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GROWTH STAGE THEORIES AND AGRICULTURAL DEVELOPMENT POLICY*

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1.0 *Introduction*

In this paper I review and attempt to evaluate the potential contribution of growth stage theories to the formulation of agricultural development policy. I particularly consider (a) the List industrial fundamentalism approach; (b) the Fisher-Clark industrial transformation approach; (c) the Rostow leading sector approach; and (d) the elaboration of these approaches as guides for agricultural development policy by Schultz, Johnston and Mellor, and others.

In evaluating the potential contribution of the growth stage schema, or any other approach, to agricultural development policy a sharp distinction should be made between economic analysis and economic policy or planning. Analysis implies the breaking down of a complex phenomenon, such as the process of agricultural development, into its components in order to achieve an understanding of component elements and processes. Economic policy or planning involves utilization of the growth components and elemental processes to design new patterns of organization leading to more rapid development.¹

If this symbiotic relationship between economic analysis and economic planning is to persist, the analyst must identify those strategic variables which will have a relatively high pay-off when they are manipulated by those engaged in economic policy making and planning. And the

* IRRI Journal Paper No. 52. The author is indebted to F. C. Byrnes, W.A. Hendrix, Loyd Johnson, K. W. Kapp, and A. M. Weisblat for comments on an earlier draft of this paper.

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¹ This distinction is similar to that made in biology between genetics and plant breeding. At the International Rice Research Institute, for example, the rice geneticist is involved in (a) measuring the yield components (number of panicles per plant, number of grains per panicle, and grain weight) and those physiological characteristics (maturity, plant height, straw strength, leaf size, angle, colour, number, and others) of the rice plant which contribute either directly or indirectly to differences in grain yield, and (b) determining the genetic mechanisms or process involved in the transmission of these economic traits from parents to progenies. The rice breeders utilize this knowledge from genetics in the design of crosses and selection of plants with the desired growth characteristics, agronomic traits, nutritional value, and others. In this symbiotic relationship, the breeder has a right to ask whether the geneticist is identifying those components which have significant economic value and which can be readily manipulated by the breeder. And the geneticist has a right to question the breeder if he continues to employ *ad hoc* trial and error procedures when information is available that would enable him to proceed more efficiently to the achievement of varietal improvement objectives. See T. T. Chang, *Present Knowledge of Rice Genetics and Cytogenetics*, Technical Bulletin No. 1, International Rice Research Institute, Laguna, Philippines, August 1964, pp. 48, 49; P. R. Jennings, "Plant Type as a Breeding Objective," *Crop Science*, Vol. 4, 1964, pp. 13-15.

economic policy maker and planner must develop sufficient sophistication to recognize and utilize the insights which the analyst can provide.²

During the last three decades economics has been involved in a major revolution and, in the last decade, has resolved a major intellectual crisis.³ After two decades of intensive testing and elaboration, a new integration of Keynesian and Classical economics has been achieved. This integration has resulted in a new consensus regarding the broad monetary and fiscal policy measures appropriate to the achievement of relatively high rates of economic growth in modern capitalist economies.⁴

As economists have been asked to extend their services to policy makers and planners in countries which are just beginning to experience modern economic growth, a new crisis has emerged. Something approaching a consensus has begun to emerge to the effect that economic analysis conducted within the framework of either the older developments associated with the "marginal revolution" or post-Keynesian income, employment and growth theory has been less effective than anticipated in providing the knowledge needed by policy makers and planners in solving the development problems of the emerging non-western economies.⁵

No clear-cut system of "new development economics" has emerged to dominate the field as completely as the "new economics" based on Keynes' work dominated economic thinking after 1936. The growth stage approaches have clearly established, however, a substantial "claim" in the race to stake out the boundaries of a "new development economics". Whether this "claim" can be "proven" will depend on the ability of economic analysts, working within the context of growth stage models, to provide the policy maker or planner with effective guides to the policy decisions and programme choices necessary to achieve more rapid economic growth in a specific economy at a particular time.

2.0 Growth Stage Theories in Historical Perspective

Growth stage theories are not new in the history of economic thought. Hoselitz provides a detailed review of the older literature, primarily a product of the nineteenth century German economic historians.⁶

² G. L. Johnson argues that this symbiotic relationship between analyst (production economist) and planner (farm manager) has undergone severe stress at least twice in the evolution of agricultural economics. See G. L. Johnson, "Stress on Production Economics," *Australian Journal of Agricultural Economics*, Vol. 7, June 1963, pp. 12-26.

³ For a discussion of the concept and characteristics of "scientific revolution" see T. S. Kuhn, *The Structure of Scientific Revolutions*, University of Chicago Press, Chicago, 1962.

⁴ H. G. Johnson, "The General Theory After Twenty Five Years," *American Economic Review*, Vol. 51, No. 2, May 1961, pp. 1-17; *Idem*, "Monetary Theory and Policy," *American Economic Review*, Vol. 52, No. 3, June 1962, pp. 335-384. It is perhaps more correct to refer to a consensus with respect to the Keynesian "paradigm" rather than to the Keynesian theory narrowly defined.

⁵ W. A. Lewis, *The Theory of Economic Growth*, Allen and Unwin, London, 1955, pp. 140, 141; P. T. Bauer, "The Study of Underdeveloped Economies," *Economica*, Vol. 30, November 1963, pp. 360-371; J. Robinson, *Economic Philosophy*, Aldine, Chicago, 1962, pp. 99-123; D. Seers, "Why Visiting Economists Fail," *Journal of Political Economy*, Vol. 70, August 1962, pp. 328-332.

⁶ B. F. Hoselitz, "Theories of Stages of Economic Growth," in B. F. Hoselitz *et al.*, *Theories of Economic Growth*, Free Press of Glencoe, Illinois, 1960, pp. 193-238.

2.1 *Industrial Fundamentalism (List)*

Hoselitz identifies three main patterns in the nineteenth century German literature: (a) classifications based on shifts in occupational distribution (List); (b) classifications based on the changes in the degree of economic integration (Hildebrand, Bücher, Schmoller); and (c) classifications based on changes in the system of property rights and associated changes in economic ideology (Sombart, Marx). Because of the role which List gave to commercial policy as a tool in achieving a transition from an agricultural to an industrial economy, his work continues to be of interest for countries attempting to create modern economies.⁷

List distinguishes five development stages: (a) the savage; (b) the pastoral; (c) the agricultural; (d) the agricultural and manufacturing; and, finally, (e) the agricultural, manufacturing, and commercial. However, major attention is focused on "a description of the conditions under which a mature agricultural stage can exist, under which it may progress, and how an agricultural stage can be transformed into one on a higher level by the introduction of manufacturers".⁸ List regarded the introduction of manufacturing as the dynamic element in the process of economic growth. This dynamic quality was attributed not only to the higher productivity of industrially based societies but to the favourable environment for cultural, social, technological, and scientific progress generated in an industrialized society.

List was particularly concerned with demonstrating the positive role of industrial protectionism for countries (such as Germany or the United States in the nineteenth century) which were in transition from a high level of agricultural development to industrialization. At the same time, he argued that free trade was the appropriate economic policy for countries (a) which are "by nature" agricultural or which have not yet achieved a high level of agricultural development (mainly tropical), and (b) which have achieved an advanced level of industrial development (such as Great Britain).

List saw no role for agricultural protectionism at any stage of development. Progress in agriculture could only occur (a) under the stimulus of export demand, or (b) through the impact of domestic industrial development. Of these two sources he regarded domestic industrial development as the most important generator of agricultural progress because of the double impact resulting from (a) the increased demand for farm products from an expanding non-farm sector, and (b) the development of more efficient methods of production resulting from the application of science and technology.

2.2 *Structural Transformation (Fisher-Clark)*

The "resemblance between List's three last stages and the concept of primary, secondary, and tertiary production developed in the 1930's by A. G. B. Fisher and propagated further by Colin Clark" has been

⁷ The material in this section draws on Friedrich List, "National System of Political Economy", reprinted in S. H. Patterson (ed.), *Readings in the History of Economic Thought*, McGraw-Hill, New York, 1932, pp. 381-413; K. W. Kapp, "Friedrich List's Contribution to the Theory of Economic Development," in K. W. Kapp, *Hindu Culture, Economic Development, and Economic Planning in India*, Asia Publishing House, New York, 1963, pp. 165-170; and Hoselitz, *op. cit.*

⁸ Hoselitz, *op. cit.*, pp. 199, 200.

emphasized by Hoselitz.⁹ Fisher emphasized the "steady shift of employment and investment from the essential 'primary' activities . . . to secondary activities of all kinds, and even to a still greater extent into tertiary production" which accompanies economic progress.¹⁰ In Clark's formulation¹¹ the economic growth which accompanies this transformation is achieved, *first*, by increases in output per worker in any sector, and *second*, by the transfer of labour from sectors with low output per worker to sectors with higher output per worker.

Fisher, as List, held that such a transition was closely associated with the advance of science and technology. But an intense empiricism inhibited Clark from attempting an adequate theoretical foundation for his transition generalization.¹² Nor was he able to provide any significant policy guidance for the problem of how a predominantly agricultural society might proceed to achieve a successful transition to a modern industrial society.

The important impact of the Fisher-Clark generalizations on economic thought and on economic policy during the decade immediately following World War II must be attributed to three factors: (a) the weight of empirical evidence generated by Clark's massive scholarship; (b) a felicitous choice of a value loaded terminology;¹³ and (c) the equating of economic progress with industrialization by the planners and policy makers of countries which were attempting to emerge from economic and/or political colonization.

By the mid-1950's the analytical validity and statistical evidence, as well as the policy implications of the Fisher-Clark generalizations, were being questioned.¹⁴ Analytical criticisms were directed toward the arbitrariness of the distinctions and lack of uniformity of income elasticity of demand among products classed within each of the three categories. A number of critics pointed to the tendency of official statistics to conceal the high proportion of time spent by the rural population in secondary (handicraft, etc.) and tertiary (transport, trading, personal service,

⁹ Hoselitz, *op.cit.*, pp. 199, 200.

¹⁰ A. G. B. Fisher, *Economic Progress and Social Security*, Macmillan, London, 1945, p. 6. For Fisher's earlier works, see *The Clash of Progress and Security*, Macmillan, London, 1935, pp. 25-43 and "Production, Primary, Secondary and Tertiary," *Economic Record*, Vol. 15, March 1939, pp. 24-38.

ulation¹¹ the economic growth which accompanies this transformation

¹¹ The best exposition of Clark's approach is found in C. Clark, "The Morphology of Economic Growth," Chapter X, *The Conditions of Economic Progress*, Macmillan, London, 1940, pp. 337-373. This chapter has been omitted in later editions.

¹² "There is room for two or three economic theorists in each generation. . . . Re-statements of economic theory, of which we are offered so many, are only occasionally needed as factual knowledge advances and institutions change." *Ibid.*, p. viii.

¹³ Clark attributes the first use of the term "tertiary" to Fisher, *op. cit.*, 1935; Clark, *op. cit.*, 3rd edn., p. 491.

¹⁴ P. T. Bauer and B. S. Yamey, "Economic Progress and Occupational Distribution," *Economic Journal*, Vol. 61, December 1951, pp. 741-755, and "Further Notes on Economic Progress and Occupational Distribution," *Economic Journal*, Vol. 63, March 1964, pp. 98-106; S. Rottenberg, "Note on Economic Progress and Occupational Distribution," *Review of Economics and Statistics*, Vol. 34, May 1953, pp. 168-170; S. G. Triantis, "Economic Progress, Occupational Redistribution, and International Terms of Trade," *Economic Journal*, Vol. 63, No. 251, September 1953, pp. 627-637.

etc.) activities in economies in which occupational specialization is limited.

2.3 *Leading Sectors (Rostow)*

The decline of professional interest in the Fisher-Clark stages during the last decade is due primarily to the emergence of Rostow's leading sector growth stage approach.¹⁵ Rostow identifies five stages in the transition from a primitive to a modern economy: (a) the traditional society; (b) the preconditions for take-off; (c) the take-off; (d) the drive to maturity; and (e) the age of high mass consumption. These stages are, except for the first and last, transition stages rather than a succession of equilibrium positions.

Rostow's objective in identifying "the five major stages-of-growth and . . . the dynamic theory of production which is their bone-structure"¹⁶ was much more ambitious than the earlier growth stage approaches. Rostow is primarily concerned with the process by which a society moves from one stage to another, and his historical analysis is conducted with the objective of providing policy guidance to the leaders of the developing countries since "it is useful, as well as roughly accurate, to regard the process of development now going forward in Asia, the Middle East, Africa, and Latin America as analogous to the stages of preconditions and take-off of other societies in the late eighteenth, nineteenth, and early twentieth centuries".¹⁷

Rostow's approach starts from the empirical premise that "deceleration is the normal optimum path of a sector, due to a variety of factors operating on it, from the side of both supply and demand".¹⁸ The problem of transition, and hence of growth, therefore, becomes how to offset the tendency for deceleration in individual sectors to achieve growth in the total economy.

On the supply side, Rostow introduces the concept of a sequence of leading sectors which succeed each other as the basic generators of growth.¹⁹ On the demand side, declining price and income elasticities of demand are introduced as technical factors dampening the growth rate of leading sectors and transforming them to sustaining or declining sectors. Technology plays an important role in both the emergence of new leading sectors and the dampening of growth or elimination of older sectors.

Among factors operating outside of the market place, social choices with respect to birth rates, political choices with respect to the uses of economic surplus, cultural reactions to the impact of intrusions of

¹⁵ W. W. Rostow, "The Take-Off into Self-Sustained Growth," *Economic Journal*, Vol. 56, March 1956, pp. 25-48; and, *The Stages of Economic Growth*, Cambridge University Press, London, 1960.

¹⁶ *Ibid.*, p. 3.

¹⁷ *Ibid.*, p. 138.

¹⁸ *Ibid.*, p. 13.

¹⁹ "At any time period . . . it is possible to isolate empirically certain leading sectors at early stages of their evolution, whose rapid rate of expansion plays an essential direct and indirect role in maintaining the overall momentum of the economy . . . part of the technical basis for the stages of growth lies in the changing sequence of leading sectors . . . it is the fact that sectors tend to have a rapid growth-phase early in their life, that makes it possible and useful to regard economic history as a sequence of stages rather than merely a continuum, within which nature never makes a jump." *Ibid.*, p. 14.

external economic, political, and military pressures are identified but are incorporated into Rostow's analysis more loosely than the market and technological factors.

All three growth stage theories reviewed here treat the transition from an agricultural to an industrial society as the major problem of development policy. Rostow's system is, however, the only one which clearly specifies a dynamic role for the agricultural sector in the transition process.²⁰

In an open economy, primary sector industries may act as leading sectors and, at a particular time, carry the burden of accelerating growth. In addition, agriculture must (a) provide food for a rapidly increasing population; (b) provide a mass market for the products of the emerging industrial sectors, and (c) generate the capital investment for new leading sectors outside of agriculture.

Rostow, just as the other growth stage proponents, has not escaped criticism. Most of the papers presented at a 1960 conference of the International Economic Association on "The Economics of the Take-Off Into Sustained Growth" rejected (a) either Rostow's dating of the take-off for presently advanced countries or (b) the concept of the take-off itself.²¹ Cairncross and Kuznets have vigorously attacked (a) the analytical criteria employed to identify successive stages; (b) the leading sector hypothesis; and (c) the historical validity of Rostow's empirical generalizations concerning the take-off stage for the presently developed countries.²² Students from less developed countries have found even greater difficulty in identifying their experience with any particular stage. A recent article reached the rather startling conclusion that "after entering the 'take-off' stage in 1957 the (Philippine) economy immediately slipped back into the 'preconditions' . . . stage . . ."²³ Furthermore, the approach contains no mechanism to explain why countries such as

²⁰ "The revolutionary changes in agricultural productivity are an essential condition for successful take-off; for modernization of a society increases radically its bill for agricultural products." *Ibid.*, p. 8. "The point is that it takes more than industry to industrialize. Industry itself takes time to develop momentum and competitive competence; in the meanwhile, there is certain to be a big social overhead capital bill to meet; and there is almost certain to be a radically increased population to feed. In a generalized sense modernization takes a lot of working capital; and a good part of this working capital must come from higher productivity in agriculture and the extractive industries." *Ibid.*, p. 22.

²¹ W. W. Rostow (ed.), *The Economics of Take-Off Into Sustained Growth*, Macmillan, London, 1963. See also the review of this volume by W. P. Strassmann, *American Economic Review*, Vol. 54, No. 5, September 1964, pp. 785-790.

²² A. K. Cairncross, "The Stages of Economic Growth," *Economic History Review*, Vol. 13, No. 3, April 1961 (Second Series), pp. 450-458; S. Kuznets, "Notes on the Take-Off," *ibid.*, pp. 22-43 (reprinted in *Economic Development and Cultural Change*, July 1961). The "take-off" criteria identified by Rostow are: (1) a rise in the rate of productive investment from 5% or less to over 10% of net national product; (2) the development of one or more substantial manufacturing sectors with a high rate of growth; (3) quick emergence of a favorable political, social, and institutional framework. Rostow, *op. cit.* (1960), pp. 3-10. For theoretical support of the Rostow approach, see S. C. Tsiang, "A Model of Economic Growth in Rostovian Stages," *Econometrica*, Vol. 32, No. 4, October 1964, pp. 619-651.

²³ G. Y. Itchon, "Philippines: Necessary Conditions for the 'Take-Off'," *Philippine Economic Journal*, Vol. 1, First Semester, 1962, p. 30.

Argentina, Chile, Ceylon, Burma and India, all of which experienced very rapid growth during the latter years of the 19th century, failed to achieve a successful take-off.²⁴

3.0 *Agricultural Development Stages*

The insights into the general growth process provided by the several growth stage approaches has led to a re-examination of agricultural development patterns within the context of growth stage sequences by a number of western economists.^{25,26} Interest in the Fisher-Clark approach has resulted in extensive investigation of the role of urban-industrial development as a factor explaining regional disparities in the rate or level of agricultural development. And Rostow's leading sector approach has been utilized as a framework for examining the sequences of agricultural development activities necessary to achieve a transition from a lowly productive traditional agriculture to a highly productive commercial agriculture.

3.1 *The Industrial Impact Hypothesis (Schultz)*

The implications of the Fisher-Clark structural transformation model for the agricultural sector have been formulated by Schultz in the form of three statements:

- (1) "Economic development occurs in a specific locational matrix . . . ;
- (2) These locational matrices are primarily industrial-urban in composition . . . ;
- (3) The existing economic organization works best at or near the center of a particular matrix of economic development and it

²⁴ Kenneth Berrill, "The Problem of the 'Take-Off'," in Kenneth Berrill (ed.), *Economic Development With Special Reference to East Asia*, St. Martins Press, New York, 1964, pp. 233-245. Cairncross, *op. cit.*, p. 453.

²⁵ For a description of the growth stage approach implicit in Marxist-Leninist agricultural development theory, as it has evolved in the USSR and Eastern Europe, see D. Mitrany, *Marx Against the Peasant: A Study in Social Dogmatism*, Collier Books, New York, 1961, p. 191. "The first phase is the class conflict between peasants and landless labourers on the one hand, and landowners and capitalist farmers on the other, that leads to a common front between rural and urban workers in a revolutionary surge. The second phase coincides with the victorious political revolution and ends with the distribution of land to the small peasants and landless labourers . . . The third phase is a period of transition, with rapid urban and industrial development and the small peasant property organized on a co-operative basis. Finally, when industry can provide the necessary technical equipment . . . the independent peasant class is liquidated and agriculture is concentrated into large collective farms."

²⁶ A number of industrial development stage schemas have also been suggested. Kaname Akamatsu, "A Historical Pattern of Economic Growth in Developing Countries," *The Developing Economies*, No. 1 (Preliminary Issue), March-August, 1962, pp. 3-25, presents a seven-stage schema designed to clarify the mutual interaction between the industrial sectors of advanced and developing economies. The stages cover: (1) exchange of native (Asian) for western products, (2) decline of native production due to competition of imported manufactured products, (3) importation of western techniques and capital equipment in exchange for native primary products, (4) capital transfers from the west for the development of modern raw material and processing industries, (5) importation of capital equipment and substitution of local capital for western capital in raw material production, (6) development of local consumer goods manufacturing sectors and importation of raw materials, and (7) domestic production of capital goods and export of consumer goods.

also works best in those parts of agriculture which are situated favorably in relation to such a center."²⁷

In formulating this hypothesis, Schultz was particularly concerned with the failure of agricultural production and price policy to remove the substantial regional disparities in the rate and level of development in American agriculture. Schultz presented a rationale for the industrial impact hypothesis in terms of more efficient functioning of factor and product markets in areas of rapid urban industrial development than in areas where the urban economy had not made a transition to the industrial stage.

Formulation of the industrial impact hypothesis generated a series of empirical studies designed to test both the validity of (a) the empirical generalizations, and (b) the factor and product market rationale.²⁸ Results of these studies have generally sustained the validity of Schultz's empirical generalizations with respect to the impact of urban-industrial growth on geographic differentials of per capita or per worker farm income. The tests of the factor and product market rationale, however, have been much less conclusive. Only in the case of the labour market is the evidence clear-cut, and here the impact appears to be traced primarily to the non-farm earnings of part-time farmers.²⁹

Part of the difficulty of obtaining convincing results stems from the problem of specifying the operational variables to be used in testing the market performance hypothesis. However, the major difficulty arises from an attempt to force imperfections in the factor and product markets to bear a heavier analytical burden than they can logically stand.

The strongest methodological criticisms of the industrial impact hypothesis have been its failure to draw more heavily on developments in the field of location economics for its theoretical rationale.³⁰ As the shift toward a location economics rationale has tended to replace the market performance rationale, work on the industrial impact hypothesis has developed an independent theoretical foundation that is more solidly

²⁷ T. W. Schultz, *The Economic Organization of Agriculture*, McGraw-Hill, New York, 1953, p. 147. See also "A Framework for Land Economics—The Long View," *Journal of Farm Economics*, Vol. 33, May 1951, pp. 204-215.

²⁸ V. W. Ruttan, "The Impact of Urban-Industrial Development on Agriculture in the Tennessee Valley and the Southeast", *Journal of Farm Economics*, Vol. 37, February 1955, pp. 38-56; D. G. Sisler, "Regional Differences in the Impact of Urban-Industrial Development on Farm and Non-Farm Incomes", *Journal of Farm Economics*, Vol. 41, December 1959, pp. 1100-1112; A. M. Tang, *Economic Development in the Southern Piedmont, 1860-1950: Its Impact on Agriculture*, University of North Carolina Press, Chapel Hill, 1958; W. H. Nichols, "Industrialization, Factor Markets, and Agricultural Development", *Journal of Political Economy*, Vol. 69, August 1961, pp. 319-340; Dale Hathaway, "Urban-Industrial Development and Income Differentials Between Occupations", *Journal of Farm Economics*, Vol. 46, February 1964, pp. 56-66.

²⁹ Nichols, *op cit.*, pp. 336-337; Ruttan, *op. cit.*, pp. 48-56; Hathaway, *op. cit.*, presents evidence which he interprets to be inconsistent with the hypothesis that agricultural labour markets function more effectively in and near urban-industrial centres. The Hathaway argument is weakened, however, by choice of inappropriate criteria for testing the labour market hypothesis and an inadequate index of the level of urban-industrial development.

³⁰ D. C. North, "Location Theory and Regional Economic Growth," *Journal of Political Economy*, Vol. 63, June 1955, pp. 243-258; *Idem*, "Agriculture in Regional Economic Growth", *Journal of Farm Economics*, Vol. 41, December 1959, pp. 943-951; R. Vining, "On Describing the Structure and Development of a Human Population System," *ibid.*, pp. 922-942.

based than the Fisher-Clark industrial transformation stage approach from which it emerged.

The policy implications of the Schultz industrial impact hypothesis appear to be most relevant for the less developed regions of the more highly industrialized countries. In these areas, agricultural development can be accelerated by either increased industrial decentralization or migration of surplus agricultural workers to more distant urban-industrial centres. Such policies appear to have less scope in many of the less developed countries where (a) a major problem is that of achieving a satisfactory rate of economic growth in the non-farm economy rather than the geographic distribution of economic activity, (b) the technological prerequisites for rapid agricultural output growth in the face of a constant or declining agricultural labour force are frequently not available,³¹ or (c) the "pathological" growth of urban centres resulting from population pressure in rural areas frequently runs ahead of growth in the demand for non-farm workers.³²

3.2 *Agricultural Development Stages (Perkins, Witt, Johnston and Mellor)*

A sequence of three agricultural development stages which roughly parallel the precondition, take-off, and drive to maturity stages in the Rostow model have been presented in papers by Perkins and Witt,³³ Johnston and Mellor,³⁴ and Hill and Mosher.³⁵ A synthesis of these approaches, constructed by Wharton, is presented in Table 1.³⁶ Rostow's vigorous insistence on the critical importance of rapid growth in agricultural output during the early stages of economic development has cer-

³¹ T. W. Schultz, *Transforming Traditional Agriculture*, Yale University Press, New Haven, 1964, pp. 53-70; J. W. Mellor, "The Use and Productivity of Labor in Early Stages of Agricultural Development," *Journal of Farm Economics*, Vol. 45, August 1963, pp. 517-554.

³² B. F. Hoselitz, "The Role of Cities in the Economic Growth of Underdeveloped Countries," *Journal of Political Economy*, Vol. 61, No. 3, June 1953, pp. 195-208. *Urbanization in Asia and the Far East*, Proceedings of the Joint UN/UNESCO Seminar, Bangkok, August 1956, UNESCO Research Center on the Social Implications of Industrialization in Southern Asia, Calcutta, 1957. This view of urbanization has been questioned by N. V. Sovani, "The Analysis of 'Over-Urbanization'", *Economic Development and Cultural Change*, Vol. 12, January 1964, pp. 113-122.

³³ M. Perkins and L. Witt, "Capital Formation: Past and Present", *Journal of Farm Economics*, Vol. 43, May 1961, pp. 333-343.

³⁴ B. F. Johnston and J. W. Mellor, "The Role of Agriculture in Economic Development", *American Economic Review*, Vol. 51, No. 4, September 1961, pp. 566-593. The Johnston-Mellor approach has been elaborated in a series of articles by Mellor: "Increasing Agricultural Product in Early Stages of Economic Development: Relationships, Problems, and Prospects," *Indian Journal of Agricultural Economics*, Vol. 27, No. 2, April-June 1962, pp. 29-46; and "The Process of Agricultural Development in Low Income Countries", *Journal of Farm Economics*, Vol. 44, August 1962, pp. 700-716.

³⁵ F. F. Hill and A. T. Mosher, "Organizing for Agricultural Development", in *Science, Technology and Development*, Vol. 3, "Agriculture", United States Papers Prepared for the United Nations Conference on the Application of Science and Technology for the Benefit of Less Developed Areas, U.S. Govt. Printer, Washington, 1962, pp. 1-11.

³⁶ C. R. Wharton, "Research on Agricultural Development in Southeast Asia", *Journal of Farm Economics*, Vol. 45, December 1963, pp. 1161-1174; *Idem*, "Education and Agricultural Growth: The Educational Implications of the Requirements for Agricultural Progress", *Social Science Research Council Conference on Education and Economic Development*, Chicago, April 4-6, 1963.

tainly been an important factor in the rapid "diffusion" of the leading sector model among students of agricultural development.³⁷

TABLE 1
*Summary of Ten Major Characteristics of Agricultural Development from Stage I through Stage II and into Stage III**

General Character	Stage I (Static)	Stage II (Transitional)	Stage III (Dynamic)
1. General values, attitudes, motivations	Negative or resistant		Positive or receptive
2. Goals of production	Family consumption and survival		Income and net profit
3. Nature of decision-making process	A-rational or traditional		Rational or "choice-making"
4. Technology or state of arts	Static or traditional with no or slow innovation		Dynamic or rapid innovation
5. Degree of commercialization of farm production	Subsistence or semi-subsistence		Commercial
6. Degree of commercialization of farm inputs	Family labour and farm produced		Commercial
7. Factor proportions and rates of return	High labour/capital ratio; low labour return		Low labour/capital ratio; high labour return
8. Institutions affecting or serving agriculture and rural areas	Deficient and imperfect		Efficient and well developed
9. Availability of unused agricultural resources	Available		Unavailable
10. Share of agricultural sector in total economy	Large		Small

Source: C. R. Wharton, "Research on Agricultural Development in Southeast Asia", *Journal of Farm Economics*, Vol. 45, December, 1963, p. 1162.

* This table is an attempt to synthesize the three models of Perkins-Witt, Johnston-Mellor, and Hill-Mosher.

In the agricultural development stage models, major policy interest focuses on the programme instruments and measures that are required to move rapidly from Stage I (Static) through Stage II (Transitional) to Stage III (Dynamic). Within the agricultural sector, emphasis is typically placed on (a) the importance of biological innovations and intensity of labour use during the transition from Stage I to Stage II with (b) higher inputs of power in the form of mechanization being reserved for the transition from Stage II to Stage III. Recommendation that public social overhead investments (education, research, extension) and institutional modifications (tenure, credit, and market structure reforms) should lead the more capital intensive public infra-structure investment (communications, roads, dams) is also frequently implied. The importance of positive population policy to dampen the birth rate is increasingly identified as essential for a rapid transition from Stage I to Stage III.

Perkins and Witt have followed Rostow in emphasizing the importance of leading commercial sectors within agriculture, in contrast to the more static subsistence sectors, in the adoption of technological inno-

³⁷ In addition to Rostow, *op. cit.*, 1956 and 1961, see his "Agriculture's Role in Economic Development," *Foreign Agriculture* (USDA), Vol. 1, No. 35, September 2, 1963.

vations and as a source of much of the increase in the output of food and export commodities. Johnston and Mellor, using Japan and Taiwan as models, emphasize the possibilities of transforming the subsistence sector into a small-scale commercial sector.

The issue that remains unresolved is (a) can growth be achieved most effectively by the commercial sector absorbing the land resources and releasing the labour resources of the subsistence sector for non-farm employment, or (b) can the subsistence sector be gradually transformed into a small-scale commercial sector and eventually into a large-scale commercial sector? The difficulty of resolving this issue, within the framework of growth stage analysis, is symptomatic of the difficulty faced by stage approaches in generating useful guides to agricultural development policy at any particular time in economic history. Hopper has made a similar point in his comment that "every developing country . . . fits each of the stages . . ."³⁸

4.0 *Growth Stage Theories and Agricultural Policy Analysis*

It is now time to raise the issue posed in the introduction: What guidance can the economic analyst working within the context of growth stage models provide the policy maker or planner in making the policy decisions and formulating the programme designs necessary to achieve more rapid agricultural development? One method of answering this question is to examine the policy prescriptions implied by the agricultural growth stage approaches for several of the agricultural development choices which the nations of Southeast Asia, and the Philippines in particular, now face.

4.1 *Agricultural Production Policy*

Throughout most of Southeast Asia, population growth rates fall in the 2.5 to 3.5 per cent per year range. Thus, even modest per capita income growth rates imply an increase in the demand for farm output of 3.0 to 5.0 per cent per year.³⁹ During the interval which precedes effective population control, this range may well result in rising food prices, and as Rostow stresses, dampen the rate of total economic growth.

Example 1: Irrigation

The agricultural growth stage models, drawing heavily on Japanese experience, stress the importance of biological innovations and labour intensive methods of production during the early stages of agricultural development. Yet in most of Southeast Asia, the productivity of many of the biological innovations and labour intensive cultural practices, regarded as appropriate in Stage I, will be severely limited until the completion of capital intensive irrigation developments. In spite of a monsoon climate, lack of water is an important obstacle to full employ-

³⁸ W. D. Hopper, "Discussion: The Role of Agriculture in the World Economy", *Journal of Farm Economics*, Vol. 43, May 1961, p. 347.

³⁹ These projections are based on slightly higher population growth rate assumptions than in R. K. Hefford, "Asian Food Requirements: A Review", *Australian Journal of Agricultural Economics*, Vol. 7, December 1963, pp. 149-159. In K. V. Ramachandran, R. A. Almendralo and M. Sivamurthy, "Population Projections for the Philippines, 1960-1980", *Philippine Statistician*, Vol. 12, No. 4, December 1963, pp. 145-169, a population growth rate approximating 4.0% per year is projected for the 1975-1980 period.

ment of both land and manpower in most rice producing areas of South-east Asia.

In the Philippines, for example, not more than 200,000 hectares of the 3·2 million hectares of rice land can be adequately irrigated during the dry season. New rice varieties and cultural practices are now becoming available which make it possible to produce from 5 to 8 metric tons of rough rice per hectare per crop and from 15 to 20 metric tons per hectare per year. However, with continued reliance on rainfall alone or on irrigation systems which are effective only during the wet season, it is doubtful that yields in Central Luzon, the Philippines' rice bowl, can be pushed above a 2·5 to 3·0 tons per hectare average.

Economic analysts have not yet provided policy makers with the cost-benefit calculations that should enter into choices regarding the location and level of investment in irrigation. Enough information has been developed, in the Philippines, to suggest that such investments would result in considerably larger increments in income flows than we are accustomed to obtain on similar investments under U.S. conditions.⁴⁰ Studies in Taiwan, however, indicate relatively low returns at the present time.⁴¹

Example 2: *Mechanization*

Growth stage models typically identify mechanization as appropriate only during the later part of the transition from Stage II to Stage III. Modifications are frequently introduced for economies with a dual (i.e., plantation and subsistence) structure in the agricultural sector which favour mechanization in the plantation sector earlier than in the subsistence sector.⁴² This evaluation appears to be partially based on historical analogy, and partially based on the rationale that mechanization is primarily a labour substitute in contrast to the biological innovations which increase output.

An increasing body of evidence from South and Southeast Asia provides specific instances of relatively high returns on investment in mechanical power in the subsistence sector.⁴³ Even in densely populated areas there are substantial areas of land which are not cultivated at all or only during certain parts of the year because (a) the power requirements are in excess of the amount available in the traditional man-animal technology, or (b) operations cannot be performed at sufficient speed to utilize the land at a high level of intensity. In such situations, analysis of the productivity of power inputs cannot be treated entirely within a labour substitution framework or depend on historical analogies with small-scale agricultural development in temperate regions.

⁴⁰ U.S. Bureau of Reclamation Water Survey Consultants, *Basic Data for the Central Luzon Irrigation Feasibility Study*, preliminary, 1964.

⁴¹ E. L. Rada and T. H. Lee, *Irrigation Investment in Taiwan—An Economic Analysis of Feasibility, Priority, and Repayability Criteria*, Economic Digest Series: No. 15, Joint Commission on Rural Reconstruction, Taipei, February 1963.

⁴² Perkins and Witt, *op. cit.*, pp. 335, 341, 342.

⁴³ E. K. Fisk, "The Mechanization of Agricultural Small Holdings in Underdeveloped Areas", *Malayan Economic Review*, Vol. 6, No. 2, October 1961, pp. 53-60; K. W. Kapp (with P. N. Mathur), *op. cit.*, pp. 144-162; L. Johnson, "Mechanization to Improve the Standard of Living in Tropical Rice Growing Areas", Paper No. 64-642 to be presented at the 1964 American Society of Agricultural Engineering Winter Meetings, December 8-11, New Orleans (unpublished).

4.2 *Structural Change*

The need for changes in agrarian structure is vigorously discussed in most Southeast Asian countries. Both Rostow and the agricultural development stage theorists have emphasized the importance of structural changes during the early stages of economic development. Tenure reform, fiscal policy reform, and others have been identified as important factors in reducing the political power of those who have a vested interest in the *status quo*, and releasing the productive energies of the peasants and the emerging middle class.

Example 3: *Tenure Reform*

The emphasis given to equity (i.e., income distribution) and productivity objectives in land reform varies among countries. However, there appears to be a growing recognition that the success of efforts to achieve income distribution objectives depends, to a considerable degree, on their ability to generate productivity increases. There is also a growing recognition that the limited success of campaigns to achieve productivity objectives is frequently due to the perverse income distribution effects of existing tenure relationships.⁴⁴

At present, such discussion relies primarily on preconceived ideas about goals or ideal tenure structures and *a priori* arguments about the income distribution and productivity implications of proposed changes. Documentation of existing tenure relationships, including the role of landlords and tenants in decision-making and the entrepreneurial capacity of the two groups, is typically incomplete. Evidence on current relationships between farm size, tenure, and productivity is almost non-existent.

It seems clear that the design of tenure reforms which meet both the equity and productivity conditions necessary for social and political stability and economic growth will require more rigorous analytical treatment than can be provided by the growth stage generalizations. Historical analysis may be able to clarify the reasons why the land reform programmes of the last two decades in Southeast Asia have failed to generate significant increases in productivity.

Example 4: *Income Distribution and Fiscal Policy*

In both the Rostow model and the Johnston-Mellor modification, agricultural prosperity is expected to stimulate industrial development by providing the mass purchasing power needed to sustain an expanding urban-industrial sector. Since initiation of steps leading to exchange decontrol in the Philippines in 1961, the agricultural and commodity sectors have experienced sustained increases in prices, output, and income. At the same time the sectors producing primarily for domestic consumption have, with the exception of the domestic agriculture and construction industries, failed to share in this growth. Several of the

⁴⁴ E. H. Jacoby, *Agrarian Unrest in Southeast Asia*, Asia Publishing House, Bombay, 1961; W. Ladejinsky, "Agrarian Reform in Asia", *American Journal*, Vol. 4, No. 2, September 1964, pp. 156-166 (reprinted from *Foreign Affairs*, April 1964); V. W. Ruttan, "Equity and Productivity Objectives in Agrarian Reform Legislation: Perspectives on the New Philippine Land Reform Code", *Indian Journal of Agricultural Economics*, Vol. 19, Numbers 3 and 4, July-December, 1964, pp. 114-130.

manufacturing sectors have experienced both declining prices and output.⁴⁵

One explanation for this paradox of prosperity in the commodity sectors and lagging growth in the manufacturing sectors is that the higher aggregate income in the agricultural and commodity sectors reinforces an already highly unequal income distribution.⁴⁶ As a result, the income is being utilized for non-industrial construction and importation of consumer durables rather than the purchase of the mass consumption consumer goods produced by local industry.

Use of political means to alter the income distribution effects of expanded export earnings is particularly difficult as agricultural prosperity reinforces the political power of the same groups who benefit from the present situation and delays the emergence of the appropriate political and social "preconditions".

This represents another area where economists have yet to provide the empirical information that will permit a relatively precise identification of (a) the distribution effects of a rise in the demand for export commodities, and (b) the consumption and investment behaviour of the recipients of the income flows. At the same time the growth stage approaches have little more to suggest in the way of policy guidance than the observation that structural changes are important in establishing the "preconditions" for economic growth.

5.0 *An Evaluation of the Agricultural Development Stage Approaches*

Neither the general stage models nor the agricultural development stage models provide definitive guides for the resolution of the agricultural development policy issues which have been raised in the previous section. Have they made any positive contribution at all to the analysis of these issues in a manner useful to the policy maker or planner?

1. Clearly Rostow's leading sector model and the agricultural development approaches have helped focus attention on the critical role of the agricultural sector in the development process. Although agriculture may not contribute as a leading sector, over long periods, the historical record is consistent with the proposition that failure to achieve a technically progressive agriculture can dampen the whole process of economic growth.⁴⁷ This represents a healthy reversal of the failure to appreciate agriculture's contribution in earlier growth stage approaches and a positive contribution to economic "doctrine" (ideology?). It has improved the financial environment in which agricultural economists, and

⁴⁵ B. Legarda, "Back to the 'Sugar Republic'", *Far Eastern Economic Review*, Vol. 44, No. 4, Hongkong, October 22, 1964, pp. 171, 217.

⁴⁶ B. Legarda, "Foreign Exchange Decontrol and the Redistribution of Income Flows," *Philippine Economic Journal*, Vol. 1, No. 1, First Semester 1962, pp. 18-276 and "Philippine Economic Paradoxes," *Philippine Statistician*, Vol. 8, No. 2, June 1964, pp. 89-112.

⁴⁷ M. Boserup, "Agrarian Structure and Take-Off", in W. W. Rostow (ed.), *The Economics of Take-off Into Sustained Growth*, *op. cit.*, pp. 201-224; S. Kuznets, "Economic Growth and the Contribution of Agriculture: Notes on Measurement", *International Journal of Agrarian Affairs*, Vol 3, No. 2, April 1961, pp. 56-75; W. H. Nicholls, "An 'Agricultural Surplus' as a Factor in Economic Development", *Journal of Political Economy*, Vol. 71, February 1963, pp. 1-29.

other agricultural scientists, operate, but it does not represent a new source of analytical power.⁴⁸

2. The leading sector concept does add a potentially useful tool to our analytical capacity. The concept has largely been ignored by the debate over the timing and/or existence of the "take-off".⁴⁹ The dual economy and two-sector models that have been constructed by Lewis and others⁵⁰ to illustrate the mechanism of the take-off represent useful steps in the elaboration of a suitable analytical framework for dealing with the leading sector concept. To provide a useful instrument for policy research, such models must be further elaborated to the point where they permit an analysis of the multiplier effects of specific vertical and horizontal linkages.⁵¹

The objectives of such elaboration should be to isolate the sources of output growth (or income streams); evaluate the investment (price) levels of alternative sources of growth; and arrange the alternatives in some ordering useful to public and private decision makers who are concerned with achieving a simultaneous solution to the problems of (a) increasing the rate of investment, and (b) directing this investment into areas that will produce (i.e., purchase) the largest income streams.⁵² When this elaboration has been completed the results will be recognized as disaggregated partial equilibrium development or investment models which are specific to the natural and institutional environment which characterizes a particular national or regional economy at a given time. But if this is correct, then the growth stage model has become redundant.

3. The basic limitation of the growth stage approach when employed as a guide to development policy is that it substitutes a search for economic doctrine in the form of historical generalizations, for the

⁴⁸ An emerging "bandwagon effect" is resulting in the accumulation of a good deal of excess "intellectual baggage" which could represent a serious burden on the pace of total economic growth. This intellectual baggage is frequently utilized (a) to rationalize policies of agricultural protectionism or self-sufficiency, or (b) to delay structural reforms designed to shift the surpluses from the primary sector to the emerging industrial sector. Although failure of agricultural output to expand as rapidly as the growth of demand can clearly abort an otherwise successful "take-off" into sustained growth, expansion of food output more rapidly than the rate of growth of demand except for commodities with strong export markets can result in sharp reductions of both public and private returns on investment in agricultural development, and dissipation of limited capacity for capital investment.

⁴⁹ One of the few attempts to examine the historical validity of the leading sector concept is F. W. Fogel, "A Quantitative Approach to the Study of Railroads in American Economic Growth: A Report of Some Preliminary Findings", *Journal of Economic History*, Vol. 22, June 1962, pp. 163-197. Fogel argues that the role of the railroad industry in U.S. economic growth has been overemphasized. Rostow has suggested one possible basis for this excessive concentration on the "take-off": "the introduction of a new concept—especially a new term—is an act of aggression against respected colleagues and friends", *The Economics of Take-Off Into Sustained Growth*, *op. cit.*, p. xiii.

⁵⁰ W. A. Lewis, "Economic Development with Unlimited Supplies of Labour", *Manchester School*, Vol. 22, May 1951, pp. 139-191, (reprinted in A. N. Agarwala, *The Economics of Underdevelopment*, Oxford University Press, London, 1958, pp. 400-449); G. Ranis and J. C. H. Fei, "A Theory of Economic Development", *American Economic Review*, Vol. 51, No. 4, September 1961, pp. 533-565; D. W. Jorgenson, "The Development of a Dual Economy", *Economic Journal*, Vol. 71, No. 282, June 1961, pp. 309-334.

⁵¹ A. O. Hirschman, *The Strategy of Economic Development*, Yale University Press, New Haven, 1958, pp. 98-119.

⁵² T. W. Schultz, *Transforming Traditional Agriculture*, *op. cit.*, pp. 71-82.

development of analytical power. When the analyst is confronted by limitations in the analytical power of his discipline, generalizations based on historical experience may contribute to "wise" policy decisions. Policy prescriptions based on generalizations from a limited historical sample should, however, be based on observations drawn from the same "population". In my opinion, the new technological alternatives are sufficient to negate the Rostow assumption that "it is useful, as well as roughly accurate, to regard the process of development now going forward in Asia, the Middle East, Africa, and Latin America as analogous to the stages of preconditions and take-off of other societies in the late eighteenth, nineteenth, and early twentieth centuries."⁵³

4. The insight of List and the historians that a nation's economic growth at a given time is a product of its past and can be fully understood only by study of that past is fundamental.⁵⁴ At the same time, I conclude that emphasis on the "take-off" and the differentiation of "stages" in both the general and agricultural development stage approaches represents a "blind alley" rather than the route to a new "revolution" in economic thought. Even if current disagreements with respect to "take-off" dates could be resolved we would at best be confronted with a set of valid historical generalizations concerning the processes by which countries which are now developed arrived at their current level of development.

5. At the same time I do not reject the possibility that a taxonomic scheme, utilizing growth stages as labels in its filing system, may represent a potential contribution to the analysis of economic development. Progress in economics is characterized by the construction of models which give relevance to substantive empirical propositions by being "anchored to some particular space-time segment".⁵⁵ A valid growth stage taxonomy could provide a more general anchoring—for all countries with a large subsistence sector, for example—than the more specific local anchoring which I have suggested above.⁵⁶ Such a taxonomy could serve as a guide for selection of appropriate analytical models for analyzing the consequences of particular policy alternatives for agricultural or general economic development. It could not be expected to provide direct insight with respect to development policy decisions.

⁵³ Rostow, *op. cit.*, p. 12.

⁵⁴ F. H. Knight, "Economics", in *On the History and Method of Economics*, University of Chicago Press, Chicago, 1956, pp. 17, 18. (Reprinted from *Encyclopaedia Britannica*, 1951.)

⁵⁵ A. G. Papandreou, "Theory Construction and Empirical Meaning in Economics", *American Economic Review*, Vol. 53, No. 2, May 1963, pp. 205-210; G. C. Archibald, "A Discussion", *ibid.*, pp. 227-229. See also N. Georgescu-Roegen, "Economic Theory and Agrarian Economics", *Oxford Economic Papers*, New Series, Vol. 12, No. 1-3, February-October 1960, pp. 2-11.

⁵⁶ Kuznets, *op. cit.*, 1964, suggests that "The very ease with which separate segments can be distinguished in the historical movement from non-modern to modern economic growth and within the long span of the latter should warn us that any sequence of stages . . . must meet some minimum requirements if it is to be taken seriously," (p. 3). He then lists five requirements for a relevant growth stage taxonomy: "(a) . . . empirically testable characteristics common to all or an important group of units experiencing modern economic growth . . . (b) The characteristics . . . must be distinctive in that, not necessarily singly but in combination, they are unique to that stage . . . (c) The analytical relation to the preceding stage must be indicated . . . (d) The analytical relation to the succeeding stage must be indicated . . . (e) . . . a clear indication of the universe for which the generality of common and distinctive characteristics is claimed; . . ." (p. 24, 25).