

PUBLIC POLICY, MARKETS AND TECHNICAL PROGRESS IN THE GRAIN-PLOUGH CULTURE

Taye Mengistae

I. INTRODUCTION

That "everything depends on everything else" is an axiom in economics but has never been of formal use in the formulation or assessment of agrarian policy in Ethiopia. And yet changes in such policy have always come as a package of public measures of often conflicting goals. Some of the measures in the past consisted of rural development projects mainly for the diffusion of innovations in farming techniques. These were often supported or undermined by change or lack of it in this or that aspect of the marketing environment or institutional structure of the rural economies targeted. Some changed the relative prices or fiscal parameters faced by villagers or the institutional structure of their activities. These too either hindered or facilitated the success of rural development programmes in the diffusion of agronomic innovations. The appraisal or evaluation of any policy measure or development project is therefore misleadingly incomplete if it ignores the concurrence of all forms of "external shocks" to the economies the intervention is directed at.

However, the hindrance that public policy has so far represented to many rural development projects in as far as it influences the marketing and institutional context of the projects seems to have been known too well. So well that the question is seldom raised whether or not public policy could have been flawed also in terms of the choice of the elements of the research and extension component of the same projects. Project documents do often appraise the chosen package of elements -- and find it acceptable -- on grounds of high benefit-cost ratios that could have been even higher had government marketing or institutional policy been better. It is as often overlooked, though, that the same ratios are based on a partial analysis that suppresses inter-activity linkage effects, and can therefore be misleading measures of the worth of the selected package relative to other alternatives. The result has been a general condoning of "the agronomic bias" of most rural development projects in the country. The bias may be understood in two senses. The first is the focus of research, extension and credit schemes on improving farming techniques to the exclusion or relative neglect of improvement in the technology of home activities. Secondly, projects rarely pay attention to less predominant items in the traditional crop-mix of project areas.

Although exaggerated in one sense, the importance of the marketing environment of rural economies also seems to have been generally underestimated in a second. The possibility is rarely considered that incomes in a rural locality could be raised higher by means of an appropriate marketing policy than through poorly targeted efforts at improving production techniques. It is not sufficiently stressed either that,

should projects for the diffusion of improved techniques be unavailable to a community, there may be an alternative in the right form of public intervention in the market for their produce. The latter does not necessarily involve government intervention in the market to manipulate relative prices of rural produce through fiscal measures or price controls or purchase schemes, although these have become synonymous with marketing policy in the country.

As a critique of the current approaches to rural development programmes along these lines, this paper advances some hypotheses regarding the response of economies of the grain-plough culture to positive policy interventions. By positive interventions we mean those increasing the net incomes of rural households or their marketable surplus without reducing one or the other.

The paper is based on an analysis of the 1988-89 social accounts of the economy of a village. This is the village of Ude located some 60 kilometers south-east of Addis Ababa along the Addis - Nazareth highway. The following section provides an overview of the grain-plough culture as the background to a discussion of the structure of Ude's economy in the next section. This is aimed at bringing out those linkages in the village that are common to varieties of the culture while suppressing the peculiarities of Ude stemming from its exceptional natural resource endowment and relatively urbanized regional environment. A model of the village economy is then used to deduce the following propositions in the last section. First, policy interventions that increase the demand for rural produce at stable market prices raise both rural incomes and marketable surpluses more than those involving the net transfer of resources to villagers in the form of, say, subsidies to external supplies, price support to sales or straight forward grants. The former amount to a final demand injection into village economies. We may refer to the second as "transfer injections". Secondly, final demand injections may generate more incomes and marketable surpluses when they are directed at home activities than when they are at the production of traditionally exported grain. Final demand injections may also be more effective on the same criterion if they are directed at the less known crops of an economy. Thirdly, projects for the diffusion of improved techniques of production in home activities are not necessarily less effective than the more traditional projects of agronomic intervention. Within the latter category those directed at traditionally dominant crops may be inferior to those focussing on the less known items of the crop-mix of the targeted rural economy.

II. THE GRAIN-PLOUGH CULTURE

A. The Village as an Economy

The grain-plough culture is one of the many classes used by Westphal (1975) in his taxonomy of technological systems of peasant agriculture in Ethiopia. It is distinguished from others by the dominance of cereals and pulses in cropping pattern to the point of "near exclusion of permanent crops, vegetables and tuber crops".

Extending over the central, south-eastern and northern highlands of the country, and probably engaging the larger part of its rural population, the culture straddles scores of types of rural economies that differ from one another in several respects. These include the nature and degree of natural resource endowment as reflected in cropping pattern and farm yields, internal institutional structure or profile and the strength and pattern of commercial ties to the rest of the countryside and urban centers. Diversity in these terms is indeed generally recognizable at the lowest possible level of definition of a rural economy, i.e., the village. Following Connel and Lipton (1977), we understand the village economy to be a rural territorial administrative unit inhabited by a small population of farming households that are tied to one another by internal transactions of greater diversity and intensity than transactions with outsiders as well as by the sharing of land titles that define the territory as their work place and domicile.

The similarity between any two adjacent villages is likely to be more striking than their differences. Villages in both share the same languages and religion and the norms of social and economic behaviour associated with these. The technology of production and consumption and natural resource endowment is also no doubt the same as is the institutional profile of farming if not its institutional structure. As we extend the boundary of the neighbourhood of comparison to include more and more villages, however, we are bound to observe differences, first, in farm yields, next in institutional structure and the structure and strength of external commercial ties, then in institutional profile and, eventually, in cropping pattern, consumption habits and social norms.

B. Institutional Profiles

A rural economic institution is understood here as an organization of village administration or a distinctive combination of the mode of access of households to primary factors of production, the households' role in the management of production, the households' place in the village's work-force, and the mode of realization of their share in the net output of the village.

Smallholder farming has always characterised the grain-plough culture. However, it is a concept that is too abstract in the Ethiopian context to constitute a type of economic institution as understood here. This is because at least six different forms of it can be identified in recent agrarian history of the country, i.e., over the past thirty years or so alone. As indicated in Table 1, these are distinguished from one another by the forms of land tenure on which they are based. For convenience, the latter have been classified in the table by region and into those of the imperial and the post-imperial periods.

Each system of tenure has always corresponded to a unique institution of village administration: the *rist* or *deisa* system of tenure to the *atbia* court, the freehold system of the imperial south to the *chika* court and the *meret-le-arashu* form of tenure to the "village (peasant) association".

Table 1: Recent Types of Economic Institutions in the Grain-Plough Culture

Forms of land tenure	Types of rural households		
	Landlords	Small-holders	<i>Amratch</i> *
Imperial North	Type 1	Type 1	--
1. <i>Rist</i> system	--	Type 2	--
2. <i>Deisa</i> system	--	Type 3	--
3. Northern peasant tenancy			
Imperial South	Type 2	Type 4	--
4. Freehold ownership	--	Type 5	--
5. Southern peasant tenancy			
Post-imperial Ethiopia			
6. <i>Meret-le-arashu</i> system	--	Type 6	Type 1/ Type 2

* This is the popular name of the *wolba* (Type 1) or *malba* (Type 2) collectivisation institutions of the 1980s (see the appendix for a glossary of local terms).

The institutional profile of a village is the system of institutions found in it and differs from the village's institutional structure by which we mean the relative importance of different institutions in the village in terms of control over resources in general and farmland in particular. Since the 1960s village economies of the grain-plough culture have operated in the framework of four major institutional profiles. These are: (1) the *rist* - based profile (or Profile A) understood as a system of Type 1 landlords, Type 1 smallholders, Type 3 smallholders and the *atbia* court; (2) the *deisa* - based profile (or profile B) as a system of Type 2 smallholders and the *atbia* court; (3) the freehold profile (or profile C) as a system Type 2 landlords, Type 4 small holders, Type 5 smallholders and the *chicka* court; and (4) the *meret-le-arashu* profile (or profile D) as a system of Type 6 smallholders and the village association or a system of Type 6 smallholder, *amaratch* farmers and the village association. Each village economy of the imperial period was characterized by profile A or Profile B in the North and by Profile C in the south. The 1975-82 agrarian reform replaced all these by introducing Profile D throughout the country.

C. External Environment and Public Policy

That we should speak of a technological system as a "culture" should be connotative of the fact that the system essentially remains to be the same as what it was centuries ago except for its geographical expansion and the rather infrequent diffusion of marginal innovations here and there. However, economies of the culture

have undergone major transformations of internal institutional structure and external linkages within the last half century. The maturity of the modern day Ethiopian state in the fifties broadened their external environment to include public policy of ever expanding scope and increasing dimensions. The urbanization process that accompanied the development of the state also created a network of regional markets in agricultural produce that terminated in the capital and two or three other major urban centers. This network has been deepening fast over the last three decades and is tying more and more village households to urban economies and the rest of the countryside as suppliers of farm produce and consumers of urban goods and services as well as agricultural produce of other regions and localities.

These relatively new aspects of the external environment of village economies have grown so much in importance today that, given the relative stability of their technology, changes in the welfare of their communities have become outcomes of "shocks" resulting as much from shifts in public policy or markets or both as from changes in climatic conditions. Indeed, we have reached a stage where changes in their institutional structure or technology depend more on public policy than on anything else. The institutional profiles, A, B and C of the grain-plough culture as described above were mainly outcomes of the process of the abolition of the *gult* institution in the course of the evolution of the central Imperial Government. Likewise, their replacement by the *meret-le-arashu* profile of the post-imperial period was a direct result of the land-reform and *wolbanisation* drive that followed the fall of the monarchy. And just as the marketing environment of villages for this period was the outcome of the "socialization" policy of the new government, the marketing regime it supplanted was supported by of the *laissez faire* policy of the government of the time. Other forms of public policy vis-a-vis the culture include fiscal measures, rural settlement schemes and rural development programmes.

D. The Study Village

At the time of our case study, the village of Ude had a population of 972 in 195 households on its territory of 680 hectares. It was villagised in 1985 when all its households were moved to three residential blocks of newly built tin-roofed mud houses of an average of two rooms. Together with the paths connecting them, the homestead plots attached to each house, the village churchyard, school compound, and association and other official premises, the residential blocks occupied about 45 hectares of the village's territory. About 33 hectares of the same territory were enclosed as the site of a Ministry of Agriculture reforestation programme on the hillsides of the village. Another 127 hectares of land was used as communal grazing fields, leaving the remaining 495 hectares as fields for growing *teff*, wheat, barely, broad beans, peas and chickpeas.

During the imperial period the village was characterized by the freehold institutional profile in which most households operated as smallholders of Type 5 in tenancy to mostly absentee landlords under contractual agreements that involved the payment of a fixed quantity of *teff* grain per hectare as an annual land rent. The

1975 land reform introduced the *meret-le-arashu* profile to the village when the newly established village association distributed the village farmland to resident households with an average holding of three hectares per household on a usufructuary basis subject to redistribution as the need arose. By the time of the study the number of households had grown to the point where average holdings fell to 2.5 hectares. The period between 1975 and 1982 also saw the development of the village association into the local arm of the central government, its domain extending beyond the administration of the distribution of village land to include the administration of justice, the collection of taxes for the central treasury, the levying of cash or labour "contribution" to local public projects, the administration of compulsory grain delivery schemes, and the implementation of projects of this or that ministry of the central government. In 1982, a *wolba* was established the membership of which grew to 74 households by the time of the study and held 241 hectares or 49 per cent of the village farmland including 74 per cent of the area of the highest yielding soil variety of the locality. The remaining 121 households continued to operate as smallholders of Type 6 with an average holding of 2.1 hectares of crop fields against a per household figure of 3.3 hectares under the *wolba* or *ameratch* institution.

As elsewhere in the grain-plough culture, farming in the village is a mixture of crop production with animal husbandry but the latter playing the subsidiary role, primarily as means of raising "breeders needed to produce ploughing team replacement". Any cattle raised above the requirement are kept mainly on the natural pasture of communal grazing fields the size and quality of which depends on what is left of the village territory once the demand for cropping fields is met. Animal husbandry is, nevertheless, a crucial link in the entire complex of farming activities to the extent that more than half of the cost of production of cereals or pulses produced in the village is the cost of upkeep of plough oxen as the only source of traction power in land preparation and of donkeys as the only means of transport of grain and straw.

The most important crop in the village is *teff*, taking up more than 50 per cent of total crop acreage. Wheat accounts for 18 per cent of the same area while peas, broad beans and chickpeas take up another 20 per cent. Barely is also substantially grown. Most of the homestead plot of each household is used for growing maize for home consumption but considerable space having been left for trees and growing pepper, onion and a variety of vegetables. Barring occasional backyard tree plantings and communal participation in the village reforestation programme, there is little activity in permanent cropping.

Of no less significance than cropping or animal husbandry in terms of the employment of village resources is a series of home activities that connects grain harvested from the fields to what is served as food or beverages at household tables. Apart from cooking and brewing, this includes various forms of post-harvest processing, the fetching of water, and the collection and processing of fuel material. Water is fetched by household members from three wells spread out in the village

at considerable distances from each other, donkeys often being used as means of transport. The most important fuel material in the village is cow dung and is supplemented by twigs collected from the acacia trees dotting crop fields and straw of pulse crops. *Injera*, a sort of pancake made of *teff* or wheat flour or some combination of these and *wot*, a traditional currey are the main diet, while the favourite beverage is *tella*. Post-harvest processing produces the ingredients of these in the form of flour of various types, *kik*, *shiro*, *asharo*, *bikil*, *enkuro*, pepper powder and the like.

Home activities are basically organized at the household level involving the labour of mostly of the female and younger members of the household with a variety of the traditional cooking, processing, and brewing utensils as capital. Regardless of the institutional framework of farming in the village, the household has also been the basic unit of supply of farm labour. However, most smallholders also use substantial migrant wages labour during the harvesting season. And, as in the other areas of the grain-plough culture, farm capital has mainly consisted of plough oxen the market value of a pair of which is several times that of farm implements and other livestock combined. At the time of our study there were 1.85 and 1.62 oxen per smallholder and per *amaratch* respectively in the village. Ownership of livestock other than oxen averaged 2.6 per household.

Ude is thus very much like any other village of the grain-plough culture in terms of the structure of production activities and that of the resource base of these. Its institutional structure is typical of the same culture except for the exceptionally high degree of its *wolbanisation* at the time of the study. However, the village and, indeed, its broader regional setting of the Ada area have always been different from most economies of the rest of the culture in three major respects. First, this is an area that is endowed with farmland of possibly the highest yield in the country of high value varieties of *teff* and wheat as food grains of the greatest demand in major urban centers throughout the country. The national average yield for *teff*, for instance, has been in the neighborhood of eight quintals per hectare while nearly twice that much is reported in Ude. Besides, the *Ada-Netech-teff* variety, of which the area is the major supplier, has always fetched the highest price of all varieties, sometimes twice as much as that of some varieties.

Secondly, lying along the busiest highway in the country at a drive of an hour or two from Addis Ababa, Nazareth, Debre Zeit, or Mojo, or Akaki, the largest agglomeration of townships in the country, villages of the Ada area also have the most urbanized and commercial environment of all rural economies of the grain-plough culture. This has meant greater exposure of Ada villagers to goods and services of urban origin and, possibly, greater urban influence in their economic behaviour and social attitudes, than is usually the case in the culture. It also has meant that Ada villagers had better access directly to consumers as suppliers of grain as a result of which they obtain a higher share of the price of their produce at terminal markets than most villages in the country. At the time of study, this was of particular significance as it allowed villagers of Ude to more than make-up for the

loss they incurred through the compulsory grain delivery scheme of the Agricultural Marketing Corporation (AMC).

Thirdly, its relatively urbanized regional context and comparatively rich agricultural potential has made Ude and the neighbouring villages among the first in the priority list of the government as targets of new policy packages. This has been to the advantage of the village in as far as the policy takes the form of rural development programmes and to its disadvantage when policy assumes such forms as the *wolbanisation* and compulsory grain delivery schemes of the post-imperial period. Being within the area of one of the earliest rural development projects, the Ada District Development Project, Ude was among the villages of the culture first exposed to agricultural extension and credit schemes. And at the time of the study, it was one of less than a dozen villages covered by a pilot project of a relatively intensive training and visiting extension and credit programme. The latter included the distribution of chemical fertilizer, herbicides, and improved seed varieties for *teff* and wheat and improved input for cattle fattening. At the same time, the village saw the strongest enforcement of the *wolbanisation* and compulsory grain delivery programmes of the 80s and probably lost more resources than any other through both [Taye 1991].

III. UDE - THE STRUCTURE OF ITS ECONOMY

A. Social Accounts

All said and done, the picture of an economy must be painted as an array of figures in "dollars and cents", that is, as a system of social accounts. In rural economies like Ude, a large part of the flows of resources take place outside of the market and, hence, without actual price-tags. The drawing up of such accounts has therefore to involve some sort of shadow pricing. The social accounting matrix of Table 2 is based on unit accounting prices of village products computed by adding to the market price of "imported" inputs a net income mark-up directly proportional to the total of direct and indirect village labour input. The coefficient of proportionality is the weighted average of the "wage rate" implicit in the market prices of village produced tradables. On the assumption that the consumption of own produce by villagers takes place at a level of a subsistence minimum, this "wage rate" has been defined as rate of return to labour over and above this minimum, i.e., as a "surplus wage rate". Such a procedure clearly involves the assumption of homogeneity of labour and uniformity of capital intensity across village activity lines and allocates net incomes between these accordingly. The resulting vector of relative prices expresses the exchange ratios that would rule in the village if all resources were to circulate between activity lines through exchange while maintaining the physical output proportions observed during our accounting year. The same prices respect market prices in as far as the cost of imported inputs is valued at and the "surplus wage rate" derived from such prices.

The social accounting matrix reported in Table 2 has been extremely aggregated and is in figures in per household terms in order to facilitate comparison with other rural economies of the grain-plough culture and beyond. It has only two village institution accounts: one for smallholders and a second for the *wolba* and village association of the time combined. Production accounts have been aggregated into one for home activities and a second for farming. Other combined accounts are one for each of external supplies, capital, and external institutions. Each account in the table consists of a row of receipts by accounts of origin and a corresponding column of expenditure of the same entries by accounts of destination.

We read from the first row of the table that, at our accounting prices, a total income of Birr 3950.60 per household accrued to smallholders of Ude during the 1988/89 crop year of which Birr 1538.20 or 39 per cent was due to home activities and the remaining Birr 2412.40 due to farming activities. The entry of the first row in column 7 is the amount of total transfers from external institutions per village household to the smallholder account. Total smallholder receipts per household at market prices for marketed village produce but at accounting prices for the rest add up to Birr 4,324.20.

The column of the same account, that is, column 1, shows that Birr 116.70 of this total receipt was transferred to the village association and *wolba* (row 1), Birr 150.60 was transferred to external institutions (row 7), Birr 91.20 was the value of consumption of external supplies by smallholders (row 5) and Birr 3820.80 the value of consumption of home-made food, beverages and other household services (row 3), leaving annual per household savings worth Birr 144.90 (row 6). It should be noted that, of the total transfers of Birr 116.70, Birr 84.80 was the value of labour services smallholders provided free of charge to the village *wolba*, the rest being the sum of fees paid to the village association office or cash contribution to the association's projects. Of the total transfers to external institutions, Birr 138.10 is an accounting transfer to the urban public sector implicit in the excess of accounting prices over official prices for grain sold under the AMC's compulsory delivery scheme.

We read from the production accounts that the village farming output per household in 1988/89 was worth Birr 6,138.90 of which Birr 2,180.50 was input to farming itself, Birr 1973.70 input to home activities, Birr 204.10 investment expenditure and Birr 1,780.60 the value of sales of village produce to urban economic units. Reading the capital account, we see that the value of total investment per household for the same year was Birr 336.20 of which Birr 132.20 was expenditure on external supplies of capital goods and Birr 204.10 the cost of village resources invested mainly in the form of labour on construction and tree planting (column 6). Birr 144.90 of the same total investment was on account of smallholders and Birr 191.30 on that of other village institutions (row 6). In the external institutions account (row 7 and column 7), we read that such institutions bought village produce worth Birr 1,780.60 per village household at our accounting prices or Birr 1979.66 at market prices and sold to villagers goods and services worth Birr 2,050 at market prices. Of the total external supplies to the village, 27.3 per cent were by other rural

units, 61.7 per cent by the urban public sector and only 11 per cent by the urban private sector. External institutions benefitted from a total transfer of Birr 150.60 per village household on account of smallholders and Birr 91.30 per village household on account of the other village institutions of which more than 85 per cent was an implicit transfer to the urban public sector. On their part, villagers benefitted from a total external transfer per household of Birr 373.60 on account of smallholders and Birr 137.70 on account of other village institutions. Disaggregated accounts show that the village transferred more resources to the public sector than it received and received more from the urban private sector than it transferred to the same, but, on balance, benefitted from a net transfer of resources from the urban sector as a whole due to favourable free market conditions and despite the rather extractive package of marketing, pricing, and fiscal policies it faced.

Of the total value of the village's output of Birr 7079.30 per household, 32 per cent was actually traded and 25.2 per cent the cost of "imported inputs", which makes Ude one of the most monetised of village economies in the country. If we suppress the net output of home activities on account of being non-traded, gross income will fall to Birr 3697.40 at market prices of which Birr 1520.60 or 41 per cent is cash receipts.

B. Modelling the Village Economy

As already pointed out, the economy of Ude is much more complex than the impression given by Table 2. The fully disaggregated matrix of the village is a system of 46 accounts of which three are village institutions current accounts, nine external supplies accounts, three external institutions accounts, one combined capital and 30 production accounts. Of the 30 production activities identified, nine are activities of supply of food, beverages and other household services, ten activities of post-harvest processing, three activities of fuel and water supply and eight farming activities.

**Table 2: Social Accounting Matrix of Ude, in Birr and Per Household Terms
(March 1, 1988 to February 20, 1989)**

R			EXPENDITURE							Total
			1	2	3	4	5	6	7	
E	Village institutions	1. Smallholders	--	--	1,538.20	2,412.40	--	--	373.60	4,324.20
C		2. Other	116.70	17.30	511.90	828.00	--	--	137.70	1,473.90
E	Production	3. Home activities	3,820.77	1,273.80	2,358.00	--	--	--	--	7,452.60
I		4. Farming	--	--	1,973.70	2,180.50	--	204.10	1,780.60	6,138.90
P	Other	5. External supplies	91.20	37.80	1,070.80	717.90	--	132.20	--	2,049.90
T		6. Capital	144.90	191.30	--	--	--	--	--	336.20
S		7. External institutioa	150.60	91.30	--	--	2,050.00	--	--	2,291.90
		Total	4,324.20	1,611.60	7,452.60	6,138.80	2,050.00	336.20	2,291.90	

*Row entries may not exactly add up to column totals due to rounding-off

Given the technology of village production activities, social norms as determinants of preferences of villagers as consumers of village produce, and the institutional structure of the village economy as reflected in inter-institution transfer rates, the dependence of the structure of village production and the distribution of the output and net income it generates on villagers' decisions is stronger than that of entries into accounts of external supplies or external institutions. It also seems safe to assume that investment or saving decisions of villagers are determined as a by-product of consumption decisions. In this sense, entries of external supplies, external institutions and village capital accounts can be regarded as exogenous to the economy of Ude while those of the current accounts of village institutions and production accounts are endogenous.

If we aggregate receipts of exogenous accounts as "leakages" of the endogenous accounts and outgoings from the exogenous accounts as "injections" into the endogenous ones, the structure of Ude's economy as observed in 1988/89 can be described by a matrix of 34 accounts the format of which is shown in Table 3. In the table, T_{11} is a 3x3 sub-matrix of inter-village institutions transfers, T_{12} a 3x30 sub-matrix of the distribution of village net incomes by lines of production activity and village institutions, T_{21} a 30x3 matrix of the distribution of village consumption by activity of source and village institution, and T_{22} a 30x30 matrix of intermediate flows of village production. Dividing the entries of each endogenous account by the corresponding column total leads to a 33x33 matrix of coefficients

$$A = \begin{bmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{bmatrix}$$

This is a description of the structure of the village economy in terms of a sub-matrix of average rates of inter-institution transfer, A_{11} , a sub-matrix of input coefficients, A_{22} , a sub-matrix of average budget share of consumption items, A_{21} , and a sub-matrix of the relative income shares of institution by activity lines, A_{12} .

In identifying the production and current village institution accounts as the endogenous part of Ude's system of accounts, we have already gone a long way towards a model of the village's economy. The following assumptions can also be made as safe approximation to reality in the village: (1) unitary income elasticity of consumption demand for village produce, i.e., constancy of the A_{21} coefficients matrix; (2) constant marginal rates of inter-institution income transfer, i.e., constancy of the A_{11} matrix; and 3) constant relative distribution of net incomes across village production activities and village institutions, i.e., constancy of A_{12} . If the village economy is not subject to climatic or ecological shocks or innovation in techniques of production the technology matrix A_{22} also becomes fixed. If we further suppose that all village resources are underutilised, the village economy can be described by the system of equations.

Table 3: Format of Ude's Social Accounting Matrix

R E C E I P T S			EXPENDITURE			
			Endogenous accounts		Injections	
			1	2		
			1	Village institutions	T ₁₁	T ₁₂
2	Production	T ₂₁	T ₂₂	x ₂	y ₂	
3	Leakages	l ₁	l ₂		t _x	
4	Total	y ₁	y ₂	t _x		

$$\begin{bmatrix} y_1 \\ y_2 \end{bmatrix} = \begin{bmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{bmatrix} \begin{bmatrix} y_1 \\ y_2 \end{bmatrix} + \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} \quad (1)$$

$$\text{or } y = Ay + x \quad (2)$$

- where
- y_1 = vector of total receipts of village institutions
 - y_2 = vector of village output
 - x_1 = vector of injections into village institution accounts
 - x_2 = vector of injections into village production accounts
 - y = (y_1, y_2) and $x' = (x_1, x_2)$

This is a model whereby the structure and level of incomes of village institutions, y_1 , and the level of village production activities, y_2 are entirely determined by the structure and level of injections since the solution to the system of equations is

$$y = Mx \quad (3)$$

$$\text{where } M = (I-A)^{-1} \quad (4)$$

Each element m_{ij} of the multiplier matrix M measures the total effect of one Birr worth of injection through the j th endogenous account on the total receipts of the i th endogenous account.

The assumption that all village resources are not fully employed is not one that is warranted for all village economies of the grain-plough culture and certainly not for Ude. Injections into rural economies in the form of public sector transfers have

also often been mainly the cost of rural extension services. As these are generally expected to introduce changes in the matrix A_{22} , the assumption of constancy of input coefficients despite changes in x_1 is therefore unrealistic at least in villages where rural development projects are in progress. The model of the village economy just set out is therefore a rather poor basis for the precise measurement of the impact of a package of policy interventions or other external shocks on a particular village economy. However, once computed from actual accounts, the coefficients matrix A and the multiplier matrix derived from it can be used to great advantage in a comparison of alternative forms of policy intervention without any restrictive assumptions.

IV. UDE - PATTERNS IN ITS RESPONSE TO POLICY INTERVENTIONS

A. Forms of Policy Interventions

The model of Ude's economy just set out is a useful device of classifying the external shocks that the village may be subject to without subscription to the more questionable assumptions on which its predictive worth depends. There are at least four types of such shocks. First we have what we may call "institutional shocks". These are shocks that are generally associated with the institutional transformation of the village economy and find expression in changes in the sub-matrices A_{11} and A_{12} of the coefficients matrix A . As such, they must involve changes in the nature of village institutions or the parameters of distribution of incomes or average rates of transfer between existing ones or a combination of both. Then we have shocks that alter the input coefficients sub-matrix, A_{22} . These are "technological shocks" that represent technical progress when they have the overall effect of increasing village net incomes with a given level and structure of primary factor inputs. The third category of shocks includes those changing the vector, x_1 , of external transfers to villages or its counterpart, I_1 , of leakages. These are "transfer shocks". We also have "final demand shocks" as a fourth category that consists of changes in the vector of final demand injections, x_2 or in its counterparts, I_2 . Changes in x_2 involve changes in the structure or extent of the market for village produce or of investment expenditure of village output at given prices while those in I_2 mean a different level or structure of village spending on external supplies.

As indicated earlier, institutional shocks in recent history of the grain-plough culture have been results of radical shifts in agrarian policy, particularly in as far as it relates to land tenure and settlement. In contrast, the other forms of shocks are observed to be outcomes of public measures or the lack of these as often as they have been due to events autonomous of the state of policy. Technical progress wherever observed has been in areas of extension and improved input supply schemes, but we have also the positive technological shocks of exceptionally good harvests associated with the more fortunate phase of the "climatic cycle" to which the culture seems to be subject. Negative technological shocks of crop failures due to

drought are probably the most noticeable features of many areas of the culture and are quite rightly not directly attributed to public policy.

Transfer shocks also seem to have generally originated as much in changes in public policy as they have in autonomous changes in the prices of village produce relative to those of external supplies. Transfer shocks are said to be due to public policy when they are a result of one or more of the following: changes in direct tax rates in villages; changes in rates of indirect taxation or subsidies to external supplies of villages; outright grant of public sector services to villages or grants of cash or services by villages to the public sector; and changes in the farmgate price of villages relative to shadow or bench mark prices as a result of direct government intervention in transactions. Final demand shock are attributed to public policy when direct government intervention in markets alters the extent and structure of the demand for villages produce at given prices.

As part of the external environment of rural economies like Ude, agrarian policy or reforms in such policy can then be seen as some combination of the following types of government intervention in villages: technological intervention in the form of rural extension and input distribution programmes; public transfer injections (or withdrawals) in the form of fiscal measures and pricing policy; and final demand injection in the form of agricultural marketing policy as distinguished from fiscal measures or pricing policy; and institutional interventions of one form or another.

Policy changes with respect to the last of these are much less frequent than those with respect to the other three and seem to figure rather low on the current agenda of reforms in the country. It appears then that if and when a new agrarian policy unfolds, it will have involved a choice from a menu of options that differ from one another in terms of (a) the relative weight attached to technological interventions, transfer injections and final demand injections, and (b) the content of each of whichever of these as are included.

B. Multipliers, Linkage Effects and Constraints

Table 4 is the multiplier matrix, M , derived from a moderately aggregated version of Ude's 1988/89 accounts. In what will follow, we shall use it to compare transfer injections, final demand injections and technological interventions, on the one hand, and broad variants of each, on the other. The comparison is in terms of efficacy as complementary or alternative components of a hypothetical policy package aimed at increasing village incomes and marketable surpluses and will be done under the alternative assumptions of the full employment of all village resources or the underemployment of the same resources.

On the second assumption, each entry m_{ij} of the multiplier matrix measures the amount by which "receipts" of the i th account will have increased when the effects of a unit of injection through the j th account on the village economy have fully worked out. If both i and j are production accounts, m_{ij} is the amount by which the

output of i will have increased for every Birr of final demand injection into j by the time the repercussion of the injection on the entire system of accounts has been observed. If j is a production account but i an institution one, m_{ij} measures the full effect of every Birr of the final demand injection on the net income of the relevant institution. If we assume the full employment of resources, instead, each m_{ij} of final demand injection through j measures the constraints to the realization of every Birr of planned marketable surplus or investment. This constraint will be in the form of additional output requirement if the latter is a production account and required increment in incomes if i is an institution account. Likewise, m_{ij} measures the income or production multiplier effect on the i th account of every Birr of a transfer to institution j if all resources are underutilized, but the income or production constraint posed by the i th account for the absorption of the transfer if there is full employment of resources.

Table 4 can also be used for comparing different forms of technological intervention although these by definition must alter the A -matrix of the village and the corresponding M -matrix. If we assume full employment at the point of interventions of this kind, the M -matrix is a basis for comparing alternative forms of intervention by the strength of constraints to increasing incomes, investment or marketable system they are intended to remove or relax. If resources are underemployed throughout, the pre-intervention M -matrix can be used to estimate the effect of interventions on the village net output provided the scope of the intervention is limited to one or two activity lines.

C. Public Policy, Transfers and Markets

One of the results of the study on which this paper is based was that, as was often reported by others, smallholders were more efficient in the utilization of resources than the *wolba* institution of village farming. This is borne out by the first two columns of Table 4. If we were to assume that village resources were underemployed at the point of a hypothetical transfer injection, the first three entries of column one suggest that village incomes would increase by a further Birr 1458 for every Birr 1000 of external transfer of one form or another to the village's smallholder account. On the other hand, the additional income generated would fall to Birr 974 for the same transfer if this were made through the *wolba* account. This result, that transfer injections would raise real incomes higher when made to the account of the more productive institution in the village, can further be seen in that the same injection would not have any multiplier effect at all if made to the account of the village association office (column 3) which is the least productive of all village institutions. The same figures could be interpreted as an ex-post measure of the opportunity cost of a transfer leakage from the village in terms of foregone incomes

Table 4: Multiplier Matrix, M in $y = Mx$ of Ude, 1988

S.No.	Institution current	INSTITUTION CURRENT			PRODUCTION ACCOUNT							
		1	2	3	4	5	6	7	8	9	10	11
1	Smallholders	2.028	0.704	--	9.220	2.961	9.624	4.453	1.209	7.065	0.563	1.259
2	<i>Wolba</i>	0.412	1.270	--	3.525	1.126	3.862	1.712	0.486	3.110	0.458	0.479
3	Village association	0.018	0.015	1	0.094	0.030	0.098	0.045	0.012	0.075	0.008	0.013
P R O D U C T I O N												
4	Food and drink preparation	1.911	1.309	--	15.635	3.088	8.160	4.660	1.277	7.620	0.728	1.315
5	Household services	0.053	0.036	--	0.267	2.083	0.281	0.128	0.035	0.210	0.021	0.037
6	Post-harvest processing	0.439	0.301	--	4.255	0.708	12.318	1.072	0.294	1.754	0.291	0.302
7	Fuel and water	0.478	0.327	--	4.369	1.975	3.047	4.162	0.319	1.903	0.181	0.329
8	Draft animal power	0.183	0.126	--	1.800	0.584	1.976	0.990	1.335	1.673	0.070	0.298
9	Temporary crops	0.968	0.663	--	9.716	2.810	8.595	4.411	1.856	9.166	0.368	1.644
10	Permanent crops	--	--	--	--	--	--	--	--	--	1.000	--
11	Livestock and dairy products	--	--	--	--	--	--	--	--	--	--	1.000

regardless of whether or not village resources are fully utilized. In that case, the more productive is the institution of the account subject to "leakage", the greater the cost of transfer of resources from the village to external institutions.

The economy of Ude is thus clearly sensitive to transfer interventions in the sense of a high opportunity cost of leakages or multiplier effect of injections. However, a comparison of column 4 to 11 with the first three columns of Table 4 shows that the village is by far more sensitive to final demand interventions. Column 9, for instance, shows that for every Birr 1000 of increase in the external demand for grain at accounting prices there would be an increase of Birr 10,250 in village incomes assuming village resources are all underemployed. The same figure can also be interpreted as the loss in village incomes due to a 1000 Birr fall in the external demand for Ude's grain. Either way, the figure is several times higher than the income generated or foregone through an equal amount of transfer injections or withdrawals. The effect of final demand interventions on the village is also far stronger than that of transfer interventions when the former directly impact on all production activities except in the case of injection to the production of permanent crops, which, as pointed out, is rather marginal to the production system of Ude and, indeed, that of villages of the grain-plough culture in general.

What this means is simply that a marketing policy that widens the market for village products while stabilizing the prices of these increases village incomes far higher than any transfer injection, be this in the form of support of farm prices above opportunity cost, subsidizing external supplies to villagers, or outright grants of cash or services. Conversely a marketing policy that would result in shrinking markets at stable prices for village produce would cost the village far more incomes than one that would transfer resources from villagers by keeping prices of village produce below opportunity cost or raising tax rates on village incomes, property or external supplies.

D. Public Policy, Markets and Technological Interventions

Supposing Ude faced a project aimed at a wider market for its products at stable cost prices and assuming that its resources were all underemployed at the point of project commencement, columns 4-11 of Table 4 can be interpreted in an interesting way. Although villagers in Ude are making substantial sales of fattened cattle and are beginning to sell processed grain and *kubet* as fuel material, village "exports" have predominantly been those of unprocessed grain mainly *teff*, wheat and pulses in that order of importance. However, comparison of column 9 of the table with columns 4 and 6 shows that an expansion of the traditional grain markets would increase village incomes by far less than an equal expansion in its market for processed grain or the opening up of new markets for the traditionally non-traded but potentially tradable items of food or beverages such as *injera*, *dabo* or *tella*. Column 7 and 11 show that an expansion of the market for Ude's fattened cattle or dairy products would generate less income than an equal amount of expansion of the market for such products. It thus turns out that if the project for widening the market for Ude's

produce has to be targeted to only a selection of products, the targets of priority are not necessarily the traditionally dominant "exports".

If we drop the assumption of underemployment of resources in the village, the same project of expanding the markets for its produce will not be feasible unless it is supported by a project for the introduction of new techniques of production that would relax constraints to increasing marketable surpluses. Projects of the latter kind have operated in Ude for nearly two decades in the form of extension services and credit facilities for access to improved inputs. These have always focused on the production of traditional marketables, i.e., *teff* and wheat grain to the exclusion, not only productive home activities, but also the production of other crops and, until very recently, animal husbandry. As already pointed out, this has been a general characteristic of extension and credit programmes throughout the grain-plough culture. However, columns 4 to 11 of Table 4 indicate that this bias may conflict with the programmes' declared objectives of maximizing rural incomes or marketable surplus. Even if we assumed that the only marketable village produce is unprocessed grain, the productivity of home activities is a greater constraint to increasing the marketable surplus of the same produce than productivity in farming. It should follow that technological interventions aimed at raising the productivity of home activities could be a more efficient way of increasing the village marketable surplus of grain than those intended to increase productivity in farming. However, extension programmes in Ude as elsewhere also often exhibit bias in the sense of unwarranted targeting of research and extension services on the one or two crops of traditional village "exports". In the case of Ude, these have been *teff* and wheat. And yet the M-matrix of the disaggregated system of accounts of the village -- not reported here -- shows that productivity in other farming activities is almost as strong a constraint to increasing the marketable surplus of *teff* or wheat as is productivity in *teff* or wheat farming.

The use of Table 4 to compare technological interventions by targeted activities under the assumption of underemployment of resources also show that interventions targeted at home activities in general have a greater multiplier effect on net incomes or aggregate output than those directed at farming activities. The M-matrix of the disaggregated accounts shows that, within the sub-category of agronomic interventions, those targeted at pulses or barely, for instance, would have greater multiplier effects than those focusing on *teff* or wheat.

V. CONCLUDING REMARKS

At a rather general level, this paper makes the economic case for integrated rural development programmes in the wider sense of "integration", that is, in that of the comprehensiveness of programmes to include policy interventions in the marketing, fiscal and institutional framework as well as in the technological basis of the entire range of rural production activities. And if and whenever and wherever such programmes are affordable and feasible, the paper's propositions should be relevant to the problem of the optimal sequencing of their components. However, a stronger

case has long been made against integration as a strategy at the countrywide level: that their components of technological intervention are not affordable. The complementing of these components by appropriate final demand or transfer interventions is not necessarily feasible either due to political, administrative or fiscal constraints.

Our propositions are therefore better interpreted in relation to the prioritization and optimal sequencing of the affordable and feasible "top-something" interventions into a "minimum package". The argument that final demand interventions are an effective means of raising rural incomes is a case of their inclusion in such a package. The argument that the same interventions are more efficacious than transfer injections is a case for minimal role for fiscal measures and maximum role for interventions in the market for rural produce as components or part of the policy context of rural development programmes. At the level of marketing policy, both propositions lead to the advocacy of a policy aimed at expanding and diversifying the demand for rural produce at stable prices while avoiding the manipulation of relative prices as a means of supporting rural incomes. Such a policy is liberal to the extent it does not restrict the interplay of market forces but is at the same time activist to the extent it must involve public investment in the infrastructure for rural marketing and may involve the use of public enterprises as dealers in rural produce.

The paper's critique of the agronomic bias of past and present rural development projects applies not only to the minimum package programmes (MPPs) of the 70s and early 80s but also the recent the Peasant Agricultural Development and Extension Programmes (PADEP) and the relief and conservation-oriented "integrated" programmes of international NGOs. And although presented here in rather formal terms, this is an argument the validity of which is quite often supported by the opinions of target communities about individual components of these programmes. Villagers generally appreciate and take advantage of extension service and credit facilities in farming activities. But they are also often observed to resist or reject the adoption of some innovations particularly in the form of some improved seed varieties that project personnel believe should be attractive to farmers on grounds of having higher yields than traditional varieties. Project personnel are often puzzled by such resistance and are surprised to observe that the digging of water wells or the installation of grain mills are often ranked higher by villagers than credit facilities for high-yielding farm inputs. However, the difference in points of view between the local community and project personnel involved in such cases does not seem to be due to the irrational conservatism of the former as is sometimes supposed to be the case. If irrationality is involved at all, it appears, it is on the part of project personnel whose "economic" appraisal of agronomic innovations is short-sighted to the point of suppressing the repercussions of individual interventions through the entire production system that tightly links each farming activity to every other, each home activity to the others, and the sub-system of home activities to that of farm activities.

The argument for greater attention to home activities and less prominent items in traditional cropping-mix in technological and final demand injections is also consistent with the emphasis of increasing marketable surplus as a policy objective. In the early days of rural development programming in the grain-plough culture, village marketables were limited to a grain type or two. Agronomic bias in the programmes of the time might therefore have been harder to detect and, possibly, also justifiable. This is no longer the case today. It is true that rural "exports" continue to be dominated by traditional marketables. However, products the export of which was unimaginable twenty years ago are now important sources of cash earnings by villagers. More and more of them are selling such items as *kik*, *shiro*, *bread*, or *kubet* in the nearby townships and it may not be long before we observe the selling of village baked *injera* in urban centres. And if there is anything in the notion of "rural industrialization" in development thinking it is something for which policy support can only start in the form of the humble projects of providing infrastructure and intermediation to quicken the pace of growth of infant markets of this kind. With the fast rise of the prices of the less prominent items of farm produce relative to those of traditional marketables, the choice of targets for technological intervention as means of increasing supplies to urban centers is also becoming an increasingly difficult task.

It is undoubtedly true that technological interventions in home activities are increasing in importance as components of rural development programmes. However, it also seems to be mostly the case that recognition of the importance of such interventions is a grudging and misconceived one. Too often such interventions are a one-shot affair and are not formally appraised for their relative worth in terms of increasing incomes or marketable surplus. Sometimes they are included in a project as a means of soliciting acceptance for boldly innovative and less popular agronomic interventions.

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APPENDIX

GLOSSARY OF LOCAL TERMS

1. *Amratch* Amharic word meaning "producer" that came to be adopted as the popular name for agricultural producers' co-operatives.
2. *Atbia* Literally means village in Amharic; the *atbia* court was the office at the village level of the magistrate or headman in Amharic and Tigrean speaking areas.
3. *Chika* The southern equivalent of the *Atbia* in northern Ethiopia during the Imperial Period.
4. *Dabo* Home-baked traditional bread.
5. *Deisa* A communal system of land tenure based on periodic redistribution of farmland in Tigrean areas during the imperial period.
6. *Gult Institution* A traditional rural policy in Ethiopia whereby a lord kept law and order in a particular territory and extracted tribute from inhabitants in the name of an overlord up in the hierarchy of regional power.
7. *Kik* Crushed and cleaned dried peas or beans used as ingredient of currey.
8. *Kubet* Dried cake of cow-dung used as fuel.
9. *Malba* Official name for agricultural producer co-operatives established in the 1980s in Ethiopia and in which all farmland but not equipment was collectively owned by co-operative members.
10. *Meret-le-arashu* Literally means "land-to-the tiller" in Amharic and was the slogan for the political movement for the land reform that was carried out in 1975.
11. *Wolba* Official name for agricultural producers co-operative established in the 1980s in Ethiopia and in which farmland, draft animals and farm implements and equipment were commonly owned.
12. *Rist* Land holding rights inherited through gene descent in northern Ethiopia of the imperial period.
13. *Shiro* Powder of pulses used as ingredient in the making of traditional currey.
14. *Teff* Staple crop of Northern Ethiopia.
15. *Tella* Traditional alcoholic beverage brewed from barley, maize or sorghum.