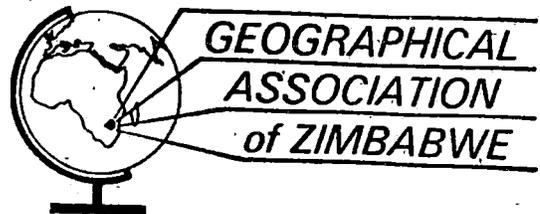


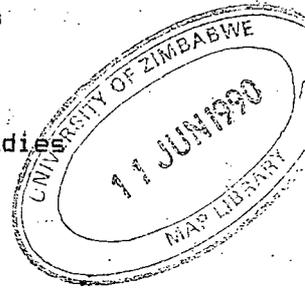


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### INTRODUCTION

Reports of chronic food shortages, malnutrition and famines in many Developing Countries are frequent. Food production is very low, in fact so low that these countries have come to be referred as international basket cases - implying that they are recipients of massive international food aid. The problem therefore is how to provide enough food to the starving and underfed millions of humanity inhabiting poor countries. Food aid is inadequate and cannot be relied upon indefinitely as it contains numerous political strings which reduce the dignity and self-reliance of the recipient country. Food productivity has to increase within the Developing Countries themselves.

For a time, the Green Revolution which started in the countries of South East Asia was believed by many to be the long awaited messiah of poor countries especially in view of its 'miracle' seeds which in some areas boosted productivity by at least a hundred fold. Disillusionment with the Green Revolution has largely come about because of its failure to boost productivity of the majority of the poorest rural farmers and its tendency to increase the affluence of the already affluent. Why has this been so? Are there any lessons for Africa and if there are, how do they affect the chances of an African Green Revolution?

### THE GREEN REVOLUTION IN INDIA

To be in a position to answer these questions it is necessary to examine the Indian Green Revolution. The Indian Green Revolution represents a spectacular breakthrough in biological and chemical attempts to ease the plight of the hungry. However, as this paper will show, merely growing more food is not the solution to the world's food problem. Who produces and how benefits are distributed are equally important considerations. Between 1963 and 1964 dwarf Mexican wheat varieties were introduced to India's experiment stations. The Mexican strains were adapted to Indian conditions through research carried out in Northern India. Meanwhile, the International Rice Research Institute based in the Phillipines was also making great strides in developing a new hybrid rice variety. Improved seeds were also imported from Developed Countries like the US and tried in Asian conditions. Emphasis was mostly on rice but there was also research on other food grains like sorghum and maize. By 1967, high yielding varieties (hyv's) were ready to be distributed to Indian farmers. These new varieties:

- a. were more responsive to fertilizers;
- b. had higher yields per unit of fertilizers;
- c. apart from rice seeds they resisted drought and adapted to various temperature ranges; and

- d. they could give 200% to 400% the yields of indigenous varieties.

Many analyses of the Green Revolution have placed undue emphasis on the 'miracle' seeds. The hyv seeds happened to appear at a time when some advances had been made in the provision of complementary factors like fertilizers, irrigation, extension services, agricultural credit and marketing facilities. In fact, it was the inadequate supply of these back-up facilities to the majority of India's rural poor and not the lack of hyv seeds, which undermined the greenness of the Green Revolution. Provision of these factors was class and area specific. Coombs and Ahmed note that:

in those select rural areas ... in the Green Revolution districts of South East Asia, the marked tendency has been for the greatest benefits to go where they went before - to the more progressive better-off farmers and large landowners. In the absence of land reform and other distributive measures, the old power structure and hierarchical social patterns have ... often solidified. (Coombs and Ahmed, 1978).

The Green Revolution was greener in districts with the greatest number of large private holdings like Punjab, Haryana and Western Uttar Pradesh. In many of the poorest parts of India there was no Green Revolution or it was limited to small isolated pockets.

The Green Revolution has also been under attack for concentrating on wheat and not on rice which is the staple diet of the Indian people. Initially, however, the aim was not to 'ignore' rice for extensive and expensive research had also been carried out on this cereal. The reasons for the wheat drama and relative rice fiasco again lie in the social-political and economic background of the revolution. Wheat farmers of the north of India were mostly individual owners of relatively large and consolidated land. Their area had the largest number of irrigation canals and tube wells. The use of hired hands in this area was relatively low. In this same area, 50% of the acreage under crops was under hyv seeds compared to less than 10% or even 2% in the rice growing areas. As shown in the table below, although wheat and rice production increased, rice in relative terms was lagging behind wheat.

Production of Cereals in India (million tons)

Crop	1950-51	1966-67	1967-68	1969-70
Rice	20,58	30,44	37,61	40,43
Wheat	6,48	11,53	16,54	20,10
Jowar	5,50	8,95	10,05	9,72
Bajra	2,60	4,50	5,19	5,33
Maize	1,73	4,99	6,27	5,67

(Source: Chakravarti, 1973)

Whilst rice production increased by 196%, wheat production shot up by as much as 311%. That rice production was less successful is further supported by frequent food deficits in rice growing areas. The lack of relevant infrastructure and public services in these areas raised production costs. Rice production areas are the most densely populated parts of India. Landlessness is high. Most farmers who produce rice as their staple food cannot afford chemical fertilizers, pesticides, tube wells, irrigation canals and flood control measures.

Moreover those farmers who grow high yield variety rice get lower prices. Ironically, it is the indigenous low yield variety rice which commands higher prices because Indian consumers find it tastier and fluffier. HYV rice remains limp, short-grained and less tasty when cooked. The shorter stems of new dwarf varieties imply less cattle feed and greater vulnerability to flooding. In these areas lack of flood control also led to washing away of the few fertilizer inputs. Extension services were also not available to the majority of small farmers. Although the hyv seeds were handed to as many farmers as possible, knowledge in appropriate spacing, depth and timing, fertilization, water management and pest and disease control was sadly lacking according to a study carried out by the International Rice Institute. Larger farmers were however more able to identify their requirements, bypass the need for local extension and head directly to the source of knowledge whereas their small neighbours were not. The small farmers were also less fortunate in obtaining credit and thus could not raise much needed financial inputs.

On a national level the Green Revolution furthered the development of capitalist relations of production in agriculture and the rural class struggle. Absentee landlords lured by visible returns created by the Green Revolution began to take an increasing interest in farming, displacing their tenants and forcing up land prices. Even retired army officers and civil servants began to run modern capitalist farms and use labour-displacing technology to minimise supervision problems. Landless agricultural labourers increased and the somewhat paternalistic relationship between landlord and tenant soon gave way to a more impersonal relationship between employer and employee in which demand and supply of labour fixed wages. Rural unrest became more marked.

If the Indian Green Revolution continues without an appropriate redirection to meet the need of the poorest and smallest farmers, Chakravati warns that:

'economic disparities are likely to become much sharper and add to the already simmering socio-political tensions in these areas' (Chakravati, 1973).

The Indian Green Revolution however reveals that the main bottleneck to rural development is not rural conservatism, for farmers were quite willing to try new seeds, fertilizer inputs and pesticides as long as they had access to and could afford them. It also shows that science has an important contribution to make in increasing agricultural productivity. Hindsight from the Indian experience has, however, underlined that the onslaught against hunger and malnutrition in Less Developed Countries cannot be made by biological and chemical advances alone. It requires a total frontal attack on all aspects of the food problem. Newman notes that:

'It was a failure to recognize this that has led to much of the disillusionment now surrounding the prospects of the Green

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Revolution for resolving mankind's food problems (Newman, 1976).

Necessarily, a truly Green Revolution has to incorporate a social revolution. The term Green Revolution itself is perhaps more appropriate to socialist revolutions as in China under Mao when hundreds of millions of peasants were mobilized into a collectivized effort to feed China's 800 million people from village communes, than to the Indian revolution.

### AFRICA'S GREEN REVOLUTION

A technological Green Revolution of the South East Asian type, though on a smaller scale is beginning to surface here in Africa. Relatively more research has so far been directed to cash crops than to important drought resistant crops like sorghum, millet and cassava. This is hardly surprising given that most of the research carried out is by or on behalf of agribusiness. Africa needs more technological research particularly on non-export food products. At present, food yields are well below potential. Malnutrition and related diseases like kwashiorkor are rife.

Ways of improving small scale raising of chickens, pigs and rabbits and even of introducing aqua-culture (fish farming) at village level to correct protein deficiency need to be explored. More research is also needed in intermediate technology like mule-drawn ploughs in areas where Western technology is inappropriate. The technological revolution in Africa should therefore be comprehensive and incorporate the totality of rural production.

As mentioned earlier the technological revolution is not identical to or a guarantee of the occurrence of a truly Green Revolution. Sufficient socio-economic changes have to be implemented to ensure that these technological inputs get down to the rural poor. There should be no inequality arising from rights to land and access to facilities like credit, fertilizers, marketing, irrigation and pest control. Unless these back-up facilities are sufficiently available to the masses they will find out, as Newman points out, that:

'the increase in yield given by the hybrid is seldom worth the extra expense of obtaining the seed' (Newman, 1976).

Given Africa's relative lack of large landless rural society, one would expect greater success in an African Green Revolution or at least fewer obstacles than was the case on the Indian sub-continent. There is enough evidence, however, from the few signs of an African Green Revolution that even Africa's communal land tenure system is no safeguard against the capitalization of agriculture with its inevitable sharpening of rural class differences. The communal land tenure is gradually being replaced by individual ownership in Kenya, Zambia, Nigeria and other countries. In many cases, African governments have bought land from colonial settlers and opened up new land for sale to 'enterprising and progressive' farmers who have received government support in subsidies, credit and marketing facilities as well as infrastructure. Rights to land are slowly being introduced even in conservative Lesotho.

In Malawi, the Lilongwe Land Development Programme, funded by the World Bank, has substantially stepped up production of maize, groundnuts and tobacco in the central province of the country where farm sizes are

greater than average. In recent years the progressive farmers covered by the programme have been able to export maize to neighbouring Zambia. The attractiveness of foreign exchange has lured Malawi's Agricultural Development and Marketing Corporation (ADMARC) into neglecting the predominantly subsistence farmers of the country. In spite of shortages among subsistence farmers, ADMARC does not adequately market its grain internally. It appears that the surplus of the progressive farmers is often considered synonymous with national surplus and the maize shortages of the rural peasants are not worth attending to. In Mali, failure by L'Office des Produits Agricoles du Mali (OPAM) to offer 'acceptable' prices to progressive farmers has made them smuggle their cereal into neighbouring countries where it commands higher prices. According to Uma Lele in 1970

'such ... black market ... (constituted) ... 58 percent of cereal sales and 67 percent of cereal purchases (Uma Lele, 1975).

And yet Mali experiences frequent food deficits. It becomes clear therefore that adoption of Green Revolution inputs like high yielding strains, fertilizers, irrigation etc. by a few 'progressive' farmers will not solve Africa's food problems. The masses themselves have to come to the fore-front of the Green Revolution. This is the only way to ensure that increases in productivity are accompanied by an equitable distribution of benefits.

An ideal African Green Revolution would thus be both a technological and social revolution.

#### BIBLIOGRAPHY

- ALLABY, M. (1972)  
Who will eat?, London, Tom Stacey Ltd.
- BAGWATI, J. (1970)  
The Economics of Underdeveloped Countries, London, World University Library.
- BARCHANK, K. (1973)  
International Social Science Journal, 25(3), pp. 285-92.
- CHAKRAVATI, (1973)  
Association of American Geographers Journal, 63, pp. 319-30.
- CHURCH, R.H. (1977)  
Africa and the Islands, London, Longman.
- COOMBS, P.H. and AHMED, M. (1978)  
Attacking Rural Poverty, Baltimore, John Hopkins University Press.
- CHRISPEELS, M.J. and SADAVAD, (1977)  
Plants, Food and People, San Francisco, Freeman and Company.
- EMBLETON, C. and MOUNTJAY, A.B. (1966)  
Africa - A Geographical Study, Essex, Hutchinson.
- GHOSH, M.G. (1976)  
Economics of the Green Revolution, Bombay, Asia Publishing House.

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BARCHANK, K. (1973)

International Social Science Journal, 25(3), pp. 285-92.

CHAKRAVATI, (1973)

Association of American Geographers Journal, 63, pp. 319-30.

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Attacking Rural Poverty, Baltimore, John Hopkins University Press.

CHRISPEELS, M.J. and SADAVAD, (1977)

Plants, Food and People, San Francisco, Freeman and Company.

EMBLETON, C. and MOUNTJAY, A.B. (1966)

Africa - A Geographical Study, Essex, Hutchinson.

GHOSH, M.G. (1976)

Economics of the Green Revolution, Bombay, Asia Publishing House.

GROVE, A.T. and KLEIN, M.G. (1979)  
Rural Africa, London, Cambridge.

ISLAM, N. (1974)  
Agricultural Policy in Developing Countries, London, Macmillan.

MYINT, H. (1976)  
Green Revolution in South East Asia, in Leading Issues in Economic Development, G.M. Meir (ed) New York, Oxford University Press.

SCIENTIFIC AMERICAN (1976)  
Food and Agriculture, San Francisco, Freeman and Company.

LELE UMA (1975)  
The Design of Rural Development, Lessons from Africa, Baltimore, John Hopkins U.P.

KNIGHT, C.G. and NEWMAN, J.L. (eds) (1976)  
Contemporary Africa: Geography and Change, New Jersey, Prentice Hall, pp. 71-80.



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