Livelihoods and Food Security Programme

Agriculture Productivity and Nutrition

Rural Household Economic Behaviour and Decision Making Processes

This document has been produced with financial assistance from the United Kingdom, and with technical and implementation support from the Food and Agriculture Organization of the United Nations (FAO). The views expressed herein can in no way be taken to reflect the official opinion of the United Kingdom or of FAO.

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Acronyms

ADF	Agricultural Development Fund
AGRITEX	Agricultural Technical and Extension Services
APN	Agricultural Production and Nutrition
CABS	Central African Building Society
CBZ	Commercial Bank of Zimbabwe
DDF	District Development Fund
DFID	Department of International Development
DLD	Department of Livestock Development
DRSS	Department of Research and Specialist Services
EMA	Environmental Management Agency
FAO	Food and Agricultural Organisation
FC	Forestry Commission
FPL	Food Poverty Line
FTLRP	Fast Track Land Resettlement Programme
Kg/ha	Kilogramme per hectare
LSCS	Large Scale Commercial Sector
LSFP	Livelihoods and Food Security Project
MAMID	Ministry of Agriculture, Mechanisation and Irrigation Development
MENRM	Ministry of Environment and Natural Resource Management
MDG	Millennium Development Goals
MFIs	Microfinance Institutions
MLGRUD	Ministry of Local Government and Rural Development
MLRR	Ministry of Lands and Rural Resettlement

MYDIE	Ministry of Youth Development, indigenisation and Employment Creation
NGO	Non-Governmental Organisation
PICES	Poverty Income Consumption and Expenditure Survey
POSB	Peoples Own Savings Bank
PPDLA	Poverty and Poverty Datum Line Analysis in Zimbabwe
PSIP	Public Sector Investment Programme
PWMA	Parks and Wildlife Management Agency
RA	Resettlement Area
RC	Rotating Clubs
RDC	Rural District Council
SACCOS	Savings and Credit Cooperatives
SEDCO	Small Enterprise Development Corporation
SSCS	Small Scale Commercial Sector
TCPL	Total Consumption Poverty Line
WHO	World Health Organisation
ZDHS	Zimbabwe Demographic and Health Survey
ZIMSTAT	Zimbabwe National Statistical Agency
ZIMVAC	Zimbabwe Vulnerability Assessment Committee
ZNC	Zimbabwe Nutrition Council

ACKNOWLEDGMENT

This paper was prepared for FAO by Vimbai Vudzijena and edited by Jannie Armstrong.

1.0 Introduction

FAO is in the process of implementing the Agricultural Production and Nutrition (APN) component of the Livelihoods Food Security Programme (LFSP) financed by DFID. If well designed APN has great potential to improve the livelihoods of targeted farm households. In order to facilitate effective design of the APN component, an in-depth understanding of targeted household economic decision making processes, as well as their existing livelihoods patterns is necessary. The main objective of this research paper was therefore to investigate and understand factors that influence household decisions when allocating scarce resources (capital, labour, time, and land) to livelihood activities.

1.1 Methodology

The study adopted the DFID sustainable livelihoods framework and an agricultural farm household model developed by Singh, Squire and Strauss (1986) in analysing available secondary information on rural households livelihoods. The Zimbabwe National Statistical Agency (ZIMSTAT 2013) provided data on household poverty, income, expenditure and consumption patterns. ZIMVAC (2011/12, 2012/13, 2013/14) provided data on rural livelihoods. Key informant interviews were held with Harare based respondents to provide qualitative detail of household livelihoods and behavioural patterns. It was not, however, possible to make definitive conclusions on factors that influence household resource allocation decisions. Most of the secondary data available focus on describing what households do, without providing additional analysis on why they do it. This represents a critical data gap, which will be considered in greater detail in the recommendations.

2.1 Theoretical backdrop

Smallholder farm households have traditionally been viewed as farmers in the conventional sense of subsistence or small scale commercial farmer. Basic market economics would therefore suggest that as the prices of agricultural products rises, agricultural production will rise to take advantage of the increased margins. In this model, resource efficiency is evaluated in relation to the resource's rate of return, namely its opportunity cost. Making decisions as guided by the resource's opportunity cost constitutes what is generally termed an economic decision. Economically rational households would therefore be expected to produce only those crops or products with a comparative advantage, assessed in relation to the combined opportunity costs of producing a good or a service.

This model does not withstand scrutiny when considered in the context of lived experience. Farmers' response to price stimuli will be conditioned by the operational and structural constraints households face (Bond, 1983; Rao, 1988b and Bayon, 1989, cited in Vudzijena, 1992), and by the practical realities of agriculture: a field of maize cannot be plowed under and replanted with coffee in response to global market prices. Moreover, farmers put priority on securing their own food, in a

large part because of the poorly functioning food markets. Production of staple food crops is elastic, and may have very thin margins, but it will meet a household's food needs. Also, smallholder farmers are known to be risk averse, making economic decisions based on the need to avoid or minimise exposure to risk, rather than increasing potential yet uncertain income gains.

Proponents of the Farm Household Models (Singh, Square and Strauss (1986) and Low, 1986) reject analytical frameworks (such as the ration economic model) which ignore the fact that that peasant farmers operate as a household, a unit, rather than as an individual. A household is a complex unit as it consists of individuals and within it individual production, consumption and labour supply decisions are made. In this regard, a household and not a farmer, becomes a unit of analysis in assessing decision making parameters. Contrary to orthodox neoclassical economic theory where a firm is the producing unit and a household a consumer, the household unit behaves as a firm (producer), a consumer and a supplier of labour simultaneously. In order to assess farm household resource allocation decisions, the net position (consumer or producer) of a household becomes critical, as do the intra household dynamics at play. This set of nested relationships generate the complexity of meaningful analysis for rural farm households economic behaviour.

3.0 Household livelihoods patterns

Households' livelihoods are directly related to a number of factors, including asset base, risk management strategies applied, market dynamics (for both inputs/outputs), land and natural resource tenure systems and the policy and institutional frameworks. In Zimbabwe, smallholder farmers are resource constrained (physical, financial and human) and also face a collapse in local level (that is at ward, village and community level) input and output value chains (USAID / Zimbabwe 2012, ZimVAC 2012, 2013). The land tenure policy allows communal households (that is, households living on land designated as communal) to operate under customary tenure, and this empowers them to occupy and use land within customary norms and practices. This tenure system does not provide for the trading of land and natural resource rights, limiting their access to credit facilities from formal financial intermediaries in land development and agricultural financing.

There are two major external factors that influence households' livelihoods context which are, firstly, the availability of the supporting infrastructure (including agricultural extension, input/output markets, institutions, etc) that contribute to making agriculture a viable livelihood. Second, the seasonality of agricultural production and the need to smooth consumption requirements during periods of low productivity and income prior to harvest. It is this latter factor which stimulates rural households to engage in non-farm livelihoods strategies to generate income in the immediate term.

3.1 Key data for Zimbabwe

Zimbabwe generally has a young population (PICES: 2013), with 42 percent of the population being under 15 and 4.3 percent being over 65 years. These age groups have critical implications for the active rural labour market, as the 0-17 age group is still of school going age and the 65+ age group

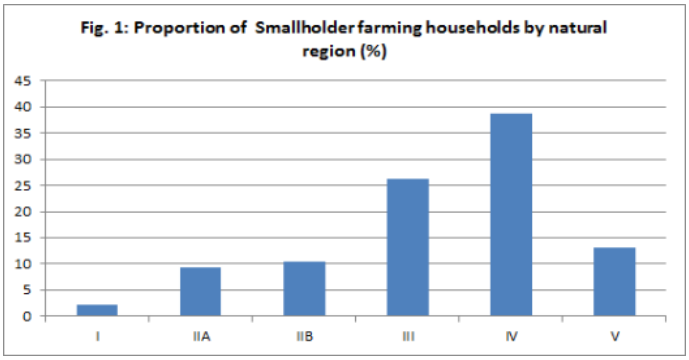
represents the retirement age in Zimbabwe. Average household size is estimated at 4.7 persons in rural areas (PICES 2013). Dependency ratios are high at 0.5, indicating the pressures on active populations to support multiple household members. A further 87.9 percent of rural Zimbabweans are literate, with Male and female literacy rates estimated at 92.3 percent and 84.1percent respectively.

Agriculture remains the livelihood strategy of first choice, accounting for 58.6 percent of household annual incomes. Formal wages and salaries count for about 36.1 percent and other (including remittances petty trading, casual work, informal businesses, natural resources and other non-agricultural sources) for about 5.3 percent (PICES, 2013).

This low proportion of other sources indicates that these livelihoods options are subordinate to agriculture as the primary strategy. Agriculture is an attractive livelihoods option given that it provides food for household consumption, in addition to cash income.

3.2 Household behaviour patterns

Households in communal areas operate as both producing as well consuming units, relying on own labour which can be hired out in times of distress. Therefore, predicting household interest and commitment to project interventions can be complex since household interest in a project will depend on its net position, as well as the gender dynamics within the unit. The majority of net producers are located in high rainfall areas (NR I&II) while the majority of households in low rainfall -dry areas (NR III, IV &IV) are net consumers. Given that about 80 percent of smallholders farming households are located in dry natural regions III-V (see Fig.1), the majority of communal area households can be characterized as net consumers.



Net consumers produce at subsistence level, mainly for household consumption. In 2012/13, close to 90 percent of small holder farmers were net consumers, in that they had to engage the market (either as a consumer to purchase food, or to supply labour, or both) at some point during the consumption year to supplement own production (ZimVAC). Further analysis of ZimVAC data sets revealed that the figure ranges between 60 – 70 percent in a normal year, which is still considerably high, adequate to justify the characterization above.

3.2.1 Risk averse households

Communal area households are risk averse and prioritize activities that minimize or eliminate risk. Risk aversion is associated with poorly functioning markets, in particular food markets which do not provide stability in terms of supply and prices. Households are thus unable to predict when and at what price the market will deliver food, and if they will be able to afford them. Unable to trust

markets, household therefore develop their own risk and mitigation strategies based on their own best assessment of their situation.

As a basic mitigation strategy, rural households try to hold livestock (predominantly small livestock, that is poultry and shoats) which acts as an ex-post insurance to smoothen consumption (*fallback position*) in times of distress, usually when crop production fails. Prevailing prices are regarded as given and households are obligated to dispose of these assets (or other assets held for a similar purpose) at the going market prices or as part of in-kind exchanges with cereals.

As part of its project crop vouchers, FAO has tried to pilot a rural insurance scheme for farmers in two districts in the country with minimal success. Uptake and interest from insurance companies was limited, and indeed was interest from farmers. In the absence of viable insurance markets, farmers are more likely to take a risk averse position, as they should all responsibility for any risks that may occur.

The lack of an insurance market for smallholders coupled with limited access to credit, induces households to manage or optimise their production decisions (usually taken in the lean season just prior to the onset of rains) to reduce their consumption risk. The households will adjust their income generating activities so as to reduce income fluctuations, implying a general bias towards less risky activities, technologies or decisions with a low covariation with complementary off farm activities (De Janvry and Sadoulet, 2006).

A review of province level data of maize markets at national and provincial levels and indicates significant fluctuations. Market fragmentation along provincial lines was reflected in the price differentials between the national average price of US0.31/kg and prices in various provinces. Table 3.1 below shows percentage differences between the national and provincial average grain prices.

Table 3.1: Maize Grain Market Fragmentation (2011/12).

Province	% difference against national average
Matabeleland South	+46
Masvingo	+20
Mashonaland West	-32
Mashonaland East	-18.2
Mashonaland Central	-18.5

Source: ZIMVAC (2013)

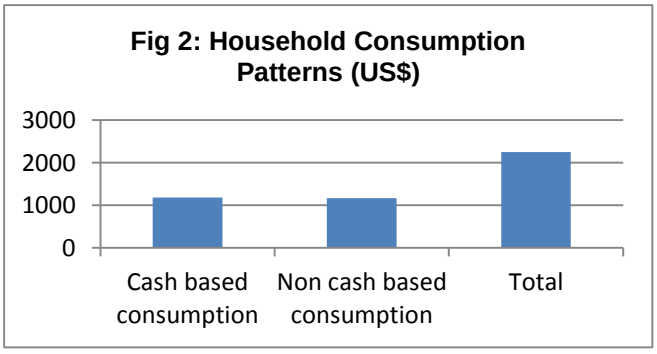
Based on this analysis, it can be concluded that the maize market is volatile and unpredictable. Farmers respond to this volatility by planting maize and other food crops every season, irrespective of crop viability in their agro-ecological conditions. Household surveys indicate that around 80 percent of poor households plant maize on a seasonal basis. That these rates can be found even in areas of low rainfall and unsuitable soils is indicative of the risk perceptions households have about the markets dynamics (though to some extent it is also informed by their cultural preference). As is also evident in the table 3.1 above, one adverse effect of market fragmentation is to implicitly tax

households in food deficit areas, while implicitly subsidizing households located in food surplus areas.

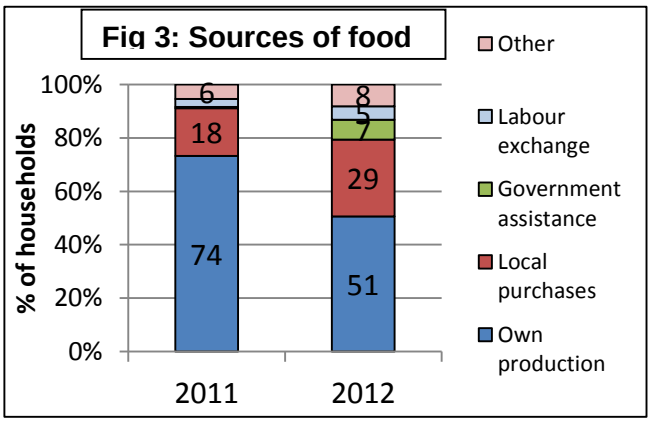
In summary, consumers in high agricultural potential areas benefit from significant levels of consumer surplus given that they are paying much less than the national average (US$0.31/kg). The converse is true in low potential areas such as the southern part of the country, with consumers paying well more than the average. However, as most smallholders are both consumers and producers, the potential advantages of this situation are not easily exploited, as increases in grain prices increase both producer profits and consumers costs alike. This may also encourage speculation, as producers may hold stock in anticipation of higher prices, and limit their interest in releasing stock during low price periods. The APN should reinforce and promote market efficiencies that would enable grain to flow freely including support for reasonable transaction costs to deficit areas, at prices that would not implicitly tax the receivers.

3.2.2 Household as both producer and consumption unit: The concept of non-separability

Smallholder farming households operate as a producing and consuming unit as discussed above. This means that the agricultural production decisions they make *(*use of improved seeds, enterprise selection, desired production levels, how much credit to take, etc*)* are significantly affected by its consumption characteristics (demographic composition, food security status, preferences and tastes, etc). This behavioural pattern is elaborated in Fig 2, which shows that households consume what they produce (non- cash based consumption). Non cash based consumption (predominantly agricultural output) is significant, to almost the equivalent levels with cash based consumption, the basket of goods and services that cannot be supplied by agriculture and need to be accessed through the market. It can therefore be posited that enhancing agricultural production contributes significantly to household consumption patterns and that the sales of surplus can support cash based consumption, with 58 percent of total household income coming from agriculture.



The net position of households reliant on weather dependent agricultural systems (as in the case of communal households in Zimbabwe) is contingent on the prevailing weather conditions over the agricultural seasons, which renders them net consumers in deficit years or net producers with surplus to sell. In 2012, according to the ZIMVAC survey, a higher than expected proportion of



households were relying on purchases of food despite the fact that the survey was undertaken during the post-harvest period in May when household stocks were expected to be high (figure 3). This confirms that most small holder farmers are net consumers, as the proportion of households consuming from own production decreases during the consumption year.

3.2.3 Household as labour supply unit

Net producers harvest enough for household consumption, and with good rainfall, produce surplus for the market. Communal area households also hire in labour for own production activities while also hiring out their labour in the agricultural and nonagricultural sectors, on a permanent and casual basis therefore raising incomes for cash based consumption. Opportunities for formal wage/salary employment are limited in communal areas and the best recourse in this regard is casual work opportunities. Accordingly, the majority of households resort to casual work to raise income (cash or in- kind) for immediate term consumption spending by the household. In 2011, in particular, 40 percent of households participated in casual work in the course of the year. ZIMVAC (2011 & 2012) reports confirm causal labour as the most common source of cash income for households though the financial returns from the activity are very low and on average about USD39 per month. Similar labour hiring practices were confirmed by the American Institute of Research (AIR) during its review of Zimbabwe's Harmonized Social Cash Transfer Programme in 2013.

Rural households face difficult trade-offs between prioritizing cash income via supply of labour, and prioritizing food production but losing out on cash income. Though the labour market exists, the participation of a number of households is limited and returns are low. This does however underscore the point that hiring in labour is not an option, implying that improving agricultural production can only be done is ways which do not require additional labour.

3.3 Livelihoods strategies

Smallholder households adopt agricultural and non-agricultural based livelihoods strategies at different times over the course of the year. Agricultural based strategies are dominated by crop and livestock production activities, while the non-agricultural based strategy is dominated by labour hiring activities in the agricultural and non-agricultural sectors (informal and formal sectors, petty trade, cross boarder activities, etc)

3.3.1 Crop production

Crop production is dominated by food crops, with maize being grown by an average 80 percent of households in 2012/2013, regardless of agro–ecological zone. Tobacco, cotton and soyabean are the major cash crops grown and in the last two years there has been a major shift from cotton production towards tobacco. Surprisingly, the total area under tobacco and cotton has remained the same (FAO post planting survey 2013). This resonates with the risk aversion tendencies of farmers who will not reallocate significant land amongst competing enterprises, but will hedge their risks despite the price incentives at least in the short to medium term. The ZIMVAC 2012 report noted that despite protracted efforts by both Government and the NGO sector to promote the

growing of small grains in drier regions, small grains continue to be grown by a minority of the smallholder farmers (Table 4.1 below).

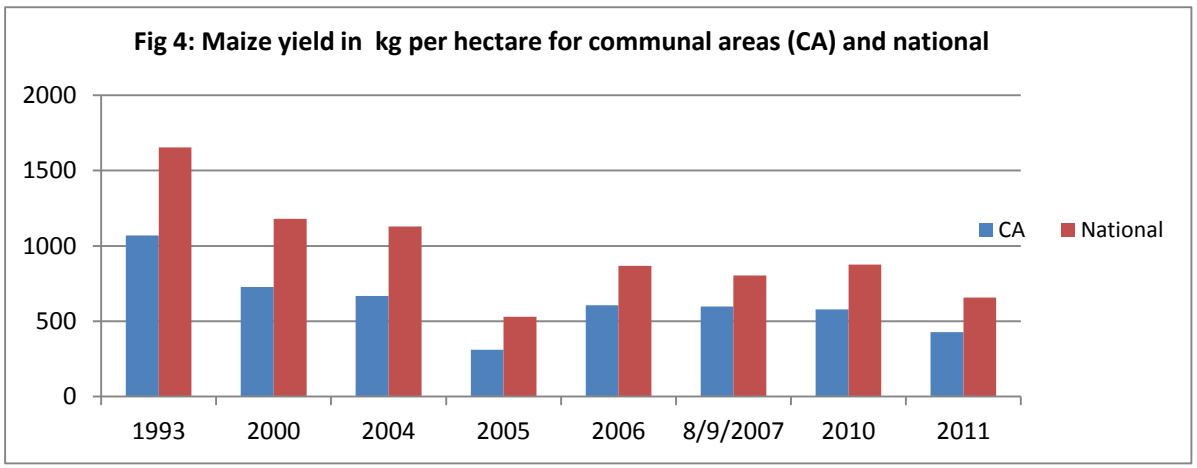
Table 4.1: Cash and food crops grown (% of households)

Crop	2011/12	2012/13
Maize	80	79
Cotton	9	12
Finger millet	6	7
Tobacco	3.5	4
Sorghum	20	20
Pearl millet	3	9

Source: ZIMVAC 2012, 2013

3.3.2 Maize yields

Maize yields are generally affected by a number of factors, chief among them being the level of fertilizer use. The proportion of households who apply both basal and ammonium nitrate is low. This is a concern given the input subsidies that donors and government offer annually. On average, smallholder farmers apply about 50 kilograms of each of basal and top dressing fertilizer which is considered too low to guarantee improvements crop production. Looking at the maize yield trends in the communal areas (shown in figure 4 below), it is clear that the sector performed well before the year 2004, and since then has dropped to just over 0.5MT/ha. This is attributable to a number factors such as input supply bottlenecks, non-performance of value chain actors, weather dependency, inherent low use of purchased inputs due to financial constraints and limited access to credit facilities. The APN therefore is an opportunity to finding a panacea for the myriad challenges confronting farmers through improving access to credit facilities, market revitalisation, providing real time and evidence-based innovations in a climate smart manner to enable inter-temporal consumption smoothing by rural farmers.



3.3.3 Livestock production patterns

The majority of farm households rear livestock, including cattle, goats, sheep, poultry and donkeys. Livestock is an integral component of a mixed farming system that households undertake. In dry regions however**,** crop production is reportedly insufficient to sustain livelihood throughout the year. Accordingly, in such regions, livestock farming plays a more critical role than in wet regions.

Table 4.1.4: Cattle ownership patterns (% of households)

Cattle owned	2011/12	2012/13
0	55	58
1	45	42
2-4	-	23
5+	19	19
Draft power	40	34

Source: ZIMVAC 2012 & 2013.

Livestock's potential contribution to livelihoods remains limited due to numerous constraints, including: lack of adequate advisory services for animal health, high mortality rates due to diseases, predation and exposure as a result of poor housing, low off-take rates, as well as an inadequate market infrastructure. Tawonezvi (1991), discovered that even in semi –arid areas of Matabeleland South, where livestock has a comparative advantage, only about 30 percent of households had livestock as their primary source of income. Small livestock therefore play an instrumental role as an immediate source of income as they can be easily sold.

3.3.4 Non-agricultural livelihoods activities

ZIMVAC (2010-2012) confirms that households have multiple livelihoods that include casual labour, remittances, formal wage employment, sale of natural products, petty trading, skilled artisanship, gold panning, beer selling, fishing, begging, cross border trade and currency trading. PICES confirmed similar non-farm activities and also identified primary production, household enterprises and financial assets investment as strategies. Primary production refers to household involvement in the process of production or asset ownership, whose return is in the form of gross wages and salaries. Household enterprises are defined as business entities owned by households but with no separate sets of accounts. Property refers to a household owning a financial asset which yields returns in the form of interest, royalties, dividends or rent. Cited examples of household enterprises are vending, welding, grocery store and others.

4.0 Agricultural livelihoods strategy revisited

In summary of the analysis provided above, agricultural livelihood strategies are characterized by the following determinants:

- **Resource endowment:** smallholder farmers generally have a limited access to key tools of trade such as draft power, equipment and technology to make timely and informed agricultural production decisions. They face with limited access financial services to invest meaningfully on the farm thereby rendering their production systems predominantly traditionally based.

- Farm households continue to employ **traditional risk management strategies**, which are economically inefficient. Mixed farming systems predominate across all regions, disaster avoidance crop production patterns remain in and livestock herds remain uninsured.

- **Imperfect, missing and semi-functional markets (input and output)**: Price differentials between the national and sub-national grain prices present huge disparities which have a net negative effect on smallholders. The distributional effect of markets in bridging the food deficit gaps is constrained due to price differentials, poor transport and communication networks.

- **Land and natural resource tenure systems:** These do not provide incentives for private investments in agriculture and natural resource sectors. Tenure rights are not tradable thereby limiting access to funding for on-farm investments from the financial services sector. Communal areas are accordingly characterised by limited and depreciating on-farm capital, irrigation infrastructure, marketing infrastructure, and tillage technology.

- **Research and extension institutions:** These have not been performing to expectations owing to under capitalisation, high staff turnover and the proliferation of semi-skilled and inexperienced staff. The Public Sector Investment Programme capacity to finance irrigation infrastructure, support research and technical services has declined. The Agricultural Development Fund, a concessionary fund designed to support short, medium and long term agricultural capital administered by the banking sector, has since ceased to exist. These have impacted negatively of the agriculutral households as research-extension linkages have declined.

- **Gender:** In most cases, agricultural innovations and technologies are insensitive to gender differences and are generally labour intensive. This culminates in additional labour requirements (man days and manpower) to participate in or use them thereby competing with existing activities. There is need to conduct thorough ergonomics (user-equipment interface/ relationship) studies for technology related interventions so that these gender related issues and issues of drudgery are addressed for the different gender types.

5.0 Observations and Implications for APN

- Agricultural livelihoods have been compromised by (1) land tenure and agricultural policy frameworks; (2) risk averse management strategies by households; (3) fragmented and imperfect domestic food markets; (4) limited development in the rural financial services, and (5) limited impact of research and extension services, gender dynamics and also limited access to critical assets such as draft power and farm equipment, implements and tools. The APN can contribute to make agriculture a lucrative venture once again enabling farmers to invest meaningfully through improved access to credit facilities, strengthen institutions, improve supporting infrastructure and improved networks.

- Risk of poor harvests is certain in low rainfall regions (IIII, IV, V) where 94 percent of communal area households live. There is need to promoted diversification, irrigated agriculture or insured dryland agriculture.

- Limited availability of cash at the household level in rural areas will continue to push both men and women to seek casual job opportunities for consumption smoothing. Rain-fed agricultural activities may provide on average no more than six months of income for a household. In planning the APN, it will be worth considering consider financing mechanisms for household expenditures during cash deficit periods. One approach would be to facilitate the development of a rural financial services system that mobilizes rural savings and invests such savings in the rural economy.

Annex 1: Average annual cash income (US$) by type of income and sector

Income type	Communal area	
	US$	% of income
Primary income	321	36.1
Property income	8	0.8
Agriculture	522	58.6
Household enterprises	40	4.5
Gross cash income	891	100
Income tax	-3	-0.3
Transfers	328	-
Net cash income	1216	-

Source: PICES-20111/12.

Annex 2: Average annual household income in kind (US$)

Income type	Communal lands	Old resettlement
Own produce	4	6
Imputed rentals	381	439
Firewood	120	125
Imputed medicare	6	6
Education	6	3
Food	590	626
Other transfers	49	34
Gifts	3	4
Wages/payments	53	40
Total	1211	1283

Source: PICES 2011

Annex 3: Average annual household cash and non cash consumption (US$)

Commodity group	Communal area	Old Resettlement
Food and non- alcoholic beverages	1081	1260
Alcoholic beverages, tobacco and narcotics	16	20
Clothing and footwear	109	147
Housing, water, electricity, gas and other fuels	571	590
Furnishings, housing equip. &routine household	151	187

maintenance		
Health	43	46
Transport	110	199
Communication	29	41
Recreation and culture	20	31
Education	90	77
Restaurants and hotels	0	0
Miscellaneous goods and services	34	41
Total	2252	2639

Source: PICES 2011

Annex 4: Maize yield in tonnes per hectare by land user sector

Year	CA	Old Resettlement	National
1993	1069	2084	1653
2000	727	1300	1180
2004	667	1820	1129
2005	310	983	529
2006	607	1338	867
8/9/2007	598	1303	803
2010	578	884	875
2011	428	761	657

Annex 5: Typical Production Patterns

Crop	% planting (2011/12)	% planting (2012/2013)
Maize	79	80
Sorghum	20	17
Pearl Millet	9	7
Finger Millet	7	6
Groundnuts	38	32
Cowpeas	15	-
Sugar beans	4	6

Roundnuts	2.3	-
Soyabeans	1.5	2
Tobacco	4	5
Cotton	12	7
Paprika	3	-
Sunflower	2.9	-

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