

PN-ABD-261
62734
AGRICULTURAL TECHNOLOGY IMPROVEMENT PROJECT

(ATIP)

MISCELLANEOUS PAPER

WOMEN'S ARABLE AGRICULTURE IN RELATION
TO THE MAIN FACTORS OF PRODUCTION:
THE ATIP EXPERIENCE

NUMBER: ATIP MP 89-1

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APRIL 1989

PRINTED: May 30, 1989

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INTRODUCTION

The role of women in Agricultural Development has been documented by numerous researchers and scholars. From the literature, it is evident that women perform a wide range of social and economic functions which warrant them to be a special target group. However, in most developing countries not much has been done to come up with programmes that would motivate women in arable agriculture, yet they are basically the main farm managers. It should be noted, nevertheless, that women are not a homogeneously disadvantaged group in terms of their capacity to carry out agricultural activities. Depending on where you are in Botswana, there is a lot of variation in circumstances affecting women's participation in agriculture.

Participation in agricultural production is governed by a wide range of factors which include; composition of the labour force, resource endowment, ecological constraints, management capabilities, access to extension services, awareness and socio-cultural and political factors. In view of these, it is apparent that women are particularly vulnerable since most of the above circumstances do not work in their favour.

This paper will mainly focus on problems affecting the efficiency and productivity of women farmers in arable agriculture. A.T.I.P. research findings in the Mahalapye and Francistown areas will be emphasized. However, other findings from the Ministry of Agriculture (MoA) pertaining to gender issues will also be discussed.

To determine how efficient a system is, one has to examine whether the system makes the most productive use of the limited human and material resources at its command. That way one is assured of the maximum amount of necessary and desirable goods and services with the minimum of human effort and sacrifice, and produces them too, in the proportion they are wanted by the community, (Rapid Results College: 1988). That is why in this paper I will take a close look at the main factors of production (land, labour, capital and management) and how they are employed in our agricultural systems. As mentioned earlier, women are the main farm managers and it goes without saying that the way arable resources are managed will have implications for women.

THE UTILIZATION OF FACTORS OF PRODUCTION AND IMPLICATIONS FOR WOMEN

- (a). Land
Generally female-headed households own less land than male-headed households simply because it is technically difficult for women to own a large area and fully utilize it. Lucas and the Arable Lands Development Programme (cited in Kerven, 1979) showed that female-headed households have less land than male-headed households. Experiences from both A.T.I.P. Mahalapye and Francistown support this. Women's agriculture is less capital intensive, thus there is currently no way they can

Prepared for the Molapo Development Project Workshop on Constraints in Agricultural Development, held in Maun, 10-12th April, 1989.

maximize production within the limited area they have. This also has long-term implications for their agriculture since lending institutions issue loans against farm assets rather than considering how productive and efficient the producers are.

(b). Capital

Hom and Nkambule-Kanyima (1984) posited that gender based division of labour results in woman being assigned chores that require little capital and that are characterized by low productivity, while more capital intensive chores are allocated to men. This is true with most of the arable activities in Botswana. Government programmes aimed at improving the welfare of farmers are biased towards men. A programme like ALDEP, for example, comprises the traction, destumping and fencing packages. The employment that is generated by such packages favours men. Given that female farmers are generally poor, one finds that such activities improve the welfare of male farmers and aggravate cash flow problems for women and thereby widening the gap between the two genders. ATIP findings in the Mahalapye area show that monthly net cash flow for male-headed households is P14.06, while that for female-headed households is P-25.36 (See Table 1). The negative net cash flow for female-headed households is attributed to the fact that they have less revenues yet their financial commitments in arable agriculture are likely to be higher. Similarly Bond (1974), showed how the economic position of women is affected by hiring in cases where they need male labour. In support of this, Cooper (cited in Hom & Nkambule-Kanyima, 1984) reported that most payments received by women, if any, are in kind or reciprocal assistance rather than cash. In view of this, one wonders how women's agriculture could ever improve given that they have to pay for arable services from the little remittances they have.

(c). Access and ownership of arable inputs - labour, draught power and farming equipment

Women in Botswana arable agriculture are generally overworked in the sense that they have multiple duties and their activities require more time than those pursued by men. In his thesis, Baker (1987) pointed out that women worked more hours on more activities than either men or boys. A total of 2435 hours for women, 1071 hours for men, 1052 for boys and 453 for girls were recorded per household per year. (See Table 2). Similar to Mahalapye, Miller and Seleka (1985) found that women in Francistown did most of the work. They pointed out that for three out of four households, there were women who planted, weeded, and harvested without help. Table 3 reports the distribution of labour in crop activities by sex and source in the Tloame Agricultural District.

Also, there are cases where men are not in residence. Here, the women must shoulder both the traditional agricultural and domestic tasks in addition to those which would have been performed by men. It should be noted however, that this only applies to certain parts of the country. In the Francistown area, for instance, whether men are in residence or not, most of the arable activities are female dominated. In addition to their multiple roles, women also make numerous decisions relating to the crop operations.

TABLE 1: AVERAGE MONTHLY CASH FLOWS, MVRU SURVEY, MAHALAPYE AREA, NOVEMBER 1983 - JUNE 1984

	VILLAGE		SEX OF HEAD		CATTLE ASSETS		
	SHOSHONG	MAKWATHE	MALE	FEMALE	36+	0-35	ALL
	PULA	PULA	PULA	PULA	PULA	PULA	PULA
SALES:							
CROPS	1.40	0.07	0.46	1.14	0.21	0.70	0.70
LIVESTOCK	53.29	13.88	57.15	8.09	81.11	10.10	39.46
BEER	27.68	1.50	9.44	34.54	26.38	12.94	12.49
OTHER	2.06	0.29	1.78	0.83	2.89	0.42	1.44
MISC. REVENUES:							
GIFTS & LOANS	19.65	27.37	20.98	24.79	13.79	28.39	22.36
WAGES	21.02	9.52	23.41	2.04	23.92	12.10	16.98
OTHER	5.48	0.41	4.83	1.69	6.49	1.73	3.70
TOTAL REVENUES:	130.22	51.04	120.05	73.12	155.29	66.38	103.13
PURCHASES:							
INPUTS	6.14	1.37	2.16	8.56	3.94	4.84	4.47
GRAIN & MEAL	14.17	6.23	10.46	13.01	13.19	10.11	11.38
OTHER FOOD	18.37	6.46	14.91	12.92	18.34	11.27	14.19
LIVESTOCK	3.18	0.00	3.23	0.00	4.73	0.18	2.06
HOUSEHOLD GOODS	21.62	5.87	19.73	9.64	23.24	11.06	16.09
MISC. EXPENDITURES:							
GIFTS & LOANS	0.92	0.46	0.95	0.42	0.93	0.63	0.76
WAGES	40.08	6.18	23.72	30.14	48.54	12.77	27.36
TRANSPORT	4.74	1.42	4.04	2.74	6.07	1.81	3.57
OTHER	25.45	16.08	23.26	20.22	20.90	23.05	22.16
TOTAL EXPENDITURES	136.16	44.96	105.99	98.48	141.04	77.08	103.32
NET CASH FLOW	-5.94	8.08	14.06	-25.36	14.25	-10.70	-0.19

* Includes fees paid for hiring traction.
Source: Baker (1987).

To illustrate the point of access to labour, Fortmann (1981) indicated that there are more male-headed households which primarily use family labour for ploughing whereas as more female-headed households rely mainly on hired and exchange labour. This takes us back to the question of cash flows which favour men.

Most female-headed households are non-cattle owning so it follows that draught power access is a major constraint. Miller and Seleka (1985) pointed out that cattle ownership reflected access to resources. Resource endowment provides a wide range of economic opportunities from which the farmer could choose. As regards the above, one finds that male farmers are better off since they have access to resources which generate investment capital. In support of this, ATIP work in the Mahalapye area revealed that timely planting and tillage practices are a function of control over traction (Baker, 1988). Fortmann (1981) also conducted a study which indicated that there is a correlation between ploughing behavior and ownership of cattle, but not by sex. See Tables 4, 5, 6 & 7 on comparisons between female and male households regarding cattle ownership and ploughing behaviour. In view of the above findings, it is apparent that female-headed households most often have to hire traction or cooperate with other farmers. This does not only affect their timely planting but, reduces their net profit as well.

TABLE 2: HOUSEHOLD LABOUR USE BY AGE-GENDER CATEGORIES, MVRU SURVEY, MAHALAPYE AREA, 1983-84

	MEN	WOMEN (HOURS)	BOYS	GIRLS
FIELDWORK:				
Plough & Plant	48	20	61	1
Wood & Thin	12	40	6	6
Birdscare ^a	23	143	11	34
Harvest (inc. Morogo)	11	103	4	11
Field Maintenance ^a	103	32	26	2
LIVESTOCK:				
Tend	468	72	732	18
Milk	18	7	46	1
BEER:				
Make	1	98	*	1
Sell	*	159	1	*
HOUSEHOLD MAINTENANCE:				
Gathering Firewood	37	77	45	29
Fetch Water	55	306	48	122
Cook	3	895	24	175
Wash	3	197	10	23
Construct & Repair	11	57	5	3
OFF-FARM:				
Wage Employment	261	154	25	19
Other Field	14	28	8	4
TOTAL:				
Per Household	1071	2435	1052	453
Per Active Person ^d	729	1188	612	246

^a Birdscaring time was not recorded. To account for birdscaring, 3.75 hours (the average length of an active field day) was added for each birdscaring person-day.

Includes clearing, desmumping, fixing threshing floor, and fencing.

^c Less than one.

^d Active people were defined to be the number of residents in each category who were not inactive due to age or health (determined on the basis of the Household Census). The number of individuals actually contributing labour fluctuated as individuals moved in and out of the household on a temporary basis.

Source: Baker (1987).

TABLE 3: DISTRIBUTION OF LABOUR IN CROP ACTIVITIES BY SEX AND SOURCE, BASELINE SURVEY, EASTERN TUTUME DISTRICT, 1984-85

LABOUR CATEGORY ^a	PLOUGH NO. %	PLANT NO. %	WEED NO. %	HARVEST NO. %
HH MEN	5 2	3 1	2 1	- -
HH WOMEN	3 1	155 75	154 74	164 80
HH MEN & WOMEN	87 42	29 14	24 12	25 12
HH & NONHH MEN	5 2	- -	1 0.5	- -
HH MEN & NON HH WOMEN	2 1	3 1	- -	2 1
HH MEN & NONHH MEN-WOMEN	1 0.5	- -	- -	1 0.5
HH & NON HH WOMEN	4 2	9 4	20 10	8 4
HH WOMEN & NONHH MEN	11 5	- -	- -	1 0.5
HH WOMEN & NONHH MEN-WOMEN	4 2	1 0.5	3 1	1 0.5
HH MEN-WOMEN & NONHH MEN	27 13	2 1	1 0.5	- -
HH MEN-WOMEN & NONHH WOMEN	3 1	- -	1 0.5	1 0.5
HH MEN-WOMEN & NONHH MEN-WOMEN	8 4	- -	- -	1 0.5
NONHH MEN	21 10	- -	- -	- -
NONHH WOMEN	- -	5 2	1 0.5	1 0.5
NONHH MEN & WOMEN	27 13	1 0.5	1 0.5	- -
TOTAL	208 100	204 100	208 100	203 100

^a HH = HOUSEHOLD

Source: ATIP, Francistown (1986).

Baker's data on equipment and land resources showed that 58 percent of female-headed households had no equipment compared to 17 percent for male-headed households. On the other hand, only 40 percent female-headed households owned one or two pieces of farm equipment as opposed to 68 percent for men. Kerven (1979) postulated that an increase in farming equipment is associated with rising productivity in arable farming. In this regard, it becomes obvious that women farmers are incapacitated compared to men.

(d). Management

In her survey of the involvement of women in agriculture, Bond (1974) found that a higher percentage of crop work is done by women. In another study Staudt (1981) showed that Women's attendance at farmer training centres was limited and that most of the courses are related to activities performed by men. In addition, Higgings (1982) noted that it's difficult for women to leave their homes, to attend residential courses at RTC's.

TABLE 4: COMPARISON OF PLOUGHING BY MALE AND FEMALE-HEADED HOUSEHOLDS, 1976-1978

	PERCENT OF ALL HOUSEHOLDS	MALE-HEADED HOUSEHOLDS (N=265)		FEMALE-HEADED HOUSEHOLDS (N=90)	
		NUMBER	PERCENT	NUMBER	PERCENT
DID NOT PLOUGH 1976 ^{***}	21	43	16	31	34
DID NOT PLOUGH 1977 ^{**}	23	50	19	31	34
DID NOT PLOUGH 1978 [*]	42	101	38	49	54

^{*} X significant at .05 level

^{**} X significant at .01 level

^{***} X significant at .001 level.

Source: Fortmann (1981).

TABLE 5: SUMMARY OF PLOUGHING BY SEX AND CATTLE OWNERSHIP, 1976-78

YEAR	SEX	PERCENT OF THOSE WHO PLOUGHED WHO OWN CATTLE ^a	PERCENT OF THOSE WITH CATTLE WHO PLOUGHED	PERCENT OF THOSE WITH NO CATTLE WHO PLOUGHED
1976	F(N=64)	56	92	55
	M(N=222)	89	97	47
1977	F(N=64)	56	92	54
	M(N=215)	90	95	43
1978	F(N=41)	56	59	35
	M(N=164)	89	71	35

^a In 1979, 43 percent of the women and 81 percent of the men owned cattle.

Source: Fortmann (1981).

TABLE 6: COMPARISON OF PLOUGHING BY CATTLE OWNERS AND NON CATTLE OWNERS BY SEX, 1976-78

	PLOUGHED 1976			PLOUGHED 1977			PLOUGHED 1978		
	M	F	X ²	M	F	X ²	M	F	X ²
CATTLE OWNERS	198	36	0.03	193	36	0.09	146	23	0.26
NO CATTLE	24	28	0.31	22	28	0.72	18	18	0.00
X ²	9.67**	4.58*		10.74**	4.58*		6.86**	2.87	

* X significant at .05 level
 ** X significant at .01 level
 *** X significant at .001 level.

Source: Fortmann (1981).

TABLE 7: COMPARISON OF SOURCES OF DRAUGHT POWER FOR MALE AND FEMALE-HEADED HOUSEHOLDS, 1976-78

SOURCE OF DRAUGHT	PERCENT OF ALL HOUSEHOLDS*	MALE-HEADED HOUSEHOLDS		FEMALE-HEADED HOUSEHOLDS	
		NO.	%	NO.	%
USED A TRACTOR 1976	15	33	15	7	12
USED A TRACTOR 1977	18	32	15	5	14
USED A TRACTOR 1978	13	22	13	5	12
USED HIRED/BORROWED OXEN ^b 1976**	15	22	10	21	36
USED HIRED/BORROWED OXEN ^b 1977**	16	25	12	20	34
USED HIRED/BORROWED OXEN ^b 1978**	10	11	7	9	22
USED OWN OXEN ^b 1976*	72	173	78	30	51
USED OWN OXEN ^b 1977*	70	165	77	28	47
USED OWN OXEN ^b 1978	76	130	79	25	61

* All percentages based on the actual number ploughing that year.

^b "Oxen" includes all forms of animal draught.

* X significant at .05 level
 ** X significant at .01 level
 *** X significant at .001 level.

Source: Fortmann (1981).

The above indicate that in addition to the fact that opportunities are not provided for women, it is also technically difficult for them to attend. Bearing in mind that women do most of the crop work one wonders how they can improve on their management skills if they never attend farmer courses.

CONCLUSION

Behind the scenes, women command the use of factors of production in arable agriculture but, factors which govern women's participation do not favour them. This is said because women spend a lot of time in the field which they are not compensated for. Women invest more time in arable agriculture than men, but the nature of activities which are women related make it seem that they are less efficient producers since their overall net profit is

less than that for men. In actuality, if women's productive capacities could be improved, their output per unit area could be comparable to that for men.

In the ATIP villages in the Francistown area, group participation seems to be primarily limited to women. Group participation appears to be one of the most effective tools to ensure agricultural information is disseminated. My observation of the group work in Mangwende Communal Area, Zimbabwe, supports this postulation. In this regard, if women could be made a special target group, and equal economic opportunities provided for both genders, agricultural development would be accelerated.

I would also like to urge policy makers to re-evaluate agricultural programmes which are aimed at improving the welfare of rural farmers since it seems they are mostly biased towards men. This bias seems to have economic implications for women because for them to secure loans from lending institutions, they should have land, draught power, labour, some income for down-payment and on the average they should be efficient producers. It is therefore very important that the same opportunities are provided for both men and women. That way, it could be proven whether or not women are as productive and efficient as men.

ACRONYMS AND ABBREVIATIONS

ATIP - Agricultural Technology Improvement Project

ALDEP - Arable Lands Development Programme

MoA - Ministry of Agriculture

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