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SUMMARY

1. An examination of Nigerian, Korean and other experiences confirms the importance of OAA's problem-solving, systems orientation as stated in the program submission.

2. Such an orientation is multidisciplinary--because it is problem solving--and solving problems with OAA technological changes will inevitably involve institutional adjustments and human change and behavior; hence, the institutional and human, as well as the bio-physical, disciplines are involved.

3. A systems orientation implies more or less formal and explicit modeling of the domains of the problems to be solved. These domains have space and time as well as disciplinary dimensions. The models need not be computerized though computerization is cheaper for medium and large problems and is probably the only economically feasible way of modeling the domains of very large scale, complex problems.

4. No single discipline or technique from a discipline can dominate a systems approach. Though this is especially true of static, market-oriented forms of economics which do not deal with the time consuming, non-market processes whereby technical, institutional and human coefficients of a society are changed, it is also true of the more dynamic but less well developed forms of economics and of other disciplines--bio-physical, institutional or humanistic.

5. The mix of disciplines required to model the domains of problems varies widely from problem to problem over space and through time. This

implies an administrative structure for OAA which will feed sustained disciplinary, problem-solving, systems competence into a very flexible organization for assembling, using, disbanding and reforming problem solving teams.

6. The systems approach calls for close iterative interaction between investigators, decision makers and/or persons affected. Thus, a problem solving systems approach for OAA must range in AID's structure from a central bureau such as TAB through regional bureaus, missions and host country agencies to the team of investigators and workers who are in the host country.

7. AID, the LDCs, and AID's consultants and contractors lack the trained personnel to carry out problem solving, systems studies of the domains of problems involving even the small number (7) of technologies in the OAA program submission. This is true whether or not the work is computerized. Paper and pencil, desk calculator work uses great quantities of professional time very ineffectively and there is a lack of systems modelers in the stable of available manpower. Therefore, OAA needs to be backed up by a "systems" training program for AID, host country and contractor persons. Such a program should include:

a. Short training sessions for administrative personnel.

b. Short training sessions for OAA project workers.

c. A one-year training program for training selected personnel to do computerized systems modeling.

8. Systems modeling of complex problem domains has recently become operational but is still developing rapidly. Among the developments which would

be most needed by OAA are:

a. efforts to bring together the systems capability rapidly developing in the bio-physical agricultural sciences and in the social sciences--a special conference should be convened for that purpose.

b. the establishment of a software library to make model components available for the use of OAA (and other) AID systems analyst. This library should contain components from the bio-physical agricultural, institutional, and humanistic disciplines and related subject matter areas.

September 11, 1974

SOME VIEWS ON OPPORTUNITIES FOR ACCELERATED ACTION (OAA)

The author has over 30 years experience in working with agricultural development problems, both domestically and abroad. This paper is written to bring lessons learned in that period to bear on the Opportunities for Accelerated Action (OAA) part of A.I.D.'s agricultural effort. Basically the idea of OAA is to exploit opportunities for (1) introducing existing new technologies such as those for high lysine maize, on-farm water management, soybeans for food, and (2) further developing such technologies as improved sorghum varieties and symbiotic nitrogen fixation.

A fundamental question about OAA is whether it is a feasible way of getting A.I.D.'s agricultural effort focused in on the needs of host countries or just a gimmick around which A.I.D.'s efforts will be re-organized without impact on their effectiveness abroad.

Nigerian and Korean Experiences

There are important lessons to be learned from Nigeria with her long history of British- and Nigerian-developed agricultural technology and from Korea with her current food production and grain management problems.

Nigeria -- At the time Nigeria was granted independence and the U.S. became involved there, she had good technology available for oil palm, cocoa, rubber, cotton and peanuts and was an important producer of all five. There were three perennials and two annual crops. Of the three perennials, cocoa is man-planted while nature regenerates the traditional wild palm and produces seedling rubber trees. Modern, improved palm and rubber trees are man produced. Both annuals whether traditional or improved are planted by man. Seldom in the agrarian affairs of the LDCs do

we find so many OAAs (opportunities for accelerated development). Yet action was slow in Nigeria. Why? Will A.I.D.'s OAA be able to overcome the kinds of constraints which have held back Nigerian development?

Nigerian taxing and marketing board policies were exploitive of her farmers, the degree of exploitation being limited by what the traffic would bear. Wild palm, with ample land and nature in charge of investment, could be taxed to the point of zero returns to land and trees and minimal returns to harvesting and processing labor; however, such taxes closed out investment in modern varieties capable of out-producing wild varieties threefold. Extension staffs were exhorted to promote "packages" of modern palm seedlings and fertilizer to get more palm oil produced to increase government revenues -- never mind the taxes on the peasant who they said would only spend the money on burial ceremonies and bride prices! The extension workers, with a technology comparatively more productive than IRR-8, could not offset Nigeria's adverse pricing policies.

In contrast to oil palm, rubber had no significant margin for taxation whether free wild seedlings or improved planting material were used. Modern state-owned plantations, competing ineffectively with small holders, and private large holders both favored the modern clones. In a few instances parts, at least, of excessively taxed modern palm plantations were replanted to rubber. At any rate, action accelerated slowly if at all!

Cocoa was also heavily taxed but had a high taxable margin. Further because man controls the investment, it was apparent that acreage maintenance and expansion was dependent on letting some income pass through the market to producers. However, the amount let through was so

small that action was limited, not accelerated.

Because all three (cocoa, rubber and palm) are perennials, the relationship between returns to growers and growth or deterioration (the net balance between investment and disinvestment) was obscured. Agricultural technologists, extension workers, government officials, marketing board administrators and A.I.D. personnel did not see that small experimental or accidental increases in prices previously so adverse as to cause disinvestment in traditional palm, rubber and cocoa did not justify investment in expensive packages of improved planting materials, fertilizer, labor and land and, hence, provided no evidence that larger price increases would also be ineffective.

For the two annual crops, the situation was somewhat different. There were no fixed investments in durable groves of trees. Adverse taxing and marketing board policies had visible impacts in a one to three year span. Nonetheless, the pressure to tax was still there from the educated elite (mainly in government and academia). Technologists and officials entertained the hope that extension "packages" would get the acreage and yields to expand the tax base. And extension workers were willing to try -- at a salary -- out of the tax base -- but without much accelerated action as the incentive for the farmer was not there.

Though Nigeria food producing technology was not improved much by the British, it is worthwhile looking at food production briefly. Before the secessionist difficulties (an euphemism for Biafran war), food production for domestic use and population grew at about equal rates as per capita real income increased slowly. Lack of effective demand and

the need for non-food goods and services such as cloth, roofing materials, education and bicycles prevented much expansion in per capita food production and consumption, though malnutrition and even starvation were present. The lack of effective demand for food was, in part, a consequence of adverse taxing policies which kept both prices and output of the cash crops discussed above too low to increase per capita farm incomes significantly. Low incomes for the three quarters or more of the population living in rural areas curtailed the demand for manufactured goods which in turn kept down the effective demand of the urban masses for food. The effect of this situation was to virtually eliminate OAAs for food in pre-war Nigeria. USAID/Lagos did not see this; thus, they concentrated on cattle, poultry, credit, maize, storage, soil conservation, water while staying away from OAAs for the income-producing export crops.

The end of the Nigerian war found Nigeria suffering from inflation, with foreign exchange controls that interferred with beef importation, and with a larger army eating much beef and other products ordinarily enjoyed by the elite and with disrupted production and trade. Food prices went up and the elite were hit in their pocketbooks. Most rural people outside of the war torn area probably continued to have about the same real income as before -- after all, they produced most of what they ate and the prices of what they bought went up along with the prices of the domestic food crops they sold. However, the urban elite had a real interest in more food production and lower food prices. As their desires to impose price ceilings and rationing have not been granted and are not administerable in Nigeria even if granted, it is likely that accurate data on food production, consumption, and population would indicate maintenance of the historical relationships among the three. The Nigerian Government, FAO and USAID

are now even more interested in food production opportunities. At the national seminars on agriculture held in Ibadan the summer of 1971 the interrelations between food production, food prices, incomes from cash crops and effective demand were still incompletely but better conceived than earlier. Some Nigerians had begun to perceive of the total system in which food production, technology, taxes, income from farm and non-farm sources, consumption, etc. interact.

It is now clear that OAAs in Nigerian food production are likely to remain closely tied to (1) population growth (each baby brings its own effective demand and night soil), and (2) increases in per capita real incomes. Increases in per capital incomes for farmers areas as important in solving malnutrition problems as they are for urban people. There is more to it than just food producing technology.

Before leaving Nigerian food production, we should note the high transport cost and isolation of Nigerian markets from each other, urban population concentrations, and world markets. In such village markets, prices of food have to fall very low before sale outside of the market is possible and have to rise very high before commodities can move in. This produces wide seasonal price movements and large price responses to bumper crops and crop failures. Such phenomena attract storage specialists and marketing experts out to "get the middleman". Storage operations are both (1) expensive for small quantities in the humid tropics, and (2) likely to reduce drastically the price fluctuation in local isolated markets; thus, the OAAs are likely to be few and of marginal financial viability. In the long pull, the experience is likely to be quite different for both storage and transport projects, if the latter can reduce transport costs enough to put villages more or less continually on an export or import

basis for each commodity. This would stabilize prices, integrate Nigerian isolated markets, and yield for Nigeria the allocative advantages derivable from a national common market.

AID had one of its largest agricultural programs in Nigeria in the 1960-66 period; yet there were few real successes. In my judgment, agricultural division personnel, USAID/Lagos, and host country personnel failed to define problems on which to work. There was no consensus in Nigeria about OAAs in export crop production and such consensus as there was did not recognize the constraints of Nigerian taxing problems. On the food side, the constraint of low effective demand was not reocgnized and, hence, problems were not well formulated. Also the limited extent of local markets and their lack of integration into the national economy was not recognized -- this led to difficulties with beef production, abattoirs, poultry, potatoes and dairy projects. Grain storage and credit projects encountered the high costs attendant to small transactions in isolated markets. Where Nigeria had clearly defined problems solvable with a clearly needed action, success followed as in establishing the faculties of agriculture at ABU, the Univerisity of Nigeria and the University of Ife. The rinderpest program was also successful. Because the problems to be solved by the technologies advocated were not identified, USAID and GON officials failed to take into account the non-technical constraints to adoption of the technology. I fear the OAA program may develop similar shortcomings.

Perhaps the failure to identify problems was a result of the haste with which the large program was put in place. It certainly was not a lack of hard work on the part of J. B. Davis, the head of the Agricultural Division, who administered the program at the time. More likely, however, the failure to identify programs originated in (1) a greater interest in disciplines and subject matter than in problems, and (2) lack of capacity

to study systematically the domain of the problems. Agriculturalists are interested in agriculture whether or not problems are identified. Soils men are interested in soils. Agricultural economists are interested in markets, farm management, etc. Credit men are interested in credit. All are interested in building programs and important roles for themselves. This was as true of Nigerian counterparts as of USAID personnel. No wonder problems were neglected in the first round. There was little inclination to look beyond narrow disciplinary and subject matter bounds to the full dimensions of the underlying undefined problems facing Nigerians. When such a view was taken, there was little capacity either in the agricultural or program offices to make multidisciplinary analyses of problems. It was out of such a situation that the Consortium for the Study of Nigerian Rural Development (CSNRD) was established to assess the effectiveness of USAID/Lagos' agricultural program. Assessing that program required that attention be given to the multidisciplinary aspects of the many problems besetting Nigerian agriculture. Technological information was not enough. There were economic social and political dimensions as well. The Federal Ministry of Economic Planning had had top notch Nigerian and expatriate economists. USAID/Lagos' program division had top notch economists. Similarly, there were top notch agricultural scientists in Nigerian, British, U.S. and other agencies both multi- and bi-lateral. There was not, however, a systems approach to put these skills together to define problems and to then study the domain of the problem to find a solution. The program submission on OAA makes an assertion which was then true in Nigeria.

Failure to realize this truth was the major difficulty with the agricultural programs of the Government of Nigeria and USAID/Lagos. That assertion reads:

> "After a technological opportunity has been selected, a problem-solving, systems orientation is required to assure its successful introduction and diffusion."

By the time the Nigerian situation was rather thoroughly analyzed by CSNRD, it was too late for USAID's agricultural program. Its major input had been made. The war had taken place and the U.S. was cutting its A.I.D. appropriations. Nigeria was much less friendly. Retrenchment not exploitation of OAAs became the order of the day. The present Nigerian agricultural staff is inadequate for either helping to define the new problems, which have emerged since CSNRD, or of mounting programs to solve them. Fortunately, the Nigerians now have much greater financial and personnel resources than in the sixties.

Korea -- Korea is vastly different than Nigeria -- it is temperate not tropical. It is a major net importer of food instead of being a major exporter of agricultural products. Its government expends money to import food grains and manage its food grain economy instead of extracting revenue from its agriculture. Whereas Nigeria has had great difficulty in defining its agricultural problems, the Koreans face obvious problems of increasing food production and of managing food storage and distribution along with the importation and distribution of grains from abroad.

There are OAAs concerning food production which have been identified and on which A.I.D. is acting. The process of identifying such OAAs and acting on them is instructive and worth summarizing here. One AAA involved the need to improve rice, barley, wheat and winter forage varieties. Much of Korea's paddy land is unutilized in the winter. Thus, shortening maturity periods for the grain crops would increase the hectarage which could be double cropped for food grains, while winter forage crops for livestock would permit double cropping of more northern paddies. The opportunity then is to rebreed or introduce new varieties. Defining this opportunity was a multidisciplinary task. What was technically possible had to be assessed by plant breeders and persons knowledgeable of Korean crops, soils and climate. The availability of germ plasm and varieties had to be determined. The processes of modifying existing and of introducing new varieties had to be investigated and feasible time sequences estimated. The same was true with respect to personnel and other resources needed. Assessing the payoffs required a national framework to evaluate the consequences of changes, hectarages, yields and output in terms of several different performance criteria such as reduction in foreign exchange requirements, caloric consumption per capita, grams of protein consumed per capita per day, farm employment, effect on GNP, effect on food grain prices, etc. Once agrarian experts had arrived at informal projections concerning hectarages and yields, the systems model known as the Korean Agricultural Sector Simulation Model was used to estimate the consequences of exploiting the OAA. These estimates indicated the OAA to be one of the

most advantageous projects before Korean planners. Steps were taken then to carry out a feasibility study for an A.I.D. loan to the Korean Government to finance the desired research program. This study was done by Herbert Albrecht, Director of IITA, because of his knowledge of laboratories, field equipment, and personnel requirements and his experience in putting these together into an operating research agency. The result was approval of the loan and the employment of Dr. Omer J. Kelley, formerly of A.I.D., directly under the Korean Government to head the new Korean agricultural research organization.

The Korean situation differed from the earlier Nigerian situation in two important respects: (1) there was a clearly defined problem, well understood by both the host country and USAID personnel and (2) there was in place an AID/contractor capability to analyze the problem and to work out with the Koreans in a systems framework a solution involving a role for A.I.D. consistent with A.I.D.'s resources. It was done within personnel, financial and administrative constraints similar to those under which OAA will have to operate in the future.

Other Efforts

It is worthwhile looking at efforts of disciplinarians and subject matter specialists for lessons useful to OAA.

By disciplinarians we refer to persons whose primary interests are in their disciplines. Some disciplinarians work in relation to agricultural development problems, others only think or claim they do, while others do not care whether they do as their main interest is in the discipline not problems. Included among the disciplinarians are economists, animal

husbandrymen, genetisists, soil scientists, statisticians, etc.

My own disciplinary work at Michigan State University includes attention to investment/disinvestment theory, decision making theory, and philosophic value theory. I think my disciplinary work is relevant to problems but I know it is not focused on any particular problem and is not likely to command resources from decision makers in LDCs or from Congress except through general support of Universities.

Some disciplinary work is of known relevance to problems. The work of Ruttan and Hyami on induced technological change is a case in point -- it explains why the U.S. invested in the creation of labor saving technology while Japan invested in land-saving technology and suggests that land-short labor-long societies follow the Japanese lead. Much of Schultz's work on human capital and the relation between female earning power and birth rates is similar to the Ruttan/Hyami work. It yields valuable insights, yet is not focused on particular problems.

Even when disciplinary work is relevant to a problem, it is seldom adequate to solve it. Problems are typically multidisciplinary in nature and typically require inputs on both the positive and normative sides from a variety of disciplines.

By subject matter specialists we mean persons specializing in subjects such as food, land tenure, employment generation, institutional development, energy, etc. Like disciplinarians, subject matter specialists may work on problems, may pretend to work on problems when they do not, or may not care whether they work on problems as their interest is in the subject. There have been people and institutes specializing on food and land tenure as research topics, the Stanford Food Research Institute and

the University of Wisconsin Land Tenure Center being cases in point. The information generated by such efforts is often very useful in solving problems involving such subject matter. And, because such subject matter efforts often draw on more than one discipline, the knowledge produced is often more useful in solving problems than the knowledge produced by single academic disciplines. Governments recognize this and support institutes which specialize in such subject matter areas as health, atomic energy, food, economic development, etc. The IRRI, CYMMIT, IITA and CIAT are examples of subject matter institutes which have produced knowledge and physical outputs of great value in solving problems. They have been multidisciplinary in nature. The same was true of WIFOR which produced the improved oil palm varieties and CRIN which improved cocoa varieties in Nigeria. Yet none of these has enough breadth to handle production problems involving the need to change taxation and pricing policies, to create new infrastructure, or to retrain people. A subject matter specialist is typically concerned with more than one discipline but seldom with the particular mix of disciplines necessary to solve a specific problem.

Even an institute which concentrates on knowledge about food is not likely to have all knowledge required to solve a food problem any more than an IRRI is likely to have all of the non-technical information to solve a problem about rice.

Clearly the OAA idea is not disciplinary. Nor is it a subject to study such as food, land tenure, rural development or employment generation. Instead, it appears to be a way of organizing A.I.D.'s resources to help LDCs tackle agricultural development problems. If this is so, its orientation is towards problems, not disciplines and not subject matter. This suggests the need to look at problem definition and solution.

Problem Definition and Solution and OAA

Before problems can be solved they must be defined. Problems are defined in terms of constraints and values -- of "goods" which are sought and of "bads" to be avoided. Problems are envisioned by people and organizations with power to decide and to act. Host country agencies often have problems though they may be inept in recognizing them. Some agencies may even have vested interests in not solving problems which affect the welfare of people whose lives they control; in such cases the people involved have the problem of an unresponsive agency added to their other problems.

The orientation of OAA to problems will create administrative difficulties for A.I.D. because problems change through time and across space. Further, they are multidisciplinary in character. The domains of problems to be handled by OAA will not be stable through time and, at a period in time, will vary from LDC to LDC and from region to region. Any classification of problems and any corresponding organizational set-up for OAA to handle the problems of one country or region at one point in time will be inappropriate at another. Each problem will involve a relatively unique mix of subject matter and disciplines. Organizationally, the need will be for problem-orientation with great flexibility in assembling, disbanding and reassembling teams of disciplinarians and subject matter specialists who are ready to work on a specific problem as team members.

A.I.D.'s Mission staffs with knowledge of agriculture are now at minimal levels, its Washington staff is skeletal and its relationships with American Universities are deteriorating. Thus, personnel with agricultural skills are scarce. Of those available many are strongly oriented to disciplines and different subject matter areas. Other personnel working in agriculture are primarily administrative. Few if any have a capacity for multidisciplinary systems analysis of a problematic domain. Thus, there is general lack of problem-oriented personnel to execute the OAA idea. This shortage will appear even more critical as the nature of the demands of OAA for special skills are sketched out below.

Information and knowledge are crucial in solving problems. Much of the knowledge required is about the processes of technical, institutional and human change. In the OAA concept, the initial emphasis will be on agricultural technology and then the concomitant institutional and human changes; however, the problems, not the OAA concept, will determine the emphasis on technical, institutional and human disciplines and subjects. One thing, however, is clear -- static economics is of limited value in understanding the processes whereby technological, institutional and human change are made. Further, as many of these changes are to be made through the non-market OAA activities of the U.S. and host country government, market economics will be of limited value except in predicting the consequences of changes once made. The interest is in changing technical, institutional and human coefficients rather than in finding an optima with given coefficients. No single discipline such as one of the

technical agricultural disciplines or economics, the author's discipline, can be dominate in OAA.

The importance of process and time has other implications. It means that projections -- the envisioning of the consequences of alternative causes of action through time -- are important. Still further, it means that problem definitions change as such projections are made. Normative and positive information define a problem while study of the problem yields more normative and positive information which redefines the problem in a repetitive, interactive and iterative or dialectic manner. In A.I.D. the Missions are in closest touch with LDC problems though the contact may not be close enough for various reasons. Sometimes contractors may be in closer touch with host country personnel, institutions and people than A.I.D. direct hire personnel. In Washington Regional Bureau personnel are likely to have closer contact with the agrarian problems of the LDCs than TAB personnel. Atthis point it is clear that the OAA's problem-solving systems capacity has to be located administratively so that it can interact, iteratively, with decision makers who are concerned with the problem. This raises questions about A.I.D. staffing and the use of IPAs, TDYs and contracts.

The Nigerian and Korean experiences and the other efforts we have examined have revealed the importance of a problem-solving approach in OAA. This has led to recognition (1) of the need to study <u>domains</u> of particular problems in their unique multidisciplinary complexity with emphasis on processes, and (2) of the inadequacy of any disciplinary or subject matter approach to OAA. We have arrived at the conclusion

that OAA must be eclectic and problem-oriented, which is the same as concluding that each problem to which OAA addresses itself should be handled in a systems context.

"Handling in a systems context" does not necessarily mean computerized modeling. The essential meaning is that the domain of a specific problem is to be studied in its particular multidisciplinary complexity with due attention to time and process. Such an approach will utilize disciplinary theories, techniques and descriptive information eclecticly or as appropriate for the problem at hand. Any systematic approach involves some sort of model more or less formal and more or less explicit. Models can range all the way from a vague almost intuitive eclectic conception of the multidisciplinary domain of a problem to a highly quantified model of the same domain expressed in a special computer language. The product can range from a vague perception of the consequences of actions over time thru paper and pencil, desk calculator projections to sophisticated computer output. Since recorded history, private, civil and military decision makers have based their decisions on the output of such eclectic multidisciplinary models. Non-eclectic models dogmatically specialized on the theories, techniques and descriptive known of disciplines typically encounter credibility gaps with decision makers who quickly detect their weaknesses of omission. Great skill is required in defining problems and in investigating the multidisciplinary processes of their domains interactively and iteratively.

The making of projections with paper and pencil is very time-consuming and expensive. A.I.D. and the host LDC countries do not have command over enough personnel to do the amount of "paper and pencil, desk calculator" work required to support OAA. Further, it is doubtful if the cost of doing the work by non-computerized methods can be covered; however, computerization would encounter severe personnel problems. While A.I.D., its contractors and the LDC countries probably have enough personnel to do the job if computers are used for the larger more complex problems, existing personnel would require considerable retraining as well as reorientation. Presently, a high proportion has a disciplinary or subject matter orientation inimical to an eclectic, problem-dominated approach. This is particularly true of both the younger people (scarce in A.I.D.) and of older non-administrative types.

Among the younger people we find mainly disciplinarians and subject matter specialists with new degrees, little contact with problems, and little problem-solving experience. Even the systems scientists among them are poorly equipped to model the multidisciplinary domains of real world problems because they are so inexperienced.

Among the older administrative types are a high proportion who are eclectic enough for problem oriented work; however, few of these have either the disciplinary or the technical competence to do general, systems-science simulation work. Further, many of the older administrative types are probably unwilling to leave their administrative slots to work on problems. What is true of A.I.D. personnel is also true of the disciplinarians, administrators and subject matter specialists of potential academic and non-academic contractors. If this is an accurate assessment of personnel available, it suggests the need for a training program for A.I.D., LDC and IPA or contractor personnel. Such a training program should contain short courses for administrators, disciplinarians and subject matter specialists in addition to a substantial year-long training program for persons to actually do systems modeling. How such training should be financed with A.I.D. has been long discussed but not solved within TAB.

The state of the systems simulation approach to problem solving needs to be discussed briefly. Substantial progress has been made on several fronts; however, capacity to model large, complex problem domains is just now being established. Though results have been attained which are better and cheaper than previously attained, very great further improvements are feasible and attainable. Particularly needed is emphasis on <u>linking</u> components dealing with different phenomena and based on different theories, techniques and information together into models of the specific domains of particular problems. The payoff here is likely to be very high as individual disciplines and subject matter specialists are rapidly developing specialized components

involving energy, diffusion, water, eco-systems, bio-design, food chains, demographic processes, pesticides, waste disposal, etc. Other progress is being made on RLP, I/O, PERT, B/C components. OAA's ability to exploit a problem-oriented, systems approach would be increased if:

1. Conferences could be sponsored to bring together those who are making progress in different disciplines and fields with different theories and techniques to model different phenomena.
2. The documentation on different components could be made readily available to OAA workers through a readily available soft ware library.
3. Data banks could be established.

TAB has supported some soft ware library work and has supported many sector analysis conferences. In general, TAB seems to be well adapted, if it has the will and the means,to support OAA with conferences, soft ware library and data banks.

The second paragraph of this paper asked whether OAA was "a feasible way of getting A.I.D.'s agricultural effort focused in on the needs of host countries or just a gimmick around which A.I.D.'s efforts will be reorganized without impact on their effectiveness abroad." The answer is favorable if.... The ifs are stated below:

1. If disciplinary and subject matter tendencies to avoid or neglect problems can be overcome.
2. If the tendencies of A.I.D. to reorganize and restructure so as to survive can be replaced by a <u>will to define problems of the LDCs</u> and to earn resources by solving those problems.

3. If A.I.D./Washington, A.I.D. Missions, A.I.D. contractors and host country skills can be upgraded with respect to:
    a. problem defining;
    b. systems analysis covering the continuum:
        1. from qualitative perceptions of consequences of alternative actions over time;
        2. through paper and pencil, desk calculator projections;
        3. to rather fully computerized, formal systems analyses.
4. If model components can be assembled from disciplines and subject matter areas relevant to OAA, linkages developed among such components, and if such components and linkages can be made readily available to OAA workers from a well documented software library.