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## UNIVERSITY ASSISTANCE IN BUILDING AGRICULTURAL RESEARCH INSTITUTIONS IN SOUTHEAST ASIA – A CASE ANALYSIS

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Providing a sustained flow of improved physical, biological and social technology applicable to the country or region is essential in the strategy of agricultural development. Building research institutions, which have the capacity to supply this flow, has accounted for a large proportion of Land Grant University overseas technical assistance effort. Several papers and broad spectrum studies have attempted to review the experience to date with a view to inducing more productive effort [5, 6, 10]. We shall (a) identify the main issues relating to required features of effective research institutions, (b) examine the history of American research institutions for insight into the bases of effectiveness, (c) inventory institution-building attempts in Asian situations with regard to presence of these bases of effectiveness and (d) evaluate and interpret alternative policies of foreign assistance to build effective research programs in agriculture. Primary attention is focused upon one organizational aspect which appears to be both limitational and neglected – the engineering of dependable responsiveness of the institutions to the problems of their respective regions.

### OBJECTIVES AND PERFORMANCE OF ASIAN RESEARCH INSTITUTIONS

In 1964, T. W. Schultz argued that the record of establishing research institutions in Latin America, under U.S.A.I.D. technical assistance programs, was comparatively poor [7, p. 152]. Welsch and Sprague state categorically that "Actually very little has been done in most Southeast Asian Countries to start the real revolution that is necessary to make creation of new technology a *self-sustaining process* in each country [10, p. 2, italics added]" Within the sphere of my own Asian experience (mainly, Thailand and Malaysia), the main exception seems to be the

Malayan Rubber Research Institute, which was originally established by the British.

If the conclusions of Welsch and Sprague are accepted, some important questions are unanswered. Why have the massive infusions of advisory talent, foreign training, and technical equipment invested in the building of research institutions in Asia produced so little? Why has it not been possible for the new and expanded institutions to productively "go it alone" and perform creditably after a period of over a dozen years of continuous technical assistance, training and capital infusion?

The success of the foundation financed International Rice Research Institute and similar institutions provides the temptation to treat them as models, and to treat as explanations of the limited success of other research institutions any departures from the general model provided by these institutions. Welsch and Sprague, understandably, imply that part of the explanation is to be found in the failure to employ the commodity-oriented team approach adopted by this successful institution and the newer Rockefeller financed enterprises such as the Corn and Sorghum Research Center in Thailand<sup>1</sup>. However, the reasons appear to go far deeper than this, than the diversion of technically trained manpower from research to administration, or even the failure to develop indigenous educational institutions to produce a continuing flow of technically trained manpower, even though they are important conditioning elements. In fact, the cross-sectional comparison of experience in A.I.D. sponsored programs with the I.R.R.I. experience provides misleading clues to the problem.

The Welsch-Sprague paper states that the so-called

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<sup>1</sup>Thailand with its very large Rice Department organization, its specialized dairy research units and kenaf research station has, to a large degree, employed this strategy for several years.

crop-oriented approach "implies very well-defined objectives, *with a sharp focus on problems*" [10, p. 9, italics added]. While this sharp focus on problems is a key component needed in research organizations, the statement begs the fundamental issue of how organizationally to orient research dependably to the "right" crops (or livestock) and to the problems which are really limitational to the growth of agricultural productivity in a particular situation and time period. If the specific commodity focus is clearly and correctly defined, if adequate finance and personnel are already forthcoming, as is assured when the foundation supported institutions are set up, and if one does not have to concern oneself with the problems of entrenched bureaucracies having vested interests and the often intractable social systems which perpetuate them, the job is relatively simple. But, Rockefeller and Ford Foundations can't do it all, and the problem of building institutions which will effectively and dependably function with locally provided financing, and within an indigenous social and political environment must be faced. The critical need for a sensitive responsiveness to agricultural problems is clearly recognized in the CID-AID study. "Building an effective agricultural institution involves not only erecting and equipping laboratories and libraries, developing a technically competent staff and adopting appropriate rules and regulations. Even more important to its impact is the development of a sense of institutional dedication to resolving the important problems of agriculture. . . It also involves developing effective working relations with those. . . who use such outputs as. . . research findings. . ." [1, p.9]. Ruttan, while arguing that the Rockefeller "research institute pattern in Latin America has been exceptionally effective" [6, p. 23] and that the present Land Grant College structure is irrelevant because of its dependence upon a "highly developed infrastructure linking the university to other public and private institutions involved in technical, social and economic change. . ." [6, p. 1], also recognizes the dangers in employing the model uncritically. He pleads for a "pragmatic search for patterns of institutional organization which permit a nation to have access to professional competence. . . and to focus this competence directly on the critical barriers to technical, social and cultural change" [6, p. 23].

## INSIGHTS FROM THE EXPERIENCE OF AMERICAN LAND GRANT COLLEGES

While the clues provided by the experience of foundation-financed institutions are somewhat misleading, only very careful interpretation of American Land Grant experience provide reliable clues to the problem. The American agricultural scientist is obviously very much influenced by cross-sectional comparisons between modern research institutions in the developed world and those of the less developed areas. But, even our senior researchers have little first hand knowledge of the historical roots of the current research concerns that we have inherited. Yet, the historical antecedents of our present system are much more productive of valid insight than cross-sectional comparisons.<sup>2</sup> Therefore, we turn now to an examination of these historical antecedents as a basis for establishing a framework of relevant categories with which to analyse the experience in Southeast Asia.

The most salient single fact about the American Land Grant system is not that it has been practical, that teaching, research and extension programs exist in the same institution, or that it has resulted in the world's most technologically advanced agricultural system. Rather, it is the fact that a major explanation of the general form it has taken is found in the political pressures of organized farmer groups, i.e., that these farmer groups have served over a period of a century as a check on *the relevancy of what has been done* in the research programs of these institutions.<sup>3</sup>

Historians of the United States system tell us that the research (experiment station) arm grew out of the needs created by the demand of farmers' organizations for education "with practical. . .aim," and these organizations "in a number of cases were influential in securing readjustments in curricula and changes in personnel" [4, p. 118]. Apparently, the need for research grew out of the demand for practical relevancy of the material taught to students of agriculture as the teachers become "aware of the inadequacies of established applied science facts, principles, and methods" [4, p. 137]. That is to say, even before there were such things as a Hatch Act or an experiment station appended to a college of

<sup>2</sup>This does not mean that foreign institutions should follow a new institutional growth stages model and end up with a similar organizational form, but it does suggest some of the factors that have historically made Land Grant Colleges function effectively to serve American agriculture, factors which must be taken into account in substitute institutional configurations in less-developed areas.

<sup>3</sup>The problems that this historical relationship created are recognized, but they have been ignored in this brief review in order to focus attention on key issues.

agriculture, the political and social system had created a structure of incentives which almost assured a research program somewhat oriented to the needs of farmers would spring up. In fact, several of the schools established by individual states had small research programs before the Federal government had taken action to establish the Land Grant Experiment Station System [4, esp. 27-30 and 136-151]. In addition, these farm organizations were extremely important in another way. The existing private and public schools which were modeled along European lines, as well as some other class-oriented and vested interest groups, were openly hostile to the new system. The farm organizations provided an external check on the performance of the system, an encouragement for a general adaptation to the needs and circumstances of the times, and assured the perpetuation of the system despite these entrenched, hostile interests. That is, the farm organizations insured a continued existence of the practical agricultural format in competition with the classical education notion. It would not be accurate to say that in a positive way these were responsible for growth of the scope of the agricultural schools absolutely in the formative years. It would probably be more accurate to say that they were more hostile to classical education than to technical education in agriculture. Farmers saw little virtue in scientific agricultural training in the early years. But, the militancy of farm protests against economic conditions, plus their demand for practical relevancy, made majority farmer support of any system of public higher education to a large extent contingent upon making it available and serviceable to rural groups. Hence, the sensitivity to rural problems is rooted in a political relationship.

That the structure of the Land Grant System, including the unique relation between the colleges and their clientele, was generally attuned to emerging problems and scientific developments is evident both from the history of the evolution of the present internal organizational patterns and from cross-sectional comparisons of the various land grant colleges at the present time. Massive changes have taken place in the face of the always existent vested interests in the status quo by those with large personal investments in the development of existing structures. Dairy, animal husbandry, veterinary science, soils, agronomy and social science departments evolved from the original chairs in agricultural chemistry, applied botany and an omnibus department of horticulture. Our own discipline of agricultural economics and its major subdivisions emerged, mainly, from existing biological science departments, after (a) the disappearance of the frontier, (b) the emergence of almost fully commercial agriculture in many parts of the nation, (c) the Civil War with its dislocations, and (d) a major financial collapse. The Babcock Test and the Steenbock process were

developed in Wisconsin where dairying had been developed as a replacement for their number one industry — wheat, an industry which had been lost to the Great Plains. Soil science emerged as a major discipline after fertility reserves were significantly depleted and supplies of cheap land had been exhausted. The development of separate vegetable crop and fruit crop departments at the University of Florida reflects the importance of these industries in the state and the special problems associated with these commodities. The point is that the structure of American Land Grant College system research institutions developed because of a unique conjunction of environmental and economic circumstances, and a political and social structure such that self-interested educational bureaucrats and individual researchers found it convenient to do what would service social needs in those situations. Ruttan [6] contends that the present trend toward disengagement from direct ties to agriculture reflects an important development of an infrastructure of related institutions.

The conclusion that emerges from this cursory inspection of the historical record is that the Land Grant system, including the pattern of disciplinary subdivisions, its scientific conceptual apparatus, its organization and, even its personnel, probably reflects in some degree the unique circumstances of the American scene from the mid-19th century onward, especially the political facts of democratic political institutions and articulate farm organizations. If this same system is, without major adaptation, serviceable elsewhere, it is not because the system is inherently superior. It is because conditions in the areas concerned are in important respects similar to those that prevailed in the United States at an earlier time, a somewhat unlikely possibility. It is naive to expect that it will be *generally serviceable* under greatly different conditions, although parts of it may be. Some parts of the system reflect common characteristics in all biological phenomena of the same classes, or common characteristics of social beings, but other features do not. In considering our Asian experience, the unique qualities of the situation in that area must be kept in mind.

#### THE TYPICAL ASIAN SITUATION — A CONTRAST

Institutional, political and ecological conditions are very heterogeneous in Asia. However, some important uniformities can be noted, most of which can be illustrated by the situation in Thailand. Tropical monsoon agriculture, with management problems grossly different from anything experienced in the temperate zones, is a fairly general quality. Of equal or greater importance, thousands of years of authoritarian social and political structures have left a lasting imprint on their social and bureaucratic institutions.

Most of the countries either have recently developed nominally democratic political systems or still have authoritarian regimes. With extremely few exceptions, mainly, largescale planters of export crops, articulate interest groups do not exist. That the most outstanding success story in indigenously funded and managed research, the Rubber Research Institute of Malaya, concerns an institution which serves an industry dominated by large-scale planters, is, we would hypothesize, no mere *coincidence*.<sup>4</sup>

The difficulties involved in Thailand's attempt, with our help, to establish the Agricultural Center Northeast may possibly typify attempts throughout the entire South Asia region. The authoritarian "from the top downward" system of bureaucratic organization reflects the fact that, except for a brief period, either absolute monarchy or military junta governments have ruled until very recently. Until the elections of 1968, all political organizations were banned. Until very recently, primary attention was given to the problems of Bangkok and the Central Plain. The political, social and economic integration of the "up-country" regions with the Central Plain was limited until the threat of insurgency reared its head.

Although attempts to play "catch-up football strategy" in the political and economic game in the sensitive areas such as the Northeast have been vigorous, the traditional Thai bureaucratic structure, reinforced by shortages of trained personnel, has made it difficult to do an abrupt turnabout. Competition among ministries and departments is traditional and cooperation non-traditional. For example, more than 100 agricultural research, animal propagation, seed multiplication and demonstration stations have been established in the 15 Northeastern provinces. To the outsider, at least, their effectiveness seems to be quite limited. They are under the control of at least seven different arms of the Ministry of Agriculture, plus various arms of the Ministries of National Development, and Interior, and the Office of the National Education Council (a part of the Office of the Prime Minister).

In the Ministry of Agriculture, these stations are mostly manned by veterinarians, B.S. college graduates and vocational school graduates who have supervisors based in Bangkok.<sup>5</sup> These supervisors

sometimes travel a circuit of several such stations as time and resources permit. Projects are often selected and designed by the Bangkok-based supervisors, frequently without participation of the field staff. To some extent, the problem of personnel shortages has made this situation unavoidable, but regardless of cause, this method makes it very difficult to systematically relate research to analytically formulated problems experienced by farmers. The fact that even the Rice Department's program of basic studies, area trials and demonstration projects to test new technologies in use has not resulted in rapid diffusion from the demonstration sites is suggestive that the technology is not very well adapted to local conditions, and, hence, not very profitable or too risky. See the excellent conceptualization of the problem of technological change in subsistence agriculture by Wharton [11]. A relatively large sample survey study of fertilizer adoption by paddy farmers in the Rice Department's demonstration villages is being done under the supervision of the writer by Mr. Halvor Kolshus. It will test several of the hypotheses outlined in the Wharton paper. Computing is now in process. Other complex technologies and cropping systems have diffused rapidly. For example, see the production data on corn and kenaf [2, pp. 54-84].

The creation of the Agricultural Center Northeast is an explicit effort to get research and supervision closer to farmers and farm conditions in the Northeast. The trained personnel constraint is rapidly being removed by foreign graduate training programs. Both the geographic location and personnel training are essential conditions, but they are not sufficient conditions. As elsewhere in Asia, the "silent majority" of peasants has no effective representation which can formulate the issues. The message of the insurgents is strong but nonspecific and negative. No organizational device has yet been created which serves the function that the Grangers, populists and successor groups served in American experience — that of articulating relatively specific problems and issues.

Not atypically, the Thai government has apparently formulated the problem of developing the Center in terms of developing needed technical skills; and apparently USOM (USAID) originally supported the

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<sup>4</sup>Smallholder rubber is on the increase relatively, owing to government land development policies. However, the dependably forward-looking, articulate sector is still the plantation sector. The Institute was set up before independence but is now locally controlled and has been for many years.

<sup>5</sup>Until recently for an M.S. or Ph.D. recipient to be posted to an "up-country" station was equivalent to political banishment, and it is so regarded at the present to some degree.

project on the same basis.<sup>6</sup> The net result is that a group of technical specialists in the standard agricultural disciplines (plus fisheries management) has been recruited, and given a rather standard American set of terms of reference that includes rather little about the distinctively organizational aspects of the job. Half have had no previous foreign or tropical agricultural experience. They are cast into this situation with a standard set of American academic credentials and experience, none of it involving the engineering of institutional change or even the analysis of what type of changes are needed. Economists, in this respect, are not much better off than the engineers and biological scientists.

### IMPLICATIONS

The articulation of the above-noted difficulties is not an indictment of university foreign technical assistance and training efforts. Contributions of these programs have been substantial, and the marginal productivity of professional effort is still very high, despite the shortcomings of programs.<sup>7</sup> In terms of developing manpower and physical facility capability, these programs have been and are doing reasonably well in most respects, although there are probably some exceptions. The structure of the university contract programs is reasonably satisfactory for these purposes, although suffering significantly from developed country biases in subject matter emphases and approaches to research. The function of manpower development requires competent professional manpower inputs, men who know at least something about research procedure and how to use the technical paraphernalia of modern agricultural research. This is what has been provided!

The main difficulty has to do with a misformulation of the problem in the technical assistance contracts with universities. The contract teams have

provided generally what the contracts required. Unfortunately, this is not what has been expected or desired by the American public or AID, as indicated by the Welsch-Sprague implication that these programs have not made the creation of new technology a "self-sustaining process" [7, p. 2]. To make it a self-sustaining process requires more than inputs of manpower and equipment. It involves an institution so structured that quality manpower is recruited, developed and retained and has its energies directed on a continuing basis to the developmentally limiting factors in the situation of the target population. And it is precisely on this problem that the contract programs I know something about have made little or no headway. Indeed, in some cases, there is doubt that contractors, donors or recipients have explicitly recognized it as a problem, much less the central problem, in institution-building contracts.

A colleague has suggested that this creation of a functionally adequate institutional structure is an insoluble political problem which should be ignored, or, at best, one that will be solved over the ensuing decades or centuries. But, if research is strategic to development, we cannot wait for a natural evolution; time must be collapsed. Another has suggested that we must settle for less than the ideal and make our own research relevant, hoping that somehow this will be emulated. While this seems to be a minimum requirement, even this is difficult to accomplish. Most of us have been trained and have our experience in situations in which the main configurations of problems have been already institutionalized through marginal administrative adjustments in subject matter emphases and with the inducements provided by project approval procedures and subtle shifts in criteria for salary advances and promotions. We have no experience in, or tested procedures for doing this on a comprehensive basis, starting from "scratch".<sup>8</sup>

In view of this, should we follow the lead of the foundations? Should AID strategy be to try to do as

<sup>6</sup>The evidence is strong, statements in documents to the contrary notwithstanding, that among many Thai and Mission officials the expectation was that the job was only research, rather than institution-building. And the concept of research held by several occupying non-research positions was relatively naive. The team was criticized for not having produced an adequate research output less than one year after its first professional staff arrived on the scene.

<sup>7</sup>As an example, the evidence is strong that one very abbreviated study of kenaf marketing and policy which was done in Thailand during our first two years there could in one year pay for the entire technical assistance, commodity, and training program if the findings were implemented [8, 9].

<sup>8</sup>In 1968, the Chief of Party attempted to initiate an organized comprehensive study effort to identify such problem configurations as a basis for evaluating staffing patterns and physical facility needs, and for planning major research thrusts. However, it was regarded quite honestly by our American colleagues as a desirable but infeasible idea. It has apparently something that they simply did not feel competent to approach. The effort died a-borning. Yet the need for such studies was clearly evident from the facts which emerged in our initial research efforts. Technologies developed for kenaf fiber preparation are clearly unproductive under present market and price structures [8, p. 19-22]. Adulteration of animal feeds and additives is so pronounced that feeding recommendations to farmers are meaningless, constituting a limiting factor in livestock industry development [3, p. 7].

much of the research job as finances permit for the Asian countries, rather than building research institutions? Should a permanent cadre of career overseas researchers be developed to do it? If so, are there direct program advantages in using the university contract vehicle to do it? A disadvantage of doing the job for them, using career personnel, is accountability to our bureaucratic center rather than their user clientele. Other possibilities may exist, but there seems to be no better alternative than to attempt to develop some modification of the present indigenous institutional structure which will make it more serviceable. What is needed are changes which will complement the effectively functioning parts of existing structures, and put the entire organization more dependably on the track of developmental objectives.

A clue to the problem of how to accomplish this institutional adjustment might be found in the Taiwanese, rather than the Thai experience. The late W. A. Anderson, the architect of the present Farmers Associations of Taiwan, developed something of a model. It transformed these associations, by only modest changes in the structure of the previous authoritarian and exploitative associations inherited from the Japanese, to a fairly democratically controlled, farmer need-responsive organizations. It was done within the framework of a largely autocratic political system. It is the identification of just such workable institutional changes that we require if research organizations are to be reliably oriented to the needs of their agricultural clientele. To identify such institutional changes is a difficult professional job for a team which combines the contributions of technical specialists in the agricultural disciplines, ones who are willing to try to comprehend the unique qualities of the foreign situation in relevant terms and who are willing to recognize that their contributions will depend much more heavily upon their willingness to experiment and learn than on their previous fund of knowledge. In addition, the team must have the resources of specialists in human organization who can comprehend the behavioral and institutional facts of the situation and can relate them to the technical requirements and development objectives of the institution.

If the problem is to be realistically addressed by a

team with the demanding qualities specified, University administrators must come to recognize in both their direct actions and in the staffing of overseas contract programs that the institution-building job is not one of simple technical and institutional transfer of the American model. Rather, it is that of developing and refining new models which are workable in particular foreign ecological, bureaucratic, political and cultural contexts, but those which approximate in results the qualities of the Land Grant System. They must also come to realize that this is not something that any old hand at the college administrative game can do, nor is it something that they can expect of "just any" group of technical specialists. Typically, technical specialists have little historical perspective on their own discipline, little training in the relevant fields of human relations, and little previously acquired comprehension of the conditions of less developed agricultural areas beyond the superficial ideas that they are poor and "backward". They are, after all, American trained and experienced specialists. They need additional professional support.

Can either AID or the Universities meet this challenge, or are they too much victims of their own traditions and too bureaucratically intractable to do the job? Or must we lower our sights to more attainable but still worthwhile targets, to a more vigorous attempt to make the research that we do on our contract programs more relevant to the problems of the countries concerned, and the training that we give less culture-bound by the traditions of the developed nations? Is half a loaf enough? These are the difficult questions, the answers to which are crucial to the future of university research institution-building programs in my opinion.

Finally, if there is hope that effective institutions are to be built, AID administrators at all levels must have the wisdom to recognize that institutional change is the important need and that understanding of institutional change is the limitational technical input. They must also have the courage to use the bargaining power of the dollar (or the persuasiveness which will make it unnecessary) to obtain sanction from host governments for the needed professional inputs and to get the required changes effected.

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