The section will specifically focus on the role of technical change, innovation and the emergence of knowledge-based and learning economies in the form of regional innovation systems, clusters and learning regions. In relation to this, the section will also discuss the role of networks, trust and social capital in regional economic development. Finally, the section will examine aspects of cultural economies, ethnicity and gender.