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**Credit and Input Market Issues  
in the Green Revolution**

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CREDIT AND INPUT MARKET ISSUES  
IN THE GREEN REVOLUTION\*

by

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There is little doubt that the Green Revolution has established a much more positive tone in policy-making circles toward agriculture, as well as helped to identify the "technological barrier" as an important issue in agricultural development. Falcon's call for perspective on the limited nature of the Green Revolution is, however, timely for at least three reasons. First, care must be taken not to oversell decision makers on the importance of new agricultural technology; a great many of agriculture's problems cannot be solved by a handful of scientists in a few regional laboratories. Moreover, the needs for almost all of the "traditional" agricultural development techniques (efficient pricing policy, extension, markets, credit, etc.) are sharply increased with rapid technological change. Second, agricultural problems are very heterogeneous and there are still a number of cases around the world where a "technology barrier" is not an immediate constraint on agricultural output; e.g., pricing policy in Thailand and Nigeria, land tenure in Northeast Brazil and Guatemala, agricultural credit in Ethiopia and Bolivia, rural transportation systems in Nepal and Honduras, agricultural service institutions in Iraq and Burma, and irrigation in Peru and India.

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\*A paper prepared as a basis for discussion in conjunction with the topic "The Green Revolution: Second Generation Problems", American Agricultural Economics Association Meeting, Columbia, Missouri, August 9-11, 1970.

Third, and most importantly, Falcon is very timely in stressing that the Green Revolution is mainly touching "them that's-got". With few exceptions, new technology has been highly complementary and synergistic in farm firms which already have significant bundles of agricultural resources. New technology as well as most other major agricultural development techniques have had little fallout among the rural poor. Judged by equity criteria, agricultural policies in most parts of the world have been only slightly successful. I wonder if it is now more appropriate to stress increasing agricultural output joined with equity considerations. Can agricultural technology as well as other development tools be adjusted to have this type of impact?

After being associated with an aid agency for several years I have become impressed (or depressed) by the present difficulties of channelling resources toward rural poverty issues. In large measure, this is true not so much because of goblins wearing black hats, but because institutions which channel these resources have largely evolved to service major market participants. For example, in Brazil less than 15 percent of the farmers share in the largess of negatively priced (in real terms) institutional agricultural credit. Recently, in Ethiopia, the principal lending agency for agriculture had only 50 farm loans extended with an average value in excess of eight thousand dollars. Simply put, the institutional infra-structure which would allow rural poor to participate in technological change is, in most cases, not in place. I feel that a challenge of the 1970's will be to develop policies and programs which stimulate the growth of these types of institutions.

In line with the above discussion, I want to focus on a few issues related to agricultural credit, rural savings, and purchased inputs in

the factor market area. I feel that major amounts of attention need to be directed at these topics in order to develop institutional capacity and fuel agricultural change among rural poor.

Concurrent with technological change, there is generally a very rapid growth in the factor markets servicing agriculture. For example, during the past few years evidence has been assembled which suggests that agricultural credit requirements increase very rapidly with changes in technology and/or farm enterprises. An important part of this is due to the rapid growth in fertilizer use noted in Falcon's paper. Other costs, however, also increase. In India variable costs have been reported to have doubled for IR-8 rice producers over costs incurred with older varieties of rice. In Brazil farmers with relatively high levels of technology are absorbing over twice as much credit per acre as those with low level technology. In the Philippines, farm expenses were reported to increase by a factor of five with new rice varieties plus some enterprise changes. In southern Brazil, research at Ohio State has shown a 30-fold increase on a per acre basis in credit requirements as farmers move from extensive cattle operations to intensive crops. Even with an annual average increase of 17 percent in real institutional agricultural credit available over 1960-1968, Brazil has been unable to avoid rather serious credit rationing for small farmers. Likewise, the little guy in India is hard put to find financing for tube wells and fertilizer so as to capitalize on the high yielding grain varieties.

For purposes of initiating discussion, I would like to raise the following points:

(1) Can efficient institutional forms be developed which will allow rural poor to benefit from technological change? If these institutions

were organized mainly around providing services in factor markets, would they be more economically viable than cooperatives, for example, which are providing services mainly in the consumption and product market area? What role can cooperatives, other local joint activity groups, and private enterprise play in filling the institutional gap suggested above? Would major emphasis on "institutional engineering" require a return to "Point IV" type programs which stressed project-by-project technical assistance rather than major doses of capital?

(2) Should these institutions for servicing rural poor have as one of their major functions the mobilization of voluntary savings for relending as agricultural credit? Would this be an economically viable role for cooperatives? I feel that substantial voluntary savings capacity exists in rural areas of less developed countries. It seems to me that the paucity of appropriate financial incentives as well as lack of access to institutional forms, rather than low marginal propensities to save, blocks institutionalized savings. Examples from Korea, Taiwan, Indonesia, East Pakistan, Uganda, the Philippines, Brazil, and other South American countries are suggestive in this regard. In several of these cases, especially Korea and Taiwan, substantial interest rate increases resulted in amazing expansions in institutional savings. Tapping into new income streams, stimulated by technological change, through mobilization of voluntary savings seems a vital component of providing the substantial agricultural credit which will be needed.

(3) In almost all of the less developed countries low, administered interest rates on institutional agricultural credit are general policy. In Brazil, for example, agricultural credit borrowers are charged only about one-half the rate of interest paid by other borrowers. Both rates

have generally been below the pace of inflation and thus result in negative real rates of interest. As a result, inputs purchased with agricultural credit are subsidized through concessional interest rates. A subsidy in the range of \$100 to \$200 million dollars per year has flowed to borrowers of agricultural credit in Brazil as a consequence. Cheap-agricultural-credit policy and credit rationing have often fogged the issues of credit scarcity at efficient prices, and hidden the real extent of the "technological barrier."

Would it be a good move to generally raise administered interest rates on agricultural credit in less developed countries? Would this assist credit cooperatives, for example, to maintain financial integrity? Should credit policy be directed at providing financial resources at efficient prices rather than trying to eliminate through low interest rates monopolistic elements thought to exist in the informal rural credit market? What is the least amount of training and supervision which can be tied to small agricultural loans and still make loan programs float? Can group loans to small farmers be used as a technique of reducing default problems?

In summary, I feel that important changes in current agricultural development policy must be made if rural poverty is to be colored by the Green Revolution. While the grubby work of developing local institutions to facilitate rural change has largely gone out of vogue, I feel that it must again receive emphasis if rural poverty problems are to be seriously addressed. A major challenge is going to be finding viable economic functions which these institutions can perform. The credit-savings issue should receive serious attention in this regard.