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**THE ECONOMICS OF EXPANDING COMMERCIAL
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**GRAIN TRADE, BARTER AND TRIANGULAR TRADE :
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**AGRICULTURAL MARKETING AND TRADE POLICIES
TO PROMOTE FOOD SECURITY IN THE SADCC REGION:
A RESEARCH PROPOSAL**

K. Mlambo, D. Kingsbury, and J. Rusike

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**FOOD TRADE AND FOOD AID
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GRAIN TRADE, BARTER, AND TRIANGULAR TRADE : PROPOSED RESEARCH AND POLICY ISSUES WITH SPECIFIC REFERENCE TO ZIMBABWE'S EXPERIENCE

T. Takavarasha¹

INTRODUCTION

The concepts of border prices and comparative advantage provide a useful analytical format for assessing the feasibility of triangular transactions; and their impact in promoting grain trade, on foreign exchange savings, food security, and facilitating the adoption of appropriate grain production and consumption policies in the region.

It is important to recognize that the principle of comparative advantage is only one criterion for deciding on the feasibility of alternative agricultural policies. Government frequently has other (unquantifiable) resource allocation objectives besides efficiency, such as food security and income distribution.

This paper first reviews Zimbabwe's experience in dealing with triangular transactions in grain trade. Second, it examines major issues in maize production, export, and stockholding policy. Finally, it looks at the domestic wheat industry. In this section, research areas which are relevant for promoting grain production and regional trade are identified.

It is hoped that the tentative observations highlighted in this paper will stimulate further analysis of the important issues in pricing policy, import substitution, grain stock management, export promotion, and comparative advantage relevant to the production of agricultural products to achieve food security.

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THE CONCEPT OF TRIANGULAR TRANSACTIONS IN GRAIN TRADE

The deficit food supply situation in several SADCC member states has provided a stimulus for initiating triangular transactions, primarily involving wheat and maize.

Food supply situation in the SADCC region (SADCC, 1987)

SADCC member states are highly dependent on agricultural exports to earn foreign exchange. In 1984, five member states earned more than 40% of all export earnings from agricultural commodity sales. Trade within the SADCC region is extremely small because of product similarity, the low level of industrialization, marketing and transport constraints, and the inconvertibility of currencies.

From 1970 to 1974, the annual per capita growth rate of food production in the SADCC region fell to -1.2% due to drought, destabilization, and other factors. Consequently, during this period cereal imports to the region grew at an annual growth rate of 6.9% reaching 2.09 million mt in 1984-85. Food aid to the region doubled over the period 1980-81 to 1986-87, to about one million mt per annum.

In this paper, food aid is defined as a transfer of food resources from a donor country to a recipient country which is both experiencing structural food deficits (or food emergencies) and a shortage of foreign exchange to import food commercially (World Food Programme).

Zimbabwe's experience with triangular transactions

Zimbabwe's experience with triangular transactions and periodic food surpluses dates back to 1980-81 when the World Food Programme first initiated the concept as a means to dispense food aid to neighbouring states and to help Zimbabwe dispose of surplus maize stocks. (Latif, 1986).

In the five-year period from 1981-82 to 1985-86, Zimbabwe imported a total of 293,000 mt of wheat comprised of 63,000 mt (22%) of direct food aid, 30,000 mt (10%) of direct commercial imports, and 153,400 mt of wheat in exchange for 72,000 mt of maize for distribution to neighbouring states (Takavarasha, 1986).

Triangular transactions usually involve three or four parties: a donor/cooperating partner which provides cash to purchase food or directs food from its own resources as aid; an agent such as the WFP to handle the food aid; a country supplying the food; and the recipient country.

A triangular transaction becomes a swap/barter deal if, instead of providing cash to purchase food, a cooperating partner makes available a commod-

ity which is in short supply in the food donor country in exchange for a commodity required in the food aid recipient country. Zimbabwe has received part of its wheat through this form of trade, in exchange for maize from its surplus stocks.

Advantages and disadvantages of triangular transactions

In the absence of lucrative commercial markets for a surplus product (e.g., maize), swap deals can benefit a supplying country by reducing storage problems, interest charges, handling costs, and possible wastages. In addition, it may save foreign exchange where the triangular transaction supplies a commodity (e.g., wheat) that would otherwise have to be imported into the supplying country using scarce hard currency. This further helps the supplying country to sustain its agricultural pricing and investment policies through increased sales of surplus commodities.

However, the production of regionally tradable commodities entails foreign exchange expenditures in convertible currencies since these expenditures are required to import farm inputs. Thus, grain surplus producers selling stocks to recover costs usually prefer to receive at least part of their payments in convertible foreign exchange so they can finance imports necessary for further agricultural development.

To the recipient, a major benefit is that triangular transactions involve food bought from a neighbouring country. This invariably results in speedy delivery, provides the country with food of similar quality to which it is accustomed, and helps to promote regional trade.

However, a problem arises when production cycles are not synchronized in the region, such that food surpluses and deficits coexist within neighbouring countries².

Thus, the major problems associated with triangular transactions include the inability to find willing partners, (especially where the potential donor is also experiencing food surpluses), boom-bust grain production pattern in the region, problems in calculating appropriate costs and commodity exchange ratios, handling constraints, and high production costs in supplying countries in relation to world prices. This aspect is dealt with in the next subsection.

²The primary objective of the SADCC Regional Early Warning System for Food Security Project is to provide advance information on food crop production and food supplies in the SADCC region, so member states can take action in response to impending food shortages or surpluses.

Calculation of commodity exchange rates for triangular transactions

The administrative procedures followed in determining triangular transactions are as follows: the Grain Marketing Board (GMB)--in consultation with the Ministry of Lands, Agriculture and Rural Resettlement--determines the quantity of maize that is available for external disposal and the projected wheat shortfall to be imported; and then identifies willing bilateral or multilateral partners to supply wheat in exchange for maize to a recipient country.

After determining the appropriate exchange rates, the deal is submitted to the Special Trading Arrangements Committee, chaired by the Ministry of Trade and Commerce, for approval. The Reserve Bank is particularly interested in assessing the impact of a deal on foreign exchange earnings and on balance of payments.

There are several ways to calculate an exchange rate for commodity swaps. One method is illustrated below:

- o Assume that a cooperating partner wishes to purchase 20,000 mt of maize from Zimbabwe and donate it to a nearby state. Instead of paying Zimbabwe in cash, it offers an equivalent amount of wheat. The freight on board (F.O.B.) Harare maize price is negotiated on the basis of ruling world prices or prevailing prices in the most recent regional commercial export transactions. In most cases, this price has been below Zimbabwe's break-even price of Z\$222 per mt (1985-86).
- o Using that price, the next step is to determine how much Zimbabwe would have been paid in cash, if it had sold the maize commercially. For example: 20,000 mt times Z\$165 equals Z\$3.3 million. Thus, to lend 1 mt of wheat would cost Z\$187. It follows that Z\$3.3 million of maize revenue would buy (Z\$3.3 million divided by Z\$187) 17,600 mt of wheat. This gives a commodity exchange ratio of 1:1.14 (i.e., 1 mt of wheat costs 1.14 mt of maize).

Clearly, the commodity exchange ratio and the foreign exchange implications will depend on the negotiated prices, bridging costs, and source/destination of the commodities in question. A high exchange ratio means that more maize is paying for less wheat, and vice versa.

Table 1 shows the maize:wheat exchange ratio for selected maize-wheat deals concluded since 1981-82. During the period, the ratio has varied by 100%, ranging from 1:0.8 to 1:1.61.

As shown in Table 2, the ratio of the local selling prices of wheat and maize has varied much less than the maize:wheat exchange ratio obtained through recent swaps.

Table 3 shows economic prices for maize and wheat, calculated on the basis of average costs and quoted commodity prices for the period February to September, 1987.

Table 1. Wheat:maize exchange ratios, 1981-82 to 1987-33, Zimbabwe.

Year	Maize (mt)	Wheat (mt)	Wheat:maize Exchange Ratio
1981-82	21,450	16,500	1:1.30
1982-83	42,500	26,500	1:1.60
1982-83	4,903	4,903	1:1.00
1982-84	31,000	19,224	1:1.61
1984-85	31,600	23,704	1:1.29
1985-86	9,000	7,333	1:1.23
1986-87	2,700	3,372	1:1.80
1987-88	23,467	20,767	1:1.13
1987-88	39,899	36,272	1:1.10
1987-88	11,110	10,100	1:1.10

Source: Grain Marketing Board.

Table 2. Local selling prices of wheat and maize, 1981-82 to 1987-88, Zimbabwe

Year	Maize (Z\$/mt)	Wheat (Z\$/mt)	Wheat:maize price ratio
1981-82	137	157	1.15
1982-83	137	169	1.23
1982-84	137	169	1.23
1984-85	157	239	1.52
1985-86	177	285	1.61
1986-87	222	323	1.45
1987-88	222	358	1.61

Source: Ministry of Lands, Agriculture and Rural Resettlement.

Table 3. Calculation of economic prices for wheat and maize, 1987, Zimbabwe

Price Components	Unit	Wheat	Maize
FOB/CIF, U.S. Gulf			
Price in Zimbabwe dollars ^a	Z\$/mt ^b	187.38	114.95
Freight, insurance, and port charges	Z\$/mt	+ 61.67	(61.67)
Railage costs to/from Harare	Z\$/mt	+ 74.15	(74.15)
FOB/CIF price Zimbabwe	Z\$/mt	323.20	-20.87

^aUS prices are \$114.30 (wheat) and \$70.12 (yellow maize). A premium for white maize can be added to that figure.

^bZ\$1.00 = US\$0.61.

Proposed research

There is a need to evaluate triangular transactions to determine their impact on net foreign exchange earnings, local trading accounts of maize and wheat, the development of regional grain trade; as well as to provide a sound basis for determining commodity exchange ratios for triangular transactions.

Such analysis would also make a significant contribution to the proposed SADCC Regional Food Reserve and Regional Food Aid Project, whose main priority will be to support food needs in member states, arising from natural calamities and a shortage of foreign exchange to purchase foodstocks.

The wider implications of triangular transactions on regional trade, agricultural production policy, and grain stock management and procurement policies in individual countries also needs to be assessed. This is the subject of the next two sections which focus on analyzing some major elements of production policy in Zimbabwe.

MAIZE PRODUCTION, EXPORT AND STOCKHOLDING POLICY

Maize production policy

Maize is the most important staple food in Zimbabwe. More people are engaged in its production than in any other single crop. Thus, maize produc-

tion policy seeks to achieve self-sufficiency. Price policy attempts to strike a careful balance between the aims of the farming community and the ability of consumers, both locally and overseas, to bear the consequent increases in the consumer prices. Further, price policy decisions take into account the viability of the industry, stock levels, impact on parastatal operating costs, and food security considerations.

A major characteristic of maize production is the variations in yields, primarily due to drought and other climatic cycles.

The following statistics for the large-scale commercial sector indicate the magnitude of the yield variation. In the communal sector, yields are even more variable since most communal farms are located in the lower rainfall and more drought-prone regions (Table 4).

Drought-induced, cyclical downswings in maize yields often result in dramatic increases in food insufficiency and rapid depletion of household and national stocks.

Maize export and stockholding policy

The GMB, established by an Act of Parliament in 1931, is mandated to fulfill a food security function, which involves holding large grain stocks as one of its major functions (See Makone, 1986; and Muchero, 1986; for more details on the functions of the GMB).

Table 4. Estimated average seasonal yields for maize in the large-scale commercial sector, 1980-81 to 1985-86, Zimbabwe.

Season	Yield (mt/ha)
1980-1981	2.96
1981-1982	4.28
1982-1983	2.58
1983-1984	3.23
1984-1985	5.49
1985-1986	4.65 (estimate)

Source: Ministry of Lands, Agriculture and Rural Resettlement.

Maize is by far the most important commodity handled by the GMB, accounting for 80% of the quantity of controlled products purchased locally in 1985-86.

The significant year-to-year fluctuations in the quantities of maize purchases and sales to consumers presents a major problem in stock management and export disposal. Table 5 shows the extreme variation in production and consumption which results from these seasonal fluctuations. Notwithstanding a peak grain stock position of 1.2 million mt in 1982, Table 5 shows that stocks on 31 March 1984 (marketing year end) stood at only 122,692 mt, requiring the government to import 269,000 mt at an approximate cost of more than Z\$50 million.

When the GMB-based marketing system was conceived, communal farmers were predominantly subsistence producers. Relatively little marketed surplus was delivered to the board by this sector. In recent years, this state of affairs has changed dramatically, culminating in 1985-86 with some 45% of total maize deliveries originating from the peasant sector.

The complexity of the board's operations increased substantially as the number of producers registered with the board increased dramatically from under 30,600 in 1980 to almost 400,000 at the end of 1986. A vast majority of the newly registered producers are small farmers, most of whom deliver extremely small quantities at a time, which increases the workload.

Table 5. Maize stocks, intake and disposal, (000 mt), 1979-1987, Zimbabwe.

Year	Stocks ^a	Intake	Exports (imports)	Local consumption
1979-80	65	512	265 (149)	635
1980-81	158	815	86 (95)	724
1981-82	1,201	2,014	305	665
1982-83	1,035	1,391	492	1,042
1983-84	123	617	252	1,273
1984-85	462	942	(269)	860
1985-86	1,426	1,828	285	561

^aStocks held on 31 March.

Source : Grain Marketing Board.

Analysis of purchases from communal producers in the 1986-87 season indicates that more than 75% of the sellers delivered under 5 mt but they accounted for only 35% of the total quantity delivered from communal areas.

Another related factor is that over the past 20 years, local maize sales have increased at an average annual rate of about 8.6%, a rate that considerably exceeds the rate of population increase (Food Studies Group, 1987). There are strong indications that local maize sales are inversely related to intake, probably reflecting the reduced role of on-farm retentions and increased dependence on the market for supplies, in place of subsistence production. This trend becomes more pronounced during poor agricultural years.

Definition of surplus stock

There is growing concern that reference to "surplus", simply on the basis of stocks held by the GMB, is a misleading approach for determining future production policy and the size of externally disposable surplus (SADCC, 1987). This is "because this (measure) rests on the assumption that what farmers deliver to the GMB, for example, is what remains after they have stored adequate (on-farm) supplies to meet their own anticipated consumption requirements, and that their cash income will not be used to acquire grains on the market". In other words, it is becoming quite evident that actual national surpluses may be a lot less than indicated by the size of centralized stockpiles--when viewed in the context of marked fluctuations in production/intake levels and the increasing dependence of producers on the market to satisfy consumption requirements.

The above assumption is particularly problematic in the case of small-scale farmers who appear to be holding lower on-farm stocks and selling to the GMB an increasing percentage of their output in the immediate post-harvest period; and in turn, paying less attention to household level grain storage and repurchasing that same output at a later time at a higher cost.

Furthermore, this trend does not necessarily signify that each and every household in the producing areas is satisfying its nutritional requirements. It is possible that surpluses only exist at the national (global) level.

Two conclusions can be drawn from the above observations. First, the GMB might be receiving more than merely the surplus after on-farm requirements of small-scale farmers have been satisfied. Second, the rising national stock levels do not necessarily indicate rising net availability of grain for export.

Consequently, it is recommended that instead of continuing with the programme to establish more high capacity storage facilities--which often result in high overhead costs--attention should be given to constructing a relatively more decentralized system of lower capacity grain storage facilities at the village and district level, and which are not necessarily owned by the board.

These will not only serve as bulking-up points for onward shipping to main consumption areas, but also grain stores for eventual local redistribution in times of poor harvests and as rural food-processing centres.

Proposed research

This situation suggests at least three closely related areas for research which would contribute to our understanding of food security and regional grain trade.

Comparative advantage in maize production at both the regional and household levels³

Promoting maize production does not necessarily imply that each household must be self-sufficient in maize production. Rather, every household should have access to sufficient food, either from own production or by using income derived from nonfood crops and nonagricultural activities to purchase food.

Determining optimum stockholding policy for the GMB and promoting alternative decentralized grain storage facilities⁴

It is believed that the low marketing margins offered to rural grain traders operating under controlled prices and government's clearly stated preference

³The D.Phil research proposal by T. Takavarasha (author) involves the application and interpretation of domestic resource cost calculations for major agricultural commodities produced in Zimbabwe, to agricultural policy analysis--particularly pricing policy, production, and export policy. A. O'Driscoll, technical adviser in the Economics and Markets Branch of the Ministry is currently undertaking related research to determine the ratio of foreign currency gain to domestic costs incurred in the production of major agricultural products.

⁴Due to excessive fluctuations in maize intake and demand, government feels it should maintain stocks at an 18 months' normal consumption level, equal to the approximate demand in a drought year--approximately 1 million mt of maize. Maintaining such a stock level at 1985-86 producer prices and board costs would require an investment of Z\$222 million. At a rate of 10% per year, interest would be Z\$22.2 million per annum and the 1% shrinkage and out-turn loss would add an additional Z\$2.22 million per annum; giving a total of Z\$24.42 million.

for uniform panterritorial pricing, severely limits nongovernmental investments in rural grain trading and storage. Child, Muir and Blackie (1984) in their paper, *An Improved Marketing System for Zimbabwe* advocated an alternative approach, involving free trade within floor-ceiling prices.

This paper proposes that single channel marketing be replaced by an internal free market operating between floor and ceiling prices; these prices being maintained by GMB supply manipulation to prevent excessive producer and consumer welfare fluctuations. [Available evidence]... suggests that such a system would be more efficient and would have beneficial effects on Zimbabwean development. The system is more equitable for the rural sector. It could be expected to produce greater stability of producer incomes, more reliable food supplies, higher producer prices, and release public funds currently used for consumer subsidies and for infrastructural development.

A related research area is the role of credit for promoting on-farm or village level grain storage (Muchero, 1986). Apart from saving current unnecessary costs of excessive transportation and capital intensive central warehousing, storage credit would help small farmers to meet seasonal cash requirements without having to dispose of their food retentions.

THE DOMESTIC WHEAT INDUSTRY IN ZIMBABWE

This section highlights some of the major issues that might affect the future development of the wheat industry in Zimbabwe, and have an impact on grain trade (Longmire, Ngobese and Tembo, 1986).

Wheat production and consumption trends

In Zimbabwe, wheat is produced as an irrigated crop in the winter. Although research into the production of summer wheat is underway, summer wheat will only supplement, not replace, winter wheat production.

Zimbabwe, like many developing countries, is experiencing a very rapid growth in the demand for wheat and wheat products. This is generally attributed to changes in tastes away from traditional course grains, rising per capita incomes, and urbanization. The rise in demand reflects the preferences of urban consumers for bread as a "convenience" food, which eliminates time and fuel in food preparation. This trend also applies to rural consumers.

What is particularly disturbing to policy makers is that wheat products, particularly bread, are slowly becoming basic food staples which many people feel they cannot do without. Furthermore, this is happening at a time when production costs are increasing and foreign exchange resources are declining.

Low bread prices--relative to local food staples--consumer subsidies, and the tendency to import wheat at overvalued exchange rates are other factors which contribute to increasing wheat consumption.

For the past three years, the Grain Marketing Board's off-take of wheat has been restricted to about 20,000 mt per month or 240,000 mt annually (plus additional 10,000 mt during festive periods). If sufficient wheat were available, it is estimated that the demand could easily exceed 300,000 mt per annum. Using an estimated population figure of 8.2 million, per capita consumption is therefore between 30-36 kg per year. On that basis, about 432,000 mt--more than double current production--would be required by the year 2000 to feed the projected population of 12 million.

Between 1980 and 1986, total annual domestic intake fell short of annual off-take by an average of 25% (Table 6). Imports increased from 2,654 mt in 1980-81 to 86,248 mt in 1985-86, making up an average of 22% of local sales during that period.

Table 6. Wheat purchases and sales (000 mt) 1980-81 to 1985-86, Zimbabwe.

Year	Intake	Imports	Total	Local sales
1980-81	163.0	2.6	165.6	205.4
1981-82	200.9	16.5	217.4	223.0
1982-83	212.9	31.4	244.3	233.8
1983-84	124.3	54.8	179.1	227.4
1984-85	98.5	104.2	202.7	220.0
1985-86	205.5	86.2	291.7	247.6

^aThe production year for wheat matches the calendar year, since winter wheat is planted in May-June and harvested in October-November.

Wheat policy options for Zimbabwe

From the national point of view, the choice for future expansion of the wheat industry lies between two options: devoting agricultural resources to promoting export crops which generate the highest net gain in foreign exchange, so as to supplement domestic food production by imports, or increasing domestic wheat production through import substitution, using irrigation in the case of wheat, to achieve food security⁵.

Policies to develop the domestic wheat industry should consider comparative advantage, given the high cost of irrigation--compared to the relatively low price of dryland wheat which is influenced by overvalued currencies in importing countries and subsidies in exporting countries (Byerlee, 1985).

Another consideration is the general desire to maintain low bread prices to consumer, given the general low level of real incomes. But in the long-run, this conflicts with the food security objective. Food security can only be sustained by allowing consumer prices for wheat products to rise to levels that reflect the true cost of imported wheat or the high cost of domestic production.

As far as individual producers are concerned, their wheat production decisions are influenced by the producer price of wheat, the prices of crop and livestock products which compete for the resources used in wheat production, the prices of agricultural inputs, and the cost and availability of capital, labour, and water resources used in wheat production.

Wheat production requires farmers to make capital outlays to develop the necessary irrigation infrastructure. With production costs rising, the producer price for wheat would have to be very high to stimulate an increase in irrigation with its high capital commitment.

Apart from the obvious need to have adequate wheat available for bread, local production of wheat encourages the storage of water which, in turn, can help to reduce the effects of drought on summer crops and enhance food security.

However, reduced water storage resulting from fluctuations in rainfall has a detrimental affect on wheat production and increases farm overhead costs.

⁵Food Security refers to sustainable access to food resources, at both the national and household level; through local production, improved incomes, and capacity to import. Food self-sufficiency refers to sustained ability to produce total requirements of a given commodity from domestic resources. In landlocked countries with limited foreign exchange earnings priority, is often given to food self-sufficiency.

This factor might contribute to reducing the rate of expansion in wheat hectarage, unless there is adequate risk cover in the form of higher returns and cheaper capital (e.g., National Farm Irrigation Fund).

Proposed research

To guide the future development of the domestic wheat industry, research is needed to:

- o develop an objective basis for calculating the economic cost and foreign exchange implications of imported wheat, compared to locally produced wheat;
- o determine the optimum scale of irrigation capacity under different agroecological conditions, taking into account the impact of rainfall fluctuations on production variability;
- o analyze the returns to alternative uses of irrigation resources under large-scale and small-scale production systems; and
- o identify ways to increase the use of small grains in wheat based products and evaluate their impact on maize and wheat production and consumption

CONCLUSION

To adequately address grain trade issues and the impact of triangular transactions on regional grain trade, it is necessary to take into account the underlying domestic production and consumption patterns for grain crops.

The paper has set the framework for carrying out detailed analysis of intra country comparative advantages to evaluate different agricultural activities, and identify the need to correctly assess their foreign exchange implications.

The sharp agroecological disparities that exist in Zimbabwe, together with the threat of environmental degradation, suggest that if food security is to be enhanced, domestic agricultural policy should increasingly encourage those agricultural activities which are compatible with the local production potential--as determined by climatic and agroecological conditions, access to inputs and markets, food consumption patterns, and potential for alternative employment opportunities.

At the same time, agricultural policies cannot be based irrevocably on the hypothesis that surpluses and low prices on the world market will prevail. This suggests the need to build up short term stockpiles of major food commodities, given the inability to secure adequate foreign exchange reserves to import food, especially in times of drought-induced deficits.

The interaction between household food security and national stock

management should be closely examined, given its impact on food production and consumption patterns, and its implications on regional grain trade.

REFERENCES

- Blackie, M.J. 1984. *Restructuring agricultural delivery systems in Sub-Saharan Africa: a case study of Zimbabwe*. Working Paper 1/84. Department of Land Management, University of Zimbabwe, Harare.
- Byerlee, D. 1985. *Comparative advantage and policy incentives for wheat production in Ecuador*. CIMMYT. Economics Programme Working Paper No. 1/85. CIMMYT, Mexico.
- Child B., K. Muir, and M. Blackie. 1984. *An improved maize marketing system for Zimbabwe*. Working Paper No. 8/84, Department of Land Management, University of Zimbabwe, Harare.
- Food Studies Group. 1987. *Management information and training study of the grain marketing board*. University of Oxford, Harare.
- International Fund for Agricultural Development. 1987. *Report on the special programming mission to the Southern African Development Co-ordination Conference (SADCC)*. Report No. 0064, Harare.
- Jansen, D.J. 1982. *Agricultural prices and subsidies in Zimbabwe: benefits, costs, and trade-offs*. USAID memo, Harare.
- Longuire J., P. Ngobese and S. Tembo. 1987. *Wheat policy options in Zimbabwe and SADCC countries: preliminary findings*. Pages 216-244. In M. Rukuni and C.K. Eicher (eds.). *Food security for Southern Africa*. UZ/MSU Food Security Project, Department of Agricultural Economics and Extension, University of Zimbabwe, Harare.
- Latif, J. 1986. *Note on triangular transactions in food aid: the Zimbabwe experience*. Paper presented at the WFP-ADB Seminar on Food Aid for Development in Sub-Saharan Africa, Abidjan, Ivory Coast, 8-11 September 1986.
- Muir, K. 1984. *Crop price and wage policy in the light of Zimbabwe's development goals*. Unpublished M.Phil dissertation. Department of Land Management, University of Zimbabwe, Harare.

- Makone, I.M. 1986. *Grain marketing in Zimbabwe: review of controls*. Grain Marketing Board Paper No. 89, Harare.
- Muchero, M.T. 1986. Proposed research on the role of the grain marketing board in providing adequate marketing services to meet increasing demands from the communal farming sector in Zimbabwe. University of Zimbabwe, Harare.
- SADCC. 1987. *Food security sector annual progress report*. SADCC Food Security Technical and Administrative Unit, Meeting of SADCC Ministers of Agriculture and Natural Resources, 7-9 October 1987, Harare.
- Takavarasha, T. 1986. Food aid planning and management in Zimbabwe. Paper presented at the WFP-ADB Seminar on Food Aid for Development in Sub-Saharan Africa, Abidjan, Ivory Coast, 8-11 September 1986.



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