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9. ABSTRACT

A review of the issues and literature concerning the disadvantages of food aid, with India as a model. The principal argument against it is that food aid lowers domestic food prices, does not encourage adequate agricultural policies and thus, decreases domestic food production. Those arguments in favor of food aid are that it: 1) feeds the hungry and helps to restrain price increases; 2) provides financing for various governmental development projects; 3) builds up food stocks; and 4) eases restrained growth of production and employment. Conclusions drawn from this discussion are that financial aid is preferable to food aid, but that particular need should be determined on an individual basis.

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**Food Aid:
Disincentive Effects
and
Their Policy Implications**

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AID DISCUSSION PAPERS

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Food Aid: Disincentive Effects and Their
Policy Implications

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* At the time this article was written Paul Isenman, who is with the Agency for International Development, was a Visiting Fellow at the Institute of Development Studies, where H. W. Singer is a Professorial Fellow. The article draws in part on the personal involvement of both authors in food aid programs. We would like to thank the academic analysts and aid "practitioners" (including, particularly, John P. Lewis, Edwin Martin, John Mellor, Roger Sandilands, Paul Streeten and John White) who have assisted us through discussion of the issues raised here and through comments on earlier drafts. However, they (and A.I.D.) bear no responsibility for the views expressed or for any remaining errors. This paper is scheduled to appear in the July 1976 issue of Economic Development and Cultural Change.

October, 1975

FOOD AID: DISINCENTIVE EFFECTS AND THEIR POLICY IMPLICATIONS

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I. Introduction and Purposes of Food Aid

Food in the present situation can be considered as one of the world's limited, scarce, and vital natural resources, such as the atmosphere, or for that matter, oil. There is general agreement that in the interests of mankind as a whole, access to such scarce resources vital for a country's existence should be more equitably shared, and, specifically, should not be dependent only on the market, which allocates according to current purchasing power. In the case of food, animal feeds bid away land, fertilizer, and even grains from the needs of the poor for the grains themselves. We are all concerned that the poorest countries need special help in the circumstances created by the rise in oil prices. The case of food is in many ways even clearer: food aid appears to be an obvious mechanism by which scarce and vital supplies can be allocated outside the normal market mechanism to help meet this basic human need.

However, there is also general agreement that the long-run answer to food shortages in the poor countries must be sought in expanded food production in the poor countries themselves, and in employment and income distribution policies which provide sufficient incomes for the poor to be able to buy enough food. There is sufficient concern about the possible harmful effects of food aid on domestic food production that many economists recommend less or no food aid (other than, perhaps, for emergencies) even in the countries where nutritional and other human needs are strongest. It is the purpose of this article to review some of the analytic issues and literature relevant to this concern about the disincentive effects and risks of food aid, which we have found to be strongly held by agricultural economists and aid "practitioners", and which we share.^{1/} To make the discussion more specific, reference will be made to the experience of food aid in India. The Indian case is useful, not because India is at all a "typical" recipient of food aid, but because it received the largest historical share up to 1971. It is most often cited for negative effects of food aid, has been studied by a number of analysts, and raises most of the relevant economic and political issues.

Briefly, the disincentive argument is that the increase in food supplies provided by food aid depresses prices received by farmers and causes or supports inadequate agricultural policies by recipients, which together lead to decreases in food production. The recent stress on the need for employment and more equal income distribution, with its attendant stress on agriculture and rural development, has thus served to sharpen the criticism of food aid, which is said to interfere with these objectives. The major economic issues relevant to the disincentive effect were set out in the literature fifteen years ago.^{2/} What have changed in the past fifteen years are the perceptions of relative importance of the disincentive set of issues in comparison with the 'other benefits' set of issues. Schultz stated in 1960 that: "In all of the hearings before U.S. Congressional Committees and statements and reports of the executive branches I have found no serious consid-

ration of this aspect (the disincentive effect) of PL 480 (American food aid) operations."^{3/}

On the other hand, it is surprising how many studies and policy discussions either dismiss or miss entirely the direct purposes of food aid, as if food aid were to be judged solely on the basis of its contribution to food production. Before turning to consideration of the disincentive effect, it is worth briefly reviewing what these other (somewhat overlapping) purposes are. First, food aid provides food for the hungry, both by direct subsidized distribution, often concentrated on nutritionally vulnerable groups such as children, and by helping to contain price increases, which tend to hit the nutritionally vulnerable groups the hardest. Second, it provides financing for specific government development projects, some in agriculture and rural development and some in other sectors. Again this could occur either directly, as in "food-for-work" projects, or indirectly as in the Pakistan rural public works program. Third, it can be used to build up food stocks, which, while quite expensive, can contribute to both consumer and producer welfare by reducing price fluctuation and uncertainties.^{4/} Fourth, it eases a major constraint on growth in output and employment.^{5/}

The fourth, which is quite important, often tends to be neglected. In lower-income densely-populated countries food, along with foreign exchange, tends to be a major constraint on the pace of development. Two-thirds or even more of workers' incomes go for food in these countries, most of it for food grains.^{6/} From a Finance or Planning Minister's point of view, increments to public or private employment, through fiscal or monetary policy, must be measured against available food supplies, in many ways as if the whole economy consisted of a public sector food-for-work program in which all workers were paid two-thirds of their wages in food. So not only does food aid permit recipients to expand employment, but the high proportion of workers' incomes which go for food grains means that farm prices need not suffer from food aid in the short run and can benefit from food aid in the longer run because of dynamic effects on savings and income. A useful way to visualize the importance of the food constraint is to imagine that the developed-country worker spent two-thirds of his wages on oil products and then to consider what a limit this would put on growth in employment.

In explaining the purpose of food aid in India, Rath and Patwardhan say, "Prices of food grains were vital to the success of the plans of economic development which India had launched . . . The purpose of PL 480 imports was not only to prevent . . . sharp fluctuations in price of cereals, but also to check any excess pressure of the general inflationary forces on prices of cereals, which might arise due to the slower rate of increase in production of cereals than of other commodities in the economy."^{7/}

What the above suggests is that in food-short countries a sizeable proportion of total development aid can often be in the form of food aid without a significant cost in the efficiency of aid or in incentives

for domestic agriculture. The optimal proportion of food aid for any given country at a given time will depend on a variety of factors including: the demand and supply factors relevant to the disincentive effect (discussed below); food grain supply and price prospects; availability of export earnings to finance needed complementary imports; the existence of "slack" resources in the economy, whether underemployed (or low-productivity) labor, underutilized industrial capacity or untapped potential savings; the extent to which the recipient government would in fact use foreign exchange to import food in the absence of food aid, and the overall availability of food and non-food aid for allocation.^{8/} With the exception of the last two, these questions are also the same that should be asked by a government planning its total food import program.

The four domestic uses of food aid discussed above all flow from the role of food aid in adding to a recipient country's import capacity. Since food aid is tied to a specific set of commodities, and often to specific internal uses, it is less valuable to the recipient in carrying out its development strategy than an equal volume of aid not so restricted, except where the commodities imported and specified domestic uses correspond to what the recipient would have done with unrestricted aid. For this reason we favor relatively unrestricted forms of financial aid over food aid, even where there is no danger of a disincentive effect. It would be preferable to let the recipient then choose the balance between food and non-food imports. However, what makes food aid a subject worth special consideration is that it is partly additional, so that a \$1 increase in food aid would lead to a less than \$1 decrease in non-food aid. Food aid is unlikely to be as fully additional as it was in the past, when the U.S. and other donor nations had large long-term surpluses, built up because of domestic agricultural policies, which had a real cost far below both the nominal value of the food aid provided and its somewhat lower world market value. However, there are still a number of factors which make food aid likely to remain at least partly additional.

These include a feeling among the general public and legislatures in donor countries that, as the DAC put it, "feeding the destitute, avoiding starvation and improving the nutritional standards in developing countries should have priority as a form of development cooperation."^{9/} The political importance of farmers, who benefit from the increased demand caused by food aid, also adds to the political attractiveness of food aid. Thus, there is likely to be domestic political support for production of food specifically for food aid even when there are no overall surpluses in donor countries in some years (but not in most or all years, as in the past), either as a result of farm-income support programmes or of unexpected shifts in supply (from weather or disease effects in either major exporter or importer nations) or demand (e.g., reduced demand for animal feeds in either "market" or centrally-planned economies). Given the relatively high capital costs of food storage and the uncertainties of future prices the "shadow price" of food aid could

decline in many years even though the long-term trend is one of rising relative food grain prices. There were already signs (as of the first half of 1975) that grain prices were declining sharply, much earlier than expected. Thus, we expect food aid from major donors (including the EEC, taken as a whole) to remain at least partly additional, although this may not be true for particular bilateral donors.^{10/}

II. Effects of Food Aid on Agricultural Production

A. Price Effects

To evaluate the net effect of food aid on domestic food production we need to consider its effects on the price of food and on government policies. The price effect depends on several factors: the amount of food aid to be provided in relation to total production; the additional demand that will be created through specific projects, programmes (such as subsidized food distribution) and fiscal or monetary expansion; changes in relevant crop and input prices; the relationship of the previous points to food prices (using the price elasticity of demand); and the effect of the resultant change in food prices on food production (using the price elasticity of supply). It is preferable to estimate these effects through a multi-equation econometric model, since some of the independent variables affecting food production and demand also affect each other over time. However, this is far easier said than done. Problems include: the time and expense involved for a series of country studies; the lack in many countries of reliable data for relevant variables; the danger of leaving out or mis-specifying relevant variables or relationships (as indicated in the following discussion of the example of India); and changes in agricultural technologies or in government policies (such as price supports) which reduce the validity of conclusions drawn from analyses of past data.

These problems do not necessarily disappear when a 'common-sense' approach, based on qualitative and rough quantitative analysis of a few variables, is used instead; rather - as is also apparent from some of the analyses of the effect of food aid in India - they can easily become buried, causing hidden distortion in the results. On the other hand, in some circumstances a 'common-sense' approach does provide a feasible way to handle some of these problems and to allow for political and other factors difficult to include in models. Ideally, a combination of the econometric and common sense approaches would be desirable, at least for major food aid recipients.

The evidence that price is important to agricultural production - that farmers respond positively to price incentives - is by now well known and convincing. Thus, any significant price declines caused by food aid must be taken seriously. However, to say that prices need to be high enough to provide strong incentives for increased

production is not to say that "higher is better" or that price is necessarily the key constraint on output in a given situation. As Mellor points out, while the supply response to price changes is positive, it tends to be quite low (e.g. between 0.1 and 0.2) in land scarce countries, because of the relatively inelastic supply of land and consequent diminishing returns to other inputs (and increasing marginal costs).^{11/}

The price elasticity of supply for a given country will vary over time, depending on a number of factors, including: the technology (particularly whether it is responsive to fertilizer and other current input); other constraints on production (e.g. the timely availability of inputs); weather; and price (e.g. when prices are already at severe shortage levels, as is apparently the case in Bangladesh, relatively little price response would be expected). One must balance the needs of actual and potential surplus farmers against those of consumers, and of other under-funded sectors, against the detrimental effects of rapid food price increases on employment, and against any detrimental effects on income distribution, if larger farmers provide most of the marketed surplus of food grains. (This underlines the importance of land reform, so that growth and distribution objectives become more complementary).

For example, there is an economically and politically valid need for government distribution programs to ameliorate shortages in the cities and, at the very least, to prevent starvation in the countryside in bad years. In many or most countries there are severe political constraints on taxes or other budgetary resources, particularly in shortage years, which can be tapped for food distribution programs. Some of the literature on food aid and on pricing policy is thus somewhat cavalier in recommending something quite close to farmer incentive (price) maximization per se, with little consideration of what will be the likely increase in output (price elasticity of supply) and likely human and economic costs. Hence, in some circumstances, higher food prices may not be desirable. We hope that readers will not misinterpret the above as meaning that we favor low food grain prices. In fact we strongly favor incentive prices to farmers and believe that in developing countries farm prices have tended to be too low, but we would argue for the substitution of careful analysis of particular price situations for the rigid price "fundamentalism" that one sometimes encounters.

In Annex A we review some of the data and literature on the price and resultant production effects of food aid on food grain production in India. Because the conclusions that we reach are quite different from generally accepted thinking on this subject we have thought it desirable to devote some space, in a separate Annex, to such a review. To summarize (regrettably omitting desirable explanations and qualifications), we found that food aid did cause a decline in relative food grain prices, but only during a fairly short part (1960-1962) of the food aid period (1956-1971).

The depressing effect on prices was much less than some analysts had expected, partly because the food aid was used to increase government food distribution which, being subsidized, added to net food grain demand. The supply of food grains appeared to be responsive to price changes, but not strongly (i.e. the price elasticity of supply was positive but low, about 0.15). The most comprehensive available study (by Rogers, Srivastava and Heady in 1972) found the net loss in domestic production to be only 3 percent of the food aid provided.^{12/} The results of their multi-equation model appear to be consistent with our much less sophisticated look at the weather corrected output data for the period of low relative food grain prices. But even the study by Rogers et al ignored the dynamic effect of the food aid on growth in output and employment and, hence, on demand for food grains in subsequent periods. In fact food aid appears to have played a major supply and "insurance" role in the investment and output boom of the first half of the 1960's, which was important in itself and which generated substantial increases in food grain demand. Our conclusion is that while use of large-scale food aid should have been phased in more gradually in some years, by stockpiling more and distributing less, the short-term price effect on food production was very limited; the medium-term income and price effect on food production (taking account of the effect of food aid on growth) was probably positive; and the medium-term effect on overall output, employment and nutrition (as distinct from food grain production only) was strongly positive.

This is not at all to say that in other circumstances food aid could not, or did not, have a significant price disincentive effect on domestic production. For example, a recent article by Dudley and Sandilands discusses the rather extreme case of Colombia, where wheat imported under food aid and from commercial sources (but at a subsidized price, because of an overvalued exchange rate) rose from about 50 percent to about 90 percent of total wheat consumption from 1953 to 1971. The government support price for wheat declined by about half (in constant prices) over this period. Wheat production, concentrated in high-cost production areas, declined very sharply, to about a third of its initial level. We have a number of questions about the analysis and interpretation of this study, which assumes implicitly that if wheat imports were excessive, it was food aid and not commercial imports which should (or would) have been cut.^{13/} Since food aid accounted for only about one-third of total wheat imports, we find the title "The Side Effects of Foreign (Food) Aid" somewhat misleading. However, we do not question the basic relationship between wheat imports, farm prices and production. Indeed, not to have had a sharp decline in wheat production under such circumstances would have required a minor economic miracle.

B. Policy Effects

Even if food aid does not have a significant disincentive effect on food prices, it could still have a significant disincentive effect on the overall agricultural policies of the recipient government.

This might be apparent as a relative neglect of agriculture in regard to other sectors; in continuation of policies which did not provide adequate encouragement or support to farmers; in an unwillingness to take politically difficult steps such as land reform; or in lower farm support prices (although this should show up in an analysis of price effects). In India, although a good deal of money and policy effort was also expended on agriculture, there can be little disagreement that the strategy of the Second and Third Indian Five-Year Plans was focused on import-substituting industry, particularly heavy industry. Food aid supported and facilitated this strategy, particularly by enabling the Indian government to maintain large subsidized distribution programs, while in the eyes of many analysts not adequately addressing some basic questions of food grain production and distribution.

However, one should distinguish between criticism of the policy effects of aid and criticism of policies supported by aid but caused by political and economic factors far more powerful than aid. In the latter case there are questions whether reduction or withdrawal of the food aid would have improved the "erroneous" strategy or would merely have made its implementation less efficient and slowed development. There are also questions arising from current beliefs, in donor as well as recipient countries, about the proper role of donors on questions of basic development strategies.

In the Indian case the evidence is clear that the political and economic factors which caused the preference for heavy industry over agriculture were far more powerful than food aid which, at most, played a supportive role. In the eyes of Indian political leaders (and many leading analysts outside India) the association of industrialization with such things as modernity, greater political and military independence, increases in savings rates, and improvements in human capital, combined with an uncertainty of how Indian agriculture could best be developed and of whether food supply was (meaningfully) responsive to price incentives, greatly overshadowed the role of food aid in the formulation of Indian economic strategy (as set out in the Second and Third Five-Year Plans).^{14/} In our judgement, had there been much less food aid, growth in government expenditure and in non-agricultural output and employment would clearly have been lower, but this would hardly have been desirable if, as is likely, the basic strategy had not been changed.

We do think that up to 1965 food aid may well have had a negative effect on particular steps which might have been taken within the overall Indian development strategy to strengthen agriculture, for instance, by reducing the pressure to keep up adequate supplies of imported fertilizer. However, much of this effect (including, particularly, shortages of imported inputs as well as price policy itself) should have been reflected in the price and supply effects discussed earlier; if food aid caused both prices to decline and less fertilizer to be imported, the effect of the fertilizer shortage should have

been an (apparent) increase in the observed price elasticity of supply. As we saw, the effect on domestic production was apparently extremely small (and, taking account of demand derived from the growth effect of the food aid in the longer run, was probably positive). Also the effect of food aid on the government's agriculture budget was probably positive, because of its direct and indirect (growth-inducing) effects on overall government development expenditures. The effect on agriculture's share of budget expenditure would depend on how strongly India would have been committed to its public sector industrialization strategy in the absence of food aid.

After two successive serious droughts in 1965 and 1966, there was a reorientation of priorities towards agriculture, assisted also by growing disillusionment about the primacy of heavy industry in the development process, by the availability of the new high-yielding wheat varieties, and by food aid. Food aid provided sufficient security for the government's "buffer stock" and distribution programs so that the risk of eliminating the disincentive-causing restrictions on grain marketing in surplus areas, which had been imposed to enable the government to buy cheaper grain for subsidized distribution programs, was greatly reduced.^{15/} In addition, the agreements for American food aid contained a number of commitments for expansion and improvement of agricultural programs, within the Indian government's own targets and plans. There was, however, a great deal of political resentment within India about U.S. food aid, partly because dependence on the U.S. for food appeared to undermine India's political and economic autonomy and its sense of self-reliance, and partly because of President Johnson's "short-tether" policy, under which much needed food aid shipments were delayed in order to put pressure on India, apparently for a combination of developmental and political motives.^{16/} In spite of (indeed, partly because of) this resentment, there were redoubled efforts to emphasize and encourage agriculture, with a goal of dispensing with food aid. This goal was substantially achieved in 1972, although reverses in production since then have meant that India is still far from self-sufficient in food grains.

For the future, India clearly must give primary emphasis to agricultural production so as to be able to feed its people and to stimulate its development. As Lipton put it, "neglect of agriculture is a recipe for slow industrial growth."^{17/} However, as the recently published Redistribution with Growth, which focusses heavily on agriculture and rural development, points out, because of the very high man-land ratio in South Asia, job creation in the long-run must necessarily be concentrated outside farming.^{18/} While agriculture must and can absorb a great deal more labor, this re-emphasizes that in the long-run there must be a delicate balance between optimal producer incentives and optimal prices of food grains, or, more broadly, that neither agriculture nor industry (nor population control, etc.) is the sole key to development.

This abbreviated and simplified summary of Indian experience does not prove, but serves as an illustrative backdrop for, several more general points regarding food aid. Food aid can be used to support both "good" and "bad" agricultural policies. It would be quite unrealistic for either critics or proponents of food aid (or other forms of aid) to take it for granted that whether food aid supports inadequate or adequate policies it is necessarily a major or determining cause of such policies. Where there are competing powerful forces within a recipient government on questions of agricultural policy, donors could conceivably throw the "leverage" of their aid behind the group whose policies they prefer, but intervention by donors in the political process by which key domestic policy issues are decided can have quite high political costs for donor-recipient relations, very often does not succeed, and in some cases is likely to backfire and make the policy changes the donors support politically far more difficult to implement.

If a country has a strong commitment to agriculture and the political will and sound policies to carry out that commitment, then it is likely to use the food aid in a way that supports its agricultural development effort. As illustrated by the example of the Indian "buffer stocks", this need not always be an increase in immediate food grain consumption. If there is no such commitment, then food aid will be used to further whatever alternative economic objectives the government has (e.g. the promotion of industry at the expense of agriculture).

C. Project vs. Program Assistance

It follows from the points above and from the general fungibility of projects^{19/} that the donor often has little to gain (other than the presentational benefits of having a specific project to demonstrate the effect of its aid) from insisting on using food aid to finance projects when the recipient would prefer the food aid in "program" (or "non-project") form. (We use "project" here in a fairly broad sense, to cover all situations where the donor's aid is tied to specific activities, whether through provision of food per se, as in food-for-work programs, or through provision of "counterpart" funds generated from the food aid). As Singer et al and Sen pointed out over a decade ago, food aid in program form can make a more effective contribution to the recipient's development objectives than aid tied to projects.^{20/} For example, project tying may foreclose opportunities for expansion of poverty focussed programs in agriculture or other sectors or expansion of employment by easing bank credit limitations. Sen points to the problems and inefficiencies which can occur when donors support non-fungible projects which cause distortions in recipient's development plans or which are unlikely to be continued by the recipient when the aid (for that project) is phased out.

Such general principles must, of course, be tempered to take account of the complexities of the 'real world'. Countries cannot be divided neatly into "good" and "bad" on the basis of policy performance; most fall somewhere in between. There are a number of steps donors can take to foresee and prevent likely disincentive effects of food. The first step should be a case by case analysis of the situation and policies of major recipients of food aid, looking, inter alia, at the complex of factors discussed above. Problems, and feasible solutions, will vary considerably among countries and within countries over time. Fortunately, thinking among recipients and donors on the role of agricultural development has changed a good deal since the period a decade ago on which much of the current criticisms of disincentive effects are based. Also, the sparseness of the world food supply during 1973/1974 has made recipient countries well aware that they cannot count on large scale food aid in times of shortage, but must rely instead on their own food production (and to a limited extent on commercial food imports). It would be quite reasonable for donors and recipients to discuss mutual concerns about possible disincentive effects of large food aid programs and what might be done about them. There may be advantages in carrying out such discussions under the aegis of a multilateral agency or a multi-donor consultative group, rather than on a bilateral basis.

In some circumstances, where donors lack confidence in a recipient's overall agricultural policies, channelling food aid through specific projects may help address disincentive problems. While projects are far more fungible than first appearances would suggest, they are often seen as less than fully fungible from the recipient's point of view. Where necessary, there are steps the donor can take to increase the odds that the projects it funds will in fact be additional, such as fairly active participation by donor or voluntary agency staff in project selection and design. Some governments may welcome, or at least not object to, receiving food aid in project form.^{21/} Projects also offer a way for both recipients and donors to assure that the benefits are directed toward specific disadvantaged groups.

Food aid in project form can be particularly helpful where it is desired to direct the food aid to support of agricultural production. The food aid may be used, for example, to build up food stocks, as part of a plan to expand the overall agriculture budget, or to support labor-intensive rural infrastructure projects. Sen's point, noted above, about sticking to activities that are regarded as of high priority by the recipient government, must be kept in mind. There are many circumstances where the best use of additional food or other resources is not, for example, in rural public works programs, but perhaps in health, education, or support for labor-intensive industry.

There are also possibilities for compromise between the program and project approaches. Food aid to build up recipient stocks would fall in this category. The 1974 DAC annual report notes that "even the UN World Food Program, which has previously had a strong orientation toward financing specific projects, is considering a gradual move toward a multiproject approach; it has also considered the 'program approach'. . ." 22/

D. Implications for Food Aid Allocations

Where food aid is considered likely to have a significant disincentive effect which cannot be eliminated - generally where overall agricultural policies are considered to be weak - donors can adjust the mix between food aid and non-food aid or, if necessary, cut back on food aid without offsetting increases in other aid. The likely world market shortages and high prices of food in many or most future years, in comparison with the general surplus situation in the 1960's, mean that donors need to be increasingly concerned about the allocation of food aid. There are several reasons, though, why donors should be cautious in emphasizing agricultural "performance" criteria in the allocation process. First, to go as far as adjusting annual allocations on the basis of "performance" would cause friction between donor and recipient which would (as in the case of donor attempts to use "leverage" to force major policy changes) be counterproductive for political relations and might well either not work or even backfire. Second, donor judgements may be incorrect, particularly if not based on detailed studies of relevant economic, social and political factors. Also, such judgements, quite properly, tend to change over time. The same big-farmer strategy that looked like an efficient tough-minded approach to some donors ten years ago may look inefficient, as well as inequitable, to them today. Third, it would not only ignore the other benefits of food but would conflict with what should be the underlying allocation criteria for food aid-poverty, shortage of food, and shortage of foreign exchange to import food commercially. It would be unfortunate if "performance" criteria were inadvertently to introduce a bias towards countries which, on the basis of income and food availability, needed it the least. In essence, a moderate standard of "performance" should be considered as a condition for receiving food aid (other than that directed essentially to immediate humanitarian purposes) but not as a substitute for other allocation criteria.

Similarly, a recipient's ability to develop good food aid projects should not per se be a significant criterion of inter-country allocations, since higher-income countries tend to be more skilled at project design and presentation. Even where higher-income developing countries without aggregate food shortages submit projects for food aid financing that specifically address the needs of low income groups, preference should be given, in allocation of the aid and especially of donor assistance in project preparation,

to countries with low income and food shortages. This is not at all to say that serious attention should not be paid to project design and appraisal. For example, unless the food aid supply position improves drastically, a repetition of past donor-funded projects, which provided cereal grains for subsidized animal feeds (used to produce foods consumed primarily by high income consumers), should be no more acceptable for a very poor country than for a middle income country.

One further step which donors can take in the allocation process is to be particularly sensitive to potential conflicts between development objectives of food aid and other objectives, whether commercial (e.g. surplus disposal), political or even humanitarian. While "bad" donor motives can produce "good" development results (and vice versa), the stronger the emphasis on non-development objectives, the more risk there is that conflicts with recipient production incentives will arise and that insufficient attention will be paid to them 23/.

We have seen that the disincentive risk of food aid is far more complex, and location and time specific, than some analyses have suggested. Even where there is an observed or likely disincentive effect, food aid should not necessarily be reduced until these costs are weighed against the employment, nutritional, export or other benefits. 24/ Food production is so important that very heavy weight should be given to it, but to ask only "is there a (risk of a) disincentive effect?" is to consider any drop in food production to be an infinite cost and to ignore entirely other benefits. One should hesitate before concluding, implicitly, that shifts from grain to non-food crops should never be encouraged or that the people of a given country are better off with, in effect, no loaf rather than, say, two-thirds of a loaf (even assuming that the reduction in domestic production was as high as one-third of the food aid provided). Similarly, food aid policies (relating, for example, to its volume or stability) should not be determined merely on the basis of an assumed disincentive effect, without consideration 25/ of the costs to other objectives such as employment creation.

Donors who are concerned about disincentive effects of food aid should be willing to provide non-food aid to assist recipients in easing the constraints on agricultural production. This means, for example, relaxing regulations on tying or local cost financing in order to provide what small farmers require, diverting fertilizer from developed countries during times of shortage, and support for major land reform (which, as increasingly recognized today, implies a realignment of local and perhaps national political power, and not just passing laws and setting up institutions). Assisting in relieving constraints on agriculture should not mean donor insistence on specific other agricultural assistance as the "price" for food aid, or on projects directly associated with agricultural assistance. 26/

E. Food Aid and the Neo-Malthusians

Some critics have argued that in India and elsewhere food aid will lead to more rapid growth of population, more strain on scarce local and world resources, and ultimately to more starvation. While detailed consideration of this criticism goes well beyond the scope of this paper, there is general agreement among demographers and other social scientists studying the determinants of family size that this view, which provides an apparent moral rationale for the denial for food aid, is demographically unsound. Family size is affected by a number of socio-cultural factors and is by no means as irrational or as biologically determined as many have thought in the past. In very poor countries children, who become net positive economic assets at a young age, are the insurance against a disastrous reduction in family earnings through disability or old age. Contrary to the Malthusian view, birth rates among the poor go down, not up, as their standard of living (which in the poorest countries means initially their standard of eating) rises.^{27/} While the development process leads to a transition period of sharply lower death rates before birth rates fall, and while the determinants of the pace of this transition are not yet fully understood, the sooner and faster the death rate declines the sooner and faster the birth rate will decline. If the donor nations were to withhold food during times of near famine, as some neo-Malthusians have actually suggested, the net effect would not only be human misery but an increased economic rationale for poor families to take out more insurance by having more children.

Similarly, if less dramatically, where food aid can make a positive contribution to employment, nutrition, or other aspects of the development process, then holding it up on grounds of concern about population growth will lead to a slower demographic transition and a higher growth and long-run level of population. This applies whether or not the country has an official, or effective, family planning program.

III. Comparable Disincentive Effects of Other Types of Aid

Most of the issues discussed above, of prices, policies, projects etc., are, with only minor modifications, relevant to all forms of aid, not just food aid. While the disincentive risks of non-food aid are more dispersed, and hence less readily apparent, all financial aid ultimately could (ceteris paribus) have theoretical negative effects on the prices of capital and foreign exchange and on savings and trade policies.^{28/} But, as the previous discussion of food aid has made clear, the ceteris paribus assumption is entirely hypothetical. For non-food aid, as for food aid, it is up to recipient and donor to ensure that any disincentive risk is offset by using the aid as a basis for additional output and employment. In our observation, this disincentive risk, while a

real one, can be handled in most cases and (as in the case of food aid) is far better appreciated by recipients and donors than was the case a decade or so ago. This observation obtains substantial support from recent contributions to the debate on the statistical effects of aid on savings and growth (discussed, in part, later in this paper). In any event, to single out food aid for criticism on disincentive grounds seems a case of the fallacy of misplaced concreteness.

A. Effects on Employment and Income Distribution

There are, of course, differences in the effects of food aid and other aid. On the one hand, the disincentives of food aid are felt in the food production sector, which is both vital and often relatively neglected. On the other hand, in several ways the distorting effects of food aid are more acceptable and have more useful side-effects than that of other forms of aid, when looking at the demand side rather than just the supply side. This point is clearly brought out when comparing food aid with non-food aid which results in the import of additional capital and intermediate goods, i.e. the usual and conventional case of aid designed to lead to increased investment. Where non-food aid reduces the price of capital and foreign exchange, there is an incentive for more capital-intensive and import-intensive methods of production. Where supplies of food are increased, and as a result food prices are lowered, it is possible to attain a given level of real wages at a lower level of money wages. Thus, an incentive for more labor-intensive methods of production or composition of output is given.²⁹ Also, unlike aid for capital equipment, food is not tied to the particular (generally highly capital-intensive) technologies embodied in equipment imported from developed countries. In the interests of employment policies, taking into account the bias towards capital-intensive technology inherent in the world distribution of R & D and in other prevailing policies of developing countries, it seems clear that the "distortion" introduced by food aid is in some respects less undesirable than that of conventional financial aid.

A related point is that the lowering of food prices is likely to benefit the poorer sections of the population, both urban and rural. In low-income areas, such as South Asia, not only landless labourers but also a large percentage of small farmers are in fact net buyers of food, using purchases from cash incomes to supplement their own production. And in times of shortage it is the most nutritionally vulnerable groups who suffer most in inter-family and intra-family food distribution. A lowering of the prices of capital goods, on the other hand, will improve the relative position of the upper-income groups. Hence food aid - assuming the same degree of "incentive" impact of food aid and financial aid - is likely to lead to more equal income distribution as well as to greater employment.

B. Differences in Standards Applied to Food and Non-Food Aid

Many economists appear, paradoxically, to view food aid and non-food aid from remarkably different perspectives. Most economists believe that aid recipients should use (non-food) aid receipts to increase investment, employment and output in accord with a well-thought-out development plan and/or the signals provided by market forces. They would be horrified if the aid were used instead for short-term consumption increases or for low priority development projects with an uncertain impact. Yet, paradoxically, because of a concern about disincentives and a lack of sufficient emphasis on how food aid can in fact add to employment and investment (and, perhaps, because of the particular association of food with basic human needs) many of these same economists urge that there be virtual requirement that food aid be used for short-term consumption increases or ad-hoc "additional" projects not included as top priority in development plans. At the same time, food aid is criticized because it "benefits consumption instead of investment." While it is inconsistent to insist, implicitly, that food aid not be used for investment and to criticize food aid for not contributing to investment, both of these views, each apparently reasonably derived from valid policy concerns, are well-established in the "conventional wisdom" of food aid.

The latter criticism will appear much less impressive now than it did ten or twenty years ago, in the great days of the "take-off" and the Harrod-Domar model (which is not to say that savings are not, or should not be considered, important). "Consumption", when it means, for example, improving nutritional levels of preschool children, may have a bigger impact on future output than a good deal of what is included under the accounting category of "investment", as might the alleviation of near-starvation among adults (apart from being desirable in themselves). However, it is the argument of this paper that the justification for food aid need not lie solely or primarily in such humanitarian "consumption" uses, but that food aid, balanced with non-food aid, contributes to increases in investment, employment and output.

There is also a rather paradoxical difference in the conventional views of the disincentive effects on recipient policy of food aid and non-food aid. The earlier discussion on India noted that there were a number of factors, apparently much more powerful than the effects of aid, which led to the Indian development strategy of, in the eyes of many Indian and other critics, overemphasis on heavy industry and underemphasis on agriculture. But non-food aid to India was far larger than food aid, and went primarily for support of industry (particularly because of the high proportion of "non-project" loans) and related physical infrastructure. Would it not be inconsistent to criticize food aid to India (or any country) on grounds that it lead to underemphasis on agriculture in relation to industry unless one were prepared to criticize the much larger volume of non-food aid that went directly and indirectly to support industry? 30/

Similarly, would it not be inconsistent to think that on the one hand recipients are sufficiently trustworthy to use (relatively) unrestricted forms of non-food aid responsibly but sufficiently untrustworthy that food aid should be minimized, or purposely made uncertain. And if recipients are not considered sufficiently trustworthy to use responsibly the relatively small proportion of their total investment resources they receive from food or non-food aid, then how much hope is there that they will use domestic resources responsibly or accomplish much in their development efforts?

C. Relationship to the Debate about the Effects of Aid on Savings and Growth

While full consideration of the relationship of food aid to the broader debate on the general effects of aid on savings and growth is well beyond the scope of this paper, there are a few points worth noting here.

1. Prices and Policies

A key question underlying the debate is whether duress leads to better policy decisions (in agriculture or other areas) than where there is some breathing space (whether provided from a country's own resources or from foreign assistance). This involves considerations of risk functions and of non-economic factors affecting decision-making. The experience of food aid discussed in this paper shows how in practice more aid can lead and has led to both better and worse policies and greater and lesser local food production, depending on the circumstances.

A given analyst's judgements on such questions are likely to be influenced by his views of human nature, essentially by whether he sees people, or countries, responding better to "carrots" or to "sticks". Roughly analogous arguments have arisen over a number of other questions in the past; e.g., whether efforts to help the poor within a given country will rob them of the initiative to undertake required self-help efforts. Prevailing views on such questions have changed considerably over the past century or so, because past "models" of behavior are now recognized as being incomplete in their understanding of the variety of factors that affect individual "initiative" and "self-help".

Similarly, a conceptual model which looks at "price" or "pressure-reducing" effects of food or other aid alone, and does not consider risk, as well as the range of other relevant policy, political, and other factors, is "misspecified" and is likely to yield misleading conclusions. This is a particular problem for the several studies which analyze somewhat disembodied sets of cross-section or time-series data without looking behind the data to see what specific policies or circumstances have produced extreme values which weigh heavily in least-squares regressions.

Crises, and, to a lesser extent, more gradual adversity often induce major changes in technologies, policies and political systems. However, (as the history of Europe between the two World Wars demonstrates) these are not always changes for the better. In the case of food grain policy, such steps as enforced sales of food to the government at low prices appear to be rational risk-minimizing responses for a government intent on helping to keep up minimum food supplies in the short term to those with low purchasing power. Also, crises created by the purposeful withholding of food or other aid in times of need might produce less positive responses than crises caused by more impersonal economic problems or by the forces of nature.

While there are no conclusive studies available to resolve this point, there is some qualitative evidence that provision of, or advance commitment of, aid tends to produce better results than the denial of aid. Consider, for example, the circumstances surrounding the acceleration of economic growth in Korea and Taiwan.^{31/} In a book devoted primarily to criticism of the effects of food aid in India, Shenoy points to a series of steps taken in the past few years, in response to a worsening food supply situation but in the absence of significant amounts of food assistance, which have apparently reduced farmer incentives significantly. The reimposition of the wheat "zones" is a striking example.^{32/} (In a country as large and complex as India counter-examples can be offered to any proposition, but if Shenoy's past criticisms of the effect of food aid on food policy had been validated, one would not expect the relative deterioration of policy by Shenoy's own standards as the "crutch" of food aid was eliminated.)

2. Statistical Relationships Among Aid, Savings, and Growth

While the debate in the literature is unlikely ever to be "resolved", a recent article by Stoneman on the effect of aid on growth and savings has subjected the work of Papanek (who had criticized a series of articles which found a significant disincentive effect) to a searching criticism and re-estimation which, nevertheless, strongly confirmed Papanek's major conclusions particularly that aid contributes positively and strongly to growth, with a higher productivity than that of domestic savings.^{33/} Although not all aid is in fact saved, the percentage of aid saved must be quite high, and the return from aid invested must be more than high enough to compensate for the aid used for consumption.^{34/} Thus, although we have stated that the disincentive risk of food aid was about the same as that of other aid, this should not be interpreted as an argument against all aid. Food aid, with its visible effect on consumption, appears particularly vulnerable to the argument that aid loans reduce domestic savings (and thus future growth) because part of the loans finance consumption but all of the loans must be paid back. However, it appears to us that the underlying principles of incremental analysis suggest that the consumption arising from a loan should be charged

not to existing savings but to the loan itself.^{35/} Domestic savings would be affected (reduced) only to the extent that (on a present value basis) the loan did not yield enough to finance its repayments.^{36/} This would appear to be unlikely. Even if Stoneman's and Papanek's findings of exceptionally high returns to aid were not to apply to food aid, the "grant element" (the weighted sum of loan and grant) in food aid is quite high, probably not too far below the 87 percent grant element for all DAC aid in 1973. As Papanek notes, the portion of loans that result in investment need only be as high (ceteris paribus) as one minus the grant element for a loan not to cause a decline in domestic savings (even assuming the portion invested will yield the average return of savings, not the higher return of aid).^{37/} In addition to repayment, internal transport, storage and distribution costs must also be covered. On the other hand, as in the case of other loan aid, the repayment burden is eased by inflation and, in many cases, debt relief, or at least estimation of aid "requirements" on a net basis (i.e., when the WorldBank or other donors estimate aid requirements for a given level of growth, allowance is made for funds required to service existing aid and other loans). This is not to say that many countries do not face serious debt-service problems today, due to a variety of factors including unfavorable trade balances, the hardness of terms of some past aid and of supplier credits, and inadequate new aid flows.

More important, as discussed earlier, food aid can produce a substantial contribution to output and employment and to human-capital formation. In addition, incremental food "consumption" by the poor and hungry may in some circumstances have a high social value (i.e., in benefit-cost terms it should have a welfare weighting of more than one), and it may be socially optimal to use a part or all of a given food aid loan for this purpose. That portion of food aid which substitutes for what would or optimally should have been imported from other sources (including the free exchange equivalent of the food aid) would be expected to have as high a return as found by Papanek and Stoneman for aid as a whole. In food-short economies this is likely to be the case for the bulk of food aid, unless a donor tries to "dump" excessive amounts of food aid on a given country or the commodity composition of the food aid is not related to recipient need. Even where food aid is "excessive", the concern should be only for the disincentive effect - not for development benefits. If the yield from all aid is equal to or above that of domestic savings (even including the aid "lost" to "consumption") and if the present value of repayment and distribution costs are, say, one-third of the market value of the food aid, there is clearly a great deal of room for returns on food aid to decline (i.e., to lead to less investment or to less-productive investment) before it stops making a positive contribution to the present value of current and future savings. Therefore, we would expect food aid to contribute to growth and not to reduce savings, although quantitative analysis might well show a negative relationship between food aid and savings because of the "accounting" problem discussed above.^{38/} In addition, recent analyses of aid allocations and savings confirm Papanek's point

that GNP per capita is negatively related to aid/GNP and positively to savings/GNP, so that aid/GNP and savings/GNP are likely to be negatively related, whatever the effect of the aid on savings.^{39/} This would apply particularly to food aid, with its emphasis on poor food-short countries and disaster situations.

IV. Burden Sharing

We feel that we should not discuss the disincentive effect of food aid without also considering the question of burden sharing, because concern about burden sharing appears to underlie much of the importance placed on the disincentive issue, both in donor nations which are net food grain importers, and, now that food grains appear likely to be scarce and highly valued in world trade, in exporting nations as well.^{40/} To us, the key analytic point relevant to burden sharing is the at least partial additionality of food aid. With total aid from both exporter and importer nations grossly inadequate by any reasonable standard, with likely (at least partial) additionality of food aid, and with likely sound development uses for a good deal more food aid than is likely to be available (even though food aid is not quite as useful as unrestricted financial assistance), it seems to us that there is little reason why concern about burden sharing should stand in the way of expanding food programs.

In fact, it follows from one of the central points covered in this paper - the effect of price of supply - that if the cost of food aid to a given donor declines, the amount provided is likely to increase. While it would be unfortunate, from the point of view of donor countries, if the desire to provide food aid resulted in inefficient, high-subsidy agricultural policies, we are hopeful that if recipient nations can be asked to deal successfully with the disincentive risks of food aid on their agricultural policies, developed countries can also be asked to deal with "disincentive" risks of food aid on their own agricultural policies.

We recognize that burden-sharing is not influenced solely by development considerations. Exporter nations have export and domestic-price interests in urging burden sharing on food aid alone, as a kind of quid pro quo for providing large (or increasing) amounts of incremental food aid when prices are high. Importer nations have interests in seeing that food aid does not bid up the price of their own food imports, and would prefer aid increases to be in a form which allows them to share more in the export orders.

There appears to be little logical reason why burden sharing should be viewed as applying to specific commodities or categories. Still it is desirable (from the point of view of increasing aid flows) for net importer nations to contribute to food aid so long as there is some significant additionality in the multi-donor food aid programs to which they are contributing (not just in their own aid). Such

additionality might come from increased net (food and total) aid from exporter nations, from net-importer "traditional" donors, and, importantly, from the new group of oil-exporting donors. There are some indications that the UN World Food Programme achieves such additionality. Other internationally-agreed programs may also do so.

V. Concluding Note

It would be unfortunate to pass up possibilities of partly additional aid, at a time when total aid is grossly insufficient, because donors cannot find a way to deal with the disincentive effect that would arise in some situations. Lower food aid punishes "innocent" governments (let alone innocent and hungry people) along with the "guilty". On the other hand, we do not at all mean that food aid (or more food aid) is automatically indicated in any given situation. Rather, there should be case-by-case analysis, hopefully to some extent by recipient and donor together, which should include the range of factors relevant to the risks and opportunities discussed in this paper.

Annex A

The Price Effect of Food Aid on Food grain Output in India

We attempt here to consider the price effect of food aid on Food grain production in India. This is a difficult task, not only because the analytic and empirical issues are complex, but because it has become an accepted part of the "folklore" of food aid that it had a serious negative effect in India. We compare the effect of less food aid or no food aid rather than against the same amount of aid in dollars. While we think the latter would have been preferable, this issue raises quite a different set of questions from those considered here.

While there is no single study available (or perhaps conceivable) that simultaneously takes account of all the analytic caveats raised by Bhagwati and Chakravarty^{41/} and others, the analysis and implications of most of the numerous relevant quantitative studies appear, in our view, to point generally in the same directions, or at least to be reconcilable - although taking account of points raised in one study may change the specific conclusions reached in another.

We know of two multi-equation econometric studies of the effect of food aid on Indian agricultural production. Mann found that food aid resulted in a decline in food production equal to about a third of the food provided. Still, Mann argued (as did Streeten and Hill, who used Mann's results) for more food aid on grounds, essentially, that two-thirds of a loaf is better than no loaf.^{42/} However, a later study by Rogers, Srivastava and Heady, covering essentially the same ground, added an additional equation estimating the effect of food aid on distribution of food grains through subsidized "fair-price" shops and found that about 90 percent of the food aid resulted in additional distribution of food grains. Moreover, the subsidized prices induced net increases in total food grain consumption, so that agricultural production declined by only 3 percent of the food aid provided, or a tenth of the loss estimated by Mann.^{43/} But even this latter study did not take account of several factors affecting growth (in employment and output) - which is important in itself and for its effect on future demand for food grains: the effect of the increased supply of this basic wage good on government policies affecting growth; improvements in the incomes (because of reduced food expenditures) and work capabilities of recipients of subsidized food; and (net) increases in incomes from acreage shifted from food grains to other crops.

Moving from the results of multi-equation models to a common sense view of some of the relevant data, presented in Tables 1 and 2, we see that large quantities of food aid (mostly from the U.S., in the form of wheat)^{44/} were provided from 1957 to 1971.

TABLE 1

Millions of Metric Tons.

DATA ON THE EFFECTS OF FOOD AID

| Net food- grain Imports | US ¹ Title Food Aid | Gross Domestic Production of Foodgrains (a) | Net Imports as % Net Production (b) | Government Dis- tribution of Foodgrains (Millions M.T.) 5 | Foodgrain supply per person per day (ounces) 6 | Relative Price of Foodgrains (c) 7 | Industrial Production Growth (%) (d) 8 | Gross In- vestment Index (e) 9 | GDP Per Capita (f) 10 |
|-------------------------------|--------------------------------------|--|--|---|--|--|--|--|--------------------------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1955 | .5 | 70.7 | 1 | 1.6 | 14.8 | 92 | 8 |) | 99 |
| 1956 | 1.4 | 69.3 | 2 | 2.1 | 15.2 | 103 | 8 |) | 102 |
| 1957 | 3.6 | 72.5 | 6 | 3.1 | 15.8 | 105 | 3 |) | 99 |
| 1958 | 3.2 | 66.6 | 6 | 4.0 | 14.4 | 109 | 2 |) 91 | 104 |
| 1959 | 3.9 | 78.8 | 6 | 5.2 | 16.5 | 101 | 8 |) | 103 |
| 1960 | 5.1 | 77.1 | 8 | 4.9 | 15.8 | 95 | 11 |) | 108 |
| 1961 | 3.5 | 82.3 | 5 | 5.0 | 16.5 | 93 | 9 | 100 | 110 |
| 1962 | 3.6 | 82.4 | 5 | 4.4 | 16.4 | 97 | 10 | 114 | 109 |
| 1963 | 4.5 | 80.3 | 6 | 5.2 | 15.7 | 100 | 8 | 131 | 113 |
| 1964 | 6.3 | 80.7 | 9 | 8.7 | 16.0 | 109 | 9 | 131 | 119 |
| 1965 | 7.4 | 89.4 | 10 | 10.1 | 17.0 | 105 | 9 | 142 | 110 |
| 1966 | 10.3 | 72.3 | 16 | 14.1 | 14.4 | 108 | 0 | 130 | 109 |
| 1967 | 8.7 | 74.2 | 13 | 13.2 | 14.2 | 122 | 0 | 120 | 117 |
| 1968 | 5.7 | 95.1 | 7 | 10.2 | 16.3 | 111 | 7 | 110 | 115 |
| 1969 | 3.8 | 94.0 | 5 | 9.4 | 15.7 | 115 | 8 | 115 | 121 |
| 1970 | 3.6 | 99.5 | 6 | 8.8 | 16.1 | 108 | 3 | 123 | 124 |
| 1971 | 2.0 | 108.4 | 9 | 7.8 | 16.6 | 108 | 3 | 125 | 123 |

Notes to Table 1

Sources : To minimize problems of inconsistency of data, all data have been taken or adapted from Shenoy's PL480 Aid and India's Food Problem (Tables 2.4, 2.5, 8.2, 9.1 and A-2), except Columns 7 and 8, which are from Government of India Economic Surveys, Tables 5.2 and 1.1. Shenoy's data are also from Government of India sources.

- (a) Agricultural year July - June, ending in the year listed.
- (b) Net production is taken by subtracting the conventional rough estimate of 12½% for seed, feed and waste from gross domestic production (Col. 3).
- (c) Foodgrain prices as a % of total (wholesale) prices. Weekly average for the fiscal year April - March beginning in the year listed. 1955/56 - 1957/58 = 100, but based on the Economic Survey's 1961/62 series.
- (d) 1955/56 - 1957/58 = 100, but based on the 1952/53 series in the Economic Surveys. Data for 1969/70 - 1971/72 are extrapolations on the basis of annual growth in the Economic Survey's 1961/62 series.
- (e) Fiscal years. 1961/62 = 100. 1961/62 prices.
- (f) Fiscal years. 1955/56 - 1957/58 = 100, but based on the 1960/61 series in the Economic Surveys. NNP turns down in 1965/66, a year before other indicators, because NNP is based on estimates of current farm production, while most of the effects of the major harvest, in autumn, are not felt on other variables (except, to some extent, price) until after the beginning of the next fiscal year, in April.

TABLE 2

Expected vs Observed Cereal Yields

| | 54/5 | 55/6 | 56/7 | 57/8 | 58/9 | 59/60 | 60/1 | 61/2 | 62/3 | 63/4 | 64/5 |
|---|------|------|------|------|------|-------|------|------|------|------|------|
| (1) Effect of rainfall (Expected yield/Expected yield with normal rainfall) | 99 | 100 | 97 | 92 | 100 | 101 | 100 | 100 | 98 | 99 | 101 |
| (2) Yield (b) (pounds per acre) | | 570 | 592 | 502 | 631 | 636 | 672 | 681 | 651 | 675 | 729 |
| (3) Expected yield (c) | | 602 | 594 | 570 | 633 | 648 | 656 | 666 | 662 | 680 | 703 |
| (4) Yield deviation in % (100 x Yield/Expected Yield - 100) | | | | | - 3 | -1.8 | 2.4 | 2.2 | -1.7 | -.7 | 3.7 |
| (5) 3-year Average Relative Price of Foodgrains (April-March, 3 previous years) (1955/56 - 1957/58 = 100) | | | | | 100 | 106 | 106 | 102 | 97 | 95 | 97 |
| (6) Relative Price of Foodgrains (April - March, previous year) | | | | | 105 | 109 | 101 | 95 | 93 | 97 | 100 |

(a) 1951/2 - 1968/9 average = 100

(b) Data from Cumming and Ray, p. A-166

(c) Cummings and Ray's estimating equation (p. A-167) was :

$$\text{yield}_t = -839.58 + 26.228r_t - 0.12397r_t^2 + 11.116t$$

$$R^2 = .91$$

 (Standard errors) (6.165) (0.32) (1.124)

r_t is an all-India production-weighted rainfall index for year t.

t = 1 in 1951/52

(References to column numbers indicate Table 1). Let us take the years 1955/1956 - 1957/1958, during which period large-scale food aid was just commencing, as the base period, although during this period unfavorable rainfall conditions raised prices above what they would otherwise have been, (even allowing for the fact that most of the price effect is not felt until the following year). (Table 2, Line 1) Relative prices fell below this base-period level (set at 100 in Column 7) in only three years of the food aid period, 1960/1961 - 1962/1963.^{45/} Relative prices recovered sharply, well before the monsoon failures of 1965 and 1966, and averaged 107.5 in 1964/1965 - 1965/1966.^{46/} This would not rule out a negative effect of food aid on relative prices in other years but it does answer the somewhat unsophisticated criticism that relative food grain prices generally deteriorated during the food aid period and that food aid was a primary cause of this deterioration.

Between 1959 and 1965 net food imports averaged about 5 million tons annually, or about 7 percent of total net food grain availabilities. (Columns 1 and 4) Other things being equal, there would have been a very sharp decline in the constant and relative prices of food grains, due to their relatively low price elasticity of demand. This is, in effect, what Mann's model, which carefully separates out the effect of income on food grain demand, has measured. But, as the Rogers et al analysis indicates, the potential price decline was partially offset by roughly equal net increases in government food grain distribution at subsidized prices. (Column 5)^{47/} Still, as the combined effect of the food aid, increases in domestic production, and rises in other prices (particularly jute, but also, as might be expected during a period of intensive import substitution, manufactures), the relative price of food grains fell to an average of 95 for 1960/1961 - 1962/1963. The price of wheat, the commodity which accounted for most food grain imports, was hardest hit.

It is difficult to move from prices to their effect on food grain production without use of fairly complex models. However, in an effort to do so, and to provide a double-check on the results of Rogers et al, we calculated weather and time-trend corrected estimates of expected food grain yields (based on a regression equation estimated by Cummings and Ray)^{48/} to see if deviations from those expected yields could be explained by changes in relative prices. (See Table 2). Contrary to the view sometimes held, yields were not static prior to the "Green Revolution," as shown in Cummings' and Ray's weather-corrected time-trend and in Herdt's discussion of the importance of investment in inputs to reduce unit costs of wheat.^{49/}

The decline in production would be expected to be greatest in 1962/1963 and 1963/1964, following 3-4 years of relatively low food grain prices.^{50/} Table 2, Row 4, shows that yields were below expected levels for these years, although the deviations are too small to be more than indicative. The correlation between yield deviations

and previous three-year average prices for the period 1958/1959 - 1964/1965 was only .06. (The correlation with the previous year's prices, - .15, had the "wrong" sign). Average yields during the four years when prices in the preceding year had been low (1960/1961 - 1963/1964) were +0.5 percent above expected yields (or +1.2 percent including 1964/1965, which was also preceded by several years of low prices). Overall, there is surprisingly little evidence of any systematic detrimental effect on yields, although yields in 1962/1963 and 1963/1964 may well have been affected. This result, which focussed on the most affected years, tends to support the low price elasticity of supply for the major cereal crops found in several other, more complex, studies covering a longer time period^{51/} and to support the result of Rogers et al that food aid resulted in very little loss in domestic output. A similar analysis could be carried out for total output, although we have not done so. However, as is discussed subsequently, that part of shifts in total output which results from short-term acreage shifts between food grains and other crops may not be central to the long term effect of food aid on production. Yield is, thus, a useful, although imperfect, measure of the impact of prices (to the extent it serves as a proxy for the pace of modernization of agricultural practices).

However, as Table 1 indicates, other things were much less equal than the models of Mann or Rogers et al implied. Industrial production picked up briskly from 1969, and, reinforced by the launching of the Third Five-Year Plan in 1961/1962, investment increased sharply, both at rates unprecedented before or since.^{52/} Per capita GNP grew at about 2 percent annually, which, with the generally accepted estimate of about .5 for the income elasticity of demand for food grains in India, would have added about 1 percent per year to per capita food grain demand. (Columns 8-10).

Food aid did not cause the investment and industrial boom of the first half of the 1960's, but it played a far from insignificant role, by providing resources equal to 10 percent or more of gross investment in the Indian economy,^{53/} by restraining real wages while growth in non-agricultural output and (to a lesser extent) employment were accelerating, and by offsetting the risk that the investment boom would seriously worsen the food situation in the inevitable years of low rainfall. As Morris put it "The British viceroy who said . . . "the Indian budget is a gamble on the monsoon' was giving expression to a most obvious proposition about Indian economic life."^{54/} A multi-year government effort to accelerate growth which, because of leads and lags and adjustment problems, cannot be readily turned on and off as food grain supplies vary is an even greater gamble on several monsoons. While we do not wish to overstate the role of food aid in the rates of growth achieved, if the supply and price of food grains are an important constraint to growth and if food aid provides both "insurance" against runaway prices in bad years and additional growth resources (of a sort which make up half or so of what is purchased out of wages), then it is quite likely that in the absence of food aid government growth policies would have been less expansionary and output and investment in both the public and private sectors would have grown more slowly.^{55/}

Another important benefit from food aid was that from 1959 to 1965 food grain supply averaged (fairly consistently) a bit over 16 ounces per day, one ounce more than the average in the preceding period. (Column 6). This increase in food supplies helped improve nutritional status and the welfare of the poor. We think it also probably improved the relative position of the poor, but recognize that there are many complex questions involved, well beyond the scope of this paper (e.g. the income status of those buying at "fair-price" shops, and the complex effect of changes in food prices on various categories of the rural poor). We have not discussed the effects of food aid during the disastrous food shortage of 1966 and 1967, as we assume that this aid, at a time of record high food prices and near certainty of mass starvation, is not controversial.^{56/}

With Streeten and Hill we think that in some years food aid should have been stockpiled, rather than released quickly by the Indian government (or that more expansionary policies should have been followed in 1959/1960 - 1961/1962, if foreign exchange availabilities would have permitted).^{57/} The problem seems to have been one of timing, rather than volume. In 1960/1961 - 1962/1963, the three years when relative food grain prices were under the base period level, food aid averaged a little over 3 million tons. During the subsequent three years before the 1966/1967 shortages, food aid averaged about 6 million tons, but relative prices were up 5 percent over those of the base period. (Per capita availability was about the same in both periods.) However, the reduction of food aid in the latter part of the 1960's (partly because the U.S. offered less and partly because India did not accept all that was available) and the much greater use of stockpiling to protect farmer incomes while production was increasing, indicate that the Indian government was well aware of this point).

So long as the short-term supply effect is substantially positive, to argue that food aid should have been lower because of adverse price effects requires the additional belief that these losses would not have been mostly made up by the subsequent extraordinary increase in food grain prices and shift to the high yielding (agriculturally and financially) varieties. This would presumably not be the case for that part of the loss of food grain production which represents land shifted from food grains to other crops, since these could be shifted back. Rather, such a judgement would have to rest on production lost from that part of the resulting decline in investment in agriculture or slowdown in adoption of improved seeds and farm practices which could not also be reversed by the subsequent shift in relative prices. Offsetting that loss are the effects of the overwhelming portion of the food aid that was additional (combined with the effect of investment shifted to other sectors) on growth, and so on demand for and investment in food grain production. Thus, we wonder whether some (but by no means all) criticism of the price disincentive effect of food grains in India has not rested on an implicit assumption of an irreversibility (and perhaps asymmetry) of price effects.

Footnotes

1/ This article deals with food aid for development purposes and not, except in passing, with the less controversial case of food aid for disaster relief or other explicitly humanitarian purposes. It deals only with food grains, which account for the bulk of food aid provided, and not with cotton, milk powder, vegetable oils etc., although most of the analytic points made about the relationship of imports to domestic production are also applicable to these commodities. It does not attempt to deal with the range of other issues relevant to food aid, such as: optimal commodity composition; implementation problems; the concerns of recipients about the political risks of heavy dependence of food aid; or the need for greater access for the exports of the poor countries to the markets of the rich countries in order that they can afford to meet most of their food and other import requirements from their own export earnings.

2/ See T. W. Schultz, "Value of U.S. Farm Surplus to Underdeveloped Countries," Journal of Farm Economics 42 (December 1960): 1031-1042; H.W. Singer, M.R. Benedict, V.K.R.V. Rao, J. Figueres, and P.N. Rosenstein-Rodan, "Report by the Expert Group to the Director-General of F.A.O.," in Development through Food (Rome: F.A.O., 1961); and F.M. Fischer, "A Theoretical Analysis of the Impact of Food Surplus Disposal on Agricultural Production in Recipient Countries," Journal of Farm Economics 45 (November 1963): 863-875.

3/ Schultz, p. 1027.

4/ In spite of his deep concern about the disincentive effects of food aid, Schultz, p. 1029, sees food aid used for building stocks as contributing to increases in domestic food production. Jones and Tulloch point out the current need for food aid to be used to rebuild sharply depleted stocks in developing countries. (D.B. Jones and P. Tulloch, "Introduction: Is Food Aid Good Aid?" ODI Review no. 2 (1974), p.2.)

5/ John P. Lewis has suggested to us that it is useful to think of the expansionary effect of food aid on employment and output as arising in three ways: from planned increases in demand; from closing a food demand-supply gap that was in prospect at existing prices (e.g. when weather conditions have been unexpectedly unfavorable); and from increments to food stocks which, by reducing the risk of excessive food-price fluctuations, reduce the risks of undertaking expansionary economic policies. The distinction emphasizes that it is not always necessary or desirable to cause ex ante increases in the demand for food grains to make optimal use of food aid.

6/ The importance of this constraint and the consequent inadequacy of most traditional growth models which focus only on the savings constraint are discussed in J.W. Mellor, "Models of Economic Growth and Land Augmenting Change in Food Production," in Agricultural Policy in

Developing Countries, ed. N. Islam (London: Macmillan Press, 1974), pp. 6-14. For a survey of Engel-curve data on the proportion of income spent on food and, specifically, food grains, see K.B. Rogers, "Utilization of Food Aid in Economic Development," Center for Agricultural and Rural Development Development Report no. 6 (Ames, Iowa: Iowa State University, 1971), pp. 183-191.

7/ N. Rath and V.S. Patvardhan, Impact of Assistance under PL 480 on Indian Economy (Poona: Gokhale Institute of Politics and Economics, 1967), p. 121.

Seevers, in his sharp criticism of the food grain constraint on growth in employment as an argument for food aid, appears to be assuming implicitly that no additional non-food resources are available from any source. (G.L. Seevers, "An Evaluation of the Disincentive Effect Caused by PL 480 Shipments," American Journal of Agricultural Economics 50 (August 1968): 630-642.) Putting aside the question of whether food-scarce economies can have slack resources which can be put to use if additional food is available, Seevers is apparently assuming, not unreasonably from some points of view, that non-food aid should be taken as given, and so he does not consider the question of the balance between food and non-food aid. Donors, however, can obviously consider this question ex ante, thus forestalling the danger Seevers warns of, that (p. 636) "the full burden of restraining general inflation" would fall on food grains. Seevers' statement also assumes implicitly a near-zero elasticity of supply of exports, so that employment increases resulting from increased food supplies do not generate a part of the foreign exchange required for food imports. Finally, his criticism derives from his focus on the welfare of farmers only, not of society as a whole.

8/ For a discussion of the major issues in determining the balance between food and non-food aid see S. Chakravarty and P.N. Rosenstein-Rodan, "The Linking of Food Aid with Other Aid" (Rome: F.A.O., 1965).

9/ Development Assistance Committee, 1974 Review-Development Cooperation (Paris: OECD), p. 94.

10/ Jones and Tulloch, p. 3, also judge that EEC food aid is likely to be at least partly additional.

11/ Mellor, pp. 15-17.

12/ K.D. Rogers, U.K. Srivastava, and E.O. Heady, "Modified Price, Production and Income Impacts of Food Aid under Market Differentiated Distribution," American Journal of Farm Economics 54 (May 1972): 201-208.

13/ L. Dudley and R.J. Sandilands, "The Side Effects of Foreign Aid: The Case of PL 480 Wheat in Colombia," Economic Development and Cultural Change 23 (January 1975): 325-336. Their argument against wheat imports rests on the belief that the Colombian government, instead of subsidizing consumption of wheat (by importing it at the official exchange rate, which the authors estimate to have been overvalued by 40 percent), should have used a shadow price of .75 on domestic wheat production to determine wheat import levels. The net effect of this would have been a major increase in urban wheat prices (by an average of 20 percent). Although they state (p. 335) "It is important to consider the total benefits to Colombia from PL 480," they mean, implicitly, not "total benefits" but the difference between their estimate of the grant element of the food aid loan terms and the shadow-priced value of output foregone from otherwise-unutilized domestic resources. They do not consider at all the goals the Colombian government was attempting to pursue through wheat imports - control of inflation, increases in government revenues, growth in employment, etc. As our discussion of the Indian case shows, the benefits of food aid outside agriculture can be quite significant. Also, the empirical basis for the assumed .75 shadow price (for the total cost of the domestic wheat) appears slender in view of the crucial weight the analysis places on it. It seems odd that if farmers had such limited alternate uses for their land and labour they would show a price elasticity of supply as high as 2.05. (However, this is an indication of the need for broadening the analysis and for further empirical investigation, not for disagreement with the authors' interesting and useful demonstration of how shadow prices and import levels can be used as aspects of region-specific programs to generate rural employment). In addition, is it not playing down the importance of the Colombian government's own decision-making process and responsibilities to assume in the title ("The Side Effects of Foreign Aid") and in part of the analysis that it was the "terms of the agreements" (p. 336) of the one-third (initially one-half) of wheat imports financed by food aid which determined the government's wheat import and pricing policies? If one really believes in the implicit underlying policy model (which relies primarily on what one might call a high price elasticity of policy formulation), what does this imply for the ability of aid recipients to manage their own economies in general? Furthermore, if domestic prices were too low and wheat imports excessive, should the authors assume (in their calculation of the net benefits of food aid) that marginal cuts should or would be met initially by reductions in food aid, which does after all have a high grant element? Would it not make more sense for the larger volume of commercial imports to have been reduced instead? Have the authors overlooked this point, or perhaps confused the normal requirement in U.S. food aid agreements that "usual" levels of commercial imports not be cut with a requirement that future commercial imports be increased substantially over past levels?

14/ See e.g., the discussion of the Indian Five-Year Plans in Bhagwati and Chakravarty, which also outlines the debate that ranged until well into the 1960s on the price responsiveness of Indian agriculture. (J.N. Bhagwati and S. Chakravarty, "Contributions to Indian Economic Analysis: A Survey," American Economic Review 59 (September 1969): 1-73). Also see Lipton for a discussion of some of the reasons agriculture was underemphasized in Indian development strategy. (M. Lipton, "Strategy for Agriculture: Urban Bias and Rural Planning," in The Crisis of Indian Planning, ed. P. Streeten and M. Lipton (London: Oxford University Press, 1968).

15/ Islam and Mason make essentially the same point for Pakistan. (N. Islam, "Foreign Assistance and Economic Development: The Case of Pakistan," Economic Journal 82 (March 1972): 502-529. E.S. Mason, "Economic Development in India and Pakistan," Center for International Affairs Occasional Paper 13 (Cambridge, Mass.: Harvard University).) Islam indicates that food aid to Pakistan provided the margin of safety for introduction of flexible new policy measures, away from direct controls, to stimulate agricultural production. Islam also discusses the disincentives, as well as incentives, provided by food aid.

16/ A. Berg, "Famine Contained: Notes and lessons from the Bihar Experience," in Famine, Nutrition and Relief Operations, ed. G. Blix, Y. Hofrander and B. Vahlquist (Uppsala: Swedish Nutrition Foundation), pp. 121-122.

17/ Lipton, p. 147.

18/ H. Chenery, M. S. Ahluwalia, C.L.G. Bell, J.H. Duloy, and R. Jolly, Redistribution with Growth (London: Oxford University Press, 1974), pp. 102-103.

19/ In reference to projects, fungibility means that if a donor finances a project which the recipient would in any event have carried out from its own or other aid funds, then the donor's funds are, in effect, allocated however the recipient desires. This concept is discussed in depth in H.S. Singer, "External Aid: For Plans or Projects," Economic Journal 75 (September 1965): 523-546. The same general point applies where the specific project is in fact additional to what the recipient would otherwise have done but where it is able to make compensating adjustments in comparable projects.

20/ Singer et al., p. 85; Sen, pp. 1,038-1,039.

21/ For example, some countries may be short of manpower available for program and project selection and design, or they may value the technical assistance and fairly rigorous criteria for project review and design which are implicit in project assistance from some donors. This might apply not only in countries close to the "least-developed" stage, but where, for example, planning ministries see this as a way of improving the quality of projects submitted to them from other ministries or from regional or local authorities.

22/ Development Assistance Committee, p. 94.

23/ Press reports in early 1975 indicate strong reactions from the U.S. Congress and elsewhere to the very large proportion of U.S. food aid that went to Vietnam and other countries receiving large-scale political or military assistance from the U.S. The significance of this large-scale use of food aid for political purposes goes, of course, far beyond the disincentive issue. It underlines the importance of not just comparing worldwide food aid needs (however estimated) with worldwide food aid provided, but of looking at food aid needs and provision on a much more disaggregated basis and of finding politically feasible ways to assure that pressing developmental (as well as humanitarian) food aid needs are met.

24/ Consider the following quote from Mason, p. 64): "PL 480 . . . (in Pakistan) made possible the freeing of the grain trade in 1960, the beginning of a buffer stock operation, and some substantial changes in cropping patterns favorable to agricultural exports." Thus, he sees a (minor) positive incentive effect on food grain policy and implicitly a disincentive effect on food grain prices (relative to cotton prices), which he sees as a gain, not a loss.

25/ Where food aid is provided as a part of a package for general development purposes, the efficiency of food aid will be increased if it is fairly steady and predictable, as in the case of non-food aid. Year-to-year variations in domestic production, and thus in the optimal amount to be distributed internally, are better handled, for development and political reasons, by changes in recipient stocks than by variations in annual food aid (setting aside annual adjustments required to take care of shifts in short-term needs elsewhere). This runs counter to the recommendation made on several occasions (e.g. in Jones and Tulloch, p. 4) that food aid purposely be made unpredictable to minimize disincentive effects. That recommendation does, however, remain reasonable where food aid is not provided as a part of a total development aid package or where there are likely to be serious disincentive effects.

26/ We do not consider here the often-discussed question of whether it is "better" to give food aid or aid for food production, primarily because, given the additionality of food aid, we think that this tradeoff arises far more often in abstract discussion than in practice. (Effective) aid for food production is clearly preferable to food aid, except under conditions of severe short-term shortages.

27/ The application of these points to India is discussed in R.H. Cassen's forthcoming book, tentatively entitled Population and Development in India. As several studies have shown, income distribution as well as the rate of economic growth can have an important effect on birth rates. If rising family welfare (measured in terms of income, food consumption, health, education, etc.) leads

to lower family size, then for significant reductions in birth rates the distribution of income (and government services) must be equal enough so that poor families experience significant improvements in their welfare. Rapid growth with unequal distribution that benefits primarily higher income groups, who already tend to have smaller families, would not be expected to have as much impact on birth rates. See, e.g., J.E. Kocher, "Rural Development, Income Distribution and Fertility Decline," Occasional Paper (New York: Population Council, 1973). H.W. Singer, "Income Distribution and Population Growth" (unpublished, Institute of Development Studies, University of Sussex, 1973); to be included in a forthcoming United Nations volume of papers relating to the 1974 World Population Conference. W. Rich, Smaller Families Through Social and Economic Progress, Monograph no. 7 (Washington, D.C.: Overseas Development Council). The negative effect of increases in family welfare on birth rates is not inconsistent with the positive effect of income on birth rates noted in some studies when the effect on birth rates of the correlates and consequences of income increases (such as more education, higher value of the mother's time and reduced infant mortality) are disregarded by being held constant.

28/ The theoretical disincentive effect applies to technical as well as capital assistance, in the sense of relieving the pressure for developing human and institutional resources. It is also applicable to non-market economies, although the disincentive effect would be felt through policies and programs rather than prices.

29/ The net employment effect would be expected to be positive even after allowing for some decline in demand for agricultural labor, because of the relative low price elasticity of food grain supply noted earlier.

30/ The Development Assistance Committee, p. 87, reports that food aid was about 20 percent of total "Official (Concessional) Development Assistance" during the period 1962-1972. It is not feasible to determine what percentage of the remaining eighty per cent went directly and indirectly to industry, but in most countries the majority of non-project aid or local-cost financing went to finance industrial imports, in addition to the generally smaller amounts earmarked directly for industry. We do not mean to argue here against non-project aid, to India or other countries. Whether non-project aid has a "negative" or "positive" effect on trade and industrial policy, in India or elsewhere, is a subject well beyond the scope of this article, although many of the relevant issues parallel the food-aid disincentive issues discussed here.

31/ G. Ranis, in Chenery et al., p. 290, states, regarding Taiwan: "The timely arrival of large quantities of programme aid at the end of the 1950s and early 1960s was doubtless largely responsible for providing the little extra buffering and reassurance for a system which had to be persuaded to head out on uncharted, (import liberalisation) tracks . . . but we firmly reject the notion that aid was

'responsible' for Taiwan's good performance. Rather, aid facilitated the policy changes required for the restructuring which could take place once the necessary local decisions had been made." While Griffin is in strong disagreement with this judgement of the effect of aid in Taiwan, he does not discuss such specific effects of aid policy. (K. Griffin, "An Assessment of Development in Taiwan," World Development 1 (June 1973): 31-42). While he contends (p. 33) that "U.S. (food) aid is the second explanation for the retarded growth of agriculture," his data (p. 32) appear in fact to show that during the decade from the mid-1950s to the mid-1960s food aid tripled while the agricultural growth rate doubled.

32/ B.R. Shenoy, PL 480 Aid and India's Food Problem (New Delhi: East-West Press Pvt. Ltd., 1974), pp. 278-293. For a discussion of the negative effect of the recent food shortage (in relation to requirements for government distribution programs) on agricultural policy in India, also see W. Ladejnsky, "Wheat Procurement in India in 1974 and Related Matters," World Development (February-March 1975): 91-111.

33/ C. Stoneman, "Foreign Capital and Economic Growth," World Development 3 (January 1975): 1-10. G. F. Papanek, "The Effect of Aid and Other Resource Transfers on Savings and Growth in Less-Developed Countries," Economic Journal 82 (September 1972): 934-951. G. F. Papanek, "Aid, Foreign Private Investment, Savings and Growth in Less-Developed Countries," Journal of Political Economy 81 (January/February 1973): 120-130.

34/ This was quite contrary to the expectations of those who had focused on the effect of aid on savings. For example, Griffin had postulated, apparently quite reasonably, that anticipated aid should be treated as in effect "permanent" rather than "transient" income, so that a country's normal marginal savings rate should be applied. (K. Griffin, "Reply (On Foreign Capital, Domestic Savings and Economic Development)," Oxford Bulletin of Economics and Statistics 33 (May 1971): 156-161.) If the capital-output ratio is the same for aid as for savings (although Griffin postulated it to be higher) then aid would have been expected to have a return (as measured by its regression coefficient) under a third of that of savings (taking one-third as the high end of the range of likely marginal savings rates). (Griffin went on, somewhat inconsistently, to add aid consumed to total consumption but not to total income, and so ended up with a savings equation which purported to show "as surely as night follows day" that aid caused marginal saving rates to decline.)

35/ The same principle applies to the point raised by Stoneman (p. 13) regarding consumption arising during the construction period of aid-financed investment activities. Short-term "borrowing" of domestic savings should not be confused with a reduction of these savings. Rather, the costs of the short-term borrowing should be treated like other project costs. This borrowing cost would be relatively lower for food aid, which implicitly self-finances much of the additional consumption during this time "lag".

36/ In addition, the (present value of the) amount required to repay the portion of aid used for consumption should be subtracted from gross, not net aid. The latter (which is the common, if implicit, practice) charges this year's loans with both their own repayment and repayment of debt service on past loans. The cumulative effect of whether consumption from loans should be charged to domestic savings or the loans, whether the total amount of the consumption or the discounted present value of its repayment should be deducted, and whether the deduction should be from net or gross aid, would together have a significant effect on one's view of the effect of aid on savings.

37/ G.F. Papanek, "The Effect of Aid and Other Resource Transfers on Savings and Growth in Less-Developed Countries: A Reply," Economic Journal 83 (September 1973) p. 873. Stoneman's statement (p. 13) that even Papanek agreed that consumption from loans should be subtracted from savings is correct only with respect to loans which have no grant element (i.e. not to concessional aid) and which do not yield enough from the portion invested to cover total debt service costs. Even in such cases, it should not be the total amount of the loans which is subtracted from savings.

38/ The points made above on the need for a present-value analytic framework for considering the effect of consumption and repayment of loan proceeds and of the short-term interaction of food-aid consumption and investment cannot be handled either by conventional national-income accounting or by the very useful clarifying suggestions for national-income accounting made by Newlyn. (W.T. Newlyn, "Comment on the Effect of Aid and Other Resource Transfers on Savings and Growth in Less-Developed Countries," Economic Journal 82 (September 1973: 867-869). Nevertheless, it is erroneous to draw conclusions about the effect of aid on savings when those conclusions may be telling more about the assumptions of the accounting system than about actual effects on the savings which would have otherwise occurred.

39/ Development Assistance Committee, p. 169. R.F. Mikesell and J.E. Zinser, "The Nature of the Savings Function in Developing Countries: A Survey of the Theoretical and Empirical Literature," Journal of Economic Literature 11 (March 1973): 1-26.

40/ There are other forms of "burden-sharing" of food aid which we have not considered here. To the extent that the food used for food aid would otherwise not have been produced or would not have been offered on the world commercial market, and that the food aid replaces imports which would otherwise have taken place, other food grain exporters, including a few developing countries, would suffer reductions in export earnings. Because of the inelasticity of demand for food grains, and the thinness of world grain markets, these losses could be substantial. Of course, reduced prices to exporters mean reduced costs to importers, which include a number of major developing countries. On the other hand, to the extent that the food used for

food aid would otherwise have been offered on the world market, and that food aid is at least partly additional to other food imports, then exporters would gain, and importers lose, from the resultant higher prices. Both of these situations imply (short-term) surplus capacity at existing prices in exporter nations. Under conditions of worldwide shortage, food aid would presumably bid up prices, since offering food aid at concessional terms would increase demand at a time when short-term supply is extremely inelastic. To judge whether increasing prices in this fashion is a good thing, one would have to compare welfare gains to those receiving food aid and to exporters against welfare losses to those who would have benefited from lower prices. The world was clearly in a situation of general shortage, for the first time in recent years, in 1973-1974. For the future, even with much shorter world food supplies, there is likely to be some combination of the situations mentioned above in many or most years, with net results that will depend perhaps as much on political factors as on demand and supply elasticities. We leave it to others to try to sort out this "burden-sharing".

41/ Bhagwati and Chakravarty, pp. 28-50.

42/ J.S. Mann, "The Impact of Public Law 480 Imports on Prices and Domestic Supply of Cereals in India," American Journal of Farm Economics 49 (February 1968): 131-146. Streeten and Hill, "Aid to India," in Streeten and Lipton, pp. 341-346.

43/ Rogers et al., p. 207.

44/ Food aid can have a distorting effect on food preferences, in relation to costs and to locally produced foods. For example, in some cases, high-cost, high-protein foods have been used in nutrition programs in areas which recent research has shown would benefit more from lower-cost lower-protein but higher-calorie food. However, the shift in demand to (or increased acceptability of) wheat encouraged by the emphasis on wheat in most food aid (i.e. in "PL 480 Title I" sales from the U.S.) appears to have been desirable from a cost and nutritional point of view. This shift in demand/price/acceptability of wheat was useful when wheat production was increasing very rapidly in the late 1960s and also allowed the Indian government to buy a larger proportion of its recent large commercial imports of food grains in the form of wheat (which is significantly cheaper, in terms of both calories and protein content, than rice).

45/ We do not consider here the complex question of what relative prices "should" have been. This depends on such things as India's overall development strategy, and on comparisons with international prices (in itself a complex matter, in view of the size of Indian production and consumption of grain in relation to the total volume of world grain trade). Rather, we are looking here at the effect food aid had on relative prices and other variables, holding constant the basic economic and political strategy and structure. Thus,

we compare relative prices to a base period rather than to an "optimal" level. As in other comparable studies, we assume that changes in the wholesale price of food grains are proportional to changes in prices received by farmers and that the changes in wholesale prices implicitly take account of such factors as stated procurement prices and actual implementation of government procurement programs.

46/ Subsequently, with the monsoon failures of 1965/1967, prices shot up under near-famine conditions in spite of very large food-aid imports. Then followed the "Green Revolution" period of increases in output of High-Yielding Varieties (HYV) of wheat, with consequent reductions both in food aid and in relative food grain prices. In 1972 India was, briefly, self-sufficient in food grains, although subsequent events have shown that at least in years of poor monsoons India is still dependent on large-scale food imports. In fiscal year 1974/1975, although published data are not yet available, India is reported to have imported about 5.5 million tons of food grains, about the average level of the first half of the 1960's. However, unlike a decade ago, only a small proportion was financed by aid and, with the large increase in grain prices, India was forced to spend a huge amount, perhaps \$1 billion, of its own foreign exchange for the balance. Had more food aid been available these funds could have been used to stimulate development.

47/ One could argue that the regression analysis of Rogers et al does not prove that the causality ran from the food aid to the distribution rather than from the distribution (need) to the food aid. But this appears unlikely, both because there is little evidence that India could have received as much grain as it wanted during that period or that it would have imported the grain commercially (and carried out the same distribution program) in its absence.

48/ E.G. Cummings, Jr. and S.K. Ray, "1968-1969 Food grain Production - Relative Contribution of Weather and New Technology," Economic and Political Weekly (September 27, 1969): A163-A173.

49/ R.W. Herdt, "A Disaggregated Approach to Aggregate Supply," American Journal of Farm Economics 52 (November 1970), p. 519.

50/ It appears more reasonable that a rational farmer would respond to a price expectation based on a few years' recent prices, as J. Krishna and Rao (reported in Bhagwati and Chakravarty, p. 39, found, rather than to the previous years' price, used by Rogers et al. While the Cummings and Ray regression estimates suffer from not including a price variable (and thus risk biases in the estimates of the rainfall and time coefficients) there should be no correlation between pre-sowing price and rainfall and at most only moderate correlation between price and the time trend, and the estimates it yields are highly preferable to the uncorrected data used in a number of analyses. We used Cummings' and Ray's

equation because of their careful aggregation and non-linear treatment of rainfall, and consequent improvement in statistical fit, in comparison with linear models.

51/ The estimate of Rogers et al., of .16 for the price elasticity of food grain supply is consistent with other results reported in Mellor (pp. 15-17) and elsewhere. Mann's estimate of .21 is in the same range. Herdt carried out a detailed analysis of the price elasticity of wheat supply, which showed by far the largest price declines, in the Punjab. Herdt points to pumpsets, fertilizer, etc. which (p. 519) "lower (ed) the cost of production per unit of output between 1951 and 1964" and "encouraged some farmers in the Punjab to achieve a rapid growth of output even though relative agricultural - non-agricultural responses were unfavourable. This is the hypothesized reason for the negative estimated supply elasticity for 1951-1964." Thus, food aid apparently did not reduce the relative profitability of wheat over what it had been, although it reduced its relative price. While higher prices would undoubtedly have increased production somewhat, Mellor's point on the low price elasticity of supply during cost-reducing technological change would suggest interpreting Herdt's results as indicating in part that (perhaps because of input supply or other constraints) the supply response would have been quite low. (J.W. Mellor, "Agricultural Price Policy in the Context of Economic Development," American Journal of Agricultural Economics 51 (December 1969): 1,413-1,419.

Rath and Patvardhan had found, generally consistently with Herdt's results, that the "wheat price was relatively lower, during the period of imports under PL 480" (up to 1961, when the period of their data concluded), but that there was nevertheless a "large increase in wheat production both due to increase in area and yield per acre." (p. 156). Their State-by-State production functions for wheat showed that "it is difficult to see any effect on (wheat production) of the large wheat-imports under PL 480 through relatively lower wheat prices." (p. 165).

Shenoy expresses very strong feelings about the negative effect of food aid on wheat and other food grains production. However, he relies on a highly simplified analysis which ignores most of the relevant literature on the points he covers - e.g. he does not build weather variations into his analysis of the effect of price on wheat production, although Herdt's results and Cummings' and Ray's data point to the importance and variability of rainfall in the Indian wheat belt. In addition, his interpretation on this crucial question of what happened to wheat production appears inconsistent with his own data and analysis. For example, he states on page 252 that wheat production "did not rise significantly. . . during the (1956/1957 - 1965/1966) period except in years of . . . bumper harvests in agriculture generally," but states on page 49 that during this same period there was a "faster increase in wheat yields (than in) yields of other cereals." (Shenoy's data, Appendix Table A-1, shows that wheat acreage rose as well during this period.)

Also, he concludes that per capita wheat production declined, by comparing 1956/1957 (the highest production year up to that time) with 1965/1966 (p. 246), although he had earlier recognized that in 1965/1966 yields were depressed by "severe drought" (p. 49). However, surprisingly, Shenoy recommends a resumption in food aid, to fill "market deficits" (pp. 277 and 303).

52/ While one could argue that this growth included a good deal of high-cost import substitution, so that growth in value added in the industry sector would be lower if stated in international prices, the relative rate of industrial (and investment) growth would still probably be at its maximum during this period.

53/ Shenoy (Table 8.2) provides data which show that U.S. PL 480 aid (which is primarily in the form of food grains but also includes cotton, edible oil, and a small volume of tobacco) financed 10 percent of total gross investment during the Third Plan period when computed at the Hong Kong "free-market" exchange rate.

54/ M.D. Morris, "What is a Famine?" Economic and Political Weekly (November 2, 1974), p. 1,855.

55/ For a discussion of the link between increased food supplies (including food aid) and increased employment in India, see J.W. Mellor, "Accelerated Growth in Agricultural Production and the Intersectoral Transfer of Resources," Economic Development and Cultural Change 22 (October 1973): 1-16.

56/ But see Berg on the effect of the Indian government's use of food aid for famine relief in Bihar, and the earlier section of this article on "food aid and the neo-Malthusians."

57/ Streeten and Hill, p. 346.

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