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9. ABSTRACT

The five major sections of this report are entitled: "Spatial Interpretation of Underdevelopment;" "Area/Regional Planning Models and their Relevance for Rural Development;" "Area Regional Systems and their Relevance for Rural Development in Upper Volta;" "Aspects of Area Development Strategies for the Eastern ORD of Upper Volta;" and "Applied Research Requirements for Area Planning in the Eastern ORD." The problem of development in Africa seems to convey a common set of themes of development form and process which applies in almost any country in the continent. Following the initial experience of development after decolonization and the resultant problems of unequal distribution of the benefits of development, a number of conceptual paradigms emerged to explain the structural barriers to sustained and equitable development. Two approaches are described to have been extremely influential in presenting a descriptive model of the mechanism of underdevelopment, and a number of development models have been based on one or both approaches. The center-periphery and dual structural concepts seem to be quite ingrained in the process of identifying important variables for the development of systems of planning, spatial as well as sectoral. Area, regional or space planning for rural development depends on the role it is intended to play under the macrosystem of national or regional planning the country is using. In Upper Volta the government has introduced a regionalization concept for rural development of the country under the framework of "Organism Regionaux de Developpement" (ORD) and has divided the country into 11 ORDs. Although the existing framework of the ORDs leaves out a considerable number of functions that would ordinarily come under a system of regional development the present list of functions does contain important aspects

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that would have to be carefully analyzed in a framework of area planning and micro-spatial organization.

AREA/REGIONAL PLANNING FOR RURAL DEVELOPMENT STRATEGIES WITH SPECIAL REFERENCE TO THE EASTERN ORD OF UPPER VOLTA*

by

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Area/Regional Planning for Rural Development Strategies with Special Reference to the Eastern ORD of Upper Volta

I. Spatial Interpretation of Underdevelopment

The problem of development in Africa seems to convey a common set of themes of development form and process which applies in almost any country in the continent. In the first instance, despite significant attempts to accelerate economic progress to achieve self-sustaining growth process during the First Development Decade, the African countries demonstrated not only a very weak initial thrust, but also an accumulated experience that was considerably less than satisfactory. Both in total real product or per capita real product the African countries lagged behind the other developing regions.(1) The second and even more serious process that resulted from induced development in African countries is the extreme disparity it ushered in the sharing of development benefits between the various segments of the population.(2) A third problem that resulted from the frantic development programs of the 1950s and the 1960s is the "spatial inequality" within countries(3) which eventually led to extreme rural/urban differences in income and quality of living and the alarming growth in the gap of this difference.(4) In this context, it has often been the case that development in each country has been dominated by single strong, centers which derived the disproportionate share of the development benefits without showing any significant functional interaction with the "perepheries."(5) This process has led in almost all African countries to what could be called a socio-spatial duality in which there exists a spatially differentiated process of development which has made it

possible for the primate cities or the "core areas" to monopolize the benefits of development whereas the outlying areas are made to suffer from negative causes of "backwash effects."(6) A fourth problem that is shared by almost all African countries is a situation of socio-economic dependence.(7) In the rush for quick solutions to their development problems and partly also because of their immediate colonial past, they were forced to choose the road to dependence on global economic systems and almost completely lost the golden opportunity to derive inspiration and insight from their own socio-economic environment to develop appropriate methods of development for their own situation. This weakness ultimately led to their failure to institute meaningful, workable and stable socio-economic transformation for their peoples. Finally it can be stated that most African countries face a number of institutional, economic and spatial structural barriers that past development efforts have not been able to break down and bring about functional integration between social as well as spatial components of the economy.

Following the initial experience of development after decolonization and the resultant problems of unequal distribution of the benefits of development, a number of conceptual paradigms emerged to explain the structural barriers to sustained and equitable development.(8) A few of these paradigms have been found to be useful for better understanding of the spatial aspects of underdevelopment. One of these models belonged to the variety of "center-perephery" relationships. Among the initial formulations was the one Hirschman presented in which he argued that the initial impact of development would lead to the "concentration of economic growth around the initial starting points."(9) At the beginning of the development process "friction of space," agglomeration and external economies, and also perhaps conditions of market and other advantages of major settlements, would produce forces for the concentration of development, and, as Hirschman concedes, this phenomenon

would eventually lead to "interregional inequality of growth." "Thus, in the geographic sense, growth is necessarily unbalanced." Hirschman presents this as an "inevitable concomitant to development"[10] and describes the resulting spatial phenomenon as the emergence of "growth points" and "lagging regions." John Friedman[11] presented a somewhat similar spatial variation in development with his "center-perephery" model. According to Friedman the "core-periphery" concept has made it possible to extract the important structural problems in the relationship between developed centers and lagging or exploited regions. Friedman isolates three phenomena to demonstrate the structural relations between center and periphery. In the first instance the center-periphery relation is equated with the "colonial" model in which the periphery is being exploited through a series of resource displacements to the "core" region. Second, the terms of trade will always favor the center because of the "qualitative" difference between the products of the "core" and those of the "periphery." Finally, the interplay of these forces will produce stagnation of the periphery which eventually lead dissatisfaction and political unrest.[12] Although there are certain criticisms leveled at this model, the center-periphery framework has been found to be quite popular and extremely valuable for presenting spatial variation of development.[13]

Another useful framework for explaining the differential impact of development especially in space is the phenomenon of economic and social duality. The dual socio-economy framework refers to the existence of two more or less distinctly variant systems of socio-economic development which have produced a highly monetized and technologically well advanced economic activity in and around the primate cities whereas the rural environment has

been left essentially in its traditional backward economic activity.[14] Although the duality model has experienced some criticism[15] it is still one of the widely applicable formulations for capturing the general trend of socio-spatial duality in the developing nations. The "duality" model has especially become extremely useful for describing the colonial mode of economic operation and the role of primate cities as centers of "export enclaves," a phenomenon which has invited subordination to international trade systems in the framework of dependent economic structures.[16] Ann Siedman conceding that "the newly independent countries of Africa are characterized by dualism," uses the model to describe what she referred to as the "critical variables in the typical African dual economy."[17] She further argues that any development plan that relies on this set of inherited institutions (which is characteristic of the colonial mode of exploitation)[18] for implementation is unlikely to attain development defined as increasing the productivity and raising the level of living of the broad masses of the population."[19]

The two approaches have been extremely influential in terms of presenting a descriptive model of the mechanism of underdevelopment, and based on one or both approaches a number of development modeling has been exercised. Soja, in a recent work[20] talks about "spatial inequality in Africa" and the analysis rests on the assumption of differential modernizing influences within African countries. The differential process has produced a situation of what he called the "geographical 'elite'" as the "dominant territorial 'class'" and "peripheral areas" which produce commodities for transfer to the core centers.[21] The explanation of the "core-periphery" phenomenon has expanded its scope to include not only the traditional distance decay phenomenon but also "temporal or historical" contexts in which "the spatial organization of human societies in all its manifestations (will) be seen as

an evolving resolution to the interaction between social and spatial structures, an interaction which ... is inherently dialectical in nature."[22] Soja further argues that,

> "All aspects of social reality, whether viewed from the standpoint of 'social science' or 'scientific socialism,' include a salient spatial dimension which is comparable in importance to the historical dimension of society. To the social scientist this represents a call for closer attention to spatial relations in any consideration of such themes as development and social change or, indeed, inequality and social stratification. To the Marxist, it is no less than a demand for a historical and spatial dialectical materialism."[23]

In the final analysis Soja views that the "structural spatial inequality is rooted in ... nodality."[24]

John Friedman more recently also goes into more holistic and radical formulations to explain "contradictions between city and countryside."[25] The modern town in a developing country is characterized by a center of predominantly non-primary activities and by virtue of its centrality, it becomes the center of "corporate interests" from which

> "rural areas are scanned ... for their potential instrumental value in expanding corporate production and for accumulating wealth. Rural 'periperhies' will thus be organized to supply a steady stream of resources to a growing market economy whose ultimate reach is global. To the degree that they are seen as abstract entities, they may be manipulated and used by the abstractor without the slightest twinge of moral conscience."[26]

In summation irrespective of the manner in which they are discussed, the center-periphery and dual structural concepts seem to be quite ingrained in the process of modeling of spatial disparities as well as in identifying important variables for the development of systems of planning, spatial as well as sectoral.[27] Spatial inequality exists in Africa not only because of the unavoidable "friction of distance" but also because of other structural phenomena inherent in the political-economy of nodal centers in Africa.

Although nodality is an indispensable phenomenon for spatial organization of human activity, the traditional nodal structures and roles they played in organizing the economic space of Africa have been detrimental to integrated development. Major spatial restructuring is an urgent necessity.

II. Area/Regional Planning Models and their Relevance for Rural Development

The development literature is replete with variant approaches to solve the development problems of the poor countries of the world. Altnough most of these approaches have been discussed in a non-spatial framework, almost all of them share one important phenomenon which has strong spatial implications. They concede that a choice must be made between priority sectors and/or growth centers around which an initial thrust should be made. Hirschman's "trickling-down and polarization effects"(28) model has been a useful framework for evaluation of functional integration. The model bases itself on the choice of sectors and growth points which would be the initial recepients of development and then on the basis of market forces, a process will be underway in which the region which has a lead in development and that which has lagged behind would evolve into a complementary activity structure which would eventually bring about the benefits of development to both. Although Hirschman concedes that the process might lead to polarization of development, he however believes that eventually the "trickling down" effects would take the upper hand.(29) Myrdal addressed the problem in almost the same way with his "spread" and "backwash" effects.(30) These approaches, which essentially use a "spatial equilibrium" model operating

"under assumptions of perfect information and unhindered movement of labor and capital,"[31] argue that any displacement of factors within the spatial entity should be left to the operation of market forces. Hermansen expresses this as follows:

> "In general, the polarization and backwash effects are likely to dominate over the possible spread-and trickling-down effects, and the fruits of the national development will be concentrated in the already fairly well developed areas, and the gap will be widening. As a result of the draining of the best human resources and large parts of eventual savings from the backward to the growing regions, due to the better prospects of higher and quicker returns inherent in this spatially unbalanced process of development, the underdeveloped areas drop constantly further back."[32]

Evaluation of development experience in Africa did not produce spontaneous equalization forces between developed "nodes" and "periphery." In fact a serious disparity and widening gap in income and quality of life were experienced. Recent development in regional development modeling challenged the "equilibrium model" and concentrated its effort on more deliberate process of planning which would take into account factors that were responsible for the "backwash effects" of development to date.[33]

Although the critical evaluation of the development experience did produce better conceptual frames for planning development, a good number of the work on area/regional planning is presented in generally macro-framework to be of use for micro-spatial organization for rural development planning. Scholars that dealt with spatial organizational problems in Africa mostly concentrated on macro-analysis which is hardly useful for immediate application by micro-space planners. Recent works on "development geography" have been

classified by Slater as falling into three "modes of analysis" which he called, "spatial differentiation," "spatial diffusion," and "spatial integration."[34] Without going into the argument as to whether the classification is a useful one, it could be seen that in none of the categories do we find satisfactory approaches that would deal with problems of development organization at the local level. This does not of course mean that research is lacking. But most of it has been evaluative of past trends in spatial diffusion and spatial integration. Works by Forde, Riddel, Soja, Witthuhn Taafe, Gould, Morrill and Johnson[35] have dealt with the spatial patterns of development and some of the dynamics behind them with considerable rigour. However, very little in terms of micro-spatial modeling for rural development has come out of their otherwise splendid achievements. A second group of analysis in spatial planning has been produced extensively by socio-economic planners especially by those who worked within the U.N. and related agencies. Kuklinski, Porwit, Hermansen, Misra, Higgins and Klaasen,[36] are only a few among such planners who have sufficiently articulated the problem of harmonizing development. A third class of academicians constitutes those who have devoted most of their effort on building the theoretical framework of spatial organization. Among these are Perroux, Christaller, Losch, Isard, Alonso, Berry, Boudeville, Richardson and Williamson.[37]

The first group of scholars have contributed to the body of knowledge for the spatial manifestation of unequal development process. Working under "center-periphery" formulations or "dualistic" models they have shown that the process of development has ushered forces of "polarization" which gave "core" areas a disproportionate share of the development benefits which have left the "peripheries" to suffer from "backwash" effects. They also

challenged the "spatial equilibrium model" and reliance on market forces to do the work of optimization of resource transfers. For the purpose of micro-spatial organization for rural development one useful conclusion seems to have been reached by this type of analysis--the need for "spatial restructuring."(38)

At the root of the second group of spatial analysis--regional development approaches, is an assertion for change in focus from classical notions of development. Friedman and Alonso have put the concern in a concise manner when they indicated that "the questions of social justice in the distribution of the fruits of economic development are as important and as difficult in terms of regions as in terms of social classes."(39) Kuklinski addes another dimension by saying that "the goal of regional policy is not restricted to economic growth; it also includes important problems of social development,"(40) and Hermansen contends that there is a need for structural changes in order to bring about a "deliberate secular transformation of the industrial, social and spatial structures of the nations so as to obtain future structures which are conducive to the attainment of the permanent goals" of development which are composed of "gradual equalization in standards of living between sectoral and functional groups as well as between regions."(41)

The theoretical foundation of spatial organization studies and regional planning is found in works accomplished by various academicians some whom had very little experience in underdeveloped economies. But virtually all aspects of area/ regional planning processes rely to a considerable degree on these theoretical frameworks. Perhaps one of the most popular and extremely useful of such contributions is Christoller's theory of central places.(42) This in conjunction with "growth pole" and "growth center"

formulations[43] has been found to be of extreme relevance not only for descriptive purposes[44] but also as a tool for development planning with a view to spatial integration.[45]

Agricultural and industrial location theories both of which have undergone considerable development since Von-Thunen wrote his "isolated state,"[46] have proved extremely useful not only in studies of spatial differentiation but also in helping planning processes for more efficient localization of agricultural and industrial activities under a framework of deliberate spatial restructuring or under "general equilibrium" conditions.[47]

Industrial location theory contributed a great deal to the development of methodology for understanding the process of spatial organization for efficient input/output systems of secondary activities. Starting with one of the monumental works in this field by Alfred Weber,[48] the theory of industrial location has produced an array of valuable systems of location discussed under varying assumptions of space economy models. Among the location theoreticians whose work has been the backbone of spatial organization models are Losch, Isard, Greenhut, Hoover, and more recently Smith.[49]

In discussing regional analysis, we should note that the most important contribution coming out of the location theory school for use in planning by developing nations does not so much reside in the locational principles per se, which rely on a different empirical basis pertaining to the developed nations, but more significantly in the work of comprehensive regional analysis which relied heavily on central place as well as locational notions. Regional analysis, by virtue of being comprehensive, also brought about the inclusion of other systems which had applications for studying interregional patterns and dynamics. The emergence of regional science as a comprehensive

framework for the study of economic space, included not only static locational patterns but also dynamic growth and interaction models such as input/output themes,(50) economic base studies,(51) principles of regional and social accounting,(52) social physics, gravity and spatial interaction models,(53) diffusion dynamics,(54) and graph-theory formulations.(55) The development of regional economics and regional science since the early 1960s has been so significant that at present we find no less than half-a-dozen standard texts in this field including those by Friedman and Alonso, McKee, Hoover, Richardson and Isard.(56)

For African regional/area development on the basis of macro- as well as micro-spatial organization purposes, it is possible to extract from each of the three categories of intellectual exercise described above, elements that would assist in planning rural development.

1. "Spatial differentiation" studies have been very useful for isolating important variables responsible for spatial variations and the current spatial organization. A lot of the current conceptual frame for the "dualistic" as well as the "center-periphery" models is based on such studies. More studies of this nature with particular reference to rural spatial spatial dynamics would be needed.(57) Hermansen supports that an approach to the study of spatial organization should start from a descriptive study of what exists.(58)

2. Models of regional development, especially those that have applicability to the African situation will be extremely relevant for preparing macro-systems of planning and resource allocation. The study of regional allocation systems will be useful for disaggregating the national plan on the basis of regional variations and requirements.

3. Among the theoretical models for area planning or space organization, the African micro-spatial planning effort would definitely benefit from wise application of central place frameworks and associated growth-pole and growth-center models. Models of spatial location and spatial interaction (such as the gravity model) used together with central place systems would yield relevant structures for "normative-like optimism patterns of settlement,"(59) social services, production centers and marketing.(60)

Ideally all of these three approaches to the study of developmental space organization should be coordinated and systematized. However, an organic system of space studies and planning is yet to emerge in Africa. The current effort is scattered and deals mostly on description of existing spatial phenomena. What Slater calls "differentiation studies" of development geography have hardly been helpful for the purpose of designing the current regional efforts of the African nations. A bulk of the regional planning framework for Africa has come from the U. N. agencies and it does not seem that deliberate and sufficient effort is being made for recognition of and encouragement for systematic analysis of spatial phenomena being conducted around academic circles. The approach to regional planning in African countries has been mostly based on disaggregation principles of the national plans and it has hardly relied on empirical or deductive modeling based on African realities. Perhaps the most underdeveloped aspect of spatial studies in Africa is that dealing with micro-space modeling. Few studies have dealt with detail investigation of central place phenomena, modes of economic activity and their locational determinants, transportation and interaction principles. As Johnson expressed it:

> "it must therefore be regretted that virtually no attention has been given to central place analysis in Latin America and the Middle East, and very, very little in Africa and Asia. This indifference to spatial problems, despite the vast outpouring of books and articles concerned with economic development in the 'third world' is to some of us who have lived and worked in underdeveloped areas deeply disturbing. For genuine development cannot possibly be dissociated from geography; investment, if it is to be fruitful, must be made at "growth points," and industrialization will have little meliorative effect unless low-cost marketing can widen demand. Each critical measure of development is influenced by spatial factors. Hence, it is the underdeveloped countries that stand in most urgent need for central place studies and careful spatial analysis."(61)

III. Area/Regional Systems and their Relevance for Rural Development in Upper Volta

Area, regional or space planning for rural development depends a great deal on the role it is intended to play under the macro-system of national or regional planning the country is using. A macro-global planning exercise is a top-down approach to spatial organization. Since it is bound to deal with a first-level disaggregation of the national plan, it is not very useful for micro-area approaches which are geared to the solution of localized rural development problems. However, since micro-spatial planning (area planning) is a sub-set of national regional planning, it is important to find out the scope of the latter and the role it has given to local problems of development by its disaggregative procedures. In order to clarify at which level the micro-spatial organization operates, we will resort to decision categories that Hermansen and Kuklinski[62] have suggested in a recent work on regional disaggregation of national policies. The decision hierarchy used a four-tier system and included, (1) "macro-decisions" often made at the national level, (2) "interregional decisions" which are used for first-level disaggregation of the national plan, (3) "intra-regional decisions" which deal with second-level disaggregation which ordinarily addresses itself to issues within regions, and finally (4) "operational micro-decisions" which have to do with the lowest level of spatial-entity having to do with decisions that affect regional sectors, sub-sectors or localities, all depending on the typology of space framework used.

In Upper Volta the government has introduced, starting in 1965, a regionalization concept for rural development of the country under the

framework of "Organism Regionaux de Développement" (ORD) and has divided the country into 11 ORDs. The "Plan Cadre" of 1967-1970 of Upper Volta started out with 10 ORDs by consolidating the 44 circles. Therefore, the spatial entities of the ORDs were based on historical administrative centers. In terms of administrative organization the ORD structure fell under the "Direction du Développement Rural" (renamed "Direction des Services Agricole" in 1974) which is one of the four directorates under the Ministry of Agriculture and Livestock,(64) now reorganized into the Ministry of Rural Development.(65)

According to the 1967-70 Plan Cadre the function of the various ORDs seems to be restricted to aspects of rural development(66) specified under seven activities which are of the kind one would expect under ordinary agricultural extension systems. Secondary and tertiary activities are grouped under the "Plan du Secteur Moderne" and hence are in principle out of the jurisdiction of the ORD structure.(67)

Since the ORD function is limited to the primary activity sector, particularly agriculture, and since it seems to have very little role in other important developmental sectors of each region, the framework can hardly be considered to encompass regional development in its generic sense. Whereas traditional regional development strategies deal with the disaggregation of the national plan, often giving regions more integrated functions and greater autonomy, the ORD system operates at a much lower level of disaggregation--namely the regionalization of strategies for agricultural development and related activities. Although the existing framework of the ORDs leaves out a considerable number of functions that would ordinarily come under a system of regional development (at least theoretically), the present list of functions of the ORDs does contain important aspects that would have to be carefully analyzed in a framework

of area planning and micro-spatial organization. Patterns of location of such factors like extension and training centers, storage and marketing centers, credit outlets, rural crafts and settlements are all problems for micro-spatial organization. Related to this are also the problems of organizing spaces into viable units for local services, sub-regional services and regional services. However, the real power of the ORDs in designing their own area planning and spatial organization is not evident. Present evaluations seem to indicate that the ORDs have hardly realized their original objectives and that they have merely become a machinery for agricultural extension, credit and marketing facilities. Rural participation in decision making and effecting "horizontal integration of administrative and technical activities at the regional level" do not seem to have been greatly influenced by the ORDs.(68)

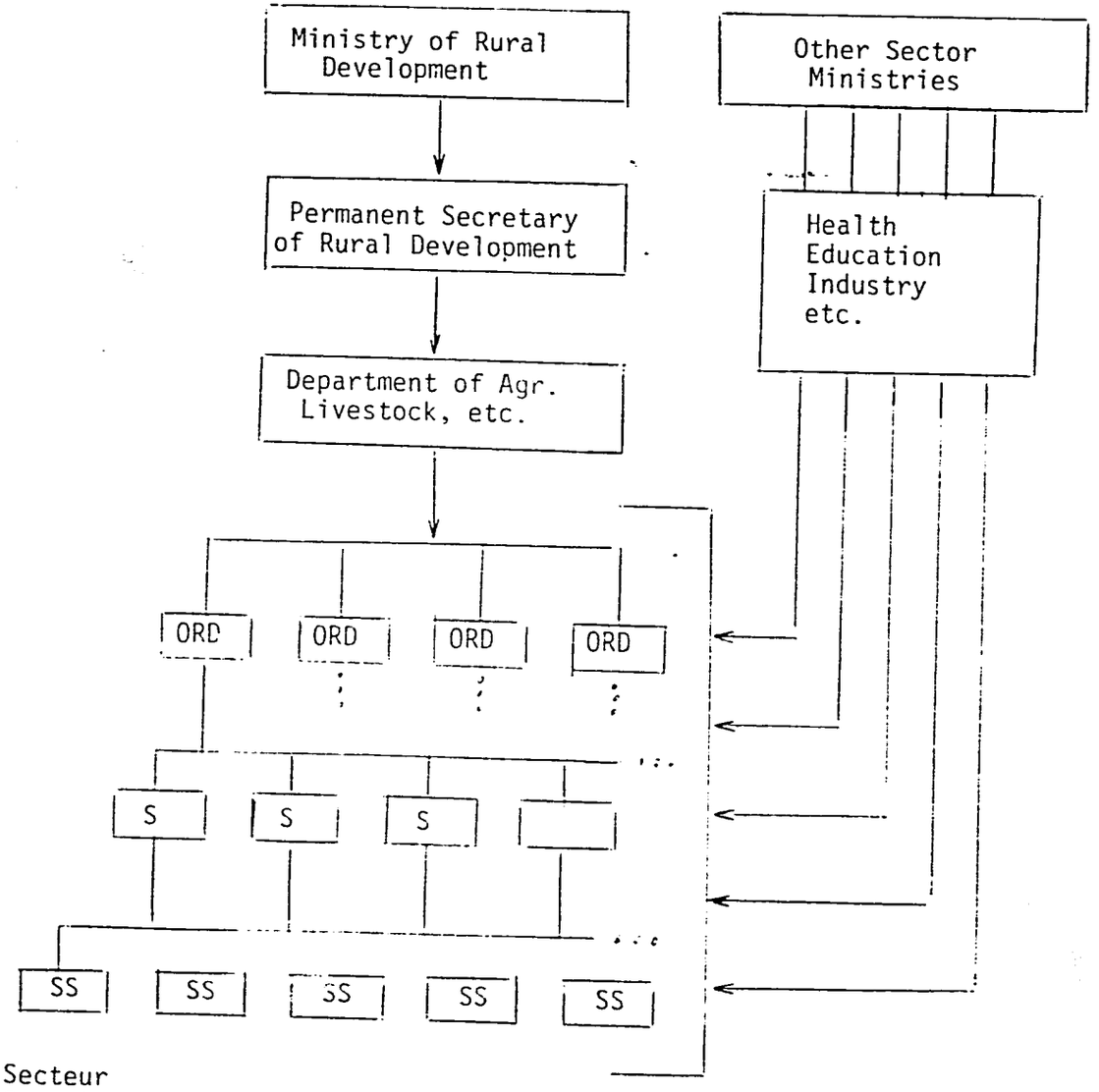
A number of factors have been blamed for the lack of achievement of the ORDs at the expected levels. The administrative framework within which ORDs operate seems to show very weak linkages. According to one study, the lack of a strong policy body at the central level, weak coordination by the central office of the rural development directorate and lack of qualified cadre of ORD personnel are mentioned to be some of the problems hindering progress.(69) There is of course the problem of overlapping decision spheres which belong to other ministeries.

How do we address the problem of micro-spatial organization of area development at the ORD level under these conditions? One of the important factors that should be realized is that the rural development administration of the ORD, the territorial administration of the corresponding départements,

and further the functions in the ORD or départements of the other sector ministries can operate independent of one another. With this division of responsibilities, some of the important components of area development in basic needs (education, health, water, food and infrastructure) as well as in secondary activities are found within decision spheres outside the present scope of the ORD (see figure 1).

As could be seen in the organizational chart (see figure 2), there is almost complete overlap between the administrative units of départements and ORDs with the exception of ORDs Sud-Quest and Bobo-Dioulasso which are consolidated under one département. This gives the ORD structure a status of administrative homogeneity. This first level of homogeneity does not however continue downwards into the smaller subdivisions. The départements have their sous-préfectures (what used to be called cercles) and arrondissement (which used to be called subdivisions). The corresponding subdivisions of the ORDs, which presumably follow development criteria of flexible nature, are the secteurs and the sous-secteurs respectively. The ORDs also have at the lowest level the "unité d'encadrement" at the smallest locality level which does not have a corresponding administrative unit. There is no indication for the numbers of the subdivisions or their boundaries to have matching correspondence. In fact in each ORD there are usually fewer administrative sous-préfectures than the corresponding division of secteurs of the ORD. For instance the Eastern ORD has three administrative sous-préfectures and six ORD secteurs.(70)

Considering the sectoral organization of development and administrative space organization in the ORDs, a high degree of regional development planning and micro-spatial organization seems to be quite unlikely. A good number of the development inputs that would have been aggregated into a holistic area/regional development are not within the ORDs decision



S = Secteur
SS = Sous-Secteur

Figure 1: Administrative Organization of the ORDs and Decision Patterns.

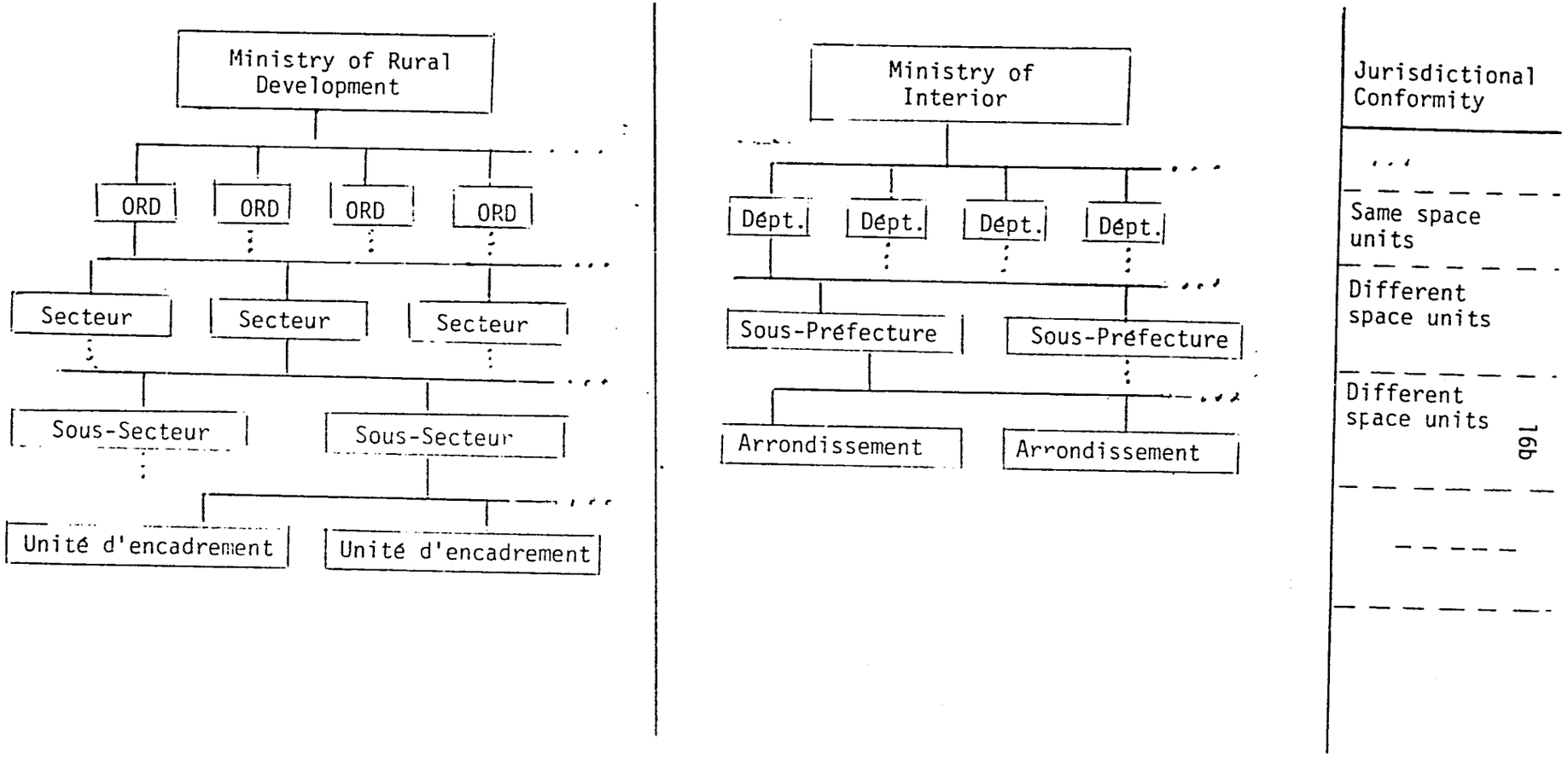


Figure 2: Territorial and Development Organization Patterns Related to ORDs, and Spatial Correspondence.

apparatus. However, two alternative possibilities can be explored. One possibility would be to concentrate on spatial and area development problems that fall within the responsibility of the ORD. Some of the implications of this alternative have been pointed out earlier. A second possibility is for the ORD to expand its scope of resource allocation, at least on an informal basis, and take responsibilities that would include social overhead capital investment patterns (basic needs) and some secondary and tertiary investments. In the following section, the discussion on a typology for rural space organization, therefore, will not exclude the possibility of the ORD to be the principal vehicle of bringing development to the rural inhabitants.

IV. Aspects of Area Development Strategies for the Eastern ORD of Upper Volta

One of the most important characteristics of a spatially sound typology of rural development is to have as its central objective a pattern of development service delivery systems and productive infrastructure within optimum access by the rural population. Under the limiting conditions of parsimony, a micro-spatial organization of rural development and related localization decisions would aim at minimizing the aggregate distance traveled by all rural inhabitants to all centers containing basic needs as well as development services. The overriding objective is to maximize the reach of development investment to as many inhabitants as the development investments would permit.

Micro-spatial organization for rural development is a subset of regional systems. In terms of projects it will deal with the contents of

a rural development package and in terms of development administration, it refers to the spatial system of efficient organization of development inputs and how the fruits of the package are delivered to the rural inhabitants in an equitable and efficient system. For the ORDs of Upper Volta the current rural development package has already been explored. Henceforth, an attempt will be made to explore some of the basic issues that concern the mechanics of space organization for rural development on the basis of the Eastern ORD.

An attempt by Friedman to describe the spatial framework of rural development[71] contains a number of solient ideas concerning spatial organization and functional integration. In this connection Friedman suggests a four-tier planning hierarchy starting with the village planning level and then going up into district planning, regional planning and national planning spheres.[72] In terms of structure, Friedman's levels fit with the existing ORD hierarchy which has a corresponding spatial division starting with the sous-secteur moving up to secteur, ORD and the national plan. However, the implicit assumption in Friedman's decision framework for the integration of the territorial administrative decisions and that of the regional development is not matched by existing conditions in ORDs in Upper Volta. Another point made by Friedman is a statement of general principles which indicates the need to assign areas "to each of the three top levels in the hierarchy of growth centers on the basis of the areal extent of their influence."[73] However, how this could be done in the field is not clearly specified. The spatial aspects of rural development planning of course go much beyond what Friedman described the work referred to, which essentially could hardly be classified as a spatial analysis. He has outlined the major principles nevertheless.

The practical aspects of spatial planning for rural development will at the outset identify the critical bundle of development inputs which will then be classified on the basis of desired and functional proximity to rural inhabitants. Although, theoretically distance decay is a continuous function for range of services and economic activities, practical considerations make demands for the adoption of convenient hierarchy of distances which correspond to a hierarchy of central places and service centers in which the relevant development investments will be located. What level of service goes where will depend on the potential magnitude of trip frequency that will be made to it by rural households if it were located within a reasonable range of the public that requires its service at some given level of frequency. To make the point clearer, for instance, a college will be located perhaps at the regional center (long distance access) but a health center or an elementary school should be located at the village center (short distance access).

In a four-tier hierarchy, which matches the decision structure described by Hermansen and Kukliniski and also Friedman, and which is also similar to what we find in the Eastern ORD, it is possible to classify development services in the following hypothetical manner:

1. Short distance services which should be accessible within less than four round-trips per daylight time. This would constitute the village interaction space and may correspond with the sous-secteur in the ORD structure (see further below).

2. Medium distance services which should be accessible within the range of four to two round trips per daylight. This would constitute the district interaction space and may correspond with the secteur in the ORD structure.

3. Long distance services whose accessibility can be within less than two round-trips per daylight. This may mean that to go to a long distance service center it may take a whole day to make the round-trip. This "long distance" space entity would constitute the regional interaction space. This corresponds with the ORD itself.

The national space would of course be the highest hierarchy requiring the maximum distance to be covered by the individual who is living at the most distant border point from the national capital.

In spatial design for rural structures, distance is an equity variable and used without allowance for scale economy and population threshold factors, it may not produce maximum efficiency in terms of cost/benefit considerations. The cost of travel, which is really the more reliable measurement than crude distance, depends on levels of technology available for transportation over the various ranges of distances to a hierarchy of centers. That is why the concept of "round-trip" time is used.

In this hypothetical framework for rural services and service centers, a hierarchy of spatial units will be derived using crude distance as surrogate for cost of traveling. The "threshold"(74) problem and consideration of critical mass of "total demand"(75) will also be noted without delving into too much detail. The terms of reference will be restricted to "basic needs" and rural development phenomena, and hence the analysis will be restricted to the typology of rural service space designing based on distance.

Although there is a considerable variation between regions, the hierarchy of rural services and infrastructure have global characteristics. In terms of investments in health, education, transport, communication, market, food storage, banking and shops, there is some form of consistency with respect to the level of services that would be required with short, medium, and long distance space entities. A rough guide to this pattern is given in figure 3.(76)

Range Distance	Territory	Education	Health	Law	Police	Produce Handling	Agricultural Service	Transport and Communication
Short	Sous-Secteur	Elementary School	Health Clinic	--	Police Station	Local market, cooperative storage	Village Extension Worker	Bus stop, post station, telephone booth
Medium	Secteur	Secondary School	Health Center	District Center	Policy Quarters	District market, district product storage silos	District extension officer (field testing and demonstration)	District bus terminal, telephone subscription, post office
Long	ORD	College	Hospital	High Court	Regional Police H.Q.	Regional market, produce storage & processing	Regional extension officer (experiment)	Regional bus terminal, telephone exchange, G.P.O.

Figure 3: Hierarchy of Functions for Local, District and Regional Center (hypothetical).

In the Eastern ORD the sous-secteurs may be programmed to contain the "short-distance" bundle of services whereas the secteurs may be assigned to cater services that would require "medium distance" access. The next problem would be how to evaluate the actual number and reach of sous-secteurs and secteurs of the Eastern ORD by comparing them with deductively derived theoretical hierarchy of spatial units. Transforming "round-trip" time into distance with the assumption of rural travel speed by rural households not exceeding five kilometers per hour, the Eastern ORD has been divided into two sets of hexagonal lattices on the basis of service centers which would deliver "short-distance" and "medium-distance" functions. As a planning and evaluative tool, use will be made of the Christaller/Losch framework of lattices.(77) At this point it should be noted that such an exercise is only a preliminary process to initiate enquiry in design for rural spaces for various activities. No claim will be made beyond this.

Assuming speed of travel by rural inhabitants to be about five kilometers per hour, we may determine in our hypothetical exercise that "short distance" services should be located within five kilometers (four round'trip equivalent in daylight) of the rural resident at the margin of the five-kilometer radius cell. This means that the rural resident at the margin can cover the round-trip distance to a central service center in about two hours. In a Loschian framework then, the smallest derived hexagonal lattice will have a radius of five kilometers. Since the hexagonal lattice is composed of six equilateral triangles, we can use the area of a hexagon whose radius (or sides) is equivalent to the maximum reach of the service center.

The three sets of equations given below will be used to determine (1) the number of lattices for the i^{th} function service area (N_i), (2) the maximum reach of the service area (R_i) given a minimum population threshold requirement to provide service and (3) the maximum reach of the service area (R_i) given a minimum aggregate income threshold requirement to provide service.

(a) $$N_i = \frac{A}{a \cdot R_i^2}$$

where:

A = area of the ORD

R_i = length of the sideof the i^{th} level hexagon which equals its "radius"

a = constant element equal to 2.598 (from standard formula for area of hexagon).

(b) $$R_i = \sqrt{\frac{{}_pT_i}{a \cdot D_i}}$$

where:

${}_pT_i$ = population threshold required for the i^{th} level of service

D_i = population density of the locality in which the i^{th} level of service will be located

a = constant = 2.598

(c) $$R_i = \sqrt{\frac{{}_yT_i}{a \cdot Y_i \cdot D_i}}$$

where:

${}_yT_i$ = aggregate income threshold required before an i^{th} level of service is made available

Y_i = income per capita in locality in which the i^{th} level of service would locate

The total area of Eastern ORD equals 43,444 square kilometers.(78) On the basis equation (a), the Eastern ORD will have close to 670 local service centers in order to reach the population of the entire region with primary (lowest level) service centers within five kilometers radius on the average. The number of lattices (or service centers) for higher radial distances could be read on the chart on figure 4.

Transforming the present sous-secteur space units, of which there are 17 in the Eastern ORD,(79) into equal access lattices we discover (from figure 4) that radial distances for rural households residing at the margin of the sous-secteur service area would involve travel distance between 30 to 35 kilometers to reach sous-secteur service centers. Considering the present sous-secteur pattern, it could be seen that some sous-secteurs in secteurs Bogarde, Diabo and Comin Yanga, which are in more densely populated parts of the ORD, may show less radial distance than that derived for the average sous-secteur lattice. However, in secteurs FADA, Kanchari and Diapaga, the actual radial distances would be much greater than those derived for the mean. In any case the sous-secteur space in its present organization seems to be too large an area for organizing local-level service components based on assumptions discussed earlier. (The question of variation of population density will not be ignored in working out more realistic lattices especially in view of population thresholds for various services.)

In the present ORD structure the lowest service unit which is the unité d'encodrement does not seem to be a spatial unit. It is the smallest cluster of farmers being served by an extension unit of the ORD. If the ORD has to effectively reach the population with the most rudimentary level of development services, the smallest spatial entity cannot exceed at the most the ten kilometer radial lattice with present technologies in transportation.

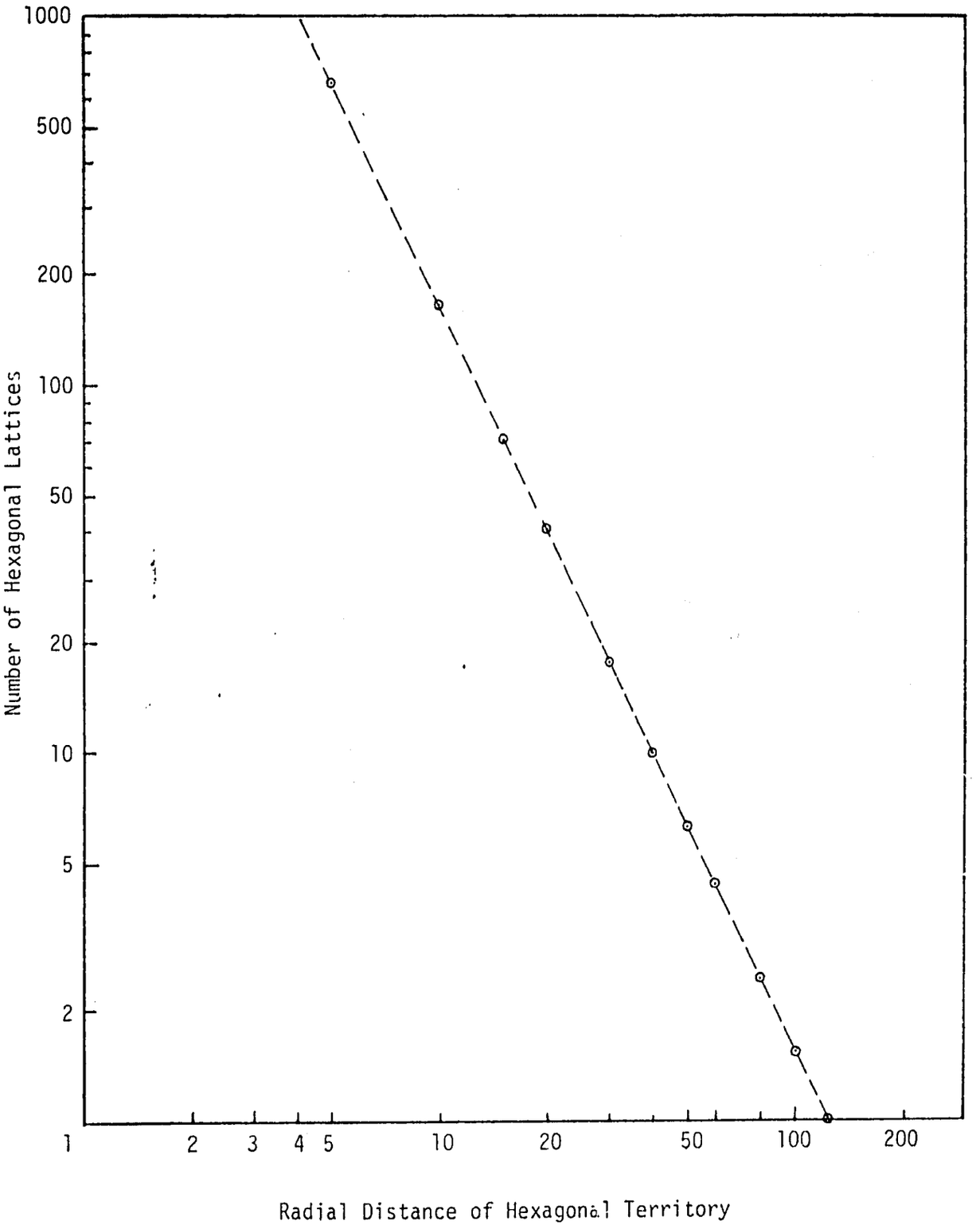


Figure 4: Number of Hexagonal Territories Calculated for Varying Radial Distances for the Eastern ORD.

Beyond that level, the effects of distance-decay would reduce the impact of the center to almost nil.

The "medium distance" center in the hypothetical framework may have a lattice-radius ranging between five to ten kilometers. According to figure 4, this means that the Eastern ORD should have a minimum of 167 "secteurs." There are only six now in the Eastern ORD. If the radial distance is doubled to 20 kilometers there should be at least 40 "secteurs." The present level of regionalization with only six sous-secteurs corresponds to a lattice framework with 50 kilometers of radial distance on the average.

The policy options for efficient delivery of rural services with maximum access to rural inhabitants include other spatial phenomena such as improvement of rural transportation, resettlement programs, mobile servicing, and land use policies. However, the principle of "distance-decay" remains to operate and with present technologies of transportation, the important option may be to concentrate on how to effectively reach the rural household and to design the rural services so that they are within easy access to the people they are meant to serve.

As mentioned earlier one important constraint, the "threshold" factor needs to be carefully assessed. In this sense "threshold population" may be defined as the minimum number of people needed to support a given hierarchy of central function. Many services including social services have scale of output requirements to operate efficiently and if such scale of operation cannot be realized, then the service may not be forthcoming. If we consider the smallest derived spatial lattice for Eastern ORD which has an area of about 65 square kilometers, it will contain a total population of about 300 people on the average, and about 60 households.(80) This might be considered too small a population to merit a service center

because of operational scale considerations. In Israel, the "village-group center provides farming and social services to from four to eight settlements mostly moshavim" which is said to contain 80-100 holdings.(81) This means that the derived ORD "sous-secteur" is somewhat too small or underpopulated. The latter is perhaps the case particularly in the Eastern ORD which experiences very low population densities. In Israel there is also the question of higher income. Although the nature of all of these phenomena has to await a study of the spatial and population conditions in Eastern ORD, it is possible to say at this juncture that the burden of variation to fulfill essential threshold or scale requirements should fall on factors such as increasing population density by resettlement and land use policies, and the use of more flexible technologies to reduce the requirements for minimum output.

V. Applied Research Requirements for Area Planning in the Eastern ORD.

The data requirements for spatial analysis fall into five categories, (1) area data, (2) point data, (3) networks, (4) flow data and (5) behavioral data. The first deals with studies in areal distributions of phenomena like population, resources and agricultural activities. The second category of data will deal with spatial phenomena that form point patterns. Examples are urban centers, service centers, industries, mining centers and the like. The network data should particularly focus on the surface transport structure of Upper Volta. Traffic and commodity movements constitute two of the important flow data that will be needed.

The data sources will be primary as well as secondary. The following list presents a more detailed tentative itemization of the major types of information required:

A. Basic data from secondary sources

1. Spatial distributional data

   a. Physical phenomena (climate, water, resources, etc.)

   b. Population distribution and densities (from census sources or regional sample surveys)

   c. Land use patterns (major areal patterns of economic activity)

   d. Administrative boundaries for both territorial as well as ORD

2. Central place patterns and functional hierarchies

   a. Location and size of village centers, towns and cities

   b. Location of markets, permanent centers of exchange as well as weekly markets

   c. Distribution of public services, schools, hospitals, and other service oriented activities including extension services

   d. Distribution of commercial agriculture, and mining and similar primary oriented activities that take point locations

   e. Distribution of industries and other forms of secondary activities

3. Data on surface transportation including roads and trails of all types connecting settlements, and communication patterns including telephone connections, newspaper circulation and the like

4. Flow data for goods and services, population and general pattern of traffic density including movement of goods and peoples by traditional means

B. Data that need to be generated by the use of surveys

1. Rural settlement patterns especially data on how rural people organize settlement at the farm level--clustered, dispensed or simply random, and also the study of the degree of permanence of settlements

2. The spatial manifestation of rural mobility particularly data on patterns of movement of rural people are making over "short distances,"

"medium distances" and "long distances" including permanent migration patterns

3. Distance decay functions with respect to the use of central place facilities including data on maximum distances people are willing to travel to a range of local, sub-regional and regional services
4. Data on rural mode of transportation especially referring to those phenomena dealing with the level of technology used in transporting goods to market
5. Study of the pattern and frequency of use of central place services including educational, health, agricultural, financial and transport services
6. Study of types of commodity that are moved over varying distances for marketing

The Eastern ORD contains variable phenomena with respect to population distribution,(82) resource endowment,(83) physical problems with particular reference to river blindness and current level of social services including transportation. The sampling framework of the survey research should take these into account. The sampling frame should also take into consideration the distribution of settlements especially and include those that are found at the margins of economic integration and those that are found far away from roads and major centers of settlement.

As Eicher and associates have indicated, there seems to be a paucity of data for purposes of planning. They have recommended the launching of baseline applied research to generate more reliable information.(84) If such a survey has not already taken place, it may be possible to integrate the data requirements of the spatial problems with the same effort.

Footnotes

1. Meier (1970), pp. 34-38.
2. Todaro (1977), pp. 94-95, Kuprianov (1976), pp. 7, Ul-Haq (1977), p. 1.
3. Soja (1976), p. 2.
4. Mabagunje (1977).
5. Logan (1972), p. 233.
6. Meier (1970), pp. 121-123, Johnson (1970), pp. 163-164, Richardson (1976), p. 5, Forde (1968), p. 106, Logan (1972), p. 229.
7. Thomas (1974), pp. 50-57. See also Papandreou (1972) for a more global understanding of the two major global "patternalisms" which operate under both capitalism and socialism.
8. See Slater (1974) for a critical appraisal of some of these approaches at structural modeling of underdevelopment.
9. Hirschman (1958), pp. 183-187.
10. Op cit., p. 184.
11. Friedmann (1966), pp. 10-13.
12. Op cit., pp. 12-13, 36. Use has been made of his stage 2 center-periphery modeling.
13. Slater (1974), pp. 334-335, 349.
14. Mieir (1970), pp. 123-164, Logan (1972), p. 229. See footnote 6.
15. Slater (1974), pp. 329-335.
16. Seidman (1974), pp. 12-20, Thomas (1974), pp. 50-57.
17. Op cit., p. 12.
18. Brackets are mine.
19. Seidman (1974), p. 16.
20. Soja (1976).
21. Op cit., p. 4.

22. Op cit., p. 9.
23. Op cit., p. 10.
24. Op cit., p. 11.
25. Friedmann (1976(1)), p. 16.
26. Loc. cit.
27. Logan (1972), Passim, Seidman (1974), p. 16.
28. Hirschman (1958), pp. 187-190.
29. Op cit., pp. pp. 188-189.
30. Myrdal (1957), Chapters 3 and 5.
31. Friedmann (1966), pp. 13-14.
32. Hermansen (1975), p. 169. See also Kuprianov (1976), p. 7.
33. Johnson (1970), p. 3, Friedmann (1966), p. 14.
34. Slater (1974), pp. 326.
35. Forde (1968), Riddel (1970), Soja (1968), Witthuhn (1968), Taafe, et al., (1963), Gould (1970), Johnson (1970), Friedmann (1976(1)).
36. Kuklinski (1972) (1975) (1977), Porwit (1975), Hermansen (1972) (1975), Misra (1972), Higgins (1972), Klassen (1977).
37. Perroux (1964), Christaller (1933), Losch (1954), Isard (1956), Alonso (1964), Boudeville (1966), Richardson (1973), Williamson (1968).
38. Johnson (1970), p. 208.
39. Friedmann and Alonso (1964), p. 1.
40. Kuklinski (1975), p. 3.
41. Hermansen (1975), p. 162.
42. Christaller (1933)
43. Perroux (1964), pp. 21-36. Consult Antoni Kuklinski's book (1972) on growth poles and growth centers, Hansen's (1972) book on growth centers in regional economic development, and Moseley (1974) on growth centers in spatial planning.

44. Johnson (1970), p. 136.

45. Weitz (1968), p. 25, Wanmali (1970), p. 5.

46. For a brief and concise explanation of Von Thunen's system, see Chisholm (1962), pp. 21-35.

47. For a more thorough analysis of the theory of agricultural location, see Dunn (1954), and for the use of agricultural location theory to study global and local patterns of agricultural activity see Chisholm (1962).

48. Weber (1929).

49. Losch (1954), especially chapters 4 and 5, Isard (1956), especially Chapter 5, Greenhut (1956), especially chapters I, XI and XII, Smith (1971), especially chapters 10-14, Pred (1969), passim.

50. Moses (1955), pp. 803-832, Isard (1960), pp. 309-374, Richardson (1973), pp. 40-50.

51. Tiebout (1962), see also Isard (1960) pp. 189-193, Richardson (1973), pp. 16-22.

52. Isard (1960) especially the discussion on the developing nations, pp. 100-107.

53. Op cit., pp. 493-533.

54. Brown (1968), and see also Morill (1965) for application of a Monte-Carlo stochastic system for describing sequential growth of urban settlements and transportation.

55. Garrison (1960), and for an extensive treatment of network analysis in geography, see Haggett and Chorley (1969).

56. Friedmann and Alonso (1964), McKee, et al., (1970), Hoover (1971), Richardson (1969) and (1973), Isard (1964) and (1975).

57. Johnson (1970), p. 150.

58. Hermansen (1975), pp. 276-297.

59. Op cit., p. 297.

60. Johnson (1970), p. 28.

61. Op cit., pp. 150.

62. Hermansen and Kuklinski (1975), pp. 251-277.

63. Haute-Volta (1968).

64. Haute-Volta (1970), IBRD (1970(2)), pp. 16-18, Gregory (1976?), p. 18.

65. USAID (1975), p. D-23.

66. Haute-Volta(1968), pp. 8-9.

67. Op cit., pp. 11-12.

68. Gregory (1976?), pp. 4-5, IBRD (1970(1)), p. 30.

69. USAID (1975), p. D-22, IBRD (1970(2)), p. 20. See also Eicher, et al., (1976), pp. 2-6.

70. Haute Volta (1968), p. 27, S.A.E.D. (1975), map insert between pages 2 and 3.

71. Friedmann(1974).

72. Op cit., p. 12.

73. Op cit., p. 15.

74. Berry (1967), p. 15. See also Saunders et al., (1976), pp. 89-102 for economies of scale in water supply.

75. Losch (1954), pp. 105-108.

76. For a similar procedural framework of spatial planning see Weitz and Prion (1968), pp. 21 and Wanmali (1970) especially pages 21-34. Kimani and Taylor (1973) have also done some work along this line in Kenya. See especially pages 12-21. See also a more recent publication on organization of extension by Benor and Harrison (1977), especially pp. 19-218. Note how this analysis hardly takes into account

the spatial question. For an extremely interesting coverage of rural service planning and delivery systems using U.S. data, see Rogers and Whiting (1976).

77. Berry (1967), pp. 59-73, Losch (1954), pp. 101-138.

78. IBRD (1970(2)), p. 19.

79. S.A.E.D. (1975). The member of sous-secteurs and secteurs for Eastern ORD is obtained from the map found between pages 2 and 3 in this publication. The map contains boundaries for both the sous-secteurs and secteurs of the ORD. The map on page v in Eicher, et al., (1976) contains four secteurs. Therefore the number of the divisions and subdivisions needs to be varified. However, it will not affect this hypothetical exercise.

80. Use was made of 1970 population data contained in IBRD (1970(2)), p. 19. It can therefore serve only for the purpose of illustrating order of magnitudes in this regard.

81. Weitz and Prion (1968), p. 21.

82. Eicher, et al., (1976), pp. 8-9.

83. Jeune Afreque (1975), pp. 11, 32-33.

84. Eicher, et al., (1976), pp. 6-7, 34, 40.

Bibliography

Alonso, William and John Friedmann, Regional Development and Planning, A Reader (Cambridge: The M.I.T. Press, 1964).

Benor, Daniel and James Q. Harrison, Agricultural Extension (Washington, D.C.: World Bank, 1977).

Berry, Brian J. L., Geography of Market Centers and Retail Distribution (Englewood Cliffs: Prentice Hall, 1967).

Boudeville, J. R., Problems of Regional Economic Planning (Edinburgh: The University Press, 1966).

Brown, Lawrence, Diffusion Dynamics (Lund: Department of Geography, The Royal University of Lund, 1968).

Chisholm, Michael, Rural Settlement and Land Use (Landon: Hutchinson University Library, 1962).

Christaller, Walter, Dic Zentralen Orte in Suddentschland (Jena: Fisher, 1933).

Dunn, Edgar S., The Location of Agricultural Production (Gainesville: University of Florida Press, 1954).

Eicher, Carl K., et al., An Analysis of the Eastern ORD Rural Development Project in Upper Volta: Report of the M.S.U. Mission (East Lansing: Department of Agricultural Economics, Michigan State University, 1976).

Friedmann, John and William Alonso, Regional Development and Planning, A Reader (Cambridge: The M.I.T. Press, 1964).

Friedmann, John, Regional Development Policy: A Case Study of Venezuela (Cambridge: The M.I.T. Press, 1966).

_____, A Spatial Framework for Rural Development, A Report to the U. S. Agency for International Development (Los Angeles: University of California, 1974), mimeo.

_____, On the Contradictions Between City and Countryside (Los Angeles: University of California, 1976).

_____, An Approach to Policies for Spatial Development (Los Angeles: School of Architecture and Urban Planning, University of California, 1974a).

Garrison, William, "Connectivity of the Interstate Highway System," 1960, reprinted in Brian J. L. Berry and Duane F. Marble, Spatial Analysis (Englewood Cliffs: Printice Hall, 1968.

Gould, Peter R., "Tanzania 1920-63: The Spatial Impress of Modernization Process," World Politics, Vol. XXII, January, No. 2, 1970.

Greenhut, Melvin L., Plant Location in Theory and Practice (Chapel Hill: The University of North Carolina Press, 1956).

Gregory, Joel W., The Regionalization of Rural Development Planning in Upper Volta (Montreal: The University of Montreal, 1976?), mimeo.

Haggett, Peter and Richard J. Chorley, Network Analysis in Geography (London: Edward Arnold, 1969).

Hansen, Niles M., Growth Centers in Regional Economic Development (New York: The Free Press, 1972).

Haute-Volta, Plan Cadre, 1967-1970 (Paris: 1968).

Haute-Volta, L'Agriculture Africaine, Tome 2 (Paris: Ediafric, 1970, pp. 313-344).

Hermansen, Tarmod, "Development Poles and Development Centers in National and Regional Planning: Elements of a Theoretical Framework," in Antoni Kuklinski, Growth Poles and Growth Centers in Regional Planning (The Hague: Mouton & Co., 1972).

_____, "Interregional Allocation of Investments for Social and Economic Development: An Elementary Model Approach to Analysis," with Kuklinski "Regional Disaggregation of National Plans: Report of the Informal Meeting Held at Geneva, 23 May 1969," and "Spatial Organization and Economic Development: The Scope and Task of Spatial Planning," in Antoni Kuklinski, Regional Disaggregation of National Policies and Plans (The Hague: Mouton and Co., 1975).

Higgins, Benjamin, "Regional Interaction, The Frontier and Economic Growth," in Antoni Kuklinski, Growth Poles and Growth Centers in Regional Planning (The Hague: Mouton and Co., 1972).

Hirschman, Albert O. The Strategy of Economic Development (New Haven: Yale University Press, 1958).

Hoover, Edgar M., The Location of Economic Activity (New York: McGraw Hill, 1948).

_____, An Introduction to Regional Economics (New York: Alfred K. Knopf, 1971).

IBRD, The Economic Development of Upper Volta, Volume I, Main Report (Washington, D.C.: World Bank, 1970(1)).

_____, The Economic Development of Upper Volta, Volume II, Agriculture (Washington, D.C.: World Bank, 1970(2)).

Isard, Walter, Location and Space Economy (Cambridge: The M.I.T. Press, 1956).

_____, Methods of Regional Analysis, An introduction to Regional Science (Cambridge: The M.I.T. Press, 1960).

_____, Introduction to Regional Science (Englewood Cliffs: Prentice Hall, 1975).

Jeune Afrique, Les Atlas Jeune Afreque, Haute-Volta (Paris: Editions J. A., 1975).

Johnson, E.A.J., The Organization of Space in Developing Countries (Cambridge: Harvard University Press, 1970).

Kimani, S. M. and D. R. F. Taylor, Growth Centers and Rural Development in Kenya (Thika, Kenya, 1973).

Klaassen, Leo H., "The Role of Social Equipment and Environment in Regional Economic Growth," and with Sjoerd Wagenaar," Towards an Operational Definition of Psychological Distance," in Antoni Kuklinski, Social Issues in Regional Policy and Regional Planning (The Hague: Mouton and Co., 1977).

Kuklinski, Antoni, ed., Growth Poles and Growth Centers in Regional Planning (The Hague: Mouton and Co., 1972).

_____, ed., Regional Disaggregation of National Policies and Plans (The Hague: Mouton and Co., 1975).

_____, ed., Social Issues in Regional Policy and Regional Planning (The Hague: Mouton & Co., 1977).

Kuprianov, A., Developing Countries: Internal Regional Disproportions in Growing Economies (Budapest: Institute for World Economics of the Hungarian Academy of Sciences, 1976).

Logan, M. I., "The Spatial System and Planning Strategies in Developing Countries," The Geographical Review, 62, No. 2, April, 1972, pp. 229-244.

Losch, August, The Economics of Location (New Haven: Yale University Press, 1954).

Mabogunje, Akin L., Urban-Rural Relationship in A Developing Economy: The Parable of the Old Wineskins, Paper presented at the 20th Annual Meeting of the African Studies Association, Houston, Texas, November 2-5, 1977.

McKee, David L., Robert D. Dean and William H. Leaky, Regional Economics, Theory and Practice (New York: The Free Press, 1970).

Meier, Gerald M., Leading Issues in Economic Development, Studies in International Poverty (Oxford: The University Press, 1970).

Misra, R. P., "Growth Poles nd Growth Centers in the Context of India's Urban and Regional Development Problems," in Antoni Kuklinski, Growth Poles and Growth Centers in Regional Planning (The Hague: Mouton and Co., 1972).

Morill, Richard L., Migration and the Spread and Growth of Urban Settlement (Lund: The Royal University of Lund, Department of Geography, 1965).

Moses, Leon N., "The Stability of Interregional Trading Patterns and Input-Output Analysis," The American Economic Review, Vol. XLV, NO. 5, December 1955, pp. 803-832.

Moseley, Malcolm J., Growth Centers in Spatial Planning (New York: Pergamon, 1974).

Myrdal, Gunnar, Economic Theory and Under-developed Regions (London: Gerald Duckworth and Co., Ltd., 1957).

Papandreou, Andreas G., Paternalistic Capitolism (Minneapolis: The University of Minnesota Press, 1972).

Perroux, Francois, "Economic Space: Theory and Applications," 1950, reprinted in John Friedmann and William Alonso, Regional Development and Planning (Cambridge: The M.I.T. Press, 1964).

Porwit, Krzysztof, "Theoretical and Methodological Questions for the Construction of Comprehensive Models in Regional Planning," in Antoni Kuklinski, Regional Disaggregation of National Policies and Plans (The Hague: Mouton & Co., 1975).

Pred, Alan, Behavior and Location (Lund: The Royal University of Lund, Department of Geography, 1969).

Richardson, Harry W., Regional Economics (New York: Praeger, 1969).

_____, Regional Growth Theory (New York: John Wiley, 1973).

Riddell, J. G., The Spatial Dynamics of Modernization in Sierra Leone: Structure, Diffusion and Response (Evanston: Northwestern University Press, 1968).

Rogers, David L. and Larry R. Whiting, eds., Aspects of Planning for Public Services in Rural Areas (Ames: North Central Regional Center for Rural Development, Iowa State University, 1976).

Saunders, Robert J. and Jeremy J. Warford, Village Water Supply, Economics and Policy in the Developing World (Baltimore: The Johns Hopkins University Press, 1976).

Seidman, Ann, Planning for Development in Sub-Saharan Africa (New York: Praeger, 1974).

Slater, David, "Contribution to a Critique of Development Geography," Canadian Journal of African Studies, Volume VIII, No. 2, 1974, pp. 325-354.

Smith, David M., Industrial Location, An Economic Geographical Analysis (New York: John Wiley, 1971).

Societe Africaine D'Etudes et De Développement (S.A.E.O.), Conditions de Diffusion du Credit Agricole et de Mise en Deuvre d'Activités Communautaires Dans le Ressort de L'ORD de l'Est Fada N'Gourma, Sous/Secteurs de Namounou et Diabo (Ouagadougou: USAID, 1975).

Soja, Edward W., The Geography of Modernization in Kenya (Syracuse: Syracuse University Press, 1968).

_____, Spatial Inequality in Africa (Los Angeles: School of Architecture and Urban Planning, U.C.L.A., 1976).

Taafe, Edward J., Richard L. Morrill and Peter R. Gould, "Transport Expansion in Underdeveloped Countries, A comparative Analysis," Geographical Review, Vol. LIII, No. 4, October, 1963, pp. 503-529.

Thomas, Clive Y., Dependence and Transformation (New York: Monthly Review Press, 1974).

Tiebout, Charles M., The Community Economic Base Study (New York: Committee for Economic Development, 1962).

Todaro, Michael P., Economic Development in the Third World (London: Longman, 1977).

Ul-Haq, Mahbub, Basic Needs: A Progress Report (Washington, D.C.: World Bank, 1977, Mimeo.).

U. S. Agency for International Development, Development Assistance Program, FY 1975, Upper Volta and Niger, (Washington, D. C.: USAID, 1975).

Voelkner, Harold E., Rural Growth Nodes in Micro-Regional Systems (Geneva: UNRISD, 1974, mimeo).

Wanmali, Sudhir, Regional Planning for Social Facilities (Hyderabad: National Institute of Community Development, 1970).

Weber, Alfred, Theory of the Location of Industries (Chicago: The University of Chicago Press, 1929).

Weitz, Raanan and Israel Prion, Spatial Organization of Rural Development and Development Trends of Spatial Rural Cooperation in Israel (rehovat: Settlement Study Center, 1968).

Wilcock, David, A Proposal for the Provision of Techincal Assistance to the Eastern ORD Integrated Rural Development Project in Upper Volta (East Lansing: Department of Agricultural Economics, MSU, 1976, mimeo).

Williamson, J. G., "Regional Inequality and the Process of National Development: A Description of the Patterns," 1965, reprinted in L. Needleman, Regional Analysis (Baltimore: Penguin, 1968).

Witthuhn, Burton O., "The Spatial Integration of Uganda as Shown by the Diffusion of Postal Agencies, 1900-1905," The East Lakes Geographer, Volume 4, December 1968, pp. 5-20.