IMPACT OF PREVIOUSLY DISADVANTAGED LAND-USERS ON SUSTAINABLE AGRICULTURAL PRACTICES

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ABSTRACT

The study was undertaken to determine the impact of previously disadvantaged land users on the use of sustainable agriculture and development practices. There is widespread evidence about previously disadvantaged land users involved in communal farming systems vulnerability to unsustainable practices. The lack of the adoption of sustainable practices due to a variety of factors is high. The stratified random sampling method was used due to its ability to attain representation. The questionnaire and semi structured interview was used for data collection. The study observed that social, economic, institutional and ecological factors have positive and negative impact on sustainable agriculture and development. The understanding among participants is that there exists a strong relationship between the ecological factors, farm practices, productivity, income and institutional arrangements impacting on the area's land users. There are vital farming requisites like recognition of indigenous knowledge, lack of input, capital, marketing, information and land use planning, with effect on sustainable resource use by disadvantaged land users. The need to form holistic approaches that entails all elements of sustainability is vital for the area development.

1. INTRODUCTION

The study was undertaken in Ganyesa in North West province on Kagisano municipality under Bophirima district council. Ganyesa district is found in 26° 26' 31" latitude and 23° 26' 40" longitude North West of Vryburg town. The district of Ganyesa receives an average rainfall of 342 mm per annum. The district is located in savanna biome and it consists of Kalahari thornveld and shrub bushveld veld types (Acocks, 1988). The soil types are predominantly red mesotrophic sandy soils, mesotrophic soil and shallow calcerous soils. It is predominantly extensive livestock activity area. The study area consists of a population of ±120 000. The area population is about 17% of North West

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province population according to South African Census Statistic of 1995. The majority of the population lives in remote rural and marginal areas depending on natural resources for survival (Hoffman & Ashwell, 2001). The district farming systems consists of two land-use systems, namely communal land use and South African development trust farms.

The resource base is complex and fragile thus making proper resource management a priority and pillar for rural development (Pretty, 1995). The study was undertaken to determine the impact of previously disadvantaged land users on sustainable agricultural practices. The farming methods, perceptions, beliefs, values and institutional arrangements of previously disadvantaged land users could have influenced the use of sustainable agriculture and were researched for this reason. Sustainability is an important concept, not just fashions that will fade away as some other concepts emerge (Tollens, 1998). The environmental and sustainable developments are critical issues of humanities current conjuncture. This important concept often had many definitions to many people in light of the constraints of environment and policy framework of their locality. The general concern lacks on what sustainability means in practice and how it will be achieved (Shiferaw & Holden, 1998). The shift to more sustainable farm practices is not a question of adopting new technologies, but rather a shift in the entire paradigm of farming which can be achieved only on the basis of incremental learning (Rolling & Jiggins, 1996).

In search of the definition of sustainability mutual understanding had arisen (Sutherland, 1998). The debate that arose about sustainable development emerged in the 1980's, made inroads in global headlines at the United Nations in Rio-De Janeiro earth summit of 1992. The most common definition that emerge from United Nations Brundtland Commission on our common future refers to sustainability as development that meets the needs of the present generations without compromising the ability of the future generations to meet their needs.

The term sustainability is an integration and cross-sectoral concept (Sutherland, 1998). Sustainability in essence encompasses issues that refer to what must be sustained, for whom and for how long, for whose benefit, at whose cost, over what area and measured by what criteria. Sustainability is even an issue of intergenerational equity, a redistribution of rights or transfer of assets to future generations (Norgaard, 1991). Sustainable agriculture in the

study is regarded as any systems of food or fibre production that systematically pursue the needs of present generations without compromising the needs of future generation by following these elements: ecological, social, economic, project and sustainable development. It implies persistence and capacity to continue for long periods, resilience and ability to bounce back after unexpected difficulties (Pretty, 1995).

2 MATERIALS AND METHODS

The methodology of the study was literature survey, Questionnaire, case study and semi structure interview. The primary and secondary surveys were used during data collection to broaden knowledge of the researcher. The methodology proved to be vital for success of qualitative research because it maximise trust and cooperation between interviewer and interviewee (Flick, 1998). The methods performed better in intensive investigation of the particular social unit under consideration (Kothari, 1990). The research was undertaken in villages of the Ganyesa district under two available agricultural development centres of Ganyesa and Pomfret. The stratified random sampling method was used to attain twelve villages used in the study. The sample size of n=100 was selected as adequate representation of the study area through computerised model of SAS random sampling method. The numbers of households were drawn and required respondents selected through SAS computer random model for semi-structured interviews.

The data was gathered during three months from January to March 2001 in order to determine the impact of the previously disadvantaged land users on sustainable agricultural practices. The data capturing took three months in order to cover varying land users in different working days and weekends. The duration of data collection was influenced by more required information with precision and research covering wide geographic areas. The collected data was verified to ensure accurate presentation of the results. The chi-squire was used to determine the level of correlation and significance of probability.

3. RESULTS AND DISCCUSION

3.1 Educational level

The area has high level of illiteracy because 24,4% of the respondents never attended school. It's a major problem in communication because written

material cannot reach these land users (Jones, 1998). The education is needed not only for the farmers but also for the whole public that are becoming less in contact with the problem of natural resources like degradation of veld, loss of soil fertility and contamination of water course (Dierolf, Krain, Kramer, Tarmuj & Nasution, 1998). The highly educated land users as shown in Table 1 should be used in advisory committees and leadership roles to limit communication bottlenecks.

Table 1: The relation of educational level with number of dependents

Educational level	Number of dependents			Total
	No dependents (%)	1-5 dependents	Above 5 (%)	
Never schooled	1.01	2.02	21.1	24.24
Schooled grade 1-12	2.02	32.32	33.33	67.68
Higher education	0.00	5.05	3.03	8.08
n=99	**3.03**	**39.39**	**57.58**	**100%**

There is a negative correlation between the respondents educational status and the number of dependents as the level of significance is P=0.0087 (P= < 0.05).

The majority of the respondents (57, 58%) with different educational status have above five dependents and that reflects rural social problems like rapid population growth that impact on sustainability (Rowe, 1996). The farmers are not eager undertake sustainable practices if their economic benefit is likely to be negatively affected, especially due to high maintenance of big families (Semgalawe, 1998). Although the big family is an opportunity as a source of labourers, but still big families could be detrimental to adoption of sustainable practices due to high cost of living (Razaak, 1998).

3.2 State of employment

54,08 % of the respondents indicated lack of employment and that may have negative potential impact to undermine adoption of sustainable development approaches (Tschirley, 1997). There is a positive correlation between the status of employment and the monthly income level of the respondents, because the level of significance is P=0.001 (P= <0.05). The unemployed respondents earn significantly less than R500 and those who are employed earn significantly more than R500 (Table 2).

Table 2: Influence of employment status on amount of monthly income

Employment status	Income level		
	< R500	> R 500	Total
	(%)	(%)	(%)
Unemployed	40.81	13.27	54.08
Employed	24.44	21.48	45.92
n=98	**65.25**	**34.75**	**100%**

3.3 Source of livelihoods

According to Düvel (1998) livestock form an integral part of the rural masses. It's a form of security and a way to uplift status of the individual in the society. The source of livelihoods in relation to gender indicates that there is a correlation because the level of significance is P=0.0012 (P= <0.05). The male respondents (27%) are relying on farming, especially livestock rather than wage and pension, whilst dominant numbers of females depends heavily on pension according to Table 3.

Only 2.2% of the respondents rely on crop production because the climate of Ganyesa district is semi arid with an annual average rainfall of 342 mm (North West State of the Environment Report Overview, 2002).

Table 3: The dependency on source of livelihoods in comparison to gender

Gender	Farming	Wage	Pension	Other	Total
	%	%	%	%	%
Male	27.27	14.14	11.11	0.0	52.53
Female	8.08	15.15	22.22	2.02	47.47
n=99	**35.35**	**29.29**	**33.33**	**2.02**	**100%**

3.4 Conflicts of interest in using agricultural natural resources

77,9% of the respondents indicated that there is huge conflict in the use of the community's natural resources. The conflict is linked to perceptions that open access induces non-landcare. 22% of the respondents denial to existence of conflict in land use shows that some communal areas can overcome the

collective action problems that affect property resources and to successfully regulate their use (Pagiola & Kellenberg, 1997).

3.5 Land use or ownership right effect on sustainable land practices

The consolidation of tenure security will go a long way towards ensuring access to development and financial assistance (Urquhart, Carnegie, Madolo, Roos, Marumo, Moahlola, Abott & Croxton, 1998).

The economic empowerment starts with improved access to land and vesting of secure tenure rights in areas where they do not exist (Strategic plan for South African Agriculture, 2001). According to Figure 1 land use rights remains the aspect that had impact towards sustainable land management.

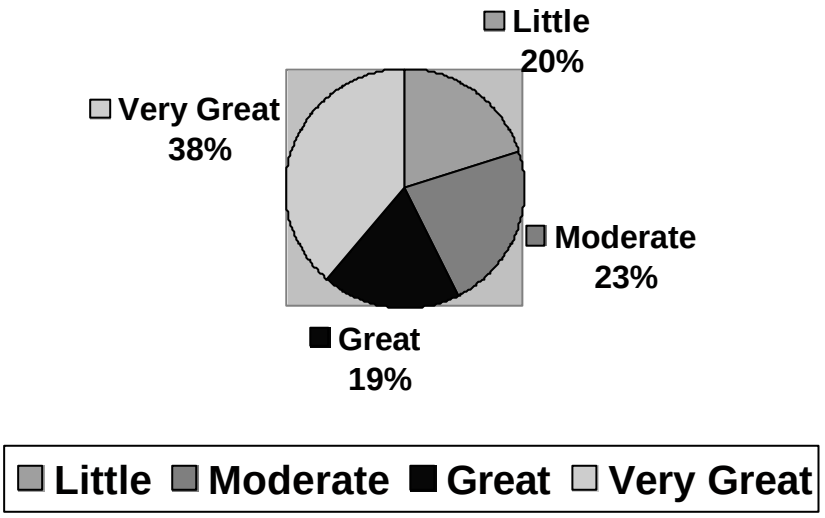

Figure 1: Impacts of land-use or ownership rights on sustainable management

The communally owned land needs to be managed and administered according to locally agreed and workable principles that reflect local social and cultural values. The impact of land use rights or ownership is not influencing the choice of custodianship of the land because majority regard land users as primary custodian of the land (Table 4). There is no correlation of the respondents regarding impact due to land use rights and custodianship of the land because the level of significance is P=1.919 (P= >0.05).

Table 4: The impacts of land use or ownership on taking custodianship of land

Land use rights impact	Custodian of land			
	Government	Tribal authority	Land users	Total
	%	%	%	%
No land use rights impact	5.15	11.34	13.40	29.90
Yes to land use rights impact	6.19	2.06	54.64	62.89
I don't know	4.12	1.03	2.06	7.22
n=97	**15.46**	**14.43**	**70.10**	**100%**

3.6 Accessibility of sustainable land management information

72% of the respondents regard information to be unavailable about veld management and cultivation systems. The situation supports Jones (1998) as indicated that majority of farmers are still left behind on the process of information exchange. It is a missing link in natural resource management, research and extension. The approach of participatory learning development may work well for these previously disadvantaged land-users due to its interactive nature (Botha & Treurnicht, 1997). The approach encompasses all forms of interaction that combine knowledge and skills of farmers with those of outside facilitators in creating sustainable improvements in farming systems (Hart, 2001).

3.7 Agricultural input prices in the communities

58% of the respondents regard input prices to be very expensive because of the closure of Agri-serves' stores. The parastatals of North West department of agriculture Agri-serves stores closure lead to unavailability of inputs and high traveling cost to attain inputs at nearest town of Vryburg. It is believed that poor resource farmer's land-use practices and conservation decision face huge constraints due to endogenous input prices (Souza-Ficho, 1997).

The local farmers should be encouraged to form co-operatives in order to make input to be accessible and stabilize their prices (Kirsten & Van Zyl, 1998).

3.8 Household farming responsibility

87% of the respondents in the study indicated that their whole families are responsible for farming activities. The father or older son is more responsible for farming activities because males are taken as household head. The reliant on only males could be a draw back for sustainability when decisions are required during their absence. The use of family labour may reduce production cost and be of advantage to communal farming as cost for labour could be channeled to other production requisites (Letsoalo, 2000).

3.9 Accessibility of sufficient markets

The availability of market opportunities remains the external elements influencing the sustainability of rural livelihoods and in leading to self- reliant rural land users (Urquhart *et al*, 1998). This is prevalent in the Ganyesa because 57% of the respondents indicated difficulty in reaching sufficient market. The perception attached to communal farmers for keeping their cattle for long periods due to status and traditional reasons might be confused by shortage of markets (Kirsten, 1998). The insufficient markets lead to keeping of animals for long periods due to lack of marketing avenues and market timing (Ruttan, 1988). The lack of information, auctions and distance to marketing may block farmer aspiration to sell agricultural commodities (Van Reenen, 1997).

There is no correlation between the use of markets and educational status of the respondents because the level of significance is P= 0.4638 (P= >0.05). The choice of market is not influenced by educational status and majority of the respondents (42%) use local market (Table 5).

Table 5: The choice or and use of markets in relation to educational level

Educational status	Marketing methods				
	Auctions (%)	Speculators (%)	Locals (%)	Terminal Market (%)	Total(%)
Never schooled	5.62	6.74	11.24	1.24	24.72
Schooled 1=12	21.35	20.22	28.09	0.00	69.66
Higher education	0.00	2.25	3.37	0.00	5.62
n=89	**26.97**	**29.21**	**42.70**	**1.12**	**100%**

The methods such as auctions with potential to explore for market accessibility should be encouraged to the farmers through circulating frequent community auctions and information days.

3.10 Hindrances in getting financial support

The lack of funding on resource poor land users are attached to government policies that it had marginalized and lead historically farmers to a limited role in agricultural economy (Letsoalo, 2000). The majority of the respondents (75%) indicated lack of access to get financial assistance. The high transaction cost is a major barrier to attain financial supports and is followed by lack of security. The majority of the respondents (91%) in the study indicated that they rely on their own funding. Some of these respondents resort to informal means such as stockvels and rotating savings clubs to generate funds for farming activities. The previous government policy as financial agents in agriculture is evident to have failed on delivery of finance for disadvantaged land users. Financers like Land bank should make sure to meet this clients especially resource poor farmers' needs and thus to be accountable. Table 6 shows the order of hindrances in attaining financial support.

Table 6: The order of hindrances in attaining financial support

Limitations	Number of respondents	% of respondents
High transaction cost	38	38%
Lack of security	28	28,5%
Lack of information	26	26,5
Unavailability of institution	3	3,%
Don't know	4	4,%
n=98	**98**	**100%**

3.11 Off-farm income of the respondents

70% of the respondents depend on off-farm income for a living. There is correlation between monthly income and impact of off farm income because the level of significance is P=0.001 (P= <0.005). Those who earn above R800, get it significantly from off farm income Table 7. The availability of off-farm income to land-users is vital because it may supplement resources for farming activities, household welfare, food security and relieving pressure on natural resources (Ruben & Hebinck, 1998).

Table 7: The relation of monthly income with significance of off farm income

Monthly income	Off farm income level				
	<10	11-50	>50	Not applicable	Total
	%	%	%	%	%
0-300	**6.98**	**8.33**	**4.65**	**0.00**	**19.96**
301-500	11.63	9.30	2.33	2.33	25.59
501-800	2.78	9.30	9.76	0.00	21.84
801-1000	4.65	6.98	12.08	0.00	23.71
>1000	0.95	2.33	5.62	0.00	8.84
n=91	**26.99**	**36.24**	**34.44**	**2.33**	**100%**

3.12 Grazing condition in the communities

There is no correlation regarding accessibility of information on rating grazing condition because level of significance is P=0.2627 (P= >0.05). The rate of information accessibility is not influencing the judgement of the communities grazing condition that was indicated to be very poor (Table 8). The land users use poor livestock condition and invasion of poisonous plants such as bitterbos (Chrysocoma ciliata) and bloutulp (Monea polystachya) and Opuntia species as indicators of degradation. 56,70% of the respondents indication that information is less accessible is a draw card for shift to ecological imperative (Rollings & Jiggins, 1996).

Table 8: The influence of information accessibility on judging grazing condition

State of accessing information	Judgment of grazing condition				
	Poor	Very poor	Good	Very good	Total
	%	%	%	%	%
Inaccessible	2.06	6.19	8.25	0.00	16.49
Less accessible	4.12	29.90	18.56	4.12	56.70
Sometimes accessible	1.03	10.31	3.09	2.06	16.49
Almost accessible	1.03	6.19	1.03	0.00	8.25
I don't know	0.00	0.00	1.03	1.03	2.06
n=97	**8.25**	**52.58**	**31.96**	**7.22**	**100%**

3.13 The usability of degradation indicators on grazing land

73% of the respondents in area are more capable of using physical or observable indicators like bush encroachment rather than grass production. The respondents in Table 9 regarded the indicators like status of grass production and sheet erosion to be unusable. It's not only due to inadequate knowledge, but a lack of equipment to use for measuring grass yield contribution.

Table 9: The usability of indicators used by communal farmers

Indicators	Very usable (% of respondents)	Moderate usable (% of respondents)	Unusable (% of respondents)
Sheet erosion	17%	10%	73%
Grass production	11%	13%	76%
Bush encroachment	73%	11%	16%
Reduced ground cover	31%	53%	16%

n=100

The preferred system of physical indicator like bush thickening, soil cover and use of local specific plants as indigenous indicators should be encouraged. The communal veld management of land users should be improved by further attention on indicators like bare patches to determine rangeland degradation.

3.14 Degradation indicator on croplands

41% of the respondents consider yield more than anything to be a good indication of cropland conditions (Table 10).

Table 10: Commonly used indicators in croplands deterioration

Indicator	% of Respondents
Crop yield decline	41%
Increased inputs on constant yield	21%
Sheet erosion	14%
Don't know	21%
n=97	**97%**

The amounts of inputs incurred during production by farmers (21%) follows yield decline when used for determination of cropland degradation. 21 % of the respondents who don't know how to determine degradation in cropland is negative to sustainable land use (Table 10). The use of farmer's days could in long run help the farmers to know indicators then obtain optimum crop production in order to alleviate food shortage and malnutrition found in rural areas (Burgess & Isaacs, 1998).

3.15 Institutional belongings of respondents

The lack of the respondents involvement in non-governmental organizations (NGO) or and community based organizations (CBO) raises question about their availability in communities (Table 11).

Table 11: Respondents institutional belongings

Institution	% of Respondents
Village or extension committee	25%
Traditional committee	13%
Local council	3%
Other stakeholders	32%
E.g. South African democratic teachers union and community committees, National African farmers union, South African agricultural union Nothing	3%
NGO	0%
n=76	**76%**

The establishment and involvement by rural land users in non-profit organizations will facilitate training, acquiring of external inputs that may improve livelihoods and reduce pressure on natural agricultural resources (Pretty, 1995). The land users that belongs to agricultural committees tends to have clear understanding of sustainable use of natural resources due to their high level of exposure on agricultural workshops and frequent interactions with agriculturist.

3.16 Composition of agricultural committees in the communities

The committee's composition in the district is dominantly males as indicated by 76% of the respondents. Only 6% of the respondents indicated to have female dominated committees. The respondents farming in food plots might have induced the female dominated committees due to its targets on women's. The study probe on Table 12 found that there is correlation of agricultural committees composition with frequency of giving feedback to the respondents because P=0.0378 (P= <0.05).

Table 12: The effect of agricultural committees composition on frequency of giving feedback to community

Committees composition	Frequency of feedback				
	Yes regularly (%)	Sometimes (%)	Not often (%)	Never (%)	Total %
Dominantly males	13.19	48.35	0.99	3.30	75.82
Dominantly females	1.10	1.10	1.10	1.10	4.40
Dominantly women	2.20	3.30	0.00	0.00	5.49
Equal mixture of all	0.00	1.10	2.20	0.00	3.30
-+Others	2.20	2.20	3.30	3.30	10.99
n=81	**8.68**	**56.04**	**17.58**	**7.69**	**100%**

The dominantly male committees give feedbacks mostly sometimes in Table 12. The equal representatives of all categories should be fostered on agricultural committees in order to influence adoption of sustainable agriculture.

3.17 Contradiction of customary and civil power in Ganyesa

53 % of the respondents cited that contradiction of customary and civil powers impacts on working together of institutional bodies. The contradictions as a result of customary and civil power should be minimized by learning environment with the peoples not imposing practices to them. The differences are negatively impacting natural resource management because local institutions such as the tribal authorities have influence on adoption of sustainable practices by local farmers (Thobela, Lax & Oettle. 1998).

3.18 Sustainable land management promotion

The government remains a dominant institution with regard to promotion of sustainable land management. The land user's farmer's committee's limited efforts in making promotion of sustainable development (Table 13) should be supported by encouraging the use of Mody model for message development Figure 2.

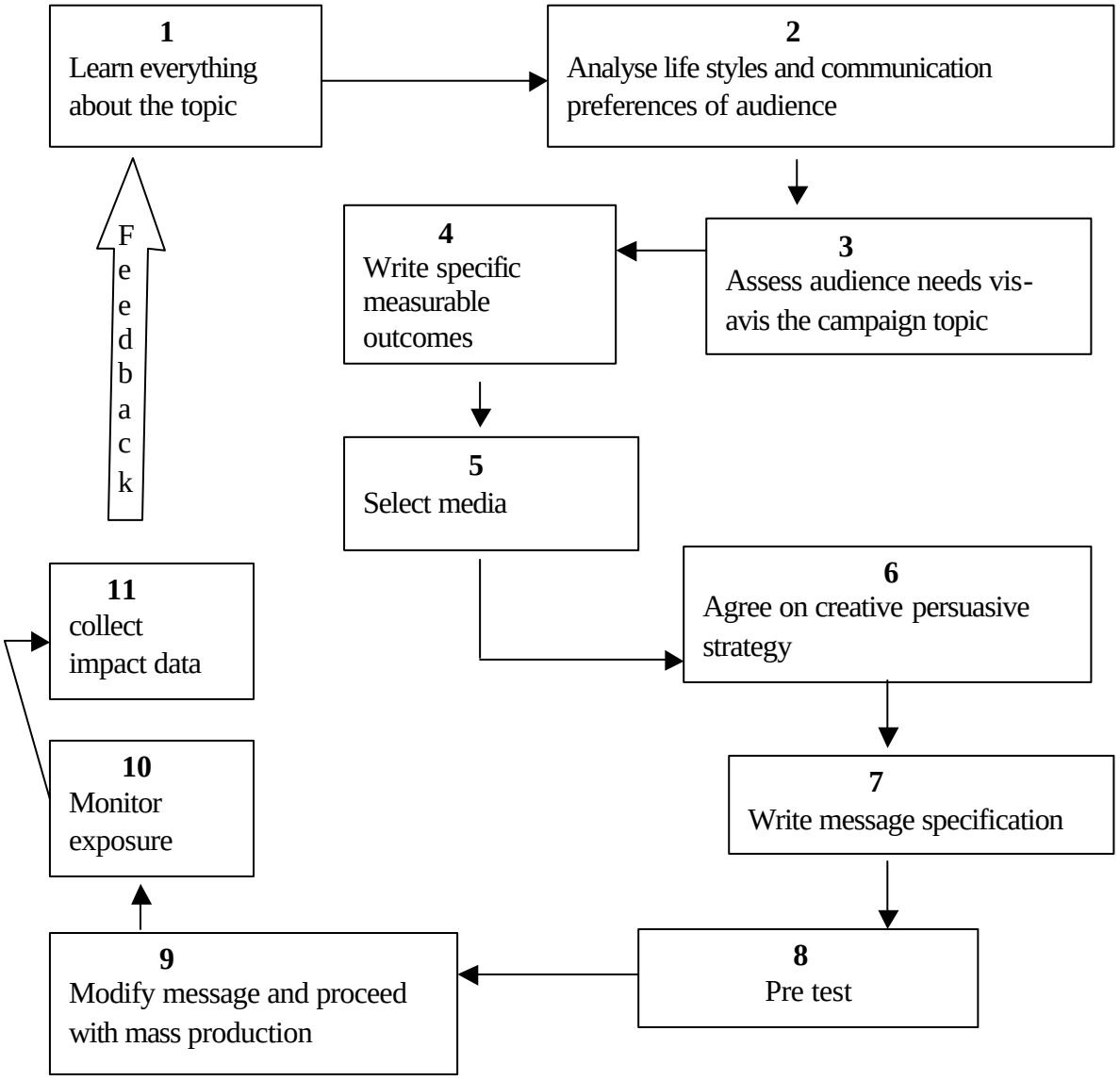

Figure 2: Mody model for message development
*(**Source:** Mody, M. 1991.Designing message for development communication)*

The model emphasizes the need for the strategy of client's diffusion of message to overcome communication barrier. The model advocates understanding of concepts and topics that impact these previously disadvantaged farmers (poor resource farmers) when initiating intervention strategy. The message design and diffusion have effects on sustainable land management promotion. The use of the model is vital because it emphasize message design based on needs of these poor resource farmers and be disseminated in the required framework. The change for message design should be informed and be continuously reviewed and monitoring with feedback to change on these farmers (Figure 2).

The concern is the total lack of the private sector, parastatals and non-governmental organizations in community promotions of sustainable land use in Table 13.

Table 13: The institutions that promote community sustainable management

Institutions	% of Respondents
Government	79%
Farmers committees	11%
Others e.g. Conservancy, Traditional groups	0%
Non-Governmental Organizational	0%
Parastatals	0%
n=90	**90%**

3.19 Enforcement of sustainable land management

The majority of the respondents (67%) indicated lack of enforcement on legislation of sustainable land management. Their reason is that no persons had being prosecuted for degrading natural resources in Ganyesa communities. 31% of the respondents think that tribal courts enforce laws on deforestation. The application of carrots and stick in these previously disadvantaged areas is vital in order to halt continuing degradation of natural resources (Critchley, 1998). The speedy repeal of Conservation of Agricultural Resources Act 43 of 1983 is vital to make the law effective in communal areas.

4 SUMMARY

Sustainable agriculture and development are intricately woven together and cannot be easily discussed separately. The concepts entail a shift in the entire paradigm of farming from entirely concentrating on production activities and entrepreneurship to ecological imperatives. This shift in farming paradigm can be achieved only on the basis of incremental learning. The shift in farming paradigm to meet the needs of present generation without compromising the needs for future generation is impacted by various smallholders' internal and external factors. The study area's high level of illiteracy with 24% of the respondents unable to read and write retards the required incremental the learning of sustainable practices.

The negative effect on adoption of sustainable practices is also accelerated by high number of respondents' dependents. The high level of unemployment by 54,08% is correlated with low significant earning of below R500. The distribution of livelihoods is skewed with males relying mostly on livestock farming as compared to females who depends on pension from social grants. The land use rights and or ownership was cited to have serious impacts on the farming systems of the respondents. It is noted that farmers are still left on the process of information exchange because majority of the respondents (72%) indicated lack of information to be a limiting factor in taking farming decision making. The reliance of smallholders on whole families is applauded for cost minimization, with exceptions on too much reliance on males for farming decisions because of some shortcomings when unavailable. 57% in the study don't reach sufficient market thus influencing them to keep livestock for long periods that impact on grazing area. The use of the market is not correlated to educational status because the level of significance is at P= 0, 4638 (P=>0.05). The majority of the smallholders (42,70%) uses local and with few only using terminal market (Table 3.5). 72% of the respondents don't have financial assistance due to high transaction cost. The living conditions are improved on those who earn above R800 on monthly basis due to off farm income. The lack of community based organization and unequal representation of community groups compositions are among issues that impact negatively the adoption and use of sustainable practices. The understanding of the smallholders situation and acknowledgement of their farming systems is vital for joint incremental learning in diffusion of sustainable agricultural practices.

5 CONCLUSION

It is concluded that there exist a strong relationship between the environmental factors, farm practices, farm productivity, farm income and institutional arrangements impacting on the previously disadvantaged land users. It is therefore important for broadening the opportunities rated as contextually relevant and worthy of implementation by land users to improve their situations. The communal system of land use can be improved and be sustainable only with a thorough understanding of all the socio-economic, ecological factors that influence productivity together with the institutional and political framework in which the system operate. It is important to understand how these combinations relate like in many households livestock holding is an asset that keeps alive their communities with rural roots and culture. The communal land users' indigenous knowledge of sustainable practices should be explored. The negative impacts brought by lack of financial support, top-down approach, low level of education, high input price, lack of land use planning, lack of marketing, lack of information and adverse poverty be reduced to facilitate sustainable agriculture and development.

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