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Urbanization, Agricultural Change and Spatial Concentration in Open Dualistic Economic Development

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Urbanization, Agricultural Change, and Spatial Concentration in Open Dualistic Economic Development: Background Paper for the 1978 May Task Force Meeting and December Conference

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THE ISSUES

That Western development experience is largely inapplicable to today's Third World problems is an argument heard often in the current debates on strategies for accelerating national economic growth. The conditions in Asia, Africa, and Latin America are different from those in the West, at the same stage of development, it is said, and a different paradigm needs therefore, to be adopted.

> ...many developing countries have been persuaded to copy Western approaches to economic development in an almost indiscriminate manner. Some of these ideas which have dominated thinking among Third World development planners for over two decades past include the strategy of economic growth through accelerated industrialization; the necessary and concomitant process of urbanization and the positive role of cities in economic development; capital intensive technology as the optimal choice of technique; centralized planning; and the various notions of the vicious cycles of underdevelopment. Lately however, dissident voices in the West no less than in the rest of the world have been raised against this dominant paradigm.....This reorientation incorporates new concepts such as the complementary if not primary goal of distribution in addition to growth as one of the basic objectives of economic development; the quality of life as a major concern in the light of the fact of limits to growth; agricultural development as the parallel requisite if not the prerequisite to accelerated industrialization; labour intensive technology and the role of small and medium-scale industries; the complementarity of rural and urban development; and the theory of mutual dependency in the new economic order. (Lo and Salih, 1976, pp.191-192.)

These arguments of development scholars have now found their way into the popular press:

> The Third World, not to be outdone in its frantic search for modernization and emancipation, too often confusing one with the other, rushes headlong into

> repeating the mistakes of our own painful, tortured progress. The concrete blocks of Bombay, Dakar and Nairobi, bought off the shelf in London, Paris or New York, grimly loom over acres of shantytowns teeming with the millions who have been misled into thinking the secret of liberation and material satisfaction was somehow to be found in the interstices of man's heavenward push.....Conspicuous urbanization .....is not the only alternative for the now developing countries. There are other models and other ways. The Third World does not have to suffocate in its own population growth. Its cities don't have to become chains around its ankles. (J. Powers, International Herald Tribune, 1977)

Scholars and policymakers often disagree when it comes to evaluating the desirability of current rates of rapid urbanization and massive rural-urban migration in the less developed world. Some see these trends as effectively speeding up national processes of socioeconomic development, whereas others believe their consequences to be largely undesirable and argue that both trends should be slowed down.

Those taking the negative view argue that most developing countries are "over-urbanized" in the sense that urban growth rates have greatly outdistanced rates of industrial development and economic growth. This has created an imbalance that finds cities in the less developed world perpetually struggling with crisis. Despite substantial gains in industrial production, new jobs do not appear anywhere near the rates required to employ a significant portion of the growing urban labor force. Despite impressive improvements in urban housing, food availability, educational services, and transportation facilities---squatter settlements proliferate, hunger and illiteracy are in evidence everywhere, and traffic congestion is worse than before. And, most importantly, resources that could otherwise be applied to more directly and immediately productive uses instead must be diverted to satisfy the ever growing demands for urban social services and infrastructure.

Supporters of current urbanization and migration patterns in developing countries point to the modernizing benefits of urbanization and to the improved well-being of most rural-urban

migrants. They contend that urbanization transforms people's outlook and behavioral patterns, while broadening their skills and fostering in them the greater acceptability of innovations and rationality necessary for generating sustained wealth and power in a modern society. They also argue that concern on welfare grounds is probably misplaced, because despite job insecurity and squalid living conditions most rural-urban migrants are better off than they were prior to their move. Their transfer from the farm to the city enables them to raise their personal income and to obtain social services of a much wider variety and superior quality than were available to them before.

The three population-related policies most frequently suggested for dealing with the urbanization problems of less developed nations are fertility reduction, economic development, and a redistribution of the urban population away from the largest cities. Countries that have achieved a high standard of living, it is pointed out, also have experienced significant declines in their birth rates. And sustained reduction in birth rates has not been accomplished without significant economic growth. Moreover, there is also some evidence that costs of services and environmental damages increase markedly with city size. Yet, although there is evidence to support these points, it is by no means irrefutable. Fertility declines have occurred without economic growth. Economic growth has occurred alongside population growth. And convincing arguments have been put forward against a narrow cost-minimization perspective in the debate on city size.

In an effort to gain an improved understanding of the systematic interrelationships that abound in national processes of urbanization, agricultural change and spatial concentration during the course of economic development, IIASA's research task on Population, Resources and Growth is focusing on: the demographics of rapid urbanization, the associated demoeconomic dualistic developmental antecedents, and the resource-service demands that spatial concentrations of human activities generate. A great deal more needs to be known about these three processes

before convincing evidence can be marshalled for or against rapid rates of urbanization. This evidence could shed some light on the following three important policy questions:

1) Is it high fertility or high rural-urban migration that is the principal cause of current rapid rates of urbanization and urban growth in less developed countries, and which of these two components of population change should receive the major attention of national population policy? Is Kingsley Davis (1965, p.46) correct, for example, in asserting that: "It is the population boom that is overwhelmingly responsible for the rapid inflation of city populations in such countries. Contrary to popular opinion...the main factor is not rural-urban migration."?

2) Is a strategy of rapid industrialization, with its predominantly urban bias, the appropriate model for most developing countries, or should agricultural and rural development programs play a much larger role than they do today. Is there wide agreement on Erik Thorbecke's (1969, p.3) belief that "Whereas in the past, agriculture was often viewed as the passive partner in the development process, it is now typically regarded as an active and co-equal partner with the industrial sector."?

3) Are the major urban agglomerations in the less developed world too large and do they consume a disproportionately large share of national resources and services, or is the problem not one of urban size but of urban growth management? Are those who call for spatial urban concentration correct in arguing that, in Alan Gilbert's (1976, p.27) words, "...large metropolitan centres produce more benefits than costs and...any attempt to retard the growth of large cities is likely to reduce national economic growth rates."?

The countries of the less developed world are currently faced with the problem of accomodating more people in urban areas within a shorter period of time than did the developed countries. The dimensions of the task confronting the cities

of developing nations are, therefore, truly gargantuan and call for appropriate policies at the national and local levels. During the next two years, several scholars at IIASA will be concentrating their research efforts to push forward our understanding of what indeed are the appropriate policy responses for this problem.

THE RESEARCH PERSPECTIVE

A fundamental problem confronting mankind is that of attaining a balance between population and food. Differentials in rates of population increase and of food supply are basic to the problem being examined in the Food and Agriculture Program. The initial research thrust of the Population, Resources, and Growth Task will thus be to improve understanding of the process by which urbanization and development affects food demand, and how, in turn, alternative agricultural policies influence urbanization and development. Toward this end, an HSS research team, working with the Food and Agriculture Program, will analyze the transition of a national economy from a primarily rural agrarian to an urban industrial-service society. Data from several nations selected as case studies will be used, and the Task will encompass two themes:

- o Spatial population growth and economic (agricultural) development (together with Food and Agriculture Program).
- o Resource/service demands of population growth and economic development (together with the Resources and Environment Area).

Early efforts will focus on the first theme, and subsequent activities on the second.

Spatial Population Growth and Economic (Agricultural) Development

Development policies directly and indirectly influence patterns of internal migration and of population distribution, and vice versa. Hence, national agricultural development policy, for example, should be consistent with population distribution policy. Toward that end, we intend to:

- o Investigate in greater detail, and at a spatially disaggregated level, the interdependence between migration, technological change in agriculture, and human settlement patterns.
- o Develop a macro model of the dynamic interdependence between urbanization, agricultural change and economic development.

- o Apply the model in examining national economic and demographic policies in a few case studies.

Resource/Service Demands of Population Growth and Economic Development

Resources and services are demanded by people; hence, if all else is fixed, demand should increase with population size. But demand also increases with economic development and growing affluence. We will examine the associations of resource/service demands with population and development, in particular, land and water resources and health care and educational services. We shall attempt to:

- o Develop a model of the interdependence between population, development, and resource/service demands.
- o Apply this model in several national case studies.

Point of Departure

During 1977 the conceptualization and design of this research activity was explored in some detail. A task force meeting was held and a proposed plan of action agreed upon. Several papers were published, establishing a new publication series in HSS.* Important contacts were made with groups doing similar or complementary work in the ILO, the World Bank, the Population Division of the United Nations, and the Population Council. Possible candidates for case studies were identified: Mexico, Japan, Poland, Sweden and Kenya.

Expected Results

Our efforts in 1978-79 will be devoted largely to a consideration of urbanization processes and agricultural development.

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*Nathan Keyfitz, *Understanding World Models*, RM-77-18, April 1977.

Andrei Rogers, *Migration, Urbanization, Resources, and Development*, RR-77-14, June 1977.

Roman Kulikowski, *Optimization of Rural Urban Development and Migration*, RM-77-41, August 1977.

Frans Willekens, *Spatial Population Growth and Agricultural Change in Developing Countries*, RR-78-00, forthcoming.

Expected results are:

- o An *investigation* of the interdependence between internal migration and technological change in the agricultural sector, stressing the impact of alternative agricultural technologies on migration and human settlement patterns.
- o A *prototype system model* that focuses on the demoeconomics of urbanization and on its developmental antecedents and consequences.
- o An *application* of this model to at least two case study nations (Mexico and Japan).

In 1980, research on the demoeconomics of urbanization will be extended and the impact on the demands for resources and services will be considered. The objective will be to build a *resource/service demand model* and to link it to the demoeconomic model.

To Be Done

A study of the patterns, causes, and consequences of internal migration will be related to an analysis of alternative agricultural technologies. A conference on urbanization, agricultural change, and economic development will be held on December 4-8, 1978, in collaboration with the Food and Agriculture Program and involving scholars from IIASA member nations and late-developing countries. A workshop on the resource and service demands of urbanization and development will be held in late 1979. National research groups will be established in case study countries to apply the models. A small task force meeting on the Mexican case study will be held on May 15-19, 1978 and will be followed in 1979 by one on Japan and Poland.

MIGRATION AND TECHNOLOGICAL CHANGE*

Studies of the interdependence between internal migration, technological change in agriculture, and human settlement patterns must consider the role of migration in fostering urban growth, urban unemployment, and poverty. They also must examine how internal migration patterns are affected and in turn affect the processes of rural development (particularly rural agricultural development). These suggest a research approach that adopts a detailed disaggregated analysis of the principal critical links between migration and agricultural development.

- o First, the migration process itself needs further study. This involves (i) a study of the migration decision, of why people move, of the characteristics of migrants, and (ii) a typological analysis of migration flows. Although the first aspect has been covered widely in the literature, and a literature review may therefore be sufficient for our needs, the second aspect has been somewhat neglected and merits attention.

  In several parts of the developing world (e.g., in Latin America) rural-urban migration is smaller than the more important urban-urban migration flows (from smaller towns to larger cities). In other parts (e.g., in West Africa) rural-rural migration is the dominant flow. The latter is frequently seasonal migration and is an integral part of the annual cycle of agricultural activities. The study of this temporary migration is important because it often leads to permanent migration.

- o Second, the impact of alternative agricultural technologies on internal migration needs to be investigated further. Migrants respond to employment opportunities. Particular attention should therefore be devoted to examining the labor requirements or labor absorptive capacities of different agricultural technologies. Because of the limited employment opportunities in the "modern" agricultural sector, the expansion of the "traditional"

*This section was developed and written jointly with Frans Willekens.

agricultural sector (small farms) needs wider attention together with the expansion of nonfarm employment opportunities in rural areas.

A number of recent agricultural policies of developing countries (and foreign aid policies of donor countries) tend to aggravate rural unemployment and to stimulate outmigration. Most important is aid for premature and excessive mechanization. Heavy mechanization of agriculture is often associated with the introduction of highly productive varieties of seeds and of fertilizers in the context of the Green Revolution. Johnston and Cowrie (1969), found that government subsidization of premature tractor mechanization schemes has often contributed to a reduction of labor requirements per acre and hence to a decline in the absorptive capacity of agriculture. Thus, today, some speak of a "second generation" of problems created by the "new" agriculture. The emphasis on heavily, capital-intensive agricultural development projects leads Todaro to conclude:

> By over emphasizing direct government production schemes that are heavily capital-intensive, including state farms, land settlement, and irrigation projects, policy-makers have failed to recognize the tremendouspotential absorptive capacity of the agricultural sector for its own rapidly expanding rural work force.....As the population grows and large-scale mechanized farming schemes are indiscriminately promoted, more and more peasants stand to lose their land, and be pushed out of any participation in the rural economy. (Todaro, 1974, pp.162 and 164).

Although there seems to be a general consensus among people dealing with agricultural transformation that the Green Revolution enhances outmigration and rapid urbanization, detailed study of this interaction has received relatively little attention.

THE DEMOECONOMIC MODEL*

Analyses of the causes and consequences of internal migration and urbanization can best be carried out within the context of formal models of demographic and economic (demoeconomic) development. Several approaches to the construction of such a framework are available, ranging from the development of a detailed planning model to the elaboration of a more aggregated general-equilibrium demoeconomic development and growth paradigm. The latter approach will be employed during the first phase of this study. A demoeconomic model will provide the organizational framework for the various case studies, offer a structure and theme for the 1978 December Conference, and help to identify those areas where additional modeling extensions are likely to yield the greatest return as the project moves toward an articulation of more specific policy prescriptions and strategies.

The general-equilibrium paradigm of demoeconomic development and change will be in the tradition of economic dualism as characterized by the work of Allen C. Kelley, Jeffrey G. Williamson and Russell Cheetham (KWC) in Dualistic Economic Development: Theory and Practice. In this book the authors develop a dualistic model with a modern (urban) sector, and a less modern (rural) sector, each with differing production, demand, and demographic conditions. The urban sector is relatively more capital intensive in production, and possesses relatively fewer possibilities for capital/labor substitution in the production process. Technical change is more rapid and is labor-saving in urban production; in contrast, agriculture employs labor-using technology.

The KWC paradigm broadens the traditional conception of production dualism to consider differing consumer demand preferences between urban and rural residents, as well as differing rates of urban and rural population growth. The framework is neoclassical in its factor pricing and employment structure. Equilibrium is facilitated by perfect factor mobility between

*This section was developed and written jointly with Allen Kelley.

sectors, and by the efficient clearing of product markets. However, in one extension of the model, several disequilibrating elements have been examined, including the introduction of costs of and lags in the transfer of labor and capital between sectors.

While this paradigm has been shown to be quite useful in identifying several of the sources of economic growth and structural change, modifications in its structure appear to be necessary to increase its relevance to the urbanization perspectives of IIASA's study. Several of these modifications will be carried out during the initial phase of the project in 1978-79.

- o First, greater attention will be accorded to the age-specific aspects of population change. Since rural-urban migrants possess ages atypical of the population at large, urbanization will alter the age distribution of both the urban and the rural populations by sector. Moreover, changing population growth rates, deriving largely from changes in fertility, can also influence the population's age structure. Both of these dimensions will be incorporated into the revised model.

- o Second, an exclusive use of the neoclassical framework does not provide the ideal means for examining the nature and consequences of labor slack, yet overt unemployment and underemployment are characteristic of urban centers at early stages of development. A useful way to model this phenomenon is by specifying an 'informal' production sector in the urban area. This production sector utilizes relatively little capital, absorbs unskilled labor at a low wage rate, and provides a means for examining the mobility of labor between skill classes within the urban sector.

- o Third, an examination of the population's economic conditions, whether by an explicit focus on society's income distribution, or on the provision of specific needs in terms of food and shelter, can be profitably highlighted

in a study of urbanization and development. By specifying alternative "minimum subsistence needs", for both food and shelter (using, say, a Stone-Geary or extended linear expenditure demand system), the revised model will be able to trace the impacts of migration and urbanization on basic human requirements, and on the broad distribution of income between various classes and locations of the economy's labor force. Government policies can influence this income and needs distribution by modifying the terms of trade of various produced goods, or by establishing minimum consumption "standards" which may differ from the behaviorally-determined demands of the various population groups.

- o Fourth, the expanded KWC paradigm will provide for a more extensive description of the government sector. Besides influencing various prices and parameters in the model, the government will also be modeled as a demander of scarce resources and a producer of various types of social overhead capital and government services. The rate of urbanization will influence the growth and composition of government expenditures, especially the division of expenditures between the provision of educational services, the supply of urban overhead capital, and investments to promote agricultural development.

Other model extensions may be considered. These include the expansion of agricultural technological and production conditions to define more explicitly a role for various government policies, the opening of the dualistic framework to international trade, the inclusion of possible disequilibrating forces in factor and product markets, and the consideration of the impacts of various forms of international aid and transfers.

The overall modeling strategy of this study will be to provide the minimum demographic and economic specifications and structure necessary to characterize the most important, and empirically verifiable, conditions underlying the relationships between development, demographic change, and urbanization.

THE CASE STUDIES

Studies of agriculture's role in economic development strategy and the process of structural transformation that it induces in developing countries often point to Japan and Mexico as polar prototypes:

> Most developing countries face a basic issue of agricultural development strategy that can be crudely defined as a choice between the "Japanese model" and the "Mexican model"....Japan and Mexico represent success stories in their respective categories....In essence the contrast between the Japanese and Mexican approaches to agricultural development lies in the fact that the increase in farm output and productivity in Japan resulted from the widespread adoption of improved techniques by the great majority of the nation's farmers whereas in Mexico a major part of the impressive increase in agricultural output in the postwar period has been the result of extremely large increases in production by a very small number of large-scale, highly commercial farm operators (Johnston, 1970, pp.86-87).

The urban/demographic consequences of the Japanese and Mexican success stories differed significantly; it therefore is important to also keep them in mind when evaluating each of the two experiences. The aggregate annual population growth rate of Meiji Japan was less than one percent; that of Mexico today is over three times as high. Urbanization proceeded at a relatively moderate pace in Japan during its structural transformation; in Mexico its pace has been startlingly high with Mexico City alone projected to have a population in excess of 30 million by the end of this century.

IIASA's case studies of the antecedents and consequences of the process of structural change in Japan's and Mexico's demoeconomies will follow the tradition of quantitative historical economic analysis as carried out by Allen Kelley and Jeffrey Williamson for Meiji Japan (Kelley and Williamson, *Lessons from Japanese Development*, 1974). Indeed Professor Kelley will be leading the Japanese study during his sabbatical stay at IIASA, January - September 1979. Yujiro Hayami, Koichi Mera and Yasukichi Yasuba will be active collaborators in this effort, both at IIASA and in their home institutions.

Professor Clark Reynolds of Stanford's Food Research Institute and author of *The Mexican Economy* will initiate IIASA's Mexican case study during his sabbatical leave at IIASA, April - September 1978. Luis Castro and Luis Colosio of IIASA and Jaime Luna, Leopoldo Solis, and Luis Unikel from Mexico will assist us in our efforts on this project.

Other collaborators will be identified and recruited in the course of convening the May task force meeting and the December conference. The case studies of Poland, Sweden and Kenya will be organized then. At this moment, it appears that the Polish case study will be led by a team consisting of Professor Zbigniew Pawlowski of the Economics Institute in Katowice and author of *Prognozy Ekonometryczne*, a text on econometrics, and Academicians Kazimierz Dziewonski and Roman Kulikowski, a geographer and a systems analyst, respectively. The Swedish case study will probably be initiated in late 1978 by Professor Lennart Ohlsson of the Economics Department of Uppsala University. The Kenyan case study has already been started at IIASA by Mahendra Shah of Kenya in collaboration with Frans Willekens of Belgium; they will be assisted by Professor Henry Rempel of the Department of Economics at the University of Manitoba during the summer of 1978.

The five case studies will provide opportunities for more detailed analyses of the historical processes of agricultural change and national structural transformation. They will be viewed against a background of broader and more descriptive examinations of world patterns of urbanization, agricultural change, and economic development. These latter examinations will be similar in many respects to three recent studies:

- Hollis Chenery and Moises Syrguin (1975), *Patterns of Development 1950-1970*, published for the World Bank by Oxford University Press, London.
- Kingsley Davis (1969 and 1972), *World Urbanization 1950-1970*, Vols. I and II, Institute of International Studies, University of California, Berkeley.

o United Nations (1976), *Global Review of Human Settlements: A Support Paper for Habitat*, Vols. 1 and 2, Pergamon Press, Oxford.

Professor Bruce Johnston of Stanford's Food Research Institute and author (with Kilby) of *Agriculture and Structural Transformation: Economic Strategies in Late-developing Countries*, will join us in September of 1978 for a year to assist us in our efforts to analyze the structural transformation of agrarian economies to industrialized economies.

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